Pearson
BTEC Level 3 National Extended Diploma in
Animal
Management

Specification

Pearson
BTEC

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Issue 3

Edexcel, BTEC and LCCI qualifications

Edexcel, BTEC and LCCI qualifications are awarded by Pearson, the UK's largest awarding body offering academic and vocational qualifications that are globally recognised and benchmarked. For further information, please visit our qualifications website at qualifications.pearson.com. Alternatively, you can get in touch with us using the details on our contact us page at qualifications.pearson.com/contactus

About Pearson

Pearson is the world's leading learning company, with 25,000 employees in more than 70 countries working to help people of all ages to make measurable progress in their lives through learning. We put the learner at the centre of everything we do, because wherever learning flourishes, so do people. Find out more about how we can help you and your learners at qualifications.pearson.com

This specification is Issue 3. We will inform centres of any changes to this issue. The latest issue can be found on our website.

Welcome

With a track record built over 30 years of learner success, BTEC Nationals are widely recognised by industry and higher education as the signature vocational qualification at Level 3. They provide progression to the workplace either directly or via study at a higher level. Proof comes from YouGov research, which shows that 62 per cent of large companies have recruited employees with BTEC qualifications. What's more, well over 100,000 BTEC students apply to UK universities every year and their BTEC Nationals are accepted by over 150 UK universities and higher education institutes for relevant degree programmes either on their own or in combination with A Levels.

Why are BTECs so successful?

BTECs embody a fundamentally learner-centred approach to the curriculum, with a flexible, unit-based structure and knowledge applied in project-based assessments. They focus on the holistic development of the practical, interpersonal and thinking skills required to be able to succeed in employment and higher education.

When creating the BTEC Nationals in this suite, we worked with many employers, higher education providers, colleges and schools to ensure that their needs are met. Employers are looking for recruits with a thorough grounding in the latest industry requirements and work-ready skills such as teamwork. Higher education needs students who have experience of research, extended writing and meeting deadlines.

We have addressed these requirements with:

- a range of BTEC sizes, each with a clear purpose, so there is something to suit each learner's choice of study programme and progression plans
- refreshed content that is closely aligned with employers' and higher education needs for a skilled future workforce
- assessments and projects chosen to help learners progress to the next stage. This means some are set by you to meet local needs, while others are set and marked by Pearson so that there is a core of skills and understanding that is common to all learners. For example, a written test can be used to check that learners are confident in using technical knowledge to carry out a certain job.

We are providing a wealth of support, both resources and people, to ensure that learners and their teachers have the best possible experience during their course. See *Section 10* for details of the support we offer.

A word to learners

Today's BTEC Nationals are demanding, as you would expect of the most respected applied learning qualification in the UK. You will have to choose and complete a range of units, be organised, take some assessments that we will set and mark, and keep a portfolio of your assignments. But you can feel proud to achieve a BTEC because, whatever your plans in life – whether you decide to study further, go on to work or an Apprenticeship, or set up your own business – your BTEC National will be your passport to success in the next stage of your life.

Good luck, and we hope you enjoy your course.

Collaborative development

Students completing their BTEC Nationals in Animal Management will be aiming to go on to employment, often via the stepping stone of higher education. It was, therefore, essential that we developed these qualifications in close collaboration with experts from professional bodies, businesses and universities, and with the providers who will be delivering the qualifications. To ensure that the content meets providers' needs and provides high-quality preparation for progression, we engaged experts. We are very grateful to all the university and further education lecturers, teachers, employers, professional body representatives and other individuals who have generously shared their time and expertise to help us develop these new qualifications.

Employers and professional bodies that have worked with us include:

- The British Veterinary Nursing Association
- British Wildlife Centre
- Heythrop Zoological Gardens Ltd
- The Llama Park
- Mini Meadows Farm
- Norfolk Dog Training.

In addition, universities, professional bodies and businesses have provided letters of support confirming that these qualifications meet their entry requirements. These letters can be viewed on our website.

Summary of Pearson BTEC Level 3 National Extended Diploma in Animal Management specification Issue 3 changes

Summary of changes made between the previous issue and this current issue	Page number
The last paragraph of the Qualification and unit content section has been amended to allow centres delivering the qualification above to alter the content to reflect the context of the country where it is being delivered.	Page 6
The External assessment section table has been amended for *Unit 1: Animal Breeding and Genetics* and *Unit 3: Animal Welfare and Ethics* from 'The supervised assessment is 2 hours in a one week period timetabled by Pearson.' to 'The formal supervision takes place in a 2-hour session timetabled by Pearson.'	Page 14
In *Unit 3: Animal Welfare and Ethics*, reference to boarding and riding establishment and breeding and sale of dogs has been removed as a result of a change in animal licensing legislation.	Page 44
In *Unit 16: Animal Grooming*, assessment criterion B.P3 has been amended to remove 'cats'. The *Essential information for assessment decisions* section requirements for Learning aims B and C has been amended from 'Learners must base this assignment on the following animal types: three different coat types in dogs, one cat and two from the following: guinea pig, rabbit or rodent.' to 'Learners must base this assignment on the following animal types: three different coat types in dogs and two from the following: cat, guinea pig, rabbit or rodent.'.	Pages 166 and 169

Summary of Pearson BTEC Level 3 National Extended Diploma in Animal Management specification Issue 2 changes

Summary of changes made between Issue 1 and Issue 2	Page number
Clarification of details within the structure and function of blood and its components in Unit 2, *Essential content*.	Page 34
The wording in Section 7 *Teacher/centre malpractice* has been updated to clarify suspension of certification in certain circumstances.	Page 264
The wording under Section 9 *Understanding the qualification grade* has been updated to clarify current practice in ensuring maintenance and consistency of qualification standards.	Page 268

Contents

Introduction to BTEC National qualifications for the animal management sector

This specification contains the information you need to deliver the Pearson BTEC Level 3 National Extended Diploma in Animal Management. The specification signposts you to additional handbooks and policies. It includes all the units for this qualification.

This qualification is part of the suite of Animal Management qualifications offered by Pearson. In the suite there are qualifications that focus on different progression routes, allowing learners to choose the one best suited to their aspirations.

All qualifications in the suite share some common units and assessments, allowing learners some flexibility in moving between qualifications where they wish to select a more specific progression route. The qualification titles are given below.

Within this suite are BTEC National qualifications for post-16 learners wishing to specialise in a specific industry, occupation or occupational group. The qualifications give learners specialist knowledge and technical skills, enabling entry to an Apprenticeship or other employment, or progression to related higher education courses. Learners taking these qualifications must have a significant level of employer involvement in their programmes.

In the animal management sector these qualifications are:

Pearson BTEC Level 3 National Extended Diploma in Animal Management (1080 GLH) 603/3043/0

Pearson BTEC Level 3 National Diploma in Animal Management (720 GLH) 601/7523/0

Pearson BTEC Level 3 National Foundation Diploma in Animal Management (540 GLH) 601/7525/4

Pearson BTEC Level 3 National Extended Certificate in Animal Management (360 GLH) 601/7524/2.

This specification signposts all the other essential documents and support that you need as a centre in order to deliver, assess and administer the qualification, including the staff development required. A summary of all essential documents is given in *Section 7*. Information on how we can support you with this qualification is given in *Section 10*.

The information in this specification is correct at the time of publication.

Total Qualification Time

For all regulated qualifications, Pearson specifies a total number of hours that it is estimated learners will require to complete and show achievement for the qualification: this is the Total Qualification Time (TQT). Within TQT, Pearson identifies the number of Guided Learning Hours (GLH) that we estimate a centre delivering the qualification might provide. Guided learning means activities, such as lessons, tutorials, online instruction, supervised study and giving feedback on performance, that directly involve teachers and assessors in teaching, supervising and invigilating learners. Guided learning includes the time required for learners to complete external assessment under examination or supervised conditions.

In addition to guided learning, other required learning directed by teachers or assessors will include private study, preparation for assessment and undertaking assessment when not under supervision, such as preparatory reading, revision and independent research.

BTEC Nationals have been designed around the number of hours of guided learning expected. Each unit in the qualification has a GLH value of 60, 90 or 120. There is then a total GLH value for the qualification.

Each qualification has a TQT value. This may vary within sectors and across the suite, depending on the nature of the units in each qualification and the expected time for other required learning.

The following table shows all the qualifications in this sector and their GLH and TQT values.

Qualifications, sizes and purposes at a glance

Title	Size and structure	Summary purpose
Pearson BTEC Level 3 National Extended Certificate in Animal Management	360 GLH (475 TQT) Equivalent in size to one A Level. Five units all of which are mandatory and one is external. Mandatory content (100%). External assessment (33%).	This qualification offers an engaging programme to support learners who want to pursue a career in an animal-related industry. It is intended as a Tech Level qualification. This size of qualification allows learners to study related and complementary qualifications alongside it, without duplication of content. It prepares learners for an Apprenticeship in animal management. When taken alongside further Level 3 qualifications, it supports access to a range of higher education courses in the animal management sector
Pearson BTEC Level 3 National Foundation Diploma in Animal Management	540 GLH (1065 TQT) Equivalent in size to one and half A Levels. Seven units of which six are mandatory and two are external. Mandatory content (89%). External assessment (44%).	This qualification is designed as a one-year, full-time course, or as part of a two-year, full-time study programme for learners who wish to take it alongside another area of contrasting study. It is intended as a Tech Level qualification and supports access to careers in the animal management sector. This qualification is primarily for learners who are intending to gain employment directly, or progress to an Apprenticeship or a higher level animal management qualification.
Pearson BTEC Level 3 National Diploma in Animal Management	720 GLH (1295 TQT) Equivalent in size to two A Levels. 10 units of which seven are mandatory and two are external. Mandatory content (75%). External assessment (33%).	This qualification is designed to be the substantive part of a 16–19 study programme for learners who want a strong core of sector study. It is intended as a Tech Level qualification and supports access to careers in the animal management sector. The qualification is a one-year, full-time course that is a comprehensive introduction to the sector, and is primarily for learners who are intending to gain employment directly, or progress to an Apprenticeship or a higher level animal management qualification.
Pearson BTEC Level 3 National Extended Diploma in Animal Management	1080 GLH (1770 TQT) Equivalent in size to three A Levels. 15 units of which eight are mandatory and three are external. Mandatory content (61%). External assessment (33%).	This qualification is a two-year, full-time course that specialises in the animal management sector. It is designed for learners who wish to focus their studies on this sector, with a firm intention of progressing to employment in one of the wide variety of roles available. The qualification is for post-16 learners and is intended as a Tech Level qualification.

Structures of the qualifications at a glance

This table shows all the units and the qualifications to which they contribute. The full structure for this Pearson BTEC Level 3 National in Animal Management is shown in *Section 2*. **You must refer to the full structure to select units and plan your programme.**

Key

	Unit assessed externally	**M**	**Mandatory units**	**O**	**Optional units**

Unit (number and title)	Unit size (GLH)	Extended Certificate (360 GLH)	Foundation Diploma (540 GLH)	Diploma (720 GLH)	Extended Diploma (1080 GLH)
1 Animal Breeding and Genetics	120				M
2 Animal Biology	120		M	M	M
3 Animal Welfare and Ethics	120	M	M	M	M
4 Practical Animal Husbandry	60	M	M	M	M
5 Animal Behaviour	60	M	M	M	M
6 Animal Health and Diseases	60	M	M	M	M
7 Work Experience in the Animal Sector	60	M	M	M	M
8 Investigative Research Project	60			M	M
9 Practical Skills in Animal Science	60				O
10 Animal Metabolism	60				O
11 Advanced Animal Nutrition	60				O
12 Business Management in the Animal Sector	60		O	O	O
13 Animal Management in a Retail Environment	60		O	O	O
14 Animals in Boarding Establishments	60		O	O	O
15 Developing an Enterprise in the Animal Sector	60		O	O	O
16 Animal Grooming	60		O	O	O
17 Principles of Animal Nursing	60		O	O	O
18 Aquatic Animal Health and Husbandry	60		O	O	O
19 Farm Livestock Husbandry	60		O	O	O

continued overleaf

Unit (number and title)	Unit size (GLH)	Extended Certificate (360 GLH)	Foundation Diploma (540 GLH)	Diploma (720 GLH)	Extended Diploma (1080 GLH)
20 Human and Animal Interaction	60		O	O	O
21 Exotic Animal Husbandry	60		O	O	O
22 Practical Estate Planning, Construction and Maintenance	60		O	O	O
23 Zoological Animal Health and Husbandry	60		O	O	O
24 Wildlife Ecology and Conservation Management	60		O	O	O

Qualification and unit content

Pearson has developed the content of the new BTEC Nationals in collaboration with employers and representatives from higher education and relevant professional bodies. In this way, we have ensured that content is up to date and that it includes the knowledge, understanding, skills and attributes required in the sector.

Each qualification in the suite has its own purpose. The mandatory content provides a balance of breadth and depth ensuring that all learners have a strong basis for developing technical skills required in the sector. Learners are then offered the opportunity to develop a range of technical skills and attributes expected by employers with some opportunity to select between optional units where a degree of choice for individual learners to study content relevant to their own progression choices is appropriate. It is expected that learners will apply their learning in relevant employment and sector contexts during delivery and have opportunities to engage meaningfully with employers.

The proportion of mandatory content ensures that all learners are following a coherent programme of study and acquiring the knowledge, understanding and skills that will be recognised and valued. Learners are expected to show achievement across mandatory units as detailed in *Section 2*.

BTEC Nationals have always required applied learning that brings together knowledge and understanding (the cognitive domain) with practical and technical skills (the psychomotor domain). This is achieved through learners performing vocational tasks that encourage the development of appropriate vocational behaviours (the affective domain) and transferable skills. Transferable skills are those such as communication, teamwork, planning and completing tasks to high standards, which are valued in both the workplace and in higher education.

Our approach provides rigour and balance, and promotes the ability to apply learning immediately in new contexts. Further details can be found in *Section 2*.

Centres should ensure that delivery of content is kept up to date. Some of the units within the specification may contain references to legislation, policies, regulations and organisations, which may not be applicable in the country you deliver this qualification in (if teaching outside of England), or which may have gone out-of-date during the lifespan of the specification. In these instances, it is possible to substitute such references with ones that are current and applicable in the country you deliver subject to confirmation by your Standards Verifier.

Assessment

Assessment is specifically designed to fit the purpose and objective of the qualification. It includes a range of assessment types and styles suited to vocational qualifications in the sector. There are three main forms of assessment that you need to be aware of: external, internal and synoptic.

Externally-assessed units

Each external assessment for a BTEC National is linked to a specific unit. All of the units developed for external assessment are of 120 GLH to allow learners to demonstrate breadth and depth of achievement. Each assessment is taken under specified conditions, then marked by Pearson and a grade awarded. Learners are permitted to resit external assessments during their programme. You should refer to our website for current policy information on permitted retakes.

The styles of external assessment used for qualifications in the Animal Management suite are:

- examinations – all learners take the same assessment at the same time, normally with a written outcome
- set tasks – learners take the assessment during a defined window and demonstrate understanding through completion of a vocational task.

Some external assessments include a period of preparation using set information. External assessments are available twice a year. For detailed information on the external assessments please see the table in *Section 2*. For further information on preparing for external assessment see *Section 5*.

Internally-assessed units

Most units in the sector are internally assessed and subject to external standards verification. This means that you set and assess the assignments that provide the final summative assessment of each unit, using the examples and support that Pearson provides. Before you assess you will need to become an approved centre, if you are not one already. You will need to prepare to assess using the guidance in *Section 6*.

In line with the requirements and guidance for internal assessment, you select the most appropriate assessment styles according to the learning set out in the unit. This ensures that learners are assessed using a variety of styles to help them develop a broad range of transferable skills. Learners could be given opportunities to:

- demonstrate practical and technical skills using appropriate equipment and processes
- complete realistic tasks to meet specific briefs or particular purposes
- write up the findings of their own research
- use case studies to explore complex or unfamiliar situations
- carry out projects for which they have choice over the direction and outcomes.

You will make grading decisions based on the requirements and supporting guidance given in the units. Learners may not make repeated submissions of assignment evidence. For further information see *Section 6*.

Synoptic assessment

Synoptic assessment requires learners to demonstrate that they can identify and use effectively, in an integrated way, an appropriate selection of skills, techniques, concepts, theories and knowledge from across the whole sector as relevant to a key task. BTEC learning has always encouraged learners to apply their learning in realistic contexts using scenarios and realistic activities that will permit learners to draw on and apply their learning. For these qualifications we have formally identified units which contain a synoptic assessment task. Synoptic assessment must take place after the teaching and learning of other mandatory units in order for learners to be able to draw from the full range of content. The synoptic assessment gives learners an opportunity to independently select and apply learning from across their programmes in the completion of a vocational task. Synoptic tasks may be in internally- or externally-assessed units. The particular unit that contains the synoptic tasks for this qualification is shown in the structure in *Section 2*.

Language of assessment

Assessment of the internal and external units for these qualifications will be available in English. All learner work must be in English. A learner taking the qualifications may be assessed in British or Irish Sign Language where it is permitted for the purpose of reasonable adjustment. For information on reasonable adjustments see *Section 7*.

Grading for units and qualifications

Achievement in the qualification requires a demonstration of depth of study in each unit, assured acquisition of a range of practical skills required for employment or progression to higher education, and successful development of transferable skills. Learners achieving a qualification will have achieved across mandatory units, including external and synoptic assessment.

Units are assessed using a grading scale of Distinction (D), Merit (M), Pass (P), Near Pass (N) and Unclassified (U). The grade of Near Pass is used for externally-assessed units only. All mandatory and optional units contribute proportionately to the overall qualification grade, for example a unit of 120 GLH will contribute double that of a 60 GLH unit.

Qualifications in the suite are graded using a scale of P to D*, **or** PP to D*D*, **or** PPP to D*D*D*. Please see *Section 9* for more details. The relationship between qualification grading scales and unit grades will be subject to regular review as part of Pearson's standards monitoring processes on the basis of learner performance and in consultation with key users of the qualification.

UCAS Tariff points

The BTEC Nationals attract UCAS points. Please go to the UCAS website for full details of the points allocated.

1 Qualification purpose

Pearson BTEC Level 3 National Extended Diploma in Animal Management

In this section you will find information on the purpose of this qualification and how its design meets that purpose through the qualification objective and structure. We publish a full 'Statement of Purpose' for each qualification on our website. These statements are designed to guide you and potential learners to make the most appropriate choice about the size of qualification suitable at recruitment.

Who is this qualification for?

The Pearson BTEC Level 3 National Extended Diploma in Animal Management, which is 1080 GLH, is intended as a Tech Level qualification, equivalent in size to three A Levels and, as such, is designed to meet the Tech Bacc measure, if studied alongside Level 3 mathematics and the Extended Project Qualification (EPQ). Outside the Tech Bacc, it will normally be the only qualification in a two-year study programme, and is ideal for learners looking for a full-time course specialising in the animal management sector, or who want to work in the animal industry or envisage a career in animal occupation(s) or animal technical role(s).

As well as direct entry to employment, this qualification will prepare learners for higher study of a specialist degree or BTEC Higher National Diploma. This route gives learners the opportunity to enter the sector at a higher level, or in a more specialist role. No prior study of the sector is needed, but learners should normally have a range of achievement at Level 2, in GCSEs or equivalent qualifications, including English, mathematics and science.

What does this qualification cover?

The content of this qualification has been developed in consultation with employers and professional bodies to ensure that it is appropriate for those interested in working in the sector.

In addition, higher education representatives have been involved to ensure that it fully supports entry to the relevant range of specialist degrees.

There are eight mandatory units, which cover the following aspects of animal management:

- animal breeding and genetics
- animal biology
- animal welfare and ethics
- practical animal husbandry
- animal behaviour
- animal health and diseases
- work experience in the animal sector
- investigative research project.

Learners will have the opportunity to work with different types of animals, from small to large domesticated and exotic animals, in order to prepare them for working in sector specialist areas.

Learners will be able to add seven optional units to the animal management mandatory content. This will allow them to explore possible progression to a wide range of employment opportunities and to a range of higher education courses. Optional units allow learners to specialise in areas of their choice including working in particular environments that link with relevant occupational areas.

The optional units cover aspects such as:

- business management in the animal sector
- animal management in a retail environment
- animals in boarding establishments
- developing an enterprise in the animal sector
- animal grooming
- principles of animal nursing
- aquatic animal health and husbandry

- farm livestock husbandry
- human and animal interaction
- exotic animal husbandry
- practical estate planning, construction and maintenance
- zoological animal health and husbandry
- wildlife ecology and conservation management
- practical skills in animal science
- animal metabolism
- advanced animal nutrition.

While taking this qualification, it is expected that learners will engage with sector employers as part of their course, including 300 hours of work experience with an employer in the sector, where they will be given opportunities to develop practical skills in preparation for employment.

What could this qualification lead to?

This qualification will prepare learners for direct employment in the animal management sector, and is suitable for learners who wish to enter a particular specialist area of work, such as:

- animal technician, in an animal breeding, educational centre or research organisation
- animal welfare centre manager, in a range of industries, including boarding establishments, sanctuaries and city farms
- pet-store manager
- animal nutritionist
- kennel and cattery manager
- rescue centre manager
- assistant zookeeper
- animal officer/inspector
- livestock manager.

There are many roles in this sector where recruitment is at graduate level. The qualification carries UCAS points and is recognised by higher education providers as meeting admission requirements to many relevant courses, for example:

- BSc (Hons) in Animal Management
- BSc (Hons) in Agriculture
- Foundation Degree in Animal Management and Behaviour (FdSc)
- Foundation Degree in Animal Management (FdSc)
- HND Animal Management.

Learners should always check the entry requirements for degree programmes at specific higher education providers.

How does the qualification provide employability and technical skills?

In the BTEC National units, there are opportunities during the teaching and learning phase to give learners practice in developing employability skills. Where employability skills are referred to in this specification, we are generally referring to skills in the following three main categories:

- **cognitive and problem-solving skills:** using critical thinking, approaching non-routine problems applying expert and creative solutions, using systems and technology
- **interpersonal skills:** communicating, working collaboratively, negotiating and influencing, self-presentation
- **intrapersonal skills:** self-management, adaptability and resilience, self-monitoring and development.

There are also specific requirements in some units for assessment of these skills where relevant, for example, where learners are required to undertake real or simulated activities.

Many of the mandatory and specified optional units encourage learners to develop the specific practical skills that employers are looking for.

How does the qualification provide transferable knowledge and skills for higher education?

All BTEC Nationals provide transferable knowledge and skills that prepare learners for progression to university or other higher study either immediately or for career progression. The transferable skills that universities value include:

- the ability to learn independently
- the ability to research actively and methodically
- being able to give presentations and being active group members.

BTEC learners can also benefit from opportunities for deep learning where they are able to make connections among units and select areas of interest for detailed study. BTEC Nationals provide a vocational context in which learners can become prepared for lifelong learning through:

- reading technical texts
- effective writing
- analytical skills
- creative development
- preparation for assessment methods used in degrees.

2 Structure

Qualification structure

Pearson BTEC Level 3 National Extended Diploma in Animal Management

Mandatory units

There are eight mandatory units, five internal and three external. Learners must complete and achieve at Near Pass grade or above in all mandatory external units and achieve a Pass or above in all mandatory internal units in group A. Learners must complete all units from group B.

Optional units

Learners must complete seven optional units from group C.

Unit number	Unit title	GLH	Type	How assessed
Pearson BTEC Level 3 National Extended Diploma in Animal Management				
	Mandatory units group A – learners complete and achieve all units			
1	Animal Breeding and Genetics	**120**	**Mandatory**	External
2	Animal Biology	**120**	**Mandatory**	External
3	Animal Welfare and Ethics	**120**	**Mandatory Synoptic**	External
4	Practical Animal Husbandry	**60**	**Mandatory**	Internal
5	Animal Behaviour	**60**	**Mandatory**	Internal
	Mandatory units group B – learners complete all units			
6	Animal Health and Diseases	**60**	**Mandatory**	Internal
7	Work Experience in the Animal Sector	**60**	**Mandatory**	Internal
8	Investigative Research Project	**60**	**Mandatory**	Internal
	Optional units – learners complete 7 units			
9	Practical Skills in Animal Science	**60**	**Optional**	Internal
10	Animal Metabolism	**60**	**Optional**	Internal
11	Advanced Animal Nutrition	**60**	**Optional**	Internal
12	Business Management in the Animal Sector	**60**	**Optional**	Internal
13	Animal Management in a Retail Environment	**60**	**Optional**	Internal
14	Animals in Boarding Establishments	**60**	**Optional**	Internal
15	Developing an Enterprise in the Animal Sector	**60**	**Optional**	Internal
16	Animal Grooming	**60**	**Optional**	Internal
17	Principles of Animal Nursing	**60**	**Optional**	Internal
18	Aquatic Animal Health and Husbandry	**60**	**Optional**	Internal
19	Farm Livestock Husbandry	**60**	**Optional**	Internal
20	Human and Animal Interaction	**60**	**Optional**	Internal
21	Exotic Animal Husbandry	**60**	**Optional**	Internal

Unit number	Unit title	GLH	Type	How assessed
22	Practical Estate Planning, Construction and Maintenance	60	**Optional**	Internal 13
23	Zoological Animal Health and Husbandry	60	**Optional**	Internal
24	Wildlife Ecology and Conservation Management	60	**Optional**	Internal

External assessment

This is a summary of the type and availability of external assessment, which is of units making up 33 per cent of the total qualification GLH. See *Section 5* and the units and sample assessment materials for more information.

Unit	Type	Availability
Unit 1: Animal Breeding and Genetics	• A task set and marked by Pearson, completed under supervised conditions. • Prior to the supervised assessment, learners will be provided with information to research in approximately 3 hours in a two week period timetabled by Pearson. • The formal supervision takes place in a 2-hour session timetabled by Pearson. • Written submission of evidence. • 80 marks.	**Dec/Jan and May/June** **First assessment May/June 2019**
Unit 2: Animal Biology	• A written examination set and marked by Pearson. • 1 hour and 30 minutes. • Written submission. • 80 marks.	**Jan and May/June** **First assessment May/June 2019**
Unit 3: Animal Welfare and Ethics	• A task set and marked by Pearson and completed under supervised conditions. • Prior to the supervised assessment, learners will be provided with a scenario to research in approximately 3 hours in a two week period timetabled by Pearson. • The formal supervision takes place in a 2-hour session timetabled by Pearson. • Written submission. • 60 marks.	**Dec/Jan and May/June** **First assessment May/June 2019**

Synoptic assessment

The mandatory synoptic assessment requires learners to apply learning from across the qualification to the completion of a defined vocational task. Within the assessment for *Unit 3: Animal Welfare and Ethics*, learners complete welfare appraisals and subsequent recommendations relating to given animal situations, drawing on underpinning values, principles, and legislative requirements applied throughout working practices in the sector. Learners complete the task using knowledge and understanding from their studies of the sector and apply both transferable and specialist knowledge and skills.

In delivering the unit you need to encourage learners to draw on their broader learning so they will be prepared for the assessment.

Employer involvement in assessment and delivery

You need to ensure that learners on this qualification have a significant level of employer involvement in programme delivery or assessment. See *Section 4* for more information.

3 Units

Understanding your units

The units in this specification set out our expectations of assessment in a way that helps you to prepare your learners for assessment. The units help you to undertake assessment and quality assurance effectively.

Each unit in the specification is set out in a similar way. There are two types of unit format:

- internal units
- external units.

This section explains how the units work. It is important that all teachers, assessors, internal verifiers and other staff responsible for the programme review this section.

Internal units

Section	Explanation
Unit number	The number is in a sequence in the sector. Numbers may not be sequential for an individual qualification.
Unit title	This is the formal title that we always use and it appears on certificates.
Level	All units are at Level 3 on the national framework.
Unit type	This shows if the unit is internal or external only. See structure information in *Section 2* for full details.
GLH	Units may have a GLH value of 120, 90 or 60. This indicates the numbers of hours of teaching, directed activity and assessment expected. It also shows the weighting of the unit in the final qualification grade.
Unit in brief	A brief formal statement on the content of the unit that is helpful in understanding its role in the qualification. You can use this in summary documents, brochures etc.
Unit introduction	This is designed with learners in mind. It indicates why the unit is important, how learning is structured, and how learning might be applied when progressing to employment or higher education.
Learning aims	These help to define the scope, style and depth of learning of the unit. You can see where learners should be learning standard requirements ('understand') or where they should be actively researching ('investigate'). You can find out more about the verbs we use in learning aims in *Appendix 2*.
Summary of unit	This new section helps teachers to see at a glance the main content areas against the learning aims and the structure of the assessment. The content areas and structure of assessment are required. The forms of evidence given are suitable to fulfil the requirements.
Content	This section sets out the required teaching content of the unit. Content is compulsory except when shown as 'e.g.'. Learners should be asked to complete summative assessment only after the teaching content for the unit or learning aim(s) has been covered.

Section	Explanation
Assessment criteria	Each learning aim has Pass and Merit criteria. Each assignment has at least one Distinction criterion.
	A full glossary of terms used is given in *Appendix 2*. All assessors need to understand our expectations of the terms used.
	Distinction criteria represent outstanding performance in the unit. Some criteria require learners to draw together learning from across the learning aims.
Essential information for assignments	This shows the maximum number of assignments that may be used for the unit to allow for effective summative assessment, and how the assessment criteria should be used to assess performance.
Further information for teachers and assessors	The section gives you information to support the implementation of assessment. It is important that this is used carefully alongside the assessment criteria.
Resource requirements	Any specific resources that you need to be able to teach and assess are listed in this section. For information on support resources see *Section 10*.
Essential information for assessment decisions	This information gives guidance for each learning aim or assignment of the expectations for Pass, Merit and Distinction standard. This section contains examples and essential clarification.
Links to other units	This section shows you the main relationship among units. This section can help you to structure your programme and make best use of materials and resources.
Employer involvement	This section gives you information on the units that can be used to give learners involvement with employers. It will help you to identify the kind of involvement that is likely to be successful.

External units

Section	Explanation
Unit number	The number is in a sequence in the sector. Numbers may not be sequential for an individual qualification.
Unit title	This is the formal title that we always use and it appears on certificates.
Level	All units are at Level 3 on the national framework.
Unit type	This shows if the unit is internal or external only. See structure information in *Section 2* for full details.
GLH	Units may have a GLH value of 120, 90 or 60. This indicates the numbers of hours of teaching, directed activity and assessment expected. It also shows the weighting of the unit in the final qualification grade.
Unit in brief	A brief formal statement on the content of the unit.
Unit introduction	This is designed with learners in mind. It indicates why the unit is important, how learning is structured, and how learning might be applied when progressing to employment or higher education.
Summary of assessment	This sets out the type of external assessment used and the way in which it is used to assess achievement.
Assessment outcomes	These show the hierarchy of knowledge, understanding, skills and behaviours that are assessed. Includes information on how this hierarchy relates to command terms in sample assessment materials (SAMs).
Essential content	For external units all the content is obligatory, the depth of content is indicated in the assessment outcomes and sample assessment materials (SAMs). The content will be sampled through the external assessment over time, using the variety of questions or tasks shown.
Grade descriptors	We use grading descriptors when making judgements on grade boundaries. You can use them to understand what we expect to see from learners at particular grades.
Key terms typically used in assessment	These definitions will help you analyse requirements and prepare learners for assessment.
Resources	Any specific resources that you need to be able to teach and assess are listed in this section. For information on support resources see *Section 10*.
Links to other units	This section shows the main relationship among units. This section can help you to structure your programme and make best use of materials and resources.
Employer involvement	This section gives you information on the units that can be used to give learners involvement with employers. It will help you to identify the kind of involvement that is likely to be successful.

Index of units

This section contains all the units developed for this qualification. Please see *pages 4–5* to check which units are available in all qualifications in the animal management sector.

Unit 1: Animal Breeding and Genetics

Level: **3**
Unit type: **External**
Guided learning hours: **120**

Unit in brief

Learners study the science of genes and genetic factors influencing the management of breeding animals. Learners will develop skills to evaluate and care for breeding stock and offspring.

Unit introduction

The study of genetics and genes dates back to the mid-1800s but most information about genes and how they interact has been explained only in the last few decades. Understanding the principles and practices of animal breeding science is core to the development of good animal husbandry practices.

In this unit, you will explore the skills and knowledge you need to be able to manage the successful breeding of captive animals, including the assessment of animals before mating, care of breeding stock and the female following conception, and care of the young, particularly in the first 48 hours of life. You will learn the principles of genetics and the use of genetic manipulation in breeding captive animal populations.

The unit will help you if you want to move directly to employment where active animal breeding programmes are managed. If you want to continue your studies at higher education level, for example for a degree in animal science, the unit will give you the scientific and practical knowledge you need.

Summary of assessment

This unit is assessed through a task set and marked by Pearson, consisting of a Part A and a Part B.

For Part A, learners will be given information relating to a specific species of animal in order to carry out preparatory monitored research. Learners are expected to spend three hours on this research.

For Part B, learners will complete the set task using their preparatory research. The task will involve a number of activities enabling learners to demonstrate their knowledge and understanding of animal breeding and genetics.

Learners will take Part B under supervised conditions in a single two-hour session timetabled by Pearson.

The total number of marks for the task is 80.

The assessment availability is December/January and May/June each year.

Sample assessment materials will be available to help centres prepare for assessment.

Assessment outcomes

AO1 Demonstrate knowledge and understanding of principles, practices, techniques and strategies related to animal breeding and genetics

Command words: calculate, describe, define, explain, give, state

Marks: ranges from 1 to 4 marks

AO2 Apply knowledge and understanding of principles, practices, techniques and strategies related to animal breeding and genetics to real-life breeding scenarios

Command words: calculate, describe, explain

Marks: ranges from 2 to 12 marks

AO3 Analyse and evaluate information relating to animal breeding and genetics, demonstrating the ability to interpret the potential impact and influence on breeding plan success

Command words: assess, analyse, evaluate, discuss

Marks: ranges from 6 to 12 marks

AO4 Be able to develop breeding management programmes and recommend breeding strategies in context with appropriate justification

Command words: assess, analyse, evaluate, discuss

Marks: ranges from 6 to 12 marks

Essential content

The essential content is set out under content areas. Learners must cover all specified content before the assessment.

A Examine the principles and practices of breeding captive animals to maximise success

A1 Reproductive strategies

- Mate recognition systems in mammals, herptiles and avian species.
- Maternal and paternal care of neonates, strategies used by mammalian and avian species.
- Survival success and strategies employed by different taxa and how these are used to benefit species.

A2 Construction of breeding programmes

- Breeding value estimation.
- Selection and mating schemes.
- Inbreeding coefficients/pedigrees.
- European Studbook Foundation (ESF).
- Selection differential.
- Intensity of selection.
- Response to selection.

A3 Animal evaluation

- Handling techniques and strategies.
- Temperament.
- Routine practices.
- Use of equipment.
- Use of information resources, breed profiles, diagrams and images.

B Investigate management practices of breeding and young animals and how they contribute to successful breeding management

B1 Selection of breeding stock

- Reasons for breeding, including pet trade, food production, sports, endangered species and conservation.
- Use of pedigrees in breeding programmes.
- Economies and the impact of animal breeding.
- Desirable characteristics in mammals, herptiles and avians.

B2 Assessment and evaluation of males, females and young animals

- Factors affecting breeding considerations (appropriate to species):
  o mouth/teeth/beak
  o eyes
  o head shape/size
  o horns
  o skin/coat/feather colour
  o limbs
  o claws/hooves/feet
  o anus/cloaca/genitals
  o posture and conformation
  o frequency of egg laying
  o duration and requirements of incubation.

- Assessment for suitability for breeding both males and females.
- Body condition scoring in mammals.
- Ageing of the animal based on teeth (as appropriate).
- Behavioural/temperament assessment.
- Identification of subtle traits in the male and female animal:
  - limbs
  - genitalia
  - teeth in mammals
  - eyes
  - teats in mammals
  - species-specific sexual characteristics.

B3 Management of breeding stock

- Diet and nutritional requirements for mammals, herptiles and avians.
- Housing.
- Incubation and hatching for herptiles and avians.
- Breeding female for mammals, herptiles and avians.
- Identification of ovulation:
  - oestrous cycle
  - role of hormones.
- Pregnancy diagnosis in mammals by visual methods.
- Fertility management.
- Purpose and methods of contraception.
- Centralised and manual record keeping:
  - identification
  - breeding
  - production
  - feeding
  - disease and treatment (veterinary)
  - breeding plans
  - financial records.

B4 Conception and parturition

- Preparation for carrying out mating.
- Methods and techniques for identification of conception.
- Health and safety:
  - risk assessments
  - personal protective equipment (PPE).
- Preparation for stages of parturition.
- Preparatory stage and expulsion stage.
- Problems arising in the run-up to birth and during parturition.
- Monitoring the female and the offspring.

B5 Care plans

- Preparing for the first 24–48 hours of life.
- Identification of the stages of development of the juvenile animal.
- Appropriate housing.
- Nutritional needs and planning.
- Health maintenance.
- Equipment for care of neonates until weaned or hatched.
- Signs of poor health.

- Prevention, causes and treatment of common diseases.
- Problems and solutions associated with orphan animals.
- Hand-rearing and fostering.

B6 Implementation of care plans, monitoring and recording progress of the offspring's first 24–48 hours of life and development to weaning or adulthood

B7 Management of offspring from birth to weaning, monitoring progress of offspring, recording systems, supportive measures

B8 Legislative requirements for breeding animals

- Animal Welfare Act 2006.
- Species-specific legislation.

B9 Common problems

- Deformities in livestock.
- Poor weight gain.
- Congenital and hereditary conditions, including cryptorchidism, atresia, hernias, glycogen storage disease, polydactyly and scoliosis.
- Hydration.
- Temperature, pulse and respiration signs and monitoring (vitals).
- Neonatal supportive measures and likely treatments, including stomach tubing, incubation, access to colostrum, humidity, environmental temperature, heat lamps and supportive medicines/treatments (nutritional support).

C Examine how the principles of genetics and genetic manipulation advance animal breeding in captive animal populations

C1 Reproductive technologies

- To include DNA screening, genetic analysis, hormone therapy, devices and techniques used to identify ovulation, artificial insemination, superovulation, synchronisation, embryo transfer, cloning, sperm sexing, genetic engineering, pregnancy diagnosis and gene therapy.
- Principles and applications in animal collections and breeding programmes should be explored.

C2 Mendelian genetics

Principles and practices of Mendel's work on pea plants:

- genetic diagrams to F2 to include monohybrid and dihybrid crosses
- analysis of genotypic and phenotypic ratios of offspring
- using simple probability tests
- Punnett squares
- Mendel's three laws of inheritance.

C3 Gene interactions

- Lethal alleles, incomplete dominance, co-dominance, multiple alleles, epistatic effects, sex linkage and sex-influenced effects.

C4 Gene mutation and evolution of mutation rate

Rates of change through

- mutation, variation, adaptation
- sequenced genomes.

C5 Spontaneous and induced mutations

- Point, insertion, deletion, duplication, translocation, frameshift, nonsense, missense, neutral and silent; the effect of mutations on variation (harmful, beneficial and neutral).

C6 Mating implications

- Non-random mating, positive assortative mating and negative assortative mating, outbreeding and inbreeding depression.

C7 Techniques

Genetic manipulation techniques used:

- DNA extraction/DNA markers
- gel electrophoresis
- recombinant DNA technology
- use of restriction enzymes
- use of vectors in transduction and transfection
- marker genes
- polymerase chain reaction (PCR)
- knockout mice, cloning.

C8 Stages in the process of genetic modification, plasmids and the insertion process

- Identification and isolation of the gene interest.
- Amplifying the gene to produce many copies.
- Associating the gene with an appropriate promoter and insertion into plasmids.
- Multiplying the plasmid in bacteria and recovering the cloned construct for injection.
- Transference of the construct into the recipient tissue, usually fertilised eggs.
- Integration of gene into recipient genome.
- Expression of gene in recipient genome.
- Inheritance of gene through further generations.

C9 Applications

Applications of gene manipulation in animal science:

- insulin production
- transgenics
- alpha-1 antitrypsin production
- gene therapy
- DNA screening/testing
- genetic testing (Severe Combined Immunodeficiency (SCID) in Arabian horses, von Willebrand's disease in dogs, Freemartinism in cattle)
- 'pharming' (production of medically useful products in the milk of goats, sheep and cows)
- gene targeting for analysis of gene regulation and function.

C10 Livestock improvement for production

Improving livestock breeds for improved production factors:

- traits and/or disease resistance
- gene hunting
- enzyme manipulation of DNA
- restriction enzymes.

C11 Genetic manipulation evaluation

Advantages and disadvantages:

- commercial, social, practical implications of techniques and potential ways in which these may be overcome.

C12 Animal ethics

Ethical considerations for altering animals through genetic manipulation:

- ethical considerations and issues faced by the use of genetic manipulation techniques in animals
- transgenic and 'pharm' animals, biotechnology advantages and disadvantages
- regulation of genetic engineering in animals
- European Food Safety Authority (EFSA) control on genetic modification of animals for the food industry.

Grade descriptors

To achieve a grade a learner is expected to demonstrate these attributes across the essential content of the unit. The principle of best fit will apply in awarding grades.

Level 3 Pass

Learners demonstrate knowledge and understanding of animal breeding principles, practices and techniques in context. They will show an understanding of animal assessment and the ability to make judgements on animals for breeding and their resulting offspring. Learners can justify the use of strategies in the breed planning for a species and are able to assess both the female and male of the species for suitability to be part of a selected breeding programme.

Level 3 Distinction

Learners demonstrate a thorough knowledge and understanding of animal breeding principles, practices and techniques in context. They will show a detailed understanding of animal assessment and demonstrate analytical and evaluative abilities, leading to justified recommendations on animals for breeding and their resulting offspring. Learners can fully justify the use of strategies in the breed planning for a species and are able to comprehensively assess both the female and male of the species for suitability to be part of a selected breeding programme.

Key terms typically used in assessment

The following table shows the key terms that will be used consistently by Pearson in our assessments to ensure students are rewarded for demonstrating the necessary skills.

Please note: the list below will not necessarily be used in every paper/session and is provided for guidance only.

Command or term	Definition
Calculate	Learners obtain a numerical answer, showing relevant working.
Compare	Learners identify the main factors relating to two or more items/situations or aspects of a subject that is extended to explain the similarities, differences, advantages and disadvantages.
Complete	Learners provide all items.
Define	Learners state or describe the nature, scope or meaning of a subject as objective facts.
Describe	Learners give a clear, objective account in their own words showing recall, and in some cases application, of the relevant features and information about a subject or process.
Discuss	Learners consider different aspects of a topic and how they interrelate.
Explain	Learners show they understand the origins, functions and objectives of a subject and its suitability for purpose. They give reasons to support an opinion, view or argument, with clear details.
Give	Learners provide one or more piece(s) of information.
Justify	Learners give evidence to support (either the statement given in the question or an earlier answer).
Identify	Usually requires some key information to be selected from a given stimulus/source.
Label	Learners name or provide key information about a stimulus material.
Plot	Learners insert given data on a given graph. This may be a single point or involve drawing lines of best fit/completing a line graph/bar chart.
State	Learners express the condition of or facts about something definitely or clearly.

Links to other units

This unit links to *Unit 2: Animal Biology*.

Employer involvement

This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local animal businesses
- opportunities for observation of organisational/business application during work experience
- support from local animal business staff as mentors.

Unit 2: Animal Biology

Level: **3**

Unit type: **External**

Guided learning hours: **120**

Unit in brief

Learners study animal anatomy and physiology at the systemic and cellular level, along with the science of animal classifications.

Unit introduction

There is great variety in the animal kingdom; each species is adapted to individual environments, diets and lifestyles. An understanding of animal anatomical and physiological systems, including common disorders and imbalances, enables one to plan for and manage the good health and welfare of both wild and domestic mammals and birds. Classification of such a vast number of species allows them to be studied in a more systematic way, tracing how natural selection has shaped evolutionary history.

In this unit, you will explore how animals carry out processes vital to life, gaining an understanding of the fascinating links between animal structure and function at a cellular, tissue and whole-body level. Through the study of musculoskeletal, integumentary, digestive, nervous, circulatory, respiratory, reproductive, excretory and thermoregulatory systems, you will gain a deeper appreciation of the exquisite control of body systems that allows mammals and birds to survive and thrive in so many different global environments. You will also examine the ways in which animals are classified and identified to species level.

The unit will give you the detailed biological knowledge that contributes to successful animal management, and will provide grounding for further study in the biological sciences.

Summary of assessment

This unit is assessed by an examination set and marked by Pearson.

The examination will last for one hour and 30 minutes.

The paper will consist of a variety of question types, including short-answer questions and extended writing opportunities that will assess learners' understanding of animal anatomy and physiology.

The number of marks for the paper is 80.

The assessment availability is January and May/June.

Sample assessment materials will be available to help centres prepare learners for assessment.

Assessment outcomes

AO1 Demonstrate knowledge of the structure and function of animal body systems, the role of cells and tissues and the classification of living organisms

Command words: complete, define, describe, explain, give, label, state

Marks: ranges from 1 to 3 marks

AO2 Demonstrate understanding of the structure and function of animal body systems, adaptations and disorders related to body systems, the role of cells and tissues, and the classification of living organisms in context

Command words: calculate, describe, explain, give

Marks: ranges from 2 to 5 marks

AO3 Analyse and evaluate biological information and data related to adaptations and disorders affecting animal body systems, and the classification of different organisms

Command words: compare, discuss, explain

Marks: 8 marks

AO4 Make connections between how animal body systems interact in order to function and adapt

Command words: compare, discuss, explain

Marks: 8 marks

Essential content

The essential content is set out under content areas. Learners must cover all specified content before the assessment.

A Understand how body systems in birds and mammals in good health should function, in order to maintain high levels of animal welfare

Learners must be able to recall and label component parts of body systems, identify their functions and demonstrate an understanding of how these contribute to the normal function of each system, including adaptations to lifestyle and diet in mammals and birds. Learners must also demonstrate an understanding of the effects of named diseases on body systems.

Interpretation of data and graphical analysis (both quantitative and qualitative) is expected in relevant contexts throughout.

A1 Musculoskeletal and integumentary systems: structure, functions, processes and adaptations

- Major functions of the skeleton (locomotion, protection, mineral storage and haematopoiesis).
- Composition and anatomy of the skeletal system:
  o joint types, cartilage, ligament and tendon attachment
  o adaptations to internal bone structure for mammals and birds
  o axial, appendicular and vertebral column division, limb and appendage bones.
- Roles of the integumentary system and adaptation in mammals and birds:
  o structure of the skin, including glands
  o differences in structure and functions of feather types
  o gross structure of hair, nails, claws, horns, antlers.
- Musculoskeletal and integumentary adaptations to locomotion in mammals and birds (including advantages and disadvantages):
  o methods of locomotion – climbing, hopping/leaping, gliding, running, powered flight, swimming
  o adaptations – body shape, relative limb bone length, muscularity, elasticity of tendons, spinal flexibility, hoof and digit arrangement, tail
  o causes, symptoms and consequences of the following musculoskeletal disorders: arthritis, hip dysplasia, osteochondrosis.

A2 Digestive system: structure, function, processes, adaptations and disorders

- The roles and importance of water, fibre, carbohydrates, lipids, proteins, vitamins and minerals in the diets of heterotrophs.
- Mouth/oral cavity adaptations in and between mammals and birds, to include comparative dental formulae in herbivores (prey animals) and carnivores (predators).
- Mechanical and chemical digestion in monogastric mammals, birds, ruminants and hindgut fermenters, to include peristaltic motion, enzyme function (as illustrated by amylase) and the role of gut flora.
- Role of the pancreas in secreting digestive enzymes, and the liver in bile production and vitamin storage.
- Regulation of blood glucose by body tissues and organs, including the roles of insulin and glucagon.
- Structural adaptations of digestive systems in birds, carnivores, ruminants and hindgut fermenters.
- Absorption of biological molecules via intestinal villi.
- Causes, symptoms and consequences of the following common digestive disorders: ingestion of foreign bodies, diarrhoea, ruminant bloat.

A3 Nervous system: structure, function, processes, adaptations and disorders

- Central and peripheral nervous system components.
- Roles and regulation of the parasympathetic and sympathetic divisions of the autonomic nervous system.
- The role of receptors and sense organs in detecting stimuli.
- General structure of non-compound, refractive eyes, to include: sclera, cornea, pupil, iris, lens, ciliary body, retina, fovea, choroid, optic disc, optic nerve, medial and lateral rectus muscles.
- The initiation of action potentials leading to sight by photoreceptors, including the advantages of UV light photoreceptors in many birds active during daylight hours.
- The role of the tapetum lucidum and how its structure is linked to its function.
- Advantages and disadvantages of eye positioning in herbivores and carnivores as illustrated by sheep, cats, owls and ducks.
- The role of and stages in voluntary and non-voluntary reactions.
- Causes, symptoms and consequences of common neurological disorders, including degenerative myelopathy in dogs, listeriosis, seizures.

A4 Circulatory and respiratory systems: structure, functions, processes and adaptations

- Structure and function of blood and its components, to include: plasma, erythrocytes, leukocytes, platelets, lymphocytes (B cells in antibody production, T cells in cell-mediated immunity – details of immune response not required).
- Advantages of a double circulatory system.
- Structure of the heart in mammals and birds, to include functions of chambers, valves and tissues.
- Initiation and regulation of heartbeat, to include roles of: sinoatrial node, atrioventricular node, stretch receptors, bundle of His, Purkinje fibres.
- Cardiac cycle: atrial and ventricular systole and diastole, including position of valves and relative blood pressures at each point in the cycle.
- Structural and functional differences between arteries, veins and capillaries, aorta and vena cava.
- Structure of lungs in mammals and birds, to include the presence of air sacs in birds.
- Structures and processes involved in inhalation and exhalation in mammals and birds.
- Changes in heart rate, respiratory rate and volume in response to changes in blood carbon dioxide and oxygen levels, to include oxygen debt from short-term anaerobic respiration.
- Biological adaptations for efficient exchange of oxygen and carbon dioxide at the cell and tissue level.
- Formation of oxyhaemoglobin, haemoglobin, oxymyoglobin and myoglobin at the lungs and tissues, to include the Bohr effect.
- Differences between foetal haemoglobin and adult haemoglobin.
- Lymphatic system: formation and constitution of lymph, structure and function of lymphatic system including its role in immunity.
- Causes, symptoms and consequences of heart murmurs, mitral valve disease and von Willebrand's disease in dogs.

A5 Reproductive system structure, hormonal control and adaptations

- Mammals: cats, cows, dogs, rabbits and pigs are to be studied for each of the following (where differences occur).
  - Gross structure of male and female reproductive system, including penis (internal and external), uterus and placenta.
  - Role and effects of changing levels of hormones (to include oestrogen, progesterone, luteinising hormone (LH), follicle-stimulating hormone (FSH), androgen-binding hormone, prostaglandin, oxytocin, cortisol, gonadotrophins and testosterone) in the following, as appropriate:
    - gametogenesis (knowledge of meiotic stages not required)
    - oestrous cycle
    - parturition
    - lactation.
  - Fertilisation, time delay before centric implantation.
  - Gestation length.
- Birds: chickens, pheasants, owls and ducks are to be studied for each of the following (where differences occur).
  - Structure of the male and female reproductive systems.
  - Effect of photoperiod and temperature on seasonal breeding.
  - Locations of fertilisation and egg production.
  - Structure of an egg – shell, air cell, shell membranes, albumen, chalazae, yolk.
  - Embryo development (limited to the role of extraembryonic membranes).
  - Effect of temperature and turning on egg incubation, length of incubation period.

A6 Excretory system: structure, function, processes and adaptations

- Gross structure of the excretory system to include:
  - mammals – kidneys, ureters, bladder, urethra
  - birds – kidneys, ureters, cloaca.
- Nephron structure, ultrafiltration, role of the loop of Henle (including adaptations to length) and action of antidiuretic hormone (ADH) in osmoregulation.
- Removal of nitrogenous waste in mammals and birds, limited to functions of uric acid and urea produced in the liver.
- Symptoms and effects of nephritis and liver cirrhosis.

A7 Thermoregulatory system: structure, mechanisms, control and disorders

- Normal temperature ranges in (endothermic) mammals and birds (recall of specific species not required).
- Negative feedback control via heat loss or heat gain centres in the hypothalamus.
- Warming and cooling mechanisms employed to gain or lose heat in response to environmental temperature changes:
  - evaporative cooling mechanisms, to include sweat production, gular fluttering and panting
  - role and effect of pili erector muscles in erection or flattening of feathers or hairs
  - overall effect of seasonal plumage/coat changes
  - basic mechanism of shivering, role of brown adipose tissue
  - effect of changes in metabolic rate
  - behavioural changes
  - mechanism and effect of vasodilation or vasoconstriction of arterioles next to the skin
  - contribution of countercurrent mechanisms to heat regulation.
- Causes, symptoms and consequences of hypothermia and hyperthermia.

B Understand how cells and tissues contribute to the normal functioning of body systems in animals

Learners must be able to identify and label cells and tissue types in micrographs and diagrams, demonstrate an understanding of how cells are controlled and recall how substances are transported in and out of cells. Learners must be able to relate the function of specialised cells and tissues to their structure, and know how these are studied by scientists.

B1 Cellular ultrastructure

Structure and function of the following cellular components and organelles:

- Nucleus, nucleolus, mitochondria, rough and smooth endoplasmic reticulum (ER), Golgi apparatus (including role in export of hormones and enzymes), secretory and conventional lysosomes, plasma membrane (including fluid mosaic model and role in cell signalling and recognition), cilia, cytoskeleton (including types and roles of motor proteins), 80S ribosomes, centrosomes, peroxisomes.

B2 How cells are studied

- Basic principles behind preparing samples for light and electron microscopy, to include Gram staining, iodine, eosin and methylene blue.
- Calculating magnification of cells and structures within cells.
- Awareness of prokaryotic and eukaryotic cells.

B3 Cellular control and transport

- Base pairing of nucleotides and helical structure in DNA.
- DNA triplet coding for amino acids and relevance to polypeptide production (detailed knowledge of transcription and translation not required).
- Consequences of mutations in genetic code as illustrated by osteogenesis imperfecta in dogs.
- Transport of substances in and out of cells (to include energy requirement, concentration gradients and results):
  o active transport (as illustrated by the sodium-potassium pump)
  o diffusion (simple and facilitated)
  o osmosis
  o endocytosis and exocytosis
  o pinocytosis and phagocytosis.
- Cell division by mitosis (limited to purposes, doubling of cell contents and formation of two genetically identical daughter cells).

B4 Structure, function and locations of the main animal tissue types

- Hierarchy of cells, tissues, organs and organ systems.
- Tissue structure variation and adaptation in accordance with location and function (learners are expected to recognise basal and apical surfaces in addition to cell junctions).
- Epithelial tissue:
  o simple/stratified/secretory
  o structural differences related to function and location (limited to squamous, cuboidal, columnar, pseudostratified and ciliated).
- Connective tissue:
  o structure of general/loose/dense/specialised connective tissue
  o structural differences related to function and location.

- Nervous tissue:
  - glial and neuron cell structure and function, to include myelinated/unmyelinated neurons
  - transmission of an action potential along an axon, including the role of saltatory conduction along with quantitative and qualitative interpretation of graphs representing potential difference changes against time
  - structure, locations and roles of sensory (afferent) neurons, interneurons (relay neurons) and motor (efferent) neurons
  - roles of synapses, neuromuscular junctions and neuroglandular junctions along with synaptic transmission of neurotransmitters.
- Muscle tissue:
  - cell development, appearance, voluntary/involuntary control and function of cardiac, smooth and skeletal muscle
  - oxygen use, vascularisation, appearance, location and function of fast and slow twitch muscle fibres
  - sliding filament theory of muscle contraction, including role of calcium and use of energy in the form of adenosine triphosphate (ATP).

C Know how living organisms can be classified in order to understand their evolutionary relationships

This section examines the models of classifying animals for ease of study. Learners must understand the basic principles of natural selection and evolution that lead to speciation. Learners must know how distinguishing features are used to establish evolutionary relationships between animals, and how these relationships are shown using phylogenetic trees. Learners must know that different classification systems exist and understand that species classifications are not static, but may change if new evidence shows that species have evolved in a different way to that previously accepted.

C1 Adaptations
- Physiological, behavioural and anatomical adaptations of animals to differing lifestyles, diets and environment.
- Principles of natural selection pressures on variation in animals, leading to evolution and speciation.
- Distinguishing features of the five vertebrate classes (Mammalia, Aves, Reptilia, Amphibia, Pisces).

C2 Use of modern technologies in classification
Genetic and biochemical analyses to show how animals are related:
- comparison of DNA base sequences
- comparison of amino acid sequences in proteins
- cross-reactivity of antigens and antibodies.

C3 Taxonomy
- Common taxonomic classification and hierarchies:
  - phylum (plural: phyla), class, order, family, genus, species
  - further divisions may be made including phyla into subphyla
  - existence of other taxonomic strategies (detail not required)
  - difficulties in classification of unusual mammals including the armadillo, bat, duck-billed platypus, whale, pangolin.
- Purpose and standard format of binomial nomenclature to identify to species level:
  - genus (plural: genera) denoted by capitalisation in scientific name
  - definition of species and variety/breed
  - binomial name italicised or underlined in print.
- Purpose, recognition and interpretation of phylogenetic trees to represent evolutionary relationships between monophyletic clades.

Grade descriptors

To achieve a grade, learners are expected to demonstrate these attributes across the essential content of the unit. The principle of best fit will apply in awarding grades.

Level 3 Pass

Learners demonstrate knowledge and understanding of animal body systems and functions of cells, tissues and organs. They understand how body systems function in healthy mammals and birds, how these systems interrelate and the effects of named diseases on those body systems. Learners select and organise information relating to the adaptations of mammals and birds, their suitability for survival in given environments and how and why mammals and birds maintain their internal environment.

Level 3 Distinction

Learners demonstrate a thorough understanding of animal body systems and their adaptations, and the functions of cells, tissues and organs. Learners make connections between control mechanisms and responses at a cellular, tissue, organ and whole-body level. They can analyse and evaluate data and information relating to biological processes in familiar and unfamiliar contexts, and interpret this in order to draw reasoned and valid conclusions.

Key terms typically used in assessment

The following table shows the key terms that will be used consistently by Pearson in our assessments to ensure learners are rewarded for demonstrating the necessary skills.

Please note: the list below will not necessarily be used in every paper/session and is provided for guidance only.

Command or term	Definition
Calculate	Learners obtain a numerical answer, showing relevant working.
Compare	Learners identify the main factors relating to two or more items/situations or aspects of a subject that is extended to explain the similarities, differences, advantages and disadvantages.
Complete	Learners provide all items.
Define	Learners state or describe the nature, scope or meaning of a subject as objective facts.
Describe	Learners give a clear, objective account in their own words showing recall, and in some cases application, of the relevant features and information about a subject or process.
Discuss	Learners consider different aspects of a topic and how they interrelate.
Explain	Learners show they understand the origins, functions and objectives of a subject and its suitability for purpose. They give reasons to support an opinion, view or argument, with clear details.

Command or term	Definition
Give	Learners provide one or more piece(s) of information.
Justify	Learners give evidence to support (either the statement given in the question or an earlier answer).
Identify	Usually requires some key information to be selected from a given stimulus/source.
Label	Learners name or provide key information about a stimulus material.
Plot	Learners insert given data on a given graph. This may be a single point or involve drawing lines of best fit/completing a line graph/bar chart.
State	Learners express the condition of or facts about something definitely or clearly.

Links to other units

This unit links to:

- Unit 6: Animal Health and Diseases
- Unit 10: Animal Metabolism
- Unit 11: Advanced Animal Nutrition.

Employer involvement

This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local animal businesses
- opportunities for observation of organisational/business application during work experience
- support from local animal business staff as mentors.

Unit 3: Animal Welfare and Ethics

Level: **3**

Unit type: **External**

Guided learning hours: **120**

Unit in brief

Learners study the ethics, regulations, legislation and practices associated with animal welfare in animal-related industries.

Unit introduction

When working with animals in any sector, ethical issues are raised about the use of animals for human purposes. These issues can inform the way society perceives animals and this can lead to passionate debate by a wide range of organisations and individuals. The understanding and application of ethical decision making allows people to work effectively within the relevant legislation, while at the same time understanding how personal views can affect interactions between the general public and those whose livelihoods rely on the use of animals. Providing and maintaining high levels of welfare are key to the wellbeing of animals and the productivity of working animals.

In this unit, you will develop an appreciation of the concepts and constructs relating to issues of animal welfare and ethics in the animal industry. You will learn about the laws and regulations that govern the animal industry, which aim to ensure the safety and welfare of animals and the people who come into contact with them. You will learn how to perform an appraisal of a situation, focusing on welfare and regulation, and create a prioritised action plan for any areas of improvement identified. To complete the assessment task within this unit, you will need to draw on your learning from across your programme.

The knowledge and skills gained in this unit are fundamental to any role in the animal sector where you are working directly with animals, for example zoos, farms or pet shops, or those concerned specifically with animal welfare, for example animal charities or welfare organisations. The unit will provide you with a sound basis for further study in the animal sector.

Summary of assessment

This unit is assessed through a task set and marked by Pearson, consisting of a Part A and a Part B.

For Part A, learners will be given information relating to a specific animal industry context in order to carry out preparatory monitored research. Learners are expected to spend three hours on this research.

For Part B, learners will complete the set task using their preparatory research. The task will contain a number of activities enabling learners to demonstrate their knowledge and understanding of animal welfare and ethics.

Learners will take Part B under supervised conditions in a single three-hour session timetabled by Pearson.

The total number of marks for the task is 60.

The assessment availability is December/January and May/June each year.

Sample assessment materials will be available to help centres prepare for assessment.

Assessment outcomes

AO1 Demonstrate knowledge and understanding of animal welfare concepts, ethical approaches, animal welfare legislation and welfare requirements

AO2 Apply knowledge and understanding of animal welfare concepts, ethical approaches, compliance with animal welfare legislation and meeting welfare requirements in context

AO3 Analyse and evaluate information and data relating to the welfare of selected animals, making informed judgements about welfare and ethical issues and recommendations to address these issues

AO4 Be able to conduct a welfare appraisal in context and make recommendations for improvements with appropriate justification

Essential content

The essential content is set out under content areas. Learners must cover all specified content before the assessment.

A Ethical issues in animal welfare

A1 Ethical approaches

The ethical frameworks which inform the actions of individuals, organisations and government towards animal use and welfare, and how these can be explored in order to assist ethical thinking and decision making.

- Ethics as standards of human behaviour in different situations – how they are separate from or informed by:
  - o accepted social practices
  - o personal feelings
  - o religion
  - o legislation
  - o science.
- The purpose of ethical frameworks when considering animal welfare, to include the definition of animal welfare.
- Definitions of the following ethical theories and their relation to the use of animals:
  - o consequentialist, to include utilitarian, contractarian and a respect for nature
  - o deontological, to include animal rights and relational importance
  - o environmental, to include human-centred, sentience-centred and environment-centred.
- Exploration of frameworks for ethical decision making where animals are involved, including:
  - o identification of the ethical issues and stakeholders in a given situation, reviewing evidence, evaluating options in light of ethical theories and coming to considered conclusions where appropriate
  - o construction of ethical matrices to assist in decision making.
- Consumer ethics:
  - o the effect of anthropomorphism and speciesism in personal reactions to animal welfare
  - o the differences between activism and extremism, including the objectives and impacts of animal-based charities and organisations.

A2 Ethical issues and legislation in the animal industry

- Learners should be familiar with the ethical considerations and impacts of legislation across sectors of the animal industry, including:
  - o keeping animals in collections, including zoos
  - o animals as pets
  - o animals as entertainment, including circuses, racing
  - o regulated and unregulated breeding and sale of animals for pets and showing
  - o animals in experimentation – drug trials, genetic manipulation, cosmetic trialling
  - o farming of animals for food, fur or other products; fate of unwanted animals; religious and cultural attitudes
  - o methods of killing, to include captive bolt, stunning, sticking, controlled atmosphere; religious and cultural attitudes
  - o research into pain perception to inform animal welfare
  - o veterinary intervention (or lack thereof) in illness and trauma
  - o wildlife and conservation
  - o welfare of animals in science and education.

- Underpinning concepts and terminology found in animal welfare legislation, related to the treatment of both wild and captive animals:
  o definitions of animal welfare
  o distinctions between EU regulations, directives, decisions and recommendations
  o the 'Five Freedoms' as a framework for assessing animal welfare, as related to the five ideal states of welfare grounded in the Brambell Report 1965; farm animal welfare codes of practice: the differences between these and legislation
  o the impact of sentience and self-awareness in the development of animal welfare legislation
  o the purposes of and differences between euthanasia, culling and killing in relation to the use of animals in wild, domestic and commercial settings
  o the role of government departments in developing animal welfare legislation
  o the role of local authorities in implementing animal welfare legislation
  o the need for policies and procedures in organisations
  o definition and understanding of terms in legislation:
    – prevention of harm
    – duty of care
    – an act of his, or failure of his to act.
- Legislative areas relating to animal welfare, to include inspection and monitoring, powers of enforcement and penalties for contravening current legislation:
  o use of animals for performance or exhibition
  o sale of animals as pets
  o control of dogs and dangerous dogs
  o dangerous wild animals
  o national and international trade in flora or fauna
  o transportation of animals
  o farmed animals
  o killing of animals
  o wildlife and conservation.

B Welfare appraisals for assessing the health and wellbeing of animals

B1 Acceptable conditions for animal health and welfare

Awareness of current recommendations to promote and maintain the welfare of different species of animals in different situations. One animal from each of the animal groups should be examined in detail for each of the following.

- The need for a suitable environment:
  o size of accommodation; stocking density
  o type and location of accommodation, including proximity to other animals (away from natural predators)
  o access to water and methods of delivery, including open sources and contained delivery systems; species preferences
  o materials used in accommodation, including ease of cleaning
  o temperature, to include indoor and outdoor housing, in relation to both endothermic and exothermic animals
  o humidity, with particular relevance to amphibians and reptiles
  o substrate, including species preferences, available types, pros and cons of each.

- The need for a suitable diet:
  - major nutrients that make up an animal's diet (carbohydrates, proteins, lipids, vitamins and minerals, and water) and their functions in the body
  - specific requirements of a species, to include calcium in reptiles, taurine in cats, vitamin C in guinea pigs
  - dietary sources of major nutrients (carbohydrates, proteins, lipids, water, vitamins and minerals)
  - comparison of different feed types from the perspective of the animal (palatability, nutritional value) and the human (cost, storage), including concentrate/forage ration formulation in farm livestock
  - importance of supplying a balanced diet to captive or domestic animals and identification of common nutritional problems (obesity, diarrhoea, diabetes, deficiencies and toxicities) and their prevention and treatment
  - specific requirements for ruminant animals (ample grazing time, pasture quality) and hindgut fermenters (caecotroph consumption)
  - dietary requirements during different life stages and work level (neonates, juveniles, adult, working and senior animals)
  - importance of food as environmental enrichment.
- The need to be able to exhibit normal behaviour patterns:
  - normal behaviours expected (grazing, digging, basking, grooming, hiding)
  - feeding, including foraging, prey capture, selective grazing, rooting
  - predator avoidance, for example alarm calls in meerkats
  - sleep/wake cycles, to include nocturnal, diurnal and crepuscular species
  - grooming/allogrooming, including intraspecific, interspecific and by humans
  - defence behaviours, including hiding
  - courtship and mating where appropriate, including ferrets, sheep and captive breeding schemes.
- The need to be housed with, or apart, from other animals:
  - categories of animals according to their type of sociality:
    - solitary (tigers, tarantulas, some hamsters)
    - eusocial (hymenoptera, naked mole rats)
    - presocial (canine, avian and primate examples)
  - common social groupings (aggregation, survival, mating, colonial, unisexual, clonal).
- The need to be protected from pain, suffering, injury and disease:
  - exercise requirements in relation to life stage and health status
  - preventative care and treatments appropriate, for example species from each of the animal groups, including parasite control, regular veterinary check-ups, vaccinations.
- Use of environmental enrichment to improve animal welfare with examples, including feeding captive big cats, toys for pet dogs, methods for captive parrot species that allow them to fully utilise their beak and claws.

B2 Animal welfare appraisals

The requirement for carrying out appraisals of animal welfare in different settings; welfare indicators and the use of measurement techniques/methods in assessment of animal welfare against personal and organisational objectives.

- Regularity, frequency and purposes of welfare appraisals appropriate to different settings, to include those applicable to:
  - pets
  - stock on farms and in abattoirs
  - zoos and wild animals
  - laboratory animals
  - service/assistance animals.

- Measuring techniques used to assess welfare:
  - traffic light system where each need is graded red/amber/green
  - animal needs indexes as a quantitative measure of the five welfare needs, including the contribution of these to assurance schemes in the food industry
  - the difference between input (resource) and output (animal) measures
  - assessment by health, physiology (cortisol analysis), behaviour, genetic selection and measuring pain and stress in animals
  - use of ethograms to create an activity budget
  - indicators of animal welfare, to include:
    - visual observation of stress behaviours (including example behaviours in example animals from each animal group)
    - body condition scoring
    - indicators of health (visual health checks, including eyes, body, behaviour, temperature and other indicators appropriate to species).
- The role of the inspector in the welfare appraisal process:
  - approach to appraisal based on role of the inspector and the purpose of appraisal
  - potential alterations to appraisal structure based on situation and objectives
  - subjectivity and objectivity in completing welfare appraisals and assessing levels of animal welfare
  - production of reports and prioritised action plans (with timescales as appropriate) from welfare appraisals, linked to industry standards.

Grade descriptors

To achieve a grade, learners are expected to demonstrate these attributes across the essential content of the unit. The principle of best fit will apply in awarding grades.

Level 3 Pass

Learners will demonstrate knowledge and understanding of welfare and ethical issues through an appraisal of a setting in context, supported by wider independent research. They will propose and justify feasible solutions to identified problems, showing an understanding of legislative requirements where contraventions are present across the five welfare needs. Learners will show that they can prioritise identified issues, supported by an awareness of legislative and regulatory impacts if action is not taken. They will demonstrate an understanding of ethical theories and apply these in context.

Level 3 Distinction

Learners will demonstrate a thorough knowledge and understanding of welfare and ethical issues through an appraisal of a setting in context, supported throughout by the use of independent research. They will fully justify recommended solutions to identified problems based on thorough analysis of the scenario information. Learners show a comprehensive understanding of legislative requirements in the context of the five welfare needs, including detailed coverage of contraventions and related penalties. Learners can justify the priority given to identified issues, and demonstrate a thorough understanding of the legislative and regulatory impacts if action is not taken. They will demonstrate a detailed understanding of ethical theories and apply these in context.

Key terms typically used in assessment

The following table shows the key terms that will be used consistently by Pearson in our assessments to ensure learners are rewarded for demonstrating the necessary skills.

Please note: the list below will not necessarily be used in every paper/session and is provided for guidance only.

Command or term	Definition
Appraisal	A formal, professional procedure by which the welfare of animals can be assessed.
Ethical issues	Issues concerning moral or professional judgements made in relation to animals.
Scenario	A given situation replicating one that might reasonably be found in the sector.
Welfare issues	Issues concerning the health and wellbeing of animals.

Links to other units

This assessment for this unit should draw on knowledge, understanding and skills developed from:
- Unit 1: Animal Breeding and Genetics
- Unit 2: Animal Biology
- Unit 4: Practical Animal Husbandry
- Unit 5: Animal Behaviour
- Unit 6: Animal Health and Diseases
- Unit 7: Work Experience in the Animal Sector
- Unit 8: Investigative Research Project
- Unit 9: Practical Skills in Animal Science
- Unit 10: Animal Metabolism
- Unit 11: Advanced Animal Nutrition.

Employer involvement

This unit would benefit from employer involvement in the form of:
- guest speakers
- technical workshops involving staff from local animal businesses
- opportunities for observation of organisational/business application during work experience
- support from local animal business staff as mentors.

Unit 4: Practical Animal Husbandry

Level: **3**
Unit type: **Internal**
Guided learning hours: **60**

Unit in brief

Learners explore the skills needed to manage high standards of health and welfare for a variety of animals by meeting their essential needs.

Unit introduction

Understanding the fundamental needs of an animal is essential to being able to care for them to a high standard, whether you are an animal keeper at a zoo, working in a veterinary environment or working in agriculture. High-quality care includes appropriate handling and restraining techniques, completion of regular health checks, and meeting animal accommodation and dietary needs.

In this broadly practical unit you will explore different handling techniques for a variety of species, learning which techniques are appropriate in different situations. You will explore accommodation design and maintenance, and learn how to assess and maintain the accommodation and surrounding environment for different animals that supports their optimum health and welfare. You will be able to implement feeding, exercise and grooming regimes as appropriate to different animals, and perform routine visual health checks that are necessary to maintain the health and welfare of the animals you manage.

This unit will prepare you for a range of employment or apprenticeship opportunities in the animal sector, including the roles of animal technician, pet shop assistant, or veterinary care assistant. The unit will also assist you in progressing to further studies of animal welfare, management or science in higher education.

Learning aims

In this unit you will:

A Explore safe animal handling techniques for different animals and situations

B Explore the preparation and maintenance of accommodation and environments to meet the needs of different animals

C Undertake animal husbandry practices to support the health and welfare of animals.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Explore safe animal handling techniques for different animals and situations	**A1** Working safely with animals **A2** Handling, moving and restraining animals	A portfolio of evidence demonstrating individual husbandry of animals from at least three of the following animal groups: mammal, avian, herptile, invertebrate.
B Explore the preparation and maintenance of accommodation and environments to meet the needs of different animals	**B1** Types of accommodation and construction materials **B2** Assessment of accommodation and environment **B3** Maintenance of animal accommodation	A report based on the activities carried out and best practice in different animal settings supported by witness statements.
C Undertake animal husbandry practices to support the health and welfare of animals	**C1** Feeding and watering animals **C2** Grooming and bathing needs **C3** Providing opportunities for exercise **C4** Health checks	

Content

Learning aim A: Explore safe animal handling techniques for different animals and situations

A1 Working safely with animals

- Risks and hazards of working with animals, including:
  - definition of risk (likelihood of harm occurring) and hazard (potential to cause harm)
  - importance of risk assessments and how to carry them out
  - high-risk groups, e.g. increased risks to pregnant women and people with low immunity
  - variety of hazards including bites/scratches, allergens, zoonoses, stings, poison, physical injury
- Safe working practices:
  - defining hazards in a real or simulated situation
  - defining risks as to the severity of any hazard, normally calculated as a risk rating of likelihood multiplied by severity
  - putting control measures in place to reduce risk
  - use of personal protective equipment (PPE), including gauntlets, gloves, masks, steel toe capped shoes
  - five steps of a risk assessment (Health and Safety Executive)
    - identify the hazards
    - decide who might be harmed and how
    - evaluate the risks and decide on precautions
    - record significant findings
    - review the assessment and update if necessary
  - practical completion of risk assessments.

A2 Handling, moving and restraining animals

- Reasons for handling, moving and restraining animals:
  - grooming, shearing, transport to vets, health checking, administering medication, breeding, capture, sexing, (force) feeding, training, cleaning accommodation, change of accommodation.
- Considerations as to whether handling animals is appropriate:
  - health issues, aggression, stress.
- Methods and equipment used for handling, moving and restraining animals:
  - methods of approach – calmly, confidently, correct level for animal
  - methods of handling or restraint as appropriate – herding dogs, pig board, mobile/permanent handling systems, lead ropes, halters, nets, crates, boxes, collar and lead, snake hooks, crush cages, catchpole, pillowcase/towel/cat bag, muzzle, scruff, claw, full-body support, tipping, manual herding, using specially designed fixtures e.g. lockout doors.

Learning aim B: Explore the preparation and maintenance of accommodation and environments to meet the needs of different animals

B1 Types of accommodation and construction materials

- Factors influencing accommodation design to meet animal welfare needs, and practical implications.
- Types of accommodation and materials used for specified animal species to meet animal welfare needs, including:
  o vivarium, aquarium and terrarium design/construction for housing reptiles, fish and amphibians
  o outdoor accommodation, e.g. kennel, barn, coops
  o hutch, cage and aviary design/construction for housing small mammals and birds
  o materials used in different types of accommodation, e.g. bricks, wood, mesh, glass, plastic, polypropylene, wire netting, animal-safe paints, locks and latches
  o consideration of suitable construction materials used for different animals.

B2 Assessment of accommodation and environment

- Assessing suitability of accommodation to meet animal welfare and human safety needs, to include temporary animal accommodation when cleaning or maintaining main habitat:
  o dimensions of available space, e.g. height consideration for arboreal animals
  o structural integrity
  o access to sufficient suitable food, water and shelter
  o temperature and humidity
  o stocking density
  o enrichment
  o cleanliness
  o health and safety of animals and humans.
- Establishing an animal in a new or changed environment, e.g. after cleaning or repair, including frequent early checks to ensure the animal is settled and not exhibiting signs of stress or discomfort.

B3 Maintenance of animal accommodation

- Selection of environmental materials to meet welfare needs:
  o materials used for substrate/bedding, including wood shavings, hay, straw, gravel, peat, peat-free compost, non-printed paper
  o suitability and safety of materials used in animal accommodation for specific species, e.g. no dust for rats (respiratory issues), no straw (unless chopped) for guinea pigs (urine burns).
- Practical maintenance of animal accommodation:
  o preparation to include cleaning, hazard spotting, repair and maintenance where needed, reporting of problems
  o spot cleaning and full cleaning, including frequency for different animals
  o animal-safe products, e.g. disinfectants, antibacterial cleaners, saline solution
  o working as part of an accommodation maintenance team in different roles, including team leader, team member, independent worker
  o features of team roles, including levels of responsibility, typical duties, e.g. recording and monitoring of accommodation maintenance.

Learning aim C: Undertake animal husbandry practices to support the health and welfare of animals

C1 Feeding and watering animals

- Planning:
  - dietary needs, to include selection of different food for different types of animals, amount of food, timing and frequency, life-stage feeding for young, old, sick, pregnant, nursing and working animals
  - ways of presenting food, including the equipment needed – bowls, bottles, drinkers, hay rack, buckets, feeders; material of different feeding equipment (plastic, stainless steel, ceramic); alternative ways to present food to introduce enrichment including feeding/treat balls, tubes, sacks; group and individual feeding.
- Implementation, recording and monitoring feeding and watering plans:
  - implementation and following of feeding and watering plans
  - record keeping and monitoring amount of food and water consumed, type of food eaten (selective feeders), frequency of feeding and watering
  - practical feeding and watering of animals from different groups.
- Review and adapt animal diet based on weight, body condition, life stage and health status.

C2 Grooming and bathing needs

- Maintaining the extremities and outer surfaces of animals, including the practical methods and equipment used.
- Reasons for bathing and grooming as appropriate to species.
- Provision of:
  - natural bathing opportunities, e.g. dust/sand baths, water baths, humidity chambers
  - coat care, e.g. brushing, shearing, preparing for show
  - foot and hoof care, e.g. hoof picking, hoof trimming, nail trimming
  - other routine care tasks, e.g. chelonian bathing, reptile/amphibian misting, beak/nail/claw trimming.

C3 Providing opportunities for exercise

Planning and enabling exercise to meet individual animal needs:

- type and quantity of exercise required
- handling equipment, e.g. leads, muzzles
- exercise equipment and environment, e.g. hamster wheels, swings and perches, trees and shrubs
- frequency, amount and type of exercise as appropriate to animal requirements, e.g. dog walking in dog-friendly areas, access to run or paddock.

C4 Health checks

Daily or routine checks carried out:

- signs of injury/disease, behaviour and appetite, state of coat and/or skin, brightness of eyes, colour, amount and consistency of urine and faeces.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Explore safe animal handling techniques for different animals and situations		
A.P1 Explain risk assessment decisions for the handling of animals in routine situations. **A.P2** Perform correct handling of animals with even temperaments in routine situations.	**A.M1** Demonstrate handling of animals with varying temperaments in different situations, analysing relevant risks.	**A.D1** Justify approaches used when handling animals with varying temperaments in different situations.
Learning aim B: Explore the preparation and maintenance of accommodation and environments to meet the needs of different animals		
B.P3 Explain the accommodation needs of different animals. **B.P4** Prepare and maintain accommodation correctly to meet the welfare needs of animals	**B.M2** Analyse the suitability of accommodation and its maintenance to meet the needs of different animals.	**BC.D2** Justify accommodation and husbandry decisions to support the welfare needs of animals in different situations. **BC.D3** Justify handling and husbandry decisions in different situations to maintain high standards of welfare for different animals with varying needs and temperaments.
Learning aim C: Undertake animal husbandry practices to support the health and welfare of animals		
C.P5 Explain own choices made when performing routine husbandry tasks. **C.P6** Perform correct routine husbandry tasks to support animal health and welfare.	**C.M3** Demonstrate and assess impact of own husbandry of animals in different situations to maintain animal welfare.	

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, C.P5, C.P6, B.M2, C.M3, BC.D2, BC.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:
- a variety of animals from at least three of the following groups: mammal, avian, herptile, invertebrate
- handling equipment, to include at least lead, collar, halter, catch poles, crush cages, nets, towel, pillowcase, muzzle
- animal accommodation, different types of substrate/bedding, brooms, dustpan and brush
- feeding/watering equipment appropriate to animals present, food appropriate to animals present, water access.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners must show reasoned evidence of well-considered decision-making processes used in selecting handling techniques, resulting in proficient handling. They must demonstrate the capacity to adapt techniques to the needs of the specific animal, such as taking account of stress, temperament or situation, while maintaining high standards of animal welfare and human safety.

For merit standard, learners must show evidence of efforts to minimise effectively calculated risks present in handling animals of different temperaments, through preparation and anticipation. Learners will handle animals in unusual situations to which the animal will not be entirely accustomed, such as during relocation or transporting, taking account of the welfare of the animal throughout.

For pass standard, learners must identify potential risks when handling animals and act to mitigate these risks appropriately. They can perform the safe handling of placid or even-tempered animals that are accustomed to frequent handling in familiar situations, such as during regular grooming. Learners select and use appropriate handling and personal protective equipment (PPE).

Learning aims B and C

For distinction standard, learners must give evidence of reasoned decision-making processes for the husbandry of animals. Consideration must be given to the advantages or disadvantages of materials, husbandry regimes and approaches, suggesting improvements or changes that may be necessary to support the health and welfare of animals with varying needs. Learners must show clear reasoning for decisions and approaches adopted in maintaining the health and safety of themselves and others when working with animals. Learners must be able to give reasons, with examples of different animals and situations, for their decisions on handling, accommodation and husbandry in relation to the high standard required. Learners can work autonomously, or as part of a husbandry team, solving problems in a time-efficient and resource-efficient manner. However, their individual distinction-level contribution must be clearly evidenced.

For merit standard, learners must give evidence to show reasoned consideration of animal welfare needs when assessing and maintaining accommodation. They must perform husbandry activities, i.e. feeding, watering, exercising and bathing of animals, with confidence and in a timely manner. They will give accounts of the effectiveness of their approaches in terms of the standards of animal welfare needs and human safety required. Learners must show evidence of recording and acting on the outcome of performed visual health checks, with consideration to the relationship between their findings and their husbandry practices. Learners must be able to work autonomously as part of a husbandry team.

For pass standard, learners must give evidence to show that they recognise the environmental needs of animals and can maintain animal accommodation over time, taking these needs into account. They can work safely, adopting reasoned approaches that consider the health and welfare of the animal before, during, and after accommodation maintenance. Learners must show that they can plan and implement feeding and watering regimes that meet the routine needs of animals, taking into account needs such as life stage and level of activity. Learners must give reasoned accounts for the regimes used. They can groom and bathe animals using appropriate equipment with minimum stress to the animal; learners must give evidence of their reasons for selecting methods and approaches. Learners must plan and enable exercise strategies for animals, taking account of their specific needs, and the safety of both animal and humans. Learners must give evidence to show that they have carried out routine visual health checks regularly and safely, documenting reasoned findings and actions. Learners must keep accurate records of their husbandry tasks, giving a reasoned account of their methods, approaches and actions. Learners must show clear awareness of their roles and responsibility as part of an animal husbandry team.

Links to other units

This unit links to:

- Unit 3: Animal Welfare and Ethics
- Unit 5: Animal Behaviour
- Unit 6: Animal Health and Diseases.

Employer involvement

This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local animal businesses
- contribution of ideas to unit assignment/project materials
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Unit 5: Animal Behaviour

Level: **3**
Unit type: **Internal**
Guided learning hours: **60**

Unit in brief

Learners explore normal and abnormal behaviours in a range of animals and how these behaviours develop. Learners observe, record and interpret animal behaviour.

Unit introduction

To work with animals, you need to understand what behaviours are normal as well as abnormal. You will be able to care for animals properly and maintain effective working practices by identifying the factors involved in an animal's behaviour.

In this unit, you will study the theories on how animals learn a range of different behaviour patterns and the ways in which animals communicate. You will develop skills to interpret animal behaviour and understand factors which influence animal behaviours. You will observe and monitor behaviour as an effective measure of an animal's welfare.

Animal behaviour is a very popular field in the animal care sector and this unit can lead to higher education or to employment as a pet behaviour counsellor, conservationist or animal trainer in a zoo, aquarium or charity.

Learning aims

In this unit you will:

A Explore the ways in which animals learn normal and abnormal behaviours, and how these behaviours can be managed

B Examine behaviour patterns and their influencing factors in animals

C Undertake animal behaviour monitoring as a measure of animal welfare.

Summary of unit

Learning aim		Key content areas	Recommended assessment approach
A	Explore the ways in which animals learn normal and abnormal behaviours, and how these behaviours can be managed	**A1** Learning theory **A2** Development of abnormal behaviours **A3** Managing abnormal behaviours	A report that investigates examples of normal and abnormal behaviours in a selected animal species.
B	Examine behaviour patterns and their influencing factors in animals	**B1** Animal lifestyles **B2** Animal communication **B3** Factors influencing behaviour	Evidence of performing sampling to monitor animal behaviour, and then using the data to create a poster examining behaviour patterns in the species observed.
C	Undertake animal behaviour monitoring as a measure of animal welfare	**C1** Interpreting animal behaviour **C2** Observing animal behaviour	

Content

Learning aim A: Explore the ways in which animals learn normal and abnormal behaviours, and how these behaviours can be managed

A1 Learning theory

- Non-associative learning.
- Habituation, e.g. prairie dogs habituating to humans and no longer alarming.
- Sensitisation, e.g. traffic phobia in dogs.
- Classical conditioning.
- Operant conditioning.
- Positive and negative reinforcement.
- Positive and negative punishment.
- Social learning.
- Insight learning.
- Imprinting.
- Flooding.
- Schedules of reinforcement, including continuous, fixed duration, fixed ratio, variable duration, variable ratio and differential, with examples of when they are best used.
- Counterconditioning and desensitisation.

A2 Development of abnormal behaviours

Types, causes and characteristics of abnormal behaviour:

- motivation, e.g. obtaining reward or relief
- stereotypical behaviours, including social, locomotor and oral abnormalities across animals in different environments, e.g. bar biting in farmed sows, pacing and circling in captive big cats, over-grooming mice in laboratories, weaving and cribbing in stabled horses, feather pecking in hens
- displacement behaviours, e.g. over-grooming, vocalisation
- hyperactivity/inactivity/learned helplessness.

A3 Managing abnormal behaviours

Factors and methods relating to the management of abnormal behaviours:

- rule out any medical factors
- medical or pharmacological interventions
- environmental management and enrichment
- behavioural modifications
- suitable referral agencies, e.g. the Animal Behaviour and Training Council (ABTC).

Learning aim B: Examine behaviour patterns and their influencing factors in animals

B1 Animal lifestyles

- Differences in behaviour seen between animals in the wild and in captive and domestic environments.
- Behavioural differences between same species in different environments.
- Factors affecting lifestyle.
- Method of feeding, including predator versus prey, herbivore, carnivore, omnivore, insectivore.
- Sleep/wake cycle, including diurnal, nocturnal, crepuscular.
- Social behaviour, including solitary, social (subsocial, parasocial and eusocial).

B2 Animal communication

- Definition, functions and types of communication (emotional displays, mating displays, parent/offspring).
- Inter- and intraspecific signals (frog mating calls also attract bats).
- Causes of conflict and signals used to reduce them.
- Filial and sexual bonding.
- Species-specific senses, e.g. vocalisation, scenting, importance of pheromones.

B3 Factors influencing behaviour

- Evolution of species-specific behaviours from animals covering a range of animal groups.
- Internal factors:
  o physical
  o physiological
  o psychological.
- External factors:
  o environment, including space, light, temperature
  o conspecifics
  o predators
  o humans.

Learning aim C: Undertake animal behaviour monitoring as a measure of animal welfare

C1 Interpreting animal behaviour

- Visual cues:
  o ear position, e.g. up, forward, flat
  o tail position, e.g. high, low, between legs
  o body posture, e.g. leaning forward, loose stance
  o movement, e.g. fast, slow
  o piloerection, e.g. raised hackles.
- Vocalisation, e.g. howling, whimpering, barking.
- Differences due to life stage, e.g. adult dog, puppy, senior dog.
- Health, e.g. signs of ill health.
- Species/breed differences, e.g. Labrador, German Shepherd, Terrier.
- Temperament, e.g. aggressive, nervous, excited.
- Relaxed, fearful, anxious, aggressive, signs of stress.

C2 Observing animal behaviour

- Construction of ethogram and interpretation of data from observation of species across a range of animal groups (e.g. farm livestock, companion animals, exotics) either directly or via media technology.
- Types of sampling methods and strategies, including continuous, instantaneous, ad libitum, focal, scanning, one-zero.
- Representing results of behaviour observations that include analysis of results, graphical representations, e.g. bar chart or pie chart, time budgets.
- Ways of reporting results, e.g. a scientific report.
- Implications of results for an animal's welfare based on the prevalence of abnormal behaviours.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Explore the ways in which animals learn normal and abnormal behaviours, and how these behaviours can be managed		**A.D1** Evaluate how animals acquire both normal and abnormal behaviours and how knowledge of learning theory can be used to develop management strategies to modify behaviours.
A.P1 Explain how animals acquire normal behaviours with reference to learning theory. **A.P2** Explain how animals may acquire abnormal behaviours with reference to learning theory and management.	**A.M1** Analyse the acquisition of abnormal behaviours with reference to learning theory and management.	
Learning aim B: Examine behaviour patterns and their influencing factors in animals		
B.P3 Explain the methods selected animals use to communicate and the reasons for communication. **B.P4** Explain how internal and external factors influence the behaviours of selected animals.	**B.M2** Analyse the link between lifestyle, environment and behaviour patterns of selected animals.	**BC.D2** Evaluate how influencing factors affect the behaviour patterns of selected animals. **BC.D3** Justify own interpretations of an animal's behaviour as a measure of its welfare.
Learning aim C: Undertake animal behaviour monitoring as a measure of animal welfare		
C.P5 Perform animal behaviour monitoring using appropriate sampling techniques in relation to a selected animal. **C.P6** Explain the results of observed animal behaviour monitoring in relation to the welfare of a selected animal.	**C.M3** Analyse observed behaviours of the selected animal being monitored and its welfare using appropriate analysis methods.	

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, C.P5, C.P6, B.M2, C.M3, BC.D2, BC.D3)

Further information for teachers and assessors

Resource requirements

The special resources required for this unit are access to a variety of animals from at least three of the following groups: mammal, avian, herptile, invertebrate.

Essential information for assessment decisions

Learning aim A

Learners need to investigate examples of normal and abnormal behaviours in a selected animal species. Animals that are likely to exhibit abnormal behaviours could be used for research (such as captive zoo animals exhibiting stereotypies). This could be achieved by visits to animal collections or viewing video footage, for example of stabled horses.

For distinction standard, learners will discuss how the selected animal developed its range of normal behaviours as well as at least two abnormal behaviours commonly seen in the species. The information will include accurate reference to learning theory throughout. The management strategies suggested to modify behaviours will be appropriate and in accordance with the Least Intrusive, Minimally Aversive (LIMA) principle, with reference to associative learning and schedules of reinforcement. Learners will consider the necessity of ruling out medical factors and the importance of environmental management and enrichment.

For merit standard, learners will discuss the role learning theory has in the acquisition of abnormal behaviours in the species, acknowledging inappropriate reinforcement as a feature. The work will show a clear understanding of the principles of managing abnormal behaviour and learning theory without confusion.

For pass standard, learners will recall knowledge to demonstrate their understanding of learning theory in relation to how animals learn normal behaviours and abnormal behaviours in certain situations. Learners will cover both associative and non-associative learning and give appropriate examples of how abnormal behaviours are acquired and managed.

Learning aims B and C

For distinction standard, learners will provide a comprehensive exploration of the implications of how the influencing factors affect the behaviour of selected animals. The information presented will clearly support the provided interpretation of the monitoring and sampling results obtained for a specific animal as a measure of its welfare.

For merit standard, learners will provide evidence of reasoned consideration of the link between lifestyle, environment and behaviour. Learners will discuss the effect of several lifestyle factors on observed behaviour patterns. The links provided will be appropriate and logical. In addition, the analysis of observed behaviour will be completed accurately and the method selected (bar chart, etc.) will be appropriate.

For pass standard, learners will construct an ethogram appropriate to their chosen species, including descriptions of all communication methods. The sampling technique used will be appropriate and undertaken safely and accurately. The likely influencing factors of behaviour will have been explained, covering both internal and external factors appropriate to the animal species. Sampling and monitoring results will also be explained.

Links to other units

This unit links to *Unit 20: Human and Animal Interaction*.

Employer involvement

Centres may involve employers in the delivery of this unit if there are local opportunities.

This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local animal businesses
- contribution of ideas to unit assignment/project materials
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Unit 6: Animal Health and Diseases

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners study common indicators of animal health, diseases and disorders as well as treatments and prevention methods in order to detect and protect animals from illness.

Unit introduction

Animals can become ill, and unlike humans they can't explain what might be wrong. The people involved in their management need to be able to reduce the risk of animal illness and recognise the signs that indicate a disease or disorder may be present.

In this unit, you will explore common indicators of health, diseases and disorders in animals. You will develop an understanding of the causes, signs and treatments of illness and disease, along with some of the skills needed to prevent animals from developing illnesses and to recognise when an animal is ill. You will investigate factors that affect animal health and learn about how pathogens and parasites can cause infection, grow and reproduce. This will help you to understand infection identification and control, and the different treatment options available. You will explore practical ways to assess the health status of an animal. You will learn assessment techniques and how to apply basic treatments and implement preventative measures, as well as how to monitor and record them to industry standards. This will help you to promote and maintain the health statuses of the animals you manage.

The skills you will learn in this unit are key to employment in the animal sector, including in zoos, farms, and pet-related industries, or for progression to a higher education course such as in animal science or veterinary nursing.

Learning aims

In this unit you will:

A Understand the growth and reproduction of pathogens, parasites and how organisms defend against disease

B Undertake health assessments to promote and maintain animal health and welfare and to treat and prevent common diseases and disorders

C Demonstrate preventative health strategies by assessing, recording and monitoring health in animals.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Understand the growth and reproduction of pathogens, parasites and how organisms defend against disease	**A1** Structure and reproduction of bacteria, viruses, fungi and parasites **A2** Routes of transmission **A3** Effects caused by pathogens and parasites **A4** Defence against disease	A report exploring the structure, growth, reproduction and transmission of pathogens and parasites of different animals.
B Undertake health assessments to promote and maintain animal health and welfare and to treat and prevent common diseases and disorders	**B1** Assessing general health in animals **B2** Common diseases in animals and their clinical signs, treatments and prevention **B3** Common disorders in domestic animals	A portfolio of evidence, including: • practical activities completed to assess animals' health, with a signed witness statement and/or observation record • report on findings, diseases and disorders.
C Demonstrate preventative health strategies by assessing, recording and monitoring health in animals	**C1** Preventative health strategies **C2** Theory and administration of basic animal treatments **C3** Preventative health assessment, recording and monitoring	A portfolio of evidence, including: • practical activities of implementing preventative health strategies with a signed witness statement and/or observation record • written preventative care plans and monitoring documents.

Content

Learning aim A: Understand the growth and reproduction of pathogens, parasites and how organisms defend against disease

A1 Structure and reproduction of bacteria, viruses, fungi and parasites

- Structure and description of:
  - bacteria – cellular structure, including cell wall, membrane, DNA structures, flagella, morphology of bacteria, Gram-positive and Gram-negative
  - viruses – genome, capsid, morphology, capsomeres, nucleocapsid and envelopes, including prions, virions and bacteriophages
  - fungi – cellular structure of yeast and moulds
  - parasites – genes, proteins and cells function in different parasites, including helminths, protozoa and ectoparasites.
- Reproduction of:
  - bacteria – asexual and sexual reproduction
  - viruses – RNA- and DNA-based viruses and use of vectors
  - fungi – asexual and sexual
  - parasites – life cycles, vectors and host interactions, including helminths, protozoa and ectoparasites.
- Growth of bacteria, viruses and fungi:
  - environmental factors affecting growth, including temperature, pH, water and oxygen, and the practical meaning of this in an animal's surroundings
  - growth, including growth curves in batch cultures
  - awareness of the meaning of total cell counts, viable cell counts, cell mass.

A2 Routes of transmission

Modes of transmission for different pathogens (such as bacteria, viruses, fungi, parasites), to include:

- touch
- bodily fluids (blood, semen, mucus, saliva)
- air
- food
- water
- insects
- formites (non-living objects, such as bedding, towels, toys and barbed wire).

A3 Effects caused by pathogens and parasites

Aetiology and pathogenesis of the following, to include direct damage to cells, effect of toxin production and physiological response of host as appropriate:

- bacterial disease, to include *Salmonella* spp, *Bordetella* spp, *Escherichia coli* spp and *Mycobacterium bovis*
- viral disease, to include canine parvovirus, feline influenza and the rabies virus
- fungal disease, to include *Microsporum canis*, and *Aspergillus* spp
- parasites, to include *Taenia saginata*, *Fasciola hepatica* and *Siphonaptera* spp.

A4 Defence against disease

The role of the immune system in disease and the prevention of disease in different animals.

- Non-specific (innate) immune response:
  - natural barriers to infection, including mechanical barriers, physical epithelium, and chemical and biological defence
  - inflammation, e.g. heat, swelling and pain
  - phagocytosis
  - role of blood in defence against disease, including blood clotting (thrombus), cascade reactions, enzyme interaction, fibrinogen, fibrin.
- Specific (adaptive) immunity:
  - humoral immunity, antibody-mediated immunity
  - cell-mediated immunity
  - leucocyte structures and functions; neutrophils, lymphocytes, monocytes, eosinophils, basophils and agranulocytes
  - adaptive immune system including specific responses and interactions of different types of B cells and T cells.
- Different types of immunity:
  - natural/artificial and active/passive.
- Allergies/hypersensitivity, to include the roles of allergens, mast cells and histamines in the immune response.
- Vaccination – interaction with the immune system, mode of action in the body and effectiveness over time, to include:
  - live attenuated
  - inactivated vaccines
  - toxoid vaccines
  - subunit vaccines
  - conjugate vaccines.

Learning aim B: Undertake health assessments to promote and maintain animal health and welfare and to treat and prevent common diseases and disorders

B1 Assessing general health in animals

Establishing the health of animals through the performance of a health assessment.

- Indicators of health status in different animal groups, to include:
  - behaviour, posture and movement
  - coat condition
  - weight
  - calculation of body conditioning score
  - presence of lumps/bumps
  - normal parameters of temperature, pulse, respiration
  - clear and shiny eyes; open, shiny and clean ears; mouth; dry/wet, open, clean nose; intact teeth of appropriate colour, all teeth present
  - pink, moist mucous membranes
  - faeces/urine output, e.g. volume, colour, texture.
- Basic assessment techniques, to include:
  - faecal floatation and analysis of herbivores
  - condition scoring
  - weighing and measuring
  - postural changes
  - environmental assessment.

B2 Common diseases in animals and their clinical signs, treatments and prevention

Variety of common diseases and their clinical signs, treatments and prevention.

- Bacterial infections, e.g. *Salmonella* spp, *Bordetella* spp, *Escherichia coli* spp and *Mycobacterium bovis*.
- Viruses, e.g. parvovirus, feline influenza and the rabies virus.
- Fungal infections, e.g. *Microsporum canis* and *Aspergillus* spp.
- Prions, e.g. scrapie and bovine spongiform encephalopathy.
- Parasites, e.g. endoparasites: protozoa and helminths, ectoparasites: fleas, ticks, lice.
- Zoonotic and notifiable diseases, to include rabies, scrapie, foot and mouth, brucellosis.

B3 Common disorders in domestic animals

- Nutritional disorders:
  - obesity
  - food toxicity, e.g. chocolate and onion in dogs and cats
  - acidosis
  - dehydration.
- Endocrine disorders and their clinical signs, treatment and prevention:
  - hyperadrenocorticism and hypoadrenocorticism in dogs
  - hyperthyroidism in cats.
- Metabolic disorders:
  - diabetes in dogs and cats
  - metabolic bone disease in reptiles and mammals
  - hypocalcaemia and hypomagnesaemia in cattle
  - ketosis in animals.

Learning aim C: Demonstrate preventative health strategies by assessing, recording and monitoring health in animals

C1 Preventative health strategies

Management techniques used to prevent or manage disease.

- Antimicrobial agents:
  - soap, including correct hand washing techniques
  - external use of antiseptics on living organisms, bactericidal versus bacteriostatic, to include alcohols, chlorhexidine and iodine
  - use of disinfectants on non-living objects, to include alcohols and oxidising agents, with correct dilution rates
  - effectiveness of antimicrobial agents: growth of pathogens on agar plates prior to and after use of antimicrobial agents.
- Sterilisation of equipment, including different methods and equipment, e.g. heat, chemical, high pressure.
- Production, monitoring and recording of species and individual health and hygiene plans:
  - management of environmental factors to prevent pathogen growth and disease transmission, to include best practice hygiene and isolation procedures
  - management practices, including rotational grazing, paddock management and management of chemicals and waste
  - vaccination schedules.

C2 Theory and administration of basic animal treatments

- Types of treatment:
  - antibiotics
  - nutrition management
  - anthelmintics for parasitic infections (topical and internal)
  - vaccines
  - reasons for routes of administration for treatments.
- Mode of action and administration of prophylactic treatments:
  - vaccination, e.g. subcutaneous, intradermal and intranasal
  - parasite treatment, to include oral drenching, paste, tablets; topical – spot on, spraying; injection
  - vector control, e.g. flea treatment in the control of myxomatosis, tick treatment in the control of Lyme disease
  - non-medical prophylactic measures, including nutrition, bathing and grooming, weight control, dental care, foot/hoof care.
- Routes of administration for medication in animals:
  - gastrointestinal, including oral (per os) – through the mouth, gavage – into the stomach via a tube or gavage needle, rectal (per rectum) – into the rectum via the anus
  - parenteral, including subcutaneous (SC) – under the skin, intramuscular (IM) – into a muscle, intradermal (ID) – into or between layers of skin
  - topical applications.

C3 Preventative health assessment, recording and monitoring

- Importance of record keeping, e.g. prevention of overdose/underdose, allergic reactions.
- Purpose and importance of record keeping and monitoring.
- Data recording with reasons, including time, date, name of treatment, strength of treatment, amount of treatment, batch number if applicable, frequency of treatment, withdrawal period if applicable. Administering person keeps health records for animal prior to and after treatment and comments on change.
- Type of records to keep, including paper-based and electronic recording systems, e.g. intake health check, treatment and monitoring forms.
- Practical monitoring and recording, to include observation and physical examination/health checks.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Understand the growth and reproduction of pathogens, parasites and how organisms defend against disease.		
A.P1 Explain the structure, growth and types of reproduction seen in pathogens and parasites in animals. **A.P2** Explain the routes of transmission and effects on animal health of bacteria, viruses, fungi and parasites.	**A.M1** Analyse how the immune system of an animal species responds to the pathogenesis and transmission of organisms.	**A.D1** Evaluate the effectiveness of the immune system of an animal in responding to the growth and reproduction of organisms.
Learning aim B: Undertake health assessments to promote and maintain animal health and welfare and to treat and prevent common diseases and disorders		
B.P3 Perform techniques to assess the health statuses of animals. **B.P4** Explain causative agents, clinical signs and the treatment and prevention of common diseases and disorders.	**B.M2** Carry out health assessments on animals, adapting for different situations, analysing the clinical signs, treatment and prevention of common diseases.	**B.D2** Justify the use of health assessments and treatment and prevention methods in promoting the health of animals.
Learning aim C: Demonstrate preventative health strategies by assessing, recording and monitoring health in animals		
C.P5 Carry out routine recording and monitoring of treatments or prevention in animals correctly and safely. **C.P6** Explain the records that need to be kept and the importance of recording and monitoring animal health on an ongoing basis.	**C.M3** Carry out health care strategies in complex situations for the treatment and prevention of animal sickness, with comprehensive recording and analysis of ongoing monitoring regimes.	**C.D3** Evaluate effectiveness of own and existing preventative care plans, treatment and monitoring, making recommendations for improvement.

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of three summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aim: B (B.P3, B.P4, B.M2, B.D2)

Learning aim: C (C.P5, C.P6, C.M3, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit learners must have access to:

- antimicrobial agents
- disinfectants and antiseptics
- a laboratory with microbiological equipment
- IT and library access
- different animals from the category list.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will articulate arguments concisely and professionally to evaluate the growth and reproduction of the two chosen species and the responses of the immune system. Learners will show depth of understanding to explain the detailed structure and function of bacteria, fungi, viruses and parasites. Learners will evaluate the effect of the environment on the growth and reproduction of all the organisms mentioned. Learners will use detailed analysis and research to explain the immune response in detail (including the involvement and interaction of different cell types) to show a thorough understanding of the role of the immune system in animal disease. Learners will include an evaluation of how the animal immune system can affect the symptoms of a disease, both positively and negatively. Learners will explicitly describe the difference between the causes and symptoms of disease.

For merit standard, learners will reach reasoned, analytical judgements considering how the immune system in animals responds to the threat of infection. Learners will select and apply knowledge relating to the pathogenesis of two specified examples of each type of disease/parasite (bacterial, viral, fungal and parasite), to include route of transmission, where they reproduce and how they cause disease. Learners will explain the relationship between the immune system's structure and functions and how it responds to infection by bacteria, fungi, viruses and parasites.

For pass standard, learners will recall knowledge and understanding to explain the transmission route and effects of two species of bacterial, viral, fungal and parasitic organisms, clearly identifying all structures and functions. Learners will explain the different types of reproduction of each pathogen and parasite as listed in the unit content. Learners will explain the effects that are caused by bacteria, viruses and fungi in an animal's body, which are instrumental in causing disease. Learners will describe the different parts of the immune system, including innate physical and chemical barriers and cells, and adaptive B and T cells. They will include the different types of immunity (natural active, artificial active, natural passive, artificial passive) that might follow in different situations.

Learning aim B

For distinction standard, learners will show how they have made the most appropriate selection of health assessments and treatment and prevention methods, making valid judgements about the risks and limitations of each method. They will carry out three detailed health assessments for different animals, assessing for all health indicators in the unit content. Learners will use detailed analysis and research to evaluate the impact of two common diseases and two disorders, including their causative agents and immune response, clinical signs, treatment options and methods of preventative management. They will consider the impact of clinical signs on the animal's health and welfare and explain in detail how the different treatments and preventions work in circumstances of increasing complexity, such as in a herd, flock or group situation.

For merit standard, learners will select and carry out appropriate methods to complete three health assessments for different animals. Learners will demonstrate the assessment techniques listed in the unit content as appropriate, modifying techniques to suit the context. Learners will carefully consider clinical signs, treatments and prevention methods for two diseases and two disorders, analysing those likely to be the most beneficial and reaching a valid conclusion. Learners will reach reasoned, analytical judgements on the impact of clinical signs on the animal's health and welfare and explain in detail how the different treatments and preventions work.

For the pass standard, learners will select and carry out appropriate animal assessment methods in well-defined situations. They will work appropriately to carry out the assessment fully, correctly and safely. They will recall knowledge to explain all health indicators listed in the content as appropriate, and explain clinical signs of disease, different treatment options and the prevention measures available for two diseases and disorders.

Learning aim C

For distinction standard, learners will draw together knowledge from across the learning aims to evaluate the effectiveness of their own preventative care plans and use of treatment and monitoring methods. They will demonstrate proficient use of methods in more advanced situations and make valid judgements about any risks or limitations in relation to the desired outcomes. Learners will use detailed analysis and research to justify the importance of preventative health plans to animals' good health. Learners will interpret the constituent parts of the preventative care plan and explain how they can be implemented effectively, reaching valid recommendations for improvement.

For merit standard, learners will select appropriate strategies for the treatment and prevention of animal sickness. They will provide appropriate solutions as a result of practical exploration. They will apply knowledge and understanding of the relationship between preventative health plans and animal welfare, and relate preventative health care methods to good health management. They will explain how each constituent part of the health plan will be implemented. Learners will select and employ treatments, delivery, and recording and monitoring methods, using treatments appropriate to their purpose, limitations and resource constraints.

For pass standard, learners will recall knowledge to describe preventative health strategies, including all the strategies in the unit content. Learners will show understanding of how important preventative health plans are to the promotion of good welfare by linking preventative health care methods to good health management. Learners will be able to outline the constituent parts of the plan and how they should be implemented. Learners will work appropriately to perform the application of basic treatments correctly and safely. They will select and use appropriate recording and monitoring methods.

Links to other units

This unit links to:
- Unit 2: Animal Biology
- Unit 9: Practical Skills in Science.

Employer involvement

Centres may involve employers in the delivery of this unit if there are local opportunities. This unit would benefit from employer involvement in the form of:
- guest speakers
- technical workshops involving staff from local animal businesses
- contribution of ideas to unit assignment/project materials
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Unit 7: Work Experience in the Animal Sector

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners study roles available in the animal sector and the progression routes required to attain them, and develop communication and employability skills through study and work experience.

Unit introduction

Where do you picture yourself in five years' time? Do you know the wealth of working opportunities open to you in the animal sector? Discovering these opportunities, and understanding the skills and qualifications needed to follow your chosen path will help you to answer these questions and plan your future career.

In this unit, you will investigate employment opportunities in the animal sector, and learn about the skills and qualifications required to progress in these routes. You will examine how good communication and employability skills can improve your prospects in gaining and keeping employment, and learn how and where to access information on employment vacancies and further courses of study. You will learn how to develop your Curriculum Vitae (CV) and contextualise it to specific vacancies, and how to develop good communication, interview and customer service skills. You will apply for and take on available work experience roles in the sector, and reflect on your own progress.

The skills acquired in this unit are essential for your progression to employment in the animal sector, either immediately following the qualification (for example, pet shop assistant or veterinary care assistant), or following further study in an apprenticeship (for example, zookeeper or dog groomer) or on a higher education course (for example, animal science, or animal behaviour and welfare).

Learning aims

In this unit you will:

A Investigate employment opportunities in the animal sector to target future progression

B Develop communication and interview skills to improve employment prospects

C Complete work-related experience in the animal sector to contribute to personal and professional development.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Investigate employment opportunities in the animal sector to target future progression	**A1** Progression opportunities **A2** Requirements for progression **A3** Relevant legislation for work placement opportunities	A portfolio of work-related learning research, completed application documents and mock interview outcomes, for example observation or video.
B Develop communication and interview skills to improve employment prospects	**B1** Applying for work-related activities **B2** Interview skills	
C Complete work-related experience in the animal sector to contribute to personal and professional development	**C1** Practical work-related experience **C2** Customer relations **C3** Reflecting on workplace practice	A report reflecting on work experience informed by employer and other feedback.

Content

Learning aim A: Investigate employment opportunities in the animal sector to target future progression

A1 Progression opportunities

Analysis of progression opportunities to determine desirability, suitability and feasibility.

- Higher education – UCAS, entry requirements, student loans.
- Apprenticeships – requirements, timescales, pay scales, balance between academic and practical work, assessment, higher apprenticeships.
- Employment sectors:
  - o public sector, e.g. education, government, local government (Department for Environment, Food and Rural Affairs)
  - o private sector, e.g. farming, food companies, pet shops
  - o voluntary sector or charities, e.g. Royal Society for the Prevention of Cruelty to Animals (RSPCA), animal shelters and sanctuaries.
- Employment sectors, to include an appropriate broad representation of current industries, e.g. wildlife management, veterinary practices, commercial enterprises.
- Self-employment, e.g. dog-walker, animal groomer, sheep shearer.

A2 Requirements for progression

Knowledge of formal and informal requirements for progression.

- Entry criteria, including qualifications, skills and knowledge.
- Self-management, including study skills, presentation and attitude, time management and planning.
- Exit criteria for specific progression routes.
- Soft skills, including communication, problem solving, individual, team and leadership skills, personal management.

A3 Relevant legislation for work placement opportunities

- Employment: safeguarding at work placements, contracts of employment and working hours (in relation to age) including zero-hours contracts/fixed-term/hourly paid/permanent (full/part) contracts, work time regulations, Pay As You Earn (PAYE), statutory leave, maternity/paternity leave, employment status.
- Different legal statuses of businesses: single owner (self-employed)/partnership/limited company/self-employed subcontractor.
- Awareness of the impact of current legislation supporting conduct in the workplace for employers and employees (full-time, part-time, casual, interns and work placements), such as:
  - o Health and Safety at Work etc Act 1974
  - o Equality Act 2010
  - o Data Protection Act 1998
  - o Control of Substances Hazardous to Health (COSHH) Regulations 2002
  - o Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 1995
  - o Animal Welfare Act 2006.

Learning aim B: Develop communication and interview skills to improve employment prospects

B1 Applying for work-related activities

- Selection of work including different sources of vacancies, such as websites, trade publications and sector-wide bodies, e.g. Lantra.
- Importance of reading job description, personal specification including relevance of essential or desirable criteria, to include qualifications, skills and experience.
- Completion of CV and contextualisation of CV or job application to specified vacancy.
- Letters of application, supporting statements and completing application forms: standing out from the crowd, addressing relevance to employers and how they might shortlist candidates.
- Correct use of language, grammar, spelling and punctuation.

B2 Interview skills

Creating an impression through effective communication.

- Preparation and presentation skills, including:
  - planning and practice for the interview
  - interview styles, e.g. competency- or behaviour-based, knowledge focused
  - personal appearance and hygiene
  - interpersonal skills and attitude
  - body language.
- Listening and talking skills, including:
  - interview conventions
  - use of language – what is/what is not appropriate
  - building rapport
  - developing a dialogue
  - effective listening and questioning
  - non-verbal communication, e.g. eye contact.

Learning aim C: Complete work-related experience in the animal sector to contribute to personal and professional development

C1 Practical work-related experience

- Operating within workplace practices, including:
  - knowledge of the purpose of the business and/or environment
  - knowledge of reporting procedures with regards to behaviour and expectations, e.g. lateness, sickness, emergency
  - health and safety protocols, e.g. fire safety, emergency procedures
  - procedures to maintain confidentiality.
- Completion of role to add value in the workplace:
  - understanding the extent and limitation of own roles and responsibilities
  - carrying out tasks according to roles and responsibilities
  - following instructions
  - communicating with others
  - self-management
  - working safely
  - reliability, regular attendance and commitment
  - punctuality
  - use of initiative
  - cooperation with colleagues and end users, e.g. customers, clients, other organisations.
- Obtaining feedback, including:
  - timesheets signed by an appointed person at work-related employment, confirming appropriate attendance and punctuality
  - employer or teacher observation/witness statements
  - employer feedback sheets, provided at intervals.

C2 Customer relations

Internal and external customers in an organisation, and applying the principles of customer service on:

- the customer, to include the paying customer, service user or colleague
  - first impressions, speed and accuracy of service, meeting customer needs and expectations, offering information and advice, dealing with problems
- the organisation
  - customer satisfaction leading to customer loyalty, repeat business, productive relationships
  - customer service that enhances an organisation's image
  - benefits to the organisation of good customer relations, including sales and/or usage by attracting new customers, improving productivity, profits
- the employee
  - job satisfaction from customer service, job security, self-esteem, promotion/progression in the organisation (or elsewhere), increased income, the employee as a customer in the organisation and the opportunity for feedback
- consequences of customer service for the customer, the staff and the organisation.

C3 Reflecting on workplace practice

Reflecting on personal performance, making use of:

- formative feedback from employer(s), colleagues, teacher, stakeholders
- performance self-assessment
- review of areas for development using SWOT (strengths, weaknesses, opportunities, threats) analysis and SMART (specific, measurable, achievable, relevant, timebound) target setting, knowledge of SWOT and SMART in learning development.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Investigate employment opportunities in the animal sector to target future progression		
A.P1 Explain the value of own research and preparation for work experience, and related opportunities and progression routes. **A.P2** Explain accurately the relevant legislation relating to a work placement.	**A.M1** Analyse the value of own research and preparation for work experience, related opportunities, and progression routes.	**AB.D1** Evaluate own preparation for and performance in work experience interview, including review of all future opportunities. **AB.D2** Evaluate how effective own preparation for, and participation in, work experience can significantly enhance future employment prospects
Learning aim B: Develop communication and interview skills to improve employment prospects		
B.P3 Explain the preparation and research required for a work experience interview. **B.P4** Demonstrate communication and interpersonal skills as an interviewee for selected work experience.	**B.M2** Perform proficiently as an interviewee for selected work experience using appropriate communication and interpersonal skills.	
Learning aim C: Complete work-related experience in the animal sector to contribute to personal and professional development		
C.P5 Explain how the work experience has improved occupational and personal skills for future opportunities. **C.P6** Review how own performance during work experience contributed to the employing organisation.	**C.M3** Assess the value of the occupational and personal skills developed during work experience to future opportunities. **C.M4** Analyse the impact on the employing organisation of own performance during work experience.	**C.D3** Evaluate the effectiveness of the work experience carried out in improving occupational and personal skills to make best use of opportunities for future employment.

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aims: A and B (A.P1, A.P2, B.P3, B.P4, A.M1, B.M2, AB.D1, AB.D2)

Learning aim: C (C.P5, C.P6, C.M3, C.M4, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to a work experience role, e.g. work placement, part-time work, volunteering etc. For the number of hours of experience required, see 'What does this qualification cover?' in *Section 1: Qualification purpose*.

Essential information for assessment decisions

Learning aims A and B

For distinction standard, learners must produce a written report evaluating the quality of their own preparation when seeking work-related experience, following investigation and research, completion of application documents contextualised for specific roles, and completion of a mock interview.

The report must include conclusions about the quality of each step of the preparation, linking this to the teacher's evaluation of the mock interview and the chance of securing employment. Learners must write a conclusion that includes clear understanding of best practice in this area.

For merit standard, learners must produce a written analysis of the quality of their own preparation when seeking work-related experience, following investigation and research, completion of application documents contextualised for specific roles and completion of a good mock interview. The analysis must include a detailed examination of each step of the preparation, linking this to the chance of securing employment. Learners must include an analysis of the teacher's evaluation of the mock interview. Learners should write their conclusions.

For pass standard, learners must consider the value of their own preparation when seeking work-related experience, following investigation and research, completion of application documents contextualised to specific roles and completion of a mock interview. Learners must include links to the teacher's evaluation of the mock interview. Learners could include a SWOT analysis.

Learning aim C

For distinction standard, learners must supply reasoning to their reflective reports to ascertain the effectiveness of the work experience they have completed and its capacity to improve their opportunities for employment. Their reasoning must consider the relationship between the occupational and personal skills developed during the work experience and how these may help them in securing future employment. The relationship between learners' own performance during work experience or work-related activity, and its impact on the employing organisation, must also be covered. Learners must also consider how well they prepared themselves for the work-related activities so that they were able to gain the most advantage from the experience(s). Links need to be shown to employer/teacher observation/witness feedback sheets.

For merit standard, learners must present in their reflective reports a relationship between the occupational and personal skills developed during the work experience, and a discussion as to how these skills will help secure future employment. Learners must consider the relationship between their own performance during the work experience and its impact on the employing organisation. Links need to be shown to employer/teacher observation/witness feedback sheets.

For pass standard, learners must present in their reflective reports a consideration of how they developed different occupational and personal skills during their work placement. Learners must make a formal assessment of their own performance during work experience based on feedback, including a SWOT analysis, and link this to their contribution to the employing organisation.

Links to other units

This unit links with all other units in the specification.

Employer involvement

Learners must have access to a work experience placement in an animal sector setting. Learners must be provided with a work experience log for them to record the skills they develop on their placement and plan for their future development.

Unit 8: Investigative Research Project

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners study the principles and purposes of research in the animal sector and develop the skills needed to conduct their own small-scale research project.

Unit introduction

Conducting research projects and investigations into issues concerning animal management is an element of work in the animal industry. Research enables those working with animals to question and evaluate new or traditional working methods with a view to suggesting alternative approaches. This unit will give you the skills and techniques needed to carry out investigations in the areas of animal management.

In this unit, you will follow the research process from start to finish. You will study the methods used in effective research, identify a project, conduct the research and present your findings. You will critically examine the process and reflect upon it to improve your analytical and presentation skills.

The skills and techniques you learn in this unit are essential for a career in managing animals. Whether designing a zoo enclosure, improving animal welfare or developing a breeding programme, good research skills are essential. The unit will also help to give you further research opportunities at a higher level in animal management or other fields of study or interest. Research skills are an essential part of higher education and give you direct opportunities for employment in the animal sector.

Learning aims

In this unit you will:

A Understand the methodologies and processes available when conducting a research project in the animal sector

B Carry out a small-scale research project investigating an aspect of animal management

C Review the effectiveness of the research project in meeting its stated aims.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Understand the methodologies and processes available when conducting a research project in the animal sector	**A1** Research methodology **A2** Investigative project processes	A research portfolio showing planning and decision processes leading to chosen project and methodology.
B Carry out a small-scale research project investigating an aspect of animal management	**B1** Planning for an animal management project **B2** Carry out an animal management project **B3** Monitor an animal management project **B4** Report and present the project outcomes in an appropriate format	A portfolio, including: • detailed planning • a report, artefact or other realisation of the project • evidence of regular project monitoring • a presentation of the report or other realisation and summary of findings • an evaluation of the project and the outcome.
C Review the effectiveness of the research project in meeting its stated aims	**C1** Review the project	

Content

Learning aim A: Understand the methodologies and processes available when conducting a research project in the animal sector

A1 Research methodology

- Research sources:
  - primary data collection including sampling
  - secondary data collection and the use of published sources
  - hypotheses, null hypotheses and the scientific method
  - reliability, validity of sources
  - circular references.
- Methods of reporting and types of project outcomes:
  - the extended essay
  - scientific papers
  - audio/visual presentations
  - design or product, e.g. plans, artefacts, computer-based products, such as the creation of web-based content or applications (apps).
- Decision making:
  - the decision-making process
  - subjectivity and objectivity
  - developing qualitative and quantitative criteria to aid decision making.

A2 Investigative project processes

- Planning frameworks:
  - scheduling
  - task and activity lists
  - use of timelines
  - flow diagrams
  - critical path analysis
  - monitoring methods.
- Factors that affect planning:
  - internal factors, e.g. workload, personal commitments, motivation
  - external factors, e.g. the target audience, seasonal or time-limited data collection, financial or technological constraints and opportunities, availability of interviewees
  - resourcing considerations, e.g. seasonality, reproductive cycles of animals, availability of equipment
  - planning for health and safety issues and other regulatory constraints
  - the need for contingency planning and problem solving.
- Investigating relevant topics:
  - suitability and feasibility
  - using decision-making methods to decide on a project, e.g. personal interest and expertise, usefulness to sector, stakeholder needs
  - selecting a final project and developing the aims and objectives and the project title.

Learning aim B: Carry out a small-scale research project investigating an aspect of animal management

B1 Planning for an animal management project

The application of planning tools and methods to create a project plan:

- risk analysis
- absolute and relative timings
- identification of critical points, tasks and activities
- identification of deadlines
- development of project record keeping.

B2 Carry out an animal management project

Following a plan to carry out a project:

- maintain project record keeping
- compliance with task lists and schedules
- completion within planned timescales and resources
- production of a completed animal sector-related investigative project.

B3 Monitor an animal management project

Following a plan to monitor a project in the animal sector:

- monitoring through formative reviews
- use of problem-solving techniques to identify and overcome challenges
- use of contingency planning to overcome obstacles
- incorporating justified changes to the project plan.

B4 Report and present the project outcomes in an appropriate format

- Reporting formats, including:
  - project title
  - aims and objectives
  - factors affecting project
  - methodologies used
  - findings, results or outcomes
  - conclusions, recommendations
  - appendices
  - referencing and acknowledgements, e.g. Harvard referencing.
- Presenting reports:
  - tailoring format to meet needs of target audience and stakeholders
  - presentation methods, e.g. paper, oral, audio-visual.

Learning aim C: Review the effectiveness of the research project in meeting its stated aims

C1 Review the project

- Constructing an appropriate evaluation framework including relevant criteria, e.g. qualitative, quantitative, peer review.
- Strengths and weaknesses of the research process.
- Validity and reliability of results, e.g. bias error, use and misuse of statistics.
- Review of conclusion, including the extent to which the investigation has met its stated aims.
- Relevance of recommendations to animal sector.
- Potential areas for further development of the research.
- The role and importance of research in supporting continuing professional development in the animal sector.
- Personal skills, e.g. autonomy, decision making, time management.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Understand the methodologies and processes available when conducting a research project in the animal sector		**A.D1** Justify the choice of research proposal and methodology in terms of suitability and relevance to the stated aims of the project.
A.P1 Explain reasons for the selection of a specific animal management research proposal. **A.P2** Explain the methodologies appropriate to the selected project.	**A.M1** Analyse the extent to which the proposed research methodology is able to meet the aims of the research proposal.	
Learning aim B: Carry out a small-scale research project investigating an aspect of animal management		**BC.D2** Evaluate the success of the animal management research project against agreed management and evaluation frameworks. **BC.D3** Evaluate the success of the animal management research project in meeting its stated aims with reference to the research, planning and monitoring methods used.
B.P3 Demonstrate the management of an animal management research project using agreed project frameworks. **B.P4** Explain the findings of the investigative animal management research project in a suitable format.	**B.M2** Assess the effectiveness of project management against agreed project frameworks. **B.M3** Analyse the findings of the animal management investigative research project.	
Learning aim C: Review the effectiveness of the research project in meeting its stated aims		
C.P5 Explain how the outcome of the investigative animal management research project met the aims of the project plan.	**C.M4** Assess the outcome of the investigative animal management research project, making recommendations for improvements.	

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, C.P5, B.M2, B.M3, C.M4, BC.D2, BC.D3)

Further information for teachers and assessors

Resource requirements

There are no specific additional requirements for this unit.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners must present a rational decision-making process resulting in their choice of research project. They must show an equal thoroughness in applying the decision-making process to all alternative proposals and have reasoned arguments for rejecting those proposals. Learners will have a clear assessment of the resource and feasibility implications for all the proposals and will demonstrate a consistent objectivity in their decision making. They will have a clear set of aims and objectives to be achieved and will be able to construct a title for the project that reflects these. Learners will apply the same initial thoroughness to the alternative projects as they do to the one finally chosen. Learners will have a clear understanding of the methodologies they intend to use and will understand the limitations of their chosen methodologies.

For merit standard, learners must consider at least two approaches to conducting their selected project, and give reasoned accounts as to why they have selected the methodologies chosen for their particular project. They will show that they have used agreed criteria to make their decision, and will have compared the options they identified in light of these criteria. They will demonstrate a clear understanding of the resources they will use, the format of the finished project and the factors that will affect the progress of the project. Learners will clearly articulate the aims, objectives and project title.

For pass standard, learners must investigate a range of suitable projects from which their final project will be selected, giving evidence that shows they have considered methodological and resource implications. Learners will clearly relate their chosen project to one or more mandatory units from the animal management qualification. Learners will carefully consider their project title, aims and objectives before they present evidence for assessment. They will usually favour one title over alternatives and will need to demonstrate objectivity in their choice.

Learning aims B and C

For distinction standard, learners must present their findings against stated aims in a professional manner and show an in-depth knowledge of the subject studied. They must be aware of other research in the same area and be able to incorporate this appropriately. Learners will identify areas for further study. Learners will have a clear audit trail from plan to outcome, showing the progress of the project, including a comprehensive and proactive research monitoring schedule.

Learners will be able to articulate clearly the differences between the project product and the project process. They will construct and use an appropriate evaluation framework, drawing on value and numerical analytical techniques.

For merit standard, learners must effectively manage the progress and completion of their chosen project. They must provide comprehensive documentation that they have created and they must have followed a detailed plan that includes regular monitoring. Learners will complete tasks to schedule, identify and overcome obstacles and meet the aims and objectives of the project. They will complete the project within an agreed timescale and to an agreed format. The findings of the project will be articulated clearly and analysed either numerically or subjectively. Learners will complete their project with due regard for regulatory requirements, including health and safety legislation. They will also be able to reflect accurately on the progress of the project and the personal skills they have practised.

Learners will assess the outcome of the project against the stated aims and objectives. They will be able to identify the strengths and weaknesses of the project and the degree to which the project aims and objectives have been realised. Learners will identify valid opportunities for improvement, for example, through further research or application of their findings.

For pass standard, learners must create and follow a plan to complete their project and monitor its progress. They will complete the project within an agreed timescale, making adjustments where identified. The findings of the project will be presented and explained in a format suitable for the audience. Learners will relate the outcome of the project to the aims and objectives. They will explain how the findings meet the stated aims and objectives.

Links to other units

This unit links with all other units in the specification.

Employer involvement

This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local animal businesses
- contribution of ideas to unit assignment/project materials
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Unit 9: Practical Skills in Animal Science

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners develop the practical skills necessary to carry out and report on scientific investigations in the laboratory.

Unit introduction

Working with animals can include working at a microbiological or chemical level. Whether you are part of a scientific team investigating bacterial infections in a veterinary laboratory, or investigating the effect of biochemical changes in animal bodies, laboratory work at this level requires accurate, methodical practical skills and reporting processes.

In this unit, you will learn how to apply scientific theory in order to safely plan and carry out experiments, and report on investigations in bacterial growth, chemical kinetics and essential analytical chemistry. You will develop the skills needed to safely investigate chemical and microbiological processes and be able to report on your experiments using the same methods as professional scientists.

This unit will help you progress to higher education courses in the fields of biological science, or prepare you for work as a laboratory assistant working with technicians in the animal industry.

Learning aims

In this unit you will:

A Understand how to plan, record and communicate findings of scientific investigations in animal science

B Explore the skills necessary to work safely with micro-organisms in order to carry out investigations in bacterial growth

C Explore the skills necessary to work safely with chemicals in order to carry out experiments.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Understand how to plan, record and communicate findings of scientific investigations in animal science	**A1** Preparation for investigating phenomena in animal science **A2** Recording and analysis of data **A3** Scientific communication methods for different audiences	A portfolio including: • risk assessments • tables and graphs of data • analytical reports • investigation reports • journal paper critiques.
B Explore the skills to work safely with micro-organisms in order to carry out investigations in bacterial growth	**B1** Preparation for microbiological experimentation **B2** Practical isolation and culture of bacteria	A portfolio including: • laboratory notebooks • reports of background knowledge required for particular investigations • scientific drawings • tables and graphs of data • quantitative and qualitative analysis of data • investigation reports • presentation of investigative findings.
C Explore the skills necessary to work safely with chemicals to carry out experiments	**C1** Theoretical background for experimentation in animal science **C2** Investigating biochemical phenomena in animal science	

Content

Learning aim A: Understand how to plan, record and communicate findings of scientific investigations in animal science

A1 Preparation for investigating phenomena in animal science

- Essential considerations when taking scientific approaches to answer research questions through carrying out safe scientific experiments and investigations of phenomena.
- Safe working practice in laboratories, to include: purpose and legalities of safe working policies, laboratory safety symbol interpretation, use of bench space, use of fume cupboards, personal protective equipment (e.g. goggles, lab coats and choice of glove material), laboratory hazard identification and risk management, control measures (including tidiness, waste disposal, dealing with spillages and essential first aid).
- Planning steps for safe, valid and reproducible experiments and investigations, e.g. types of variables, range and repeats.
- Reliable and valid recording of observations, to include use of laboratory notebooks.

A2 Recording and analysis of data

Recording of data, to include use of laboratory notebooks.

- Data handling: production of
  - o tables (with correct headings and units)
  - o graphs (e.g. line, bar, histograms; lines of best fit).
- Appropriate use of mathematical and statistical analyses
  - o calculation of average values (mean, median and mode)
  - o basic statistical analyses, e.g. standard error versus standard deviation, use of confidence intervals, one- and two-tailed t-tests.
- Drawing conclusions from analysis of investigative data, making recommendations where appropriate.
- Evaluation of techniques and equipment to improve validity and accuracy of results, to include sources and levels of random and systematic error.

A3 Scientific communication methods for different audiences

Standard layout of scientific reports and journal articles: title, authors, abstract, summary, table of contents, introduction, aims/hypothesis, materials, methods, results, discussion, conclusion, references.

- Scientific communication for other scientists and the general public:
  - o scientific terminology, use of statistics, peer review process, referencing methods
  - o changes to presentation methods to suit different audiences (posters, text, tables, graphs, diagrams)
  - o mass media (newspapers, magazines, internet) and reliability of information sources.

Learning aim B: Explore the skills to work safely with micro-organisms in order to carry out investigations in bacterial growth

B1 Preparation for microbiological experimentation

Fundamental concepts of bacterial identification, media and growth needed in order to carry out useful microbial investigations.

- Comparative features of prokaryotic and eukaryotic cells and tissues.
- Awareness of pathogenic bacteria and safety precautions when working with micro-organisms.
- Classification and identification of bacteria: binomial nomenclature, conventional bacterial taxonomy using keys, colony morphology, molecular taxonomy and use of Bergey's manual.
- Environmental factors affecting growth:
  o aerobic and anaerobic conditions (to include why incubation should not take place at temperatures of around 37 °C outside specialist microbiological laboratories)
  o pH
  o temperature
  o water.
- Bacterial growth curve stages in batch cultures – lag, exponential, stationary and death.
- Purposes and results of:
  o selective media
  o antibiotic sensitivity tests (to include measurement of a zone of inhibition)
  o simple and differential staining.
- Agar and broth preparation, advantages and disadvantages of using solid and liquid media, plate pouring.
- Techniques required for effective use of microscopes:
  o use of light microscopes, oil immersion lenses, stains and slides
  o scientific drawing of cells and tissues.

B2 Practical isolation and culture of bacteria

Techniques required for effective microbial investigation.

- Aseptic technique, sterilisation methods, disinfection methods; inoculation of plates and broths with microbes, incubation, identification of colonies.
- Total cell counts, viable cell counts, cell mass, turbidity.

Learning aim C: Explore the skills necessary to work safely with chemicals to carry out experiments

C1 Theoretical background for experimentation in animal science

Standard scientific representation, terminology, units, calculations and analytical methods in order to plan, carry out and analyse the results of scientific investigations.

- General, empirical and structural formulae, use of full chemical equations.
- Scientific terminology, including concentration, volume, surface area, rate of reaction (including initial and overall rates), pH, variables (dependent, independent, extraneous).
- Units of measurement, to include:
  - distance (μm, nm, mm)
  - time (s)
  - amount (mol)
  - mass (μg, mg, g)
  - volume (cm^3, ml, μl, l, dm^3)
  - concentration (M, mol dm^{-3}, mM)
  - pH
  - rate (cm^3 s^{-1}, mol dm^3 s^{-1}).
- Necessary calculations: pH and pK_a calculations, volumetric calculations: moles = concentration x volume ($M = CV$; $M_aV_a = M_bV_b$), yield calculations (percentage, theoretical and actual).
- Effects of buffers.
- Constructing titration curves.
- Constructing and interpreting graphs showing rates of reaction.

C2 Investigating biochemical phenomena in animal science

Considerations to be aware of when carrying out chemical experiments in order to safely and effectively investigate chemical phenomena.

- Use of relevant glassware for chemical experimentation.
- Accurate measurements of quantities (to include mass of solids, volume of liquids and volume of gases), making standard solutions and serial dilutions.
- Use of indicators, to include universal indicator and pH paper.
- Titration to determine end-points of reactions.
- Varying reaction conditions, e.g. temperature changes, varying concentrations and surface area of reactants, changing pressure of systems, use of catalysts and enzymes.
- Measuring rates of reactions, to include those catalysed by enzymes.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Understand how to plan, record and communicate findings of scientific investigations in animal science		**A.D1** Justify the effectiveness of own planning, recording and communication methods used in completed valid scientific investigations.
A.P1 Explain planning and recording processes for valid scientific investigation. **A.P2** Explain investigative findings for different audiences.	**A.M1** Analyse the effectiveness of planning, recording and communication methods used in scientific investigations.	
Learning aim B: Explore the skills necessary to work safely with micro-organisms in order to carry out investigations in bacterial growth		**BC.D2** Evaluate the effectiveness of experimental techniques used in completed valid scientific investigations. **BC.D3** Evaluate the data gained from complete practical investigations, presenting findings in standard scientific format for different audiences.
B.P3 Demonstrate safe investigation of bacterial growth. **B.P4** Explain the findings of an investigation of bacterial growth.	**B.M2** Demonstrate methodical investigation of bacterial growth analysing own data in an efficient manner to answer a research question.	
Learning aim C: Explore the skills necessary to work safely with chemicals in order to carry out experiments		
C.P5 Demonstrate safe and methodical investigation of biochemical reactions. **C.P6** Explain the findings of an investigation of biochemical reactions.	**C.M3** Demonstrate methodical investigation of biochemical reactions analysing the contribution of different variables to the outcome.	

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, C.P5, C.P6, B.M2, C.M3, BC.D2, BC.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- individual laboratory notebooks
- glassware – beakers, stirring rods, burettes, measuring cylinders, pipettes, flasks, test tubes, funnels
- stands and clamps, test tube racks, tripods, gauze, heat-proof mats, Bunsen burners, balances, filter paper, non-absorbent cotton wool
- distilled water, disinfectants, 70% alcohol (industrial denatured alcohol (IDA)), chemicals, buffers and indicators dependent on the particular investigations centres wish to examine
- thermometers, pH meters, stopwatches/timers (data logging equipment and software could be used with a variety of sensors to measure temperature, pH, turbidity etc.)
- light microscopes, slides, oil immersion lenses, common stains; incubator, autoclave/pressure cooker, refrigerator
- petri dishes, inoculating loops, spreaders, haemocytometers; non-pathogenic bacterial cultures, culture media, universal/McCartney bottles.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners must critically examine the strengths and weaknesses of their planning, recording and communication processes in a wide context, supporting their assertions with suitable supporting evidence. This will be taken from other suitable resources and from their own investigations.

For merit standard, learners must identify strengths and weaknesses in their own planning, which will be detailed and considered, and in their recording and communication of scientific investigations. They will use this to explain how effectively these processes contributed to answering the research question. Learners can compare their results with expected ones, characterised by reference to the research question and hypotheses. They are also able to articulate how the presentation of investigative findings may change depending on the intended audience.

For pass standard, learners must complete documentation demonstrating the intention to carry out an investigation that both is safe and aims to collect valid data to answer the research question. This will be shown through the use of correctly completed risk assessments, planning for an adequate range and number of observations to address the research question, and taking into account prior knowledge. Learners will adapt their reporting of investigative findings to address at least two different audiences.

Learning aims B and C

For distinction standard, learners must evaluate the methods, techniques and equipment they have used, identifying the potential sources of random and systematic error, and commenting on the impact this may have had on their results. Learners will place their data in the context of known parameters for the experiments they have carried out. Learners must also comment on if and how their choices of equipment and techniques could have been improved, along with any unresolved questions that have arisen during the course of the experiment.

For merit standard, learners must demonstrate that data collection has been carried out in a methodical and precise way, utilising tables with suitable headings and use of units. They must process the data they have generated in an appropriate manner to answer the research question. Graphs and tables will be neatly constructed and correctly labelled throughout. Learners must demonstrate careful consideration of the variables influencing their investigations. They must identify the applicable range of variables, discuss their potential effects on investigation outcomes and describe how confounding variables were controlled and/or monitored so as to gain valid and reliable data. Learners' practical abilities are characterised by orderly preparation of materials, and by demonstrating skilful use of equipment. They are able to work with good aseptic technique that leads to little or no contamination, and produce observations that lead to valid data.

For pass standard, learners must carry out an investigation in bacterial growth, as well as investigating at least two factors that affect the rate of a biochemical reaction. They are able to devise and interpret risk assessments and comply with hazard reduction practices. Learners are well prepared for each experiment, both in terms of prior knowledge and in the preparation of their work area. Enough data is gathered to allow the identification of trends and relationships in the results. Learners are able to report accurately on the findings of the investigations.

Links to other units

This unit links to:

- Unit 10: Animal Metabolism
- Unit 11: Advanced Animal Nutrition.

Employer involvement

This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local animal businesses
- contribution of ideas to unit assignment/project materials
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Unit 10: Animal Metabolism

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners study the biochemical basis of metabolic reactions in animals.

Unit introduction

Animals carry out an amazing number of chemical reactions in their cells at any given moment. An understanding of the dynamics of cellular chemistry and energy production allows a greater appreciation of how animals meet their everyday physiological needs.

In this unit, you will study the structure of and interactions between atoms and molecules, factors affecting the rate of biochemical reactions and the use of biological molecules to meet the energy demands of animals.

This unit will help you to progress to higher education courses in the field of biological science or prepare you for work in animal health and nutrition, environmental health, veterinary nursing and analytical and/or diagnostic settings.

Learning aims

In this unit you will:

A Understand atomic structure and bonding in order to establish the basis of biochemical reactions

B Explore factors affecting reactions in order to understand how biochemical reactions take place inside the animal body

C Understand the production of adenosine triphosphate in cellular respiration for animals to utilise energy.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Understand atomic structure and bonding in order to establish the basis of biochemical reactions	**A1** The structure of atoms and the formation of ions **A2** Bonding and forces of attraction	Portfolio of evidence on the bonding and non-bonding substances present in polar and non-polar substances related to their properties. Evidence may be gained from classwork exercises, investigation and research, and include laboratory notebooks, investigation write-ups, reports and presentations.
B Explore factors affecting reactions in order to understand how biochemical reactions take place inside the animal body	**B1** Rates of reaction **B2** Equilibria **B3** Enzymes as biological catalysts	Portfolio of evidence on the role of blood in establishing conditions for chemical reactions to take place, including exchange of nutrients and waste from respiring cells. Evidence may be gained from classwork exercises, investigation and research, and include laboratory notebooks, investigation write-ups, reports and presentations.
C Understand the production of adenosine triphosphate in cellular respiration for animals to utilise energy	**C1** Aerobic respiration **C2** Anaerobic respiration **C3** Other respiratory substrates	

Content

Learning aim A: Understand atomic structure and bonding in order to establish the basis of biochemical reactions

A1 The structure of atoms and the formation of ions

The influences that atomic configurations have on the properties of molecules.

- Atomic structure:
  - relative mass and charge of protons, electrons and neutrons
  - isotopes
  - electron configuration and orbital shape.
- Ion formation and ionisation energies:
  - patterns in first ionisation and successive ionisation energies in groups and periods of the periodic table, influence of proton number and electron shielding on first and successive ionisation energies.
- Differences between elements, compounds and mixtures.
- The use of the periodic table for identifying the relative atomic masses of elements for use in molar calculations.

A2 Bonding and forces of attraction

How atoms interact and rearrange to form molecules and solutions.

- Ionic and covalent bonding:
  - electronegativity, effects of ionic radius and charge, dot-and-cross diagrams
  - the importance of polar and non-polar molecules to biological organisms (to include identification of polar and non-polar molecules).
- The nature of intermolecular forces, to include:
  - permanent dipoles
  - hydrogen bonds.
- Molecular arrangement in the following phases:
  - solids, liquids, gases, emulsions, gels.
- Factors affecting the solubility of substances.
- Production of full chemical equations (including stoichiometry) under standard conditions.
- Oxidation and reduction in terms of electron gain and loss.

Learning aim B: Explore factors affecting reactions in order to understand how biochemical reactions take place inside the animal body

B1 Rates of reaction

The theory behind how reactions take place and what affects the feasibility and speed of those reactions.

- How metabolic reactions in animals take place in smaller steps with controlled energy release.
- Collision theory of reactions, to include:
  - o enthalpy changes (to include Hess's law), activation energy and construction of reaction profiles
  - o calculation of enthalpy changes in kJ mol^{-1} from given experimental results.
- Factors affecting the rates at which reactions occur in animals and their effects:
  - o concentration, temperature, pressure, surface area and catalysts
  - o investigating reaction rates:
    - – graph construction (concentration–time and rate–concentration)
    - – initial rate and continuous monitoring methods
    - – deducing orders of reaction from graphs.
- Use of the equation $\Delta G° = \Delta H° - T\Delta S°_{system}$ to determine the temperature at which a reaction is feasible and the magnitude of useful work produced.

B2 Equilibria

How dynamic equilibria may be established in readily reversible chemical reactions in animals.

- Rates of forward and backward reactions, along with concentrations of reactants and products.
- Le Châtelier's principle and the resulting position of equilibrium (limited to 'lies towards').
- Prediction and justification of the qualitative effect of a change in temperature, concentration or pressure on a homogeneous system in equilibrium.
- Acid-base equilibria as illustrated by the buffering capacity of blood, to include:
  - o Bronsted–Lowry definitions
  - o the construction of titration curves
  - o pH and pK_a calculations
  - o effects of buffers.

B3 Enzymes as biological catalysts

How enzymes catalyse reactions under different environmental conditions.

- Enzyme structure, specificity and the induced fit hypothesis, enzyme activation.
- Intracellular and extracellular enzyme action.
- Influence of temperature, pH, substrate and enzyme concentration on rate of activity.
- Enzyme inhibition:
  - o competitive, non-competitive, reversible and irreversible inhibition
  - o awareness that many drugs used to treat humans are enzyme inhibitors or activators, and that these can be fatally toxic to animals (for example ibuprofen toxicity in dogs and cats, aspirin in cats).

Learning aim C: Understand the production of adenosine triphosphate in cellular respiration for animals to utilise energy

C1 Aerobic respiration

The stages and control of aerobic respiration at an atomic and molecular level, and its importance in animal functions.

- Why animals require energy and the units of measurement for energy ($kJ\ mol^{-1}$).
- ATP production, stages of aerobic respiration of glucose and the relationship between mitochondrial structure and function in cellular respiration:
  o ATP hydrolysis and ADP phosphorylation
  o conversion of monosaccharides to pyruvate during glycolysis in the cytoplasm, including:
    – phosphorylation of hexose molecules by ATP
    – production of glycerate 3-phosphate (GP)
    – production of reduced coenzyme ($NADH + H^+$) and ATP
    – energy investment and energy generation phases.
  o locations of the link reaction and Krebs cycle
  o the events of the link reaction in producing acetyl coenzyme A using pyruvate dehydrogenase; molecules in the Krebs cycle, and production of:
    – carbon dioxide, CO_2
    – nicotinic adenine dinucleotide, $NADH + H^+$
    – reduced flavin adenine dinucleotide, $FADH_2$
    – adenosine triphosphate, ATP
    – water, H_2O
  o the electron transport chain and ATP synthase:
    – location, role in generating ATP (oxidative phosphorylation), ATP synthesis by chemiosmosis, relation of the amount of ATP produced to the flow of electrons through the electron transport chain
    – role of oxygen as a terminal electron acceptor forming water.
- Net molecular yield from these processes.

C2 Anaerobic respiration

The usefulness of anaerobic respiration to animals.

- Circumstances where animals need to respire anaerobically, use of $NADH + H^+$ in pyruvate reduction, production of lactate, consequences of lactate toxicity and oxygen deficit.
- Difference in ATP yields from one molecule of hexose sugar in aerobic conditions as compared with anaerobic conditions.
- Role of the Cori cycle in the liver and in contracting muscles, to include net reactions for conversion of glucose to lactate, gluconeogenesis and overall Cori cycle.

C3 Other respiratory substrates

How and when other biological molecules may be used to produce ATP.

- Substrate-level phosphorylation of fatty acids.
- Gluconeogenesis from carbohydrates, proteins and lipids.
- Protein hydrolysis and entry of amino acids to Krebs cycle.
- Relative energy values of different biological molecules.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Understand atomic structure and bonding in order to establish the basis of biochemical reactions		**A.D1** Evaluate the bonding and intermolecular forces present in polar and non-polar substances in relation to their properties.
A.P1 Describe atomic structure and ion formation. **A.P2** Describe the types of intermolecular and intramolecular bonding.	**A.M1** Analyse the trends in ionisation energies of elements in the periodic table.	
Learning aim B: Explore factors affecting reactions in order to understand how biochemical reactions take place inside the animal body		**BC.D2** Review the role of blood in establishing the conditions necessary for biochemical reactions and respiration to take place in the body. **BC.D3** Evaluate how biochemical reactions meet the energy needs of different animals.
B.P3 Explain the factors affecting rates of reaction. **B.P4** Explain how the acid dissociation constant (K_a) provides information about the extent to which acids and bases dissociate in aqueous solution.	**B.M2** Analyse experimental data to determine the feasibility of chemical reactions and the position of equilibrium.	
Learning aim C: Understand the production of adenosine triphosphate in cellular respiration for animals to utilise energy		
C.P5 Explain the processes involved in aerobic respiration. **C.P6** Explain the processes involved in anaerobic respiration.	**C.M3** Analyse the contribution of different substrates to respiration in animals.	

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, C.P5, C.P6, B.M2, C.M3, BC.D2, BC.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- laboratory notebooks
- standard laboratory glassware and consumables dependent on the investigations centres wish to use.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners must give a thorough and comprehensive account of the properties of both polar and non-polar substances, using at least two examples of each. They also compare and contrast the contribution of intermolecular and intramolecular forces to the interactions of those molecules in the animal body.

For merit standard, learners must make reasoned, analytical judgements on the trend in ionisation energies both down a group and across a period, discussing the effects of shielding and proton number. They must demonstrate their understanding of the difference between energy required for first and successive ionisation energies, and the contribution of ionisation to molecule formation. Learners' work will be logically structured and illustrated where appropriate, interrelating facts and concepts, with the correct use of scientific terminology throughout.

For pass standard, learners must recall knowledge by describing the atomic structure of two atoms and two ions, describing the contribution of the subatomic particles to the mass and charge of each. This must include the use of electronic configuration notation. Learners must also describe each of the intramolecular and intermolecular forces listed in the unit content, using relevant examples and appropriate diagrams in each case. Work will be accurate overall.

Learning aims B and C

For distinction standard, learners must evaluate how blood affects the rates of biochemical reactions in the body. Work will have a coherent line of reasoning apparent throughout and a deep understanding of the subject will be demonstrated. Learners will use examples of two biochemical reactions that blood has an impact in regulating, in addition to allowing the exchange of gases, nutrients and waste from aerobic and anaerobic respiration in cells. Balanced chemical equations will be given for each of these, along with the use of appropriate diagrams to illustrate how dynamic equilibria between cellular and blood chemistry are set up and maintained. Learners must draw together their knowledge and understanding from across the learning aims to evaluate how the biochemical reactions meet the energy needs of animals, using detailed analysis and research to justify conclusions.

For merit standard, learners will methodically structure their analysis of experimental data, with good-quality graphs constructed and relevant conclusions drawn that demonstrate an understanding of the link between theory and practice. Learners will determine the feasibility of at least two reactions from given pathway data and two graphs of $\Delta G°$ will be constructed, using information from a $\Delta H°$ and $T\Delta S°$ system, from which the positions of equilibria will be qualitatively described.

Learners must analyse the relative energy values of least two respiratory substrates other than glucose. They will include the role of the Cori cycle in making these substrates available for respiration, including the locations and reactions that take place. Chemical structures will be drawn clearly and labelled appropriately, and correct scientific terminology will be used throughout.

For pass standard, learners must recall knowledge to explain the effects of concentration, temperature, pressure, surface area, and non-biological and biological catalysts on rates of reaction. They must outline what K_a means in terms of the extent to which acids and bases dissociate in aqueous solution and describe the meaning of K_a in the context of their (given) experimental data in at least one instance.

Learners must show their understanding by explaining the features of processes occurring at each stage of aerobic and anaerobic respiration of glucose (glycolysis, link reaction, Krebs and electron transfer chain). This will include locations, reactants, products, enzymes, coenzymes, energy yield and relevant biochemical conditions as appropriate for each of the stages. Learners' research will be relevant and well-organised leading to suitable judgements. Work will be free of major fundamental errors.

Links to other units

This unit links to:

- Unit 2: Animal Biology
- Unit 9: Practical Skills in Animal Science
- Unit 11: Advanced Animal Nutrition.

Employer involvement

Centres may involve employers in the delivery of this unit if there are local opportunities. This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local animal businesses
- contribution of ideas to unit assignment/project materials
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Unit 11: Advanced Animal Nutrition

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners study the biological molecules essential for animals to survive, and how animal nutrition can be practically managed for optimum health, welfare and performance.

Unit introduction

An understanding of animal nutrition is an integral part of animal husbandry in all sectors of animal management, from animal production to zoo environments. A balanced diet is vital to the maintenance of animal health and welfare in a captive environment. Understanding the function of each feed component allows you to provide animals with the appropriate feeds in the correct quantities for their species, breed, activity level, and age.

In this unit, you will learn how biological molecules are taken in, broken down and used by the animal. You will develop the skills needed to assess the nutritional value of feedstuffs and formulate the correct diet for optimum wellbeing of the animals in your care.

This unit will help you to progress to higher education courses in the fields of biological science or prepare you for work in any role that requires managing animal diets.

Learning aims

In this unit you will:

A Understand the biochemical basis of biological molecules and their contribution to nutritional requirements in animals

B Understand the structure of organic and inorganic molecules and their roles in animal biology and nutritional requirements

C Explore the feeding requirements of animals in order to ensure correct diet formulation.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Understand the biochemical basis of biological molecules and their contribution to nutritional requirements in animals.	**A1** Standard representation of biological molecules **A2** Biochemical concepts	A portfolio of evidence, including a report on the nutritional requirements of specific animals in relation to the nutritional importance of biological molecules.
B Understand the structure of organic and inorganic molecules and their roles in animal biology and nutritional requirements.	**B1** Carbohydrates (saccharides) **B2** Dietary fibre (non-starch polysaccharides) **B3** Lipids **B4** Amino acids **B5** Proteins **B6** Water **B7** Micronutrients	
C Explore the feeding requirements of animals in order to ensure correct diet formulation.	**C1** Nutrient analysis of feeds **C2** Individual animal nutritional requirements **C3** Factors affecting feeding and preparation of feedstuffs	A portfolio of evidence, including: • analytical reports on nutritional labelling of foodstuffs • fully annotated diet plans to highlight the importance of biological molecules in the diet • assessments of dietary plans, taking into account deficiencies, excesses and toxicities.

Content

Learning aim A: Understand the biochemical basis of biological molecules and their contribution to nutritional requirements in animals

A1 Standard representation of biological molecules

Written and drawn representations of biological molecules:

- empirical, molecular, structural and displayed formulae of compounds
- Fischer and Haworth projections
- common functional groups, to include –COOH, –OH, use of R to represent groups of atoms in molecules.

A2 Biochemical concepts

Considerations of the components of food and their contribution to the biochemical makeup of animals.

- Proportions of biological molecules in different animals.
- Differences in structure and function of organic (containing carbon and hydrogen) and inorganic compounds.
- The energy changes associated with making and breaking bonds.
- Structural isomerism and relevance to animal nutrition.

Learning aim B: Understand the structure of organic and inorganic molecules and their roles in animal biology and nutritional requirements

B1 Carbohydrates (saccharides)

Consideration of the structure, features and functions of different carbohydrates.

- Structure and features of carbohydrates:
  - monosaccharides – α and β glucose, galactose, fructose, ribose and deoxyribose; aldoses and ketoses and their reducing powers as related to Benedict's reagent (to include reference to removal or addition of electrons and redox), cyclic/non-cyclic forms
  - condensation reactions between monosaccharides to form disaccharides and polysaccharides containing glycosidic bonds; hydrolysis reactions
  - disaccharides – lactose, maltose and sucrose
  - starches – amylose, amylopectin.
- How carbohydrates are broken down and absorbed in the digestive system.
- Role of carbohydrates in animals as energy sources, in the formation of other molecules such as glycolipids, glycoproteins and nucleotides and as part of polysaccharides (giant carbohydrates).
- Effects of excessive intake of carbohydrate.

B2 Dietary fibre (non-starch polysaccharides)

Consideration of the structure, features and functions of soluble and insoluble fibre in the diets of animals.

- Structure and features of cellulose, pectin, lignin, guar and xanthan.
- Role of insoluble fibre in digestive transit and soluble fibre in regulating blood sugar.
- Effects of excessive intake of fibre.

B3 Lipids

Consideration of the structure, features and functions of different lipids.

- Structure and features of lipids:
  - triglyceride structure, saturated/unsaturated fatty acids linked to physical properties at room temperature
  - esterification reaction to form diglycerides and triglycerides
  - formation of phospholipids.
- How lipids are broken down and absorbed in the digestive system (to include microbial formation of volatile fatty acids (VFAs) in the rumen).
- Role of lipids in animals:
  - energy storage, as part of cell membranes, insulation, organ protection and waterproofing.
- Effects of excessive intake of lipids.

B4 Amino acids

Consideration of the structure, features and functions of essential and non-essential amino acids.

- The meaning of essential and non-essential amino acids.
- Structure and features of amino acids:
  - importance of functional groups, formation of zwitterions.
- Formation of buffers from amino acid solutions.
- Condensation reaction to form dipeptides and polypeptides connected with peptide bonds, hydrolysis reactions to break down peptide bonds.

B5 Proteins

Consideration of the structure, features and functions of different proteins.

- Structure and features of proteins:
  - primary, secondary (α helices and β pleated sheets), tertiary and quaternary structures of globular and fibrous proteins
  - the importance of hydrogen bonds, disulphide bridges, hydrophobic–hydrophilic interactions and ionic bonds in maintaining specific structure.
- How proteins are broken down and absorbed in the digestive system.
- Role of proteins in animals as antibodies, enzymes, filaments in connective tissue, hormones, gas transport (to include haemoglobin), contractile muscle (to include actin and myosin filaments) and as nutrient transporters (casein in milk, ovalbumin in eggs).
- Effects of excessive intake of protein.

B6 Water

Consideration of the structure, features and functions of water.

- Structure and features of water:
  - polar nature, hydrogen bonding.
- How water is absorbed in the digestive system.
- Role of water in animals, including its importance in allowing the movement of substances around the animal body, providing a medium for chemical reactions to take place, maintaining body temperature, its function as a metabolite and its osmotic influence on cell structure and blood pressure.
- Effects of excessive intake of water.

B7 Micronutrients

Consideration of the structure, features and functions of vitamins and minerals.

- Structure and features of vitamins and minerals.
- Comparison of storage/requirement for fat-soluble and water-soluble vitamins.
- How micronutrients are absorbed in the digestive system.
- Role of vitamins and minerals in the body, to include retinol, ascorbic acid, cholecalciferol, folic acid, iron, calcium, phosphorous, magnesium, copper and zinc.
- Effects of excessive intake of micronutrients.

Learning aim C: Explore the feeding requirements of animals in order to ensure correct diet formulation

C1 Nutrient analysis of feeds

Considerations of how feedstuffs may be analysed to give nutritional information.

- Additional nutritional terminology: acid detergent fibre (ADF), additive, blending, by-pass protein, cake, colostrum, crude protein, digestibility, dry matter, malnutrition, mash, metabolisable protein, metabolisable energy, neutral detergent fibre (NDF), non-protein nitrogen (NPN), protein equivalent, premix, supplement, undegradable protein.
- Quantitative and qualitative methods of analysing feedstuffs, including dry matter determination, testing for starch using iodine, Benedict's test for reducing sugars, biuret test for proteins, emulsion test for fats or oils.
- Nutritional values of the following in animal feedstuffs (formulated and naturally occurring): carbohydrates, dietary fibre, lipids, amino acids, proteins, water and micronutrients.

C2 Individual animal nutritional requirements

The different nutritional requirements of animals based on digestive system adaptations, stage of life and health, and consequences of malnutrition.

- Suitability and different types of feed for different digestive systems, to include availability of protein and energy in the diet:
  - carnivores, herbivores (including subtypes, e.g. florivore, nectarivore etc.), omnivores.
- Changes to requirements for different stages: maintenance, activity, lactation, growth, pregnancy.
- Problems arising from incorrect nutrition: species-specific feeds fed to other animals (e.g. dog food fed to cats), toxicity (e.g. avocado, chocolate, onion).

C3 Factors affecting feeding and preparation of feedstuffs

Considerations and practical decisions that need to be made in planning and preparing, storing and presenting animal feedstuffs.

- Planning and preparation of animal dietary plans, including ration calculation for balancing energy and protein requirements (Pearson square).
- Suitability, advantages and disadvantages of different types of feed, to include:
  o additives and impurities
  o availability, ease and cost of formulation/purchase and storage
  o concentrates
  o differences between and in grass, hay, straw and silage
  o digestibility
  o raw/fermented/cooked/live
  o voluntary feed intake, e.g. ad libitum versus controlled diet.
- Storage of feedstuffs, e.g. good hygiene and security to prevent spoiling, contamination and/or pest damage.
- Presentation of feedstuffs
  o palatability (taste/texture/smell)
  o use of feed as environmental enrichment.
- Other factors including awareness of how nutrition and safety are regulated in pre-prepared animal feedstuffs.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Understand the biochemical basis of biological molecules and their contribution to nutritional requirements in animals		
A.P1 Communicate different ways of representing biological molecules. **A.P2** Explain the features of organic and inorganic compounds.	**A.M1** Compare the properties of common functional groups in biological molecules.	**AB.D1** Evaluate the nutritional importance of biological molecules to the maintenance of normal function in animals.
Learning aim B: Understand the structure of organic and inorganic molecules and their roles in animal biology and nutritional requirements		
B.P3 Explain the structure, digestion and absorption of biological molecules. **B.P4** Discuss the role and functions of biological molecules.	**B.M2** Assess the effects of deficiencies and excesses of biological molecules in animal nutrition.	
Learning aim C: Explore the feeding requirements of animals in order to ensure correct diet formulation		**C.D2** Evaluate the suitability of diet, feed storage and preparation for different animals, justifying the methods and equipment used. **C.D3** Justify how diet formulations for different animals will ensure animal nutrition by including biological molecules.
C.P5 Discuss nutrition content of animal feeds. **C.P6** Plan dietary formulation for different animals.	**C.M3** Analyse diet formulations for different animals in terms of animal nutrition and feed preparation.	

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aims: A and B (A.P1, A.P2, B.P3, B.P4, A.M1, B.M2, AB.D1)

Learning aim: C (C.P5, C.P6, C.M3, C.D2, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- varied feedstuffs for different animals
- relevant equipment to carry out common food tests in the laboratory, such as:
  - iodine
  - Benedict's solution
  - ethanol
  - filter paper and funnels
  - glass beakers
  - spotting tiles
  - test tubes and racks
  - water baths, Bunsen burners, tripods, gauze, heat-proof mats.

Essential information for assessment decisions

Learning aims A and B

For distinction standard, learners will be comprehensive in their work and accurate throughout. Their work will demonstrate an excellent understanding of the links between the structure of biological molecules, their interaction with the body of the animal, and the results of nutritional balances and imbalances.

For merit standard, learners will clearly structure their work with a good level of detail. Learners must show that they can identify the main factors relating to the properties of the functional groups in biological molecules, and explain the similarities and differences.

For pass standard, learners will recall and relate knowledge to explain the ways of representing biological molecules, their structures and roles and the features of organic and inorganic compounds. They will select and organise information, making suitable judgements. Learners' work will be correct but may be lacking in detail.

Learning aim C

For distinction standard, learners will articulate arguments concisely and professionally to evaluate the suitability of diet, feed storage and preparation, making suitable justifications for recommendations. They must show depth of understanding by showing how the diet formulations will contribute to the animals' nutrition. They must show that they have used detailed analysis and research to make recommendations.

Learners must draw on their knowledge and understanding from across the learning aims to justify the diet formulations planned for different animals, showing how the diets will provide animals with the appropriate biological molecules, and so ensure their nutrition.

For merit standard, learners must demonstrate sound awareness of what is lacking or in excess in the proposed animal nutrition and the consequences of this. They must make reasoned, analytical judgements on the diet formulations involving discussion and justification of the animal nutrition and feed preparation. They must clearly relate the diet formulation and feed preparation to the nutrition of the selected animals.

For pass standard, learners will recall and relate knowledge to discuss the nutrition content of animal feeds. Learners must consider how the feeds relate to animal nutrition and the extent to which the nutritional content in the feeds is important, but a conclusion is not required.

Learners must use relevant research and select and organise information in their plan, making suitable judgements and providing feasible solutions to identified problems.

Links to other units

This unit links to:

- Unit 4: Practical Animal Husbandry
- Unit 9: Practical Skills in Animal Science.

Employer involvement

Centres may involve employers in the delivery of this unit if there are local opportunities. This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local animal businesses
- contribution of ideas to unit assignment/project materials
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Unit 12: Business Management in the Animal Sector

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners study concepts of business management and the breadth of businesses in the animal sector, exploring the roles and responsibilities associated with it.

Unit introduction

Business management is very important in any industry. In the current economic climate, achieving competitive advantage is key to success, for example, offering high standards of animal welfare when working with animals should ensure a sustainable approach to business. As a worker in the animal sector, you need to understand what is good business management and the factors that can influence success, including effective resource management and the benefits of having appropriately trained staff. You also need to think about how organisations and suppliers in associated sectors use business management to become successful.

In this unit, you will learn about a range of organisations and associated industries. You will also learn about resource requirements, including human resources and the jobs available in the animal sector. You will examine different record systems that can affect business management, including physical records, financial records and supply chains. Finally, you will develop your practical skills, which you will use to create an improvement plan related to staff skills and business performance.

These activities will prepare you for employment in the animal sector and allow you to understand how to improve the effectiveness of organisations.

Learning aims

In this unit you will:

A Understand the range and purposes of businesses operating in the animal sector

B Investigate physical and human resources required to operate animal sector businesses

C Explore record-keeping systems to measure the success of an animal sector business.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Understand the range and purposes of businesses operating in the animal sector	**A1** Types of animal sector businesses **A2** Associated animal sector businesses **A3** Benefits and impacts of associated animal sector businesses	A report on one specific animal sector business and how it relates to other businesses in the sector.
B Investigate physical and human resources required to operate animal sector businesses	**B1** Physical resource requirements for animal sector businesses **B2** Human resource structures **B3** Job roles and responsibilities **B4** People management	Improvement plan for a chosen business in the animal sector, related to staff skills and business performance.
C Explore record-keeping systems to measure the success of an animal sector business	**C1** Financial records **C2** Staff development records **C3** Physical records	

Content

Learning aim A: Understand the range and purposes of businesses operating in the animal sector

A1 Types of animal sector businesses

Typical businesses in the sector and the objectives of each type of business.

- Commercial/profit-making organisations, e.g. pet retail store, veterinary practice, commercial farm.
- Business types, including sole trader, partnership, private and public limited company.
- Public sector businesses – implementing regulatory standards, e.g. government/local government.
- Charitable, not-for-profit organisations – ensuring animal welfare, providing animals for human needs, e.g. animal shelter, guide dogs for the blind.
- Objectives associated with business type, e.g. profit, customer service.

A2 Associated animal sector businesses

Links between an animal sector business and associated industries in the supply chain.

- Suppliers, e.g. animal feed, animal accommodation and pet toy suppliers.
- Distributors, e.g. wholesalers of wool, farm produce.
- Retailers, e.g. farm shops, supermarkets.

A3 Benefits and impacts of associated animal sector businesses

- Specific interrelationships between an animal sector business and other businesses.
- Professional bodies and their roles, e.g. quality badge status.
- Regulatory bodies and their roles, e.g. licensing, food handling, health and safety.

Learning aim B: Investigate physical and human resources required to operate animal sector businesses

B1 Physical resource requirements for an animal sector business

The resources and associated costs required for different animal businesses.

- Accommodation, such as land and buildings, e.g. farm buildings, zoo housing, retail premises.
- Operational equipment, e.g. grooming tables, animal transport, veterinary equipment.
- Supplies, e.g. animal feed, bedding, collars and leads.

B2 Human resource structures

Features of common business structure.

- Organisational structure of the business, e.g. flat, hierarchical, matrix.

B3 Job roles and responsibilities

- Understanding the job role, job descriptions and person specifications in an animal business:
  - o owner/manager, executive
  - o supervisor
  - o team worker, e.g. estate maintenance
  - o trainee, e.g. apprentice animal groomer
  - o administrator, e.g. veterinary practice manager
  - o volunteer, e.g. worker at animal sanctuary
- How job descriptions and person specifications determine level of decision making, skills required, and accountability in specific job roles.

B4 People management

The importance of effective people management in achieving a business's objectives.

- Motivation to meet business objectives, e.g. financial and non-financial motivators.
- Equal opportunities legislation.
- Appropriately trained and skilled staff to meet business objectives.

Learning aim C: Explore record-keeping systems to measure the success of an animal sector business

C1 Financial records

Types of financial record-keeping systems and potential impact if these systems are not implemented.

- Importance of keeping accurate records – legal requirements, including income statement, break-even analysis and payment of tax.
- Purchasing and ordering procedures.
- Sales records, including year on year figures for data analysis.
- Wage calculation for employees.

C2 Staff development records

The link between staff performance and the success of the business.

- Performance indicators for employees.
- Annual staff performance reviews or appraisals.
- Managing poor performance, adhering to employment legislation.
- Linking an individual's objectives to meeting business objectives and their individual contribution.
- Identifying future needs for the business and succession planning.

C3 Physical records

The records appropriate to the animal sector industry to measure business success.

- Staffing records, including working hours, shift systems or working patterns to meet operational needs.
- Customer records.
- Stock management.
- Management of buildings and facilities.
- Management of information technology and security systems.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Understand the range and purposes of businesses operating in the animal sector		**A.D1** Evaluate how a specific animal sector business interrelates with other industries and businesses in the sector to provide services.
A.P1 Explain the purposes and types of different businesses in the animal sector. **A.P2** Discuss how different businesses in the animal sector interrelate.	**A.M1** Assess the importance of a specific animal sector business and its relationship to other businesses in the sector.	
Learning aim B: Investigate physical and human resources required to operate animal sector businesses		**BC.D2** Justify the importance of effective resource management and record-keeping systems in a specific animal sector business. **BC.D3** Evaluate how effective management of resources enables a business to operate successfully in the animal sector.
B.P3 Explain the importance to the businesses of ensuring effective management of physical and human resources. **B.P4** Review job roles in contrasting animal businesses to illustrate accountability and structure.	**B.M2** Analyse how contrasting businesses manage physical and human resources.	
Learning aim C: Explore record-keeping systems to measure the success of an animal sector business		
C.P5 Explain the importance of different types of record keeping in a specific animal sector business.	**C.M3** Analyse how data from record keeping can be used to identify success in an animal sector business.	

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, C.P5, B.M2, C.M3, BC.D2, BC.D3)

Further information for teachers and assessors

Resource requirements

Learners must have access to at least two animal businesses that will allow them to research and gather information on the organisational objectives, human and physical resources and where possible, any financial data. Ideally, this should include learners' work experience placement.

Essential information for assessment decisions

Learning aims A

For distinction standard, learners will articulate their arguments and views concisely and professionally to justify the conclusions they reach in relation to the ways in which businesses in the animal sector interrelate. They will discuss advantages and disadvantages of business relationships, considering how they impact on user perception and business objectives. They will explore how decisions made beyond the main business impacts along the chain, for example, the impact of a supplier increasing prices and the need to increase their own charges, which are passed on to customers.

For merit standard, learners will show that they have selected and applied relevant knowledge to reach reasoned, analytical judgements about the relationships between animal sector businesses. Learners must consider the implications of relationships along the supply chain on their explicit business objectives, for example, how membership of a professional, regulatory business can provide assurance to customers of the business's reputation. They will discuss the differing levels of importance that various relationships have on enabling the business to perform according to its purpose.

For pass standard, learners will recall knowledge and understanding to give an account of the chosen animal sector business and its relationship with associated businesses in the animal sector. They will discuss the type of business and relate this to its purpose and objectives. They will explore business relationships along the supply chain and discuss how these enable the business to meet its objectives.

Learning aims B and C

For distinction standard, learners will articulate their arguments and views concisely and professionally to justify the conclusions they reach. Learners will show depth of understanding by making a detailed analysis of their research. They must consider how the management of physical, financial, and human resources impacts on the success of an organisation. They must discuss the types of records kept by businesses and the methods used in keeping these records, linking these to the management of resources and the success of the business in meeting its operational objectives. Learners will research staff motivational strategies used by businesses, determining where relevant their impact on business success.

For merit standard, learners will show that they have selected and applied relevant knowledge to carefully consider how businesses are structured, and how this enables businesses to meet their objectives. Learners must make reasoned, analytical judgements when considering how good record keeping provides a clear analysis of how well the business is performing. They will provide an analysis of contrasting business approaches to physical and human resource management, including consideration of the link between operating success and staff management.

For pass standard, learners must recall knowledge to give an account of the type, structure and organisation of selected businesses, and the physical resources needed to ensure the success of each business. Learners must consider the link between structure and the accountability and responsibility of selected job roles. They must use relevant research to show the importance of record keeping and the different types of record keeping, and must include examples. For example, they could include the importance of good stock control and record keeping, the effects of inappropriate physical resources as a result of poor stock control and the legal implications for not keeping correct records.

Links to other units

This unit links to *Unit 7: Work Experience in the Animal Sector*.

Employer involvement

This unit would benefit from employer involvement in the form of:
- provision of information listed in *Resource requirements*
- guest speakers
- technical workshops involving staff from local animal businesses
- contribution of ideas to unit assignment/project materials
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Unit 13: Animal Management in a Retail Environment

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners study retail animal husbandry, including the importance of the layout and design of animal accommodation, stock and livestock management, and store marketing.

Unit introduction

Good animal husbandry and management are considerations when planning the design of a new retail environment, such as a pet store. There needs to be a suitable balance to encourage customers into that environment and enable them to browse the stock available, including livestock, while ensuring that the welfare of the animals is considered. Various choices are available for the design and functionality of a retail environment for animals. You will explore the designs of animal retailers and use innovation to create your own design.

In this unit, you will learn about the effect of design on stock display, the legislative and welfare requirements to be considered when selling livestock, and how correct animal management regimes can minimise stress on animals. Any new business can be affected by the way stock is sourced and displayed, so you will investigate the options available to support business needs. Customers' perception of a business is also vital to its success, so you will explore the strategies used to create a marketing plan to generate customers. Innovation is a driver for any new retail environment and in this unit you will develop new ideas while examining the sector and the competition.

This unit will help you progress to employment in the animal sector, in particular retail environments involving animals, such as pet shops, and other businesses where animals are sold.

Learning aims

In this unit you will:

A Explore store layout designs in relation to animal husbandry needs and the needs of animal retail businesses

B Investigate the management of livestock and non-livestock to meet the needs of animal retail businesses

C Explore local marketing and promotional methods that raise the profile of animal retail businesses.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Explore store layout designs in relation to animal husbandry needs and the needs of animal retail businesses	**A1** Concepts of animal retail design and layout **A2** Factors affecting the location of stock **A3** Husbandry measures and requirements to meet animal needs **A4** Law and legislation	Design of layout for a new pet store with accompanying report explaining design, and methods of sourcing live and non-live stock.
B Investigate the management of livestock and non-livestock to meet the needs of animal retail businesses	**B1** Management of livestock **B2** Management of non-livestock	
C Explore local marketing and promotional methods that raise the profile of animal retail businesses	**C1** Local marketing methods **C2** Promotional methods	Promotional plan and report giving details of promotional methods for the animal retail business.

Content

Learning aim A: Explore store layout designs in relation to animal husbandry needs and the needs of animal retail businesses

A1 Concepts of animal retail design and layout

- Purpose of retail design – to meet customer needs and promote good practice of animal husbandry.
- Types of designs, to include grid pattern, free flow, boutique, loop species grouping, item grouping, and the advantages and disadvantages of each.
- Factors influencing design, to include customer access, car parking, delivery access, location of livestock, provision of heating and lighting, compliance with equality legislation, staff facilities, isolation and quarantine, storage, counter area.

A2 Factors affecting the location of stock

- The needs and welfare of the livestock in relation to the location, to include proximity to windows and doors, fire exits, high traffic.
- Impact of incorrectly locating stock, e.g. animal stress, loss of sales, viewing implications.
- Acquiescence with relevant legislation, policies and guidance, e.g. local authority inspections and licensing

A3 Husbandry measures and requirements to meet animal needs

- Different accommodation requirements of individual animals being sold in a retail environment, to include small mammals, aquatic species, amphibians and reptiles, avian species.
- The need for individual species' requirements to be compliant with legislation and codes of practice relating to:
  o environment, to include heating, lighting, temperature, ventilation and humidity, and suitability thereof
  o accommodation, to include the sizing of the accommodation, providing enrichment, design
  o welfare, to include social groupings, substrate and cage fixtures and fittings, security
  o maintenance and husbandry regimes, to include cleaning and maintenance routines, disinfecting and sterilisation methods, health checks, feeding routines, waste disposal, arrangements for when the store is closed, livestock records, prevention of zoonotic diseases.
- Impact of incorrect husbandry regimes, e.g. animal illness, loss of stock.

A4 Law and legislation

- Consideration of the impact of relevant laws and legislation relating to:
  o animal welfare and transportation
  o health and safety, e.g. Health and Safety at Work etc Act 1974, personal protective equipment (PPE), waste management
  o general and pet retail industry, e.g. pet shop licensing, livestock register, consumer protection

Learning aim B: Investigate the management of livestock and non-livestock to meet the needs of animal retail businesses

B1 Management of livestock

- Sourcing methods, e.g. wholesalers, specialist breeders, hobbyists, customers, small pet stores, pet superstores, importers and captive breeding.
- Considerations and potential risks of sourcing methods, e.g. cost, reliability, variety, mortality rates, history, disease, ethical sourcing.
- Methods of controlling livestock, e.g. breeding, contraception, disposal of unsold livestock.
- Legislation relating to animal welfare and sourcing.

B2 Management of non-livestock

- Stock control management:
  - systems, including just-in-time (JIT), batch control, economic order quantity (EOQ), fixed quantity, fixed interval, first in, first out
  - methods, including stock rotation, out-of-date stock, stock reviews, minimum stock levels, re-order lead time.
  - records, e.g. manual or computerised record-keeping methods.
- Considerations and potential risks associated with stock controlling methods.
- Methods of sourcing non-livestock, e.g. wholesaler, independent traders, importation.
- Considerations and potential risks associated with sources of non-livestock, e.g. cost, range, storage and minimum order requirements.

Learning aim C: Explore local marketing and promotional methods that raise the profile of animal retail businesses

C1 Local marketing methods

Characteristics of local marketing methods, including suitability, costs and audience.

- Marketing methods, to include:
  - conventional media advertising, e.g. local newspaper, leaflets, posters
  - social media advertising
  - online advertising, e.g. website, search engine pay per click advertising
  - brand recognition, e.g. logo, window advertising.

C2 Promotional methods

Selecting methods related to scale of business and financial viability, to include:

- sales promotion methods, including competitions, discount vouchers, free gifts, loyalty cards, point of sale material, e.g. display stands, posters, special promotions, pet advice clinics
- benefits and risks associated with promotional methods
- display areas and effective store design, including point of purchase, sale impulse buys, shelf barkers, window displays, linked items.

Assessment criteria

Pass		Merit	Distinction
Learning aim A: Explore store layout designs in relation to animal husbandry needs and the needs of animal retail businesses			
A.P1 Explain how layout design for a retail store takes animal needs into consideration. **A.P2** Explain how the proposed layout meets the stock needs of the retail business.	**A.M1** Assess the factors affecting the location of stock in a retail store and how the design will meet those factors.		**AB.D1** Justify how the design of the retail business and the methods it uses to source stock enable it to meet both animal and business needs.
Learning aim B: Investigate the management of livestock and non-livestock to meet the needs of animal retail businesses			
B.P3 Describe how to source livestock and non-livestock in relation to the retail business. **B.P4** Explain factors which may affect stock control in the animal retail business.	**B.M2** Analyse advantages, disadvantages and potential risks associated with methods of sourcing livestock and non-livestock in the retail business.		
Learning aim C: Explore local marketing and promotional methods that raise the profile of animal retail businesses			**C.D2** Justify the marketing plan and proposed marketing methods in relation to how they will meet business objectives and legislative requirements. **C.D3** Evaluate the importance of planning layout, sourcing of stock and marketing in ensuring business success, while meeting requirements for legislation and animal welfare.
C.P5 Produce a clear marketing plan for an animal retail business including pricing and promotional strategies. **C.P6** Discuss different methods of marketing the animal retail business, including potential risks and legislative requirements.	**C.M3** Assess how the proposed marketing plan and marketing methods will meet business objectives while complying with legislation.		

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aims: A and B (A.P1, A.P2, B.P3, B.P4, A.M1, B.M2, AB.D1)

Learning aim: C (C.P5, C.P6, C.M3, C.D2, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- opportunities to visit pet stores
- a variety of marketing resources, e.g. leaflets, websites, social media.

Essential information for assessment decisions

Learning aims A and B

For distinction standard, learners must design a pet store for a given scenario, showing that they have made valid judgements with regard to risks and limitations, and that they have made design recommendations that take into account given constraints and desired outcomes. They will discuss how legislation, health and safety and other guidelines have been implemented for the pet store to ensure animal wellbeing and human safety, providing articulated reasoning with supporting examples. Learners will consider the stock control methods used and reach valid judgements on how these methods meet business needs, for example, they could mention that the methods increase efficiency, reduce costs or minimise stock wastage. Learners must include advantages and disadvantages of the stock control methods.

For merit standard, learners will carefully consider the different factors affecting the location of stock in the store, and show that their proposed design has taken into account the context of the pet store, and any contingencies. They must include specific animal species' requirements in relation to all housing requirements and will have reviewed the husbandry regime that includes elements such as feeding, health checking, servicing and waste disposal. Learners will thoroughly discuss the advantages and disadvantages of sourcing livestock and non-livestock, identifying the most important considerations. They will include relevant risks that are linked to the methods of sourcing the stock.

For pass standard, learners will produce a pet store layout, which clearly identifies animal needs, and provides feasible solutions to identified problems. They will show their understanding of the importance of the location of livestock, including proximity to windows, doors, fire exits and high-traffic areas. Learners will recall knowledge to discuss in detail different methods of sourcing livestock and non-livestock and the suitability of each method to the retail business. They will also explain the factors affecting stock control in the pet store, showing that they have used research relevant to the situation.

Learning aim C

For distinction standard, learners will articulate arguments concisely and professionally to justify the marketing plan and proposed marketing methods. They will use detailed analysis and research to justify the recommendations made in the marketing plan. Learners must include how the proposed plan and marketing methods take legislation and other guidelines into consideration. They must draw together their knowledge and understanding from across the learning aims to evaluate the importance of planning layout, stock control and marketing methods while meeting legislative requirements and requirements for animal welfare.

For merit standard, learners will select and apply knowledge, making reasoned analytical judgements regarding the proposed marketing, promotional and pricing methods. They will show the relationships between these in meeting business objectives. Learners must include how the proposed methods will comply with legislative requirements, providing appropriate solutions as a result of their own exploration.

For pass standard, learners will produce a clear plan that identifies appropriate pricing and promotional strategies for the retail business, and which provides feasible solutions to identified problems. Learners will recall knowledge to consider different marketing methods, how the different methods interrelate to achieve business success, and which are the most appropriate for the retail business, although learners may not reach a conclusion.

Links to other units

This unit links to *Unit 4: Practical Animal Husbandry*.

Employer involvement

This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local animal businesses
- contribution of ideas to unit assignment/project materials
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Unit 14: Animals in Boarding Establishments

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners study the range of animal boarding establishments available to support the demands of customers, reflecting ever-changing lifestyles.

Unit introduction

The range and style of professional animal boarding establishments continues to grow due to lifestyle changes of customers and the rise in demand for products and services specifically targeted at pets. Additionally, the fact that animals can often be abandoned or mistreated by their owners means that there is still the need for rescue centres and sanctuaries.

In this unit, you will explore different types of animal boarding establishments, the purposes they serve and the legislation that governs them. You will learn about the complexities of animal husbandry for centres holding many animals in close quarters, and about the importance of an appropriate layout for a boarding establishment. You will explore your learning by designing your own establishment, ensuring that the design meets the welfare needs of animals and the needs of its human users.

This unit will help you to progress to employment, specifically in animal boarding establishments, such as kennels, catteries, animal rescue or animal quarantine establishments.

Learning aims

In this unit you will:

A Understand types and purposes of animal boarding establishments and their role in supporting animal welfare

B Investigate management and husbandry practices relating to animal boarding establishments

C Undertake the design and layout of animal boarding establishments to maintain animal welfare and human safety.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Understand types and purposes of animal boarding establishments and their role in supporting animal welfare	**A1** Types and purposes of animal boarding establishment **A2** Licensing, legislation and regulation	A case study of the legislation and management practices of two animal boarding establishments.
B Investigate management and husbandry practices relating to animal boarding establishments	**B1** Management procedures **B2** Husbandry planning	
C Undertake the design and layout of animal boarding establishments to maintain animal welfare and human safety	**C1** Animal welfare **C2** General management	A design for an animal boarding establishment and an accompanying report.

Content

Learning aim A: Understand types and purposes of animal boarding establishments and their role in supporting animal welfare

A1 Types and purposes of animal boarding establishments

Uses of animal boarding establishments, including the following.

- Pet boarding:
  - long term, e.g. kennels and catteries while owners are on holiday
  - short term, e.g. doggy day care, for when owners are at work.
- Rescue centres and sanctuaries, for stray or maltreated animals.
- Animal breeding centres, e.g. assistance dog breeders.
- Animal boarding training centres, e.g. pet training or working dog training.
- Quarantine centres for imported animals.

A2 Licensing, legislation and regulation

Points of licensing and regulations governing boarding establishments.

- Animal safety, e.g. animal welfare, animal health
- Human health and safety, including Health and Safety at Work etc Act 1974, biosecurity, such as Control of Substances Hazardous to Health (COSHH) Regulations 2002, Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 1995.
- Environmental, e.g. noise and environmental pollution, controlled waste.
- Animal boarding licensing regulations.

Learning aim B: Investigate management and husbandry practices relating to animal boarding establishments

B1 Management procedures

- General boarding establishment procedures to ensure animal welfare and human safety, and to meet regulatory requirements.
- Admittance records including an animal's history, species, breed, health status, temperament:
  - for pets – owner details, animal age, name, preferences, length of stay
  - for rescue animals – history and injuries
  - quarantine animals – country of origin, destination.
- Safe working practices, e.g. hygiene, personal protective equipment (PPE), risk assessments, emergency procedures.
- Recording and monitoring feed, exercise, accommodation maintenance, health checking, cleaning, behaviour, release.

B2 Husbandry planning

Factors affecting the planning of animal husbandry in establishments with multiple animals.

- Procedures for settling new arrivals to minimise stress.
- Planning for known health needs, e.g. medication, isolation.
- Planning daily husbandry procedures, including:
  - cleaning – daily clean, departure full clean, disinfecting methods, bedding changes, disposal of waste
  - feeding – specialist and non-specialist diets, amount of feed, types of feed, dietary supplements, supply of fresh water
  - exercising strategies for multiple animal residents – lead exercise, off-lead exercise, handling equipment, social play, pen exercise, secure field exercise, consideration of life stage and health status of animal.
  - health checking – identifying signs of good and ill health
  - medication – administering medication according to veterinary surgeon instructions, presentation methods, record keeping
  - enrichment – toys, chews, scratching posts etc.
  - monitoring welfare of animals.
- Meeting anxiety needs, e.g. pets away from home.
- Planning for problem animals, e.g. behavioural problems.

Learning aim C: Undertake the design and layout of animal boarding establishments to maintain animal welfare and human safety

C1 Animal Welfare

Managing animal welfare through layout and construction.

- Adhering to requirements relating to the five welfare needs:
  - a suitable environment
  - a suitable diet
  - the ability to exhibit normal behaviour patterns
  - housed with or apart from other animals
  - protection from pain, suffering, injury and disease.
- Mitigating environmental factors that could affect animal welfare, e.g. proximity of other animals, awareness of what animals can see, hear, smell.
- Exercise facilities.
- Materials used for the accommodation structure, e.g. wood, wire mesh, concrete.
- Isolation areas for quarantine.
- Environmental enrichment.
- Storage space, including animal feed and bedding, washing facilities, feeding facilities, location in relation to animals.
- Waste management.

C2 General Management

Factors affecting human usage.

- Human safety, including:
  - security, e.g. accommodation locks and catches
  - hygiene, e.g. location of dining areas and washrooms.
- Administration areas, e.g. offices, visiting public, admission rooms.
- Access, e.g. car parking, delivery of new boarders, delivery of supplies such as feed and bedding.
- Customer needs, e.g. greeting area, noticeboards and information, first impressions, aesthetics.
- Overnight accommodation for staff, to include awareness of lone working regulations.
- Environmental impacts, including minimisation of noise, waste disposal, pest control.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Understand types and purposes of animal boarding establishments and their role in supporting animal welfare		
A.P1 Explain the purposes of different animal boarding establishments in relation to animal welfare. **A.P2** Explain the legislation and regulations governing different animal boarding establishments.	**A.M1** Assess the impact of legislation and regulations on different animal boarding establishments.	**AB.D1** Evaluate how legislative compliance impacts on the management of animals in boarding establishments.
Learning aim B: Investigate management and husbandry practices relating to animal boarding establishments		
B.P3 Explain the general management procedures used in different animal boarding establishments. **B.P4** Explain the husbandry practices used in different animal boarding establishments.	**B.M2** Assess the impact of management and husbandry procedures in different boarding establishments on the welfare of resident animals.	
Learning aim C: Undertake the design and layout of animal boarding establishments to maintain animal welfare and human safety		**C.D2** Justify how the design of an animal boarding establishment meets the needs of animal residents and human users.
C.P5 Design an animal boarding establishment that meets the requirements of animal welfare. **C.P6** Explain how the design and layout of an animal boarding establishment meets the requirements of human users.	**C.M3** Assess how the design and layout of an animal boarding establishment meets the needs of animal residents and human users.	**C.D3** Evaluate the impact of legislation on the design and management of animal boarding establishments.

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aims: A and B (A.P1, A.P2, B.P3, B.P4, A.M1, B.M2, AB.D1)

Learning aim: C (C.P5, C.P6, C.M3, C.D2, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- accommodation designs for a range of animal boarding establishments
- up-to-date legislation and regulations related to animal boarding establishments
- possible work experience access to local animal boarding establishments (not essential but will enhance the learning experience).

Essential information for assessment decisions

Learning aims A and B

For distinction standard, learners will argue concisely and professionally to reach justified conclusions on the need to comply with legislation for the benefit of animal welfare and human safety in two animal boarding establishments. To reach supported judgements, learners will draw on their knowledge and understanding of the purpose of the establishment and the significance of the legislation. Learners will consider wide-ranging factors of the impact of non-compliance on the welfare of animals, such as the need to rehome animals when a licence is lost. Learners will consider the husbandry requirements of different animals and give well-reasoned arguments as to how these might be managed to meet both the welfare needs of the animals and the management practices of the boarding establishment.

For merit standard, learners will make reasoned, analytical judgements discussing the impact of legislation on the establishments. Learners will show understanding of the relationship between relevant legislation and how the establishments are run, applying their knowledge to less well-defined situations. For example, learners will consider how the management of animal husbandry needs to be scheduled so as not to conflict with human access to the facility, for example, pet boarding establishments where owners are picking up pets, or rescue centres open to the public.

For pass standard, learners will recall knowledge to explain the purposes of two different animal establishments. They will relate their knowledge to well-defined situations, showing clear links between legislation and the running of the establishment. Learners will understand the link between the purpose of the boarding establishment and the day-to-day management, such as ensuring strict hygiene, and well-scheduled, separate exercise facilities for animals in a quarantine establishment.

Learning aim C

For distinction standard, learners will articulate arguments concisely and professionally to justify the conclusions they reach. They will show how their design for an animal boarding establishment has taken account of both animal welfare and human needs. Learners will justify their decisions with evidence, demonstrating that they have considered alternative designs and materials, rejecting some and selecting those they do on merit. For example, learners could articulate arguments to demonstrate that they have considered the benefits of concrete as an alternative accommodation material for cats, but have compromised with a combined concrete and wooden structure so that cats can display normal scratching behaviour, or settled on a concrete structure with the addition of separate scratching posts.

For merit standard, learners will make reasoned, analytical judgements in relation to the suitability of their animal boarding establishment design. They will produce evidence to demonstrate that they have carefully considered the purpose of the establishment and the factors necessary to enable it to function effectively, maintaining animal welfare and taking account of human safety. For example, learners could discuss the problems in providing cats with wooden accommodation, because of the damage resulting from scratching and urination, and suggest concrete as a more appropriate, if less aesthetically pleasing, material.

For pass standard, learners will recall knowledge to give evidence of the reasons behind the decision-making process in their animal boarding establishment design. They will consider fundamental animal welfare issues, such as keeping animals out of sight of other animals when in their individual accommodation or when being taken to exercise facilities in order to reduce stress. They will consider human safety issues such as non-slip flooring materials, and separate food preparation facilities for animals and humans.

Links to other units

This unit links to *Unit 4: Practical Animal Husbandry*.

Employer involvement

This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local animal businesses
- contribution of ideas to unit assignment/project materials
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Unit 15: Developing an Enterprise in the Animal Sector

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners develop their knowledge and study the practical skills needed to set up a new enterprise in the animal sector.

Unit introduction

Have you ever wanted to start your own business and be your own boss? The animal sector provides a wealth of diverse opportunities for entrepreneurs starting new, small businesses, such as pet-sitting, dog-walking, or animal grooming services.

In this unit, you will explore ideas and the principles for setting up a new enterprise. You will research the market and select a viable business idea for the enterprise. You will prepare and present a business plan and explore ways to market the business to help make it a success.

The skills you develop in this unit will prepare you for further study, and help you if you decide to set up your own business in the animal sector. The skills are also highly valuable to employers who need people with the capacity to innovate and develop new business opportunities.

Learning aims

In this unit you will:

A Explore the nature of enterprise to develop an entrepreneurial mindset

B Investigate potential ideas for a micro-business start-up in the animal sector

C Develop a business plan for a viable micro-business start-up in the animal sector.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Explore the nature of enterprise to develop an entrepreneurial mindset	**A1** Enterprise and entrepreneurship **A2** Mindset of the entrepreneur **A3** The role of motivation when starting a new venture **A4** Barriers to setting up a venture	A written report on a successful enterprise and its entrepreneur, considering the mindset of the entrepreneur, the barriers overcome and the motivation for the venture.
B Investigate potential ideas for a micro-business start-up in the animal sector	**B1** Micro-business start-up idea investigation **B2** Models for business opportunities **B3** Factors to be considered when setting up a micro-business	A business plan supported by research, analysis and risk evaluation that collectively supports a specific recommendation for setting up a new micro-business in the animal sector.
C Develop a business plan for a viable micro-business start-up in the animal sector	**C1** Market analysis and planning **C2** Legal and financial aspects **C3** Review and evaluation	

Content

Learning aim A: Explore the nature of enterprise to develop an entrepreneurial mindset

A1 Enterprise and entrepreneurship

- Enterprise is the process of:
  - o using creativity and innovation to meet customers' needs and aspirations by:
    - – creating products and services and identifying a market for them
    - – identifying gaps in the market for existing products and services
  - o identifying and addressing the risks facing an enterprise to increase the likelihood of success, to include:
    - – strategic, e.g. a competitor coming onto the market
    - – compliance, e.g. the introduction of new health and safety legislation
    - – financial, e.g. non-payment by a customer or increased interest charges on a business loan
    - – operational, e.g. the breakdown or theft of equipment
  - o using enterprise skills and capabilities, including problem solving
  - o using new technologies and techniques.
- Entrepreneurship is the capacity and willingness to develop, organise and manage a new venture along with any of its risks, in order to make a profit.
- Types of enterprise – start-up, lifestyle, social enterprise, franchise.
- Legal formats for enterprise – sole trader, partnership, limited partnership, private limited company (LTD), public limited company (PLC).

A2 Mindset of the entrepreneur

- This includes creativity, confidence, positivity, passion, motivation, initiative, self-belief, discipline, drive, adaptability and flexibility, intuitiveness, persuasion, imagination, desire to succeed and grow, vision, capacity to inspire, focus.

A3 The role of motivation when starting a new venture

- Autonomy and better work – seeking freedom, flexibility and better work opportunities.
- Challenge and opportunity – seeking personal challenge, fulfilling a vision, opportunities to use existing skill(s) and enhance personal reputation/fame.
- Financial motives – financial security, higher income and wealth.
- Family and legacy – seeking to continue or create a family business.

A4 Barriers to setting up a venture

- Viability – ability to sell products/services to customers.
- Regular cash flow.
- Raising finance.
- Lack of skills or experience.
- Lack of financial management skills.
- Keeping up-to-date and complying with regulations.

Learning aim B: Investigate potential ideas for a micro-business start-up in the animal sector

B1 Micro-business start-up idea investigation

- Definition of micro-business.
- Idea generation for new products, services and/or market for business opportunities.
- Decision matrix: generation of selection criteria and scoring for business opportunities.

B2 Models for business opportunities

- Business activity: primary, secondary or tertiary sector of activity.
- Processes: manufacture, outsourcing, sourcing, channels to market.
- Organisational form: structure, roles and responsibilities.

B3 Factors to be considered when setting up a micro-business

- Capability and core competences.
- Time constraints.
- Financial constraints.
- Potential stakeholder influences.
- Access to physical resources.
- Availability of IT.
- Environmental influences.
- Internal risks.
- External risks.

Learning aim C: Develop a business plan for a viable micro-business start-up in the animal sector

C1 Market analysis and planning

- Target market definition.
- Secondary and primary research.
- Business environment: Porter and PESTLE (political, economic, social, technological, legal, environmental).
- Unique selling points (USPs).
- Marketing mix SWOT (strengths, weaknesses, opportunities, threats).

C2 Legal and financial aspects

- Business legal form and liability insurance.
- Legislation, e.g. consumer, employment, health and safety, data protection.
- Pricing policy.
- Projected costs: set-up, fixed and variable costs.
- Break-even forecast.
- Cash-flow forecast.
- Forecast opening and closing statement of financial position: capital structure to show investment necessary from potential investors.

C3 Review and evaluation

- Analysis, evaluation and justification.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Explore the nature of enterprise to develop an entrepreneurial mindset		
A.P1 Explain why a chosen entrepreneur and their enterprise(s) have been successful. **A.P2** Explain, using examples, why it is important for entrepreneurs to consider the risks facing an enterprise.	**A.M1** Analyse how the skills and attributes of a chosen entrepreneur, and their attitude to risk, have contributed to the success of their enterprise.	**A.D1** Evaluate the importance of the skills and mindset of the entrepreneur to the success of their enterprise.
Learning aim B: Investigate potential ideas for a micro-business start-up in the animal sector		
B.P3 Describe the potential business opportunities for a micro-business start-up in the animal sector. **B.P4** Review the factors that need to be considered to start up a micro-business in the animal sector.	**B.M2** Analyse the internal and external factors associated with a selected micro-business start-up in the animal sector.	**BC.D2** Evaluate the internal and external factors associated with a selected micro-business start-up. **BC.D3** Evaluate your plan for a micro-business and justify your conclusions.
Learning aim C: Develop a business plan for a viable micro-business start-up in the animal sector		
C.P5 Explain your marketing plan for a selected micro-business in the animal sector. **C.P6** Explain how legal and financial aspects will affect the start-up of the business.	**C.M3** Analyse the financial and marketing plans for your micro-business in the animal sector.	

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, C.P5, C.P6, B.M2, C.M3, BC.D2, BC.D3)

Further information for teachers and assessors

Resource requirements

There are no specific resource requirements for this unit.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will produce a comprehensive report on an entrepreneur and their enterprise(s). The presentation will be professional and logically structured, use the correct business and financial terminology and contain high-quality technical written language. It will include motivation, barriers and evaluation. Learners will be able to evaluate the mindset of the entrepreneur and how they have weighed up risks versus opportunities. Learners will come to a justified conclusion supported by relevant evidence.

For merit standard, learners will carry out research on an entrepreneur and an enterprise and prepare a report on them. The report will be structured, use good technical terminology and contain high-quality written language.

For pass standard, learners will carry out research on an entrepreneur and an enterprise and prepare a report that shows an understanding that although enterprise may have its benefits, there are also risks. The report will be structured, use some technical terminology and contain high-quality written language.

Learning aims B and C

For distinction standard, learners will evaluate a range of internal and external factors for the start-up of a small business and how they can be a risk to the new business (at least four factors and four risks should be evaluated). Learners will be expected to carry out research into a number of business start-ups and ensure examples are included.

Learners will also show a clear justification of the plan, giving reasons for all of its elements. A SWOT and sensitivity analysis will be used, together with ratio analysis, to give an evaluation of predicted success. Learners will use initiative and creativity and demonstrate a high standard of individual technical ability, attention to detail, innovation and precision.

For merit standard, learners will analyse the factors ensuring that there is a good range and noting that some factors and risks will affect some types of businesses and not others.

Learners will show a range of financial statements and the marketing mix should be analysed clearly. All costs will be realistic for the size of the business. Learners will provide analysis and consider viability issues.

For pass standard, learners will provide clear evidence of research into a new business idea and outlined model, giving details of the activity and its processes. The organisational form will be evidenced in the portfolio. At least four factors will be explained. If learners work in groups to research and explore, work must be submitted individually. As this is for a micro-business the choice of business should be a small entity that does not require more than four employees to start it up.

Learners will provide a coherent plan, comprising sections including legal and financial, which is supported with research.

Links to other units

This unit links to *Unit 12: Business Management in the Animal Sector*.

Employer involvement

This unit would benefit from employer involvement in the form of:

- guest speakers from small businesses
- participation in audience assessment of presentations
- work experience
- own business materials as exemplars
- support from local business staff as mentors.

Unit 16: Animal Grooming

Level: **3**
Unit type: **Internal**
Guided learning hours: **60**

Unit in brief

Learners will demonstrate the skills needed to assess and safely carry out the grooming requirements of small animals kept as pets.

Unit introduction

The need for grooming in dogs, cats and small animals is important both for the maintenance of health and for appearance. When animals are prepared for showing, grooming becomes a crucial element in how the animal is presented. Animal grooming is carried out by professionals in a variety of settings, such as grooming parlours, rescue centres and kennels, veterinary surgeries and pet shops.

In this unit, you will learn how to assess an animal's grooming needs, and develop the skills to carry out initial health checks and then prepare, bathe and dry dogs, cats and small animals. You will practice grooming skills, carrying out nail, ear, skin and coat care as well as the removal of coat by both electrical and non-electrical means.

This unit will help you to progress to professional study in animal grooming, or to employment in businesses, such as grooming parlours, that provide further training.

Learning aims

In this unit you will:

A Understand the grooming requirements of animals with different needs
B Carry out pre-grooming activities to maintain animals' coats, feet, pads, claws and ears
C Carry out the safe bathing and grooming of animals to meet welfare needs and grooming requirements.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Understand the grooming requirements of animals with different needs	**A1** Types of coat and their grooming requirements **A2** Restraint equipment and methods of handling **A3** Record-keeping requirements	A report on: • animal coat types and their care requirements • handling methods to aid the grooming • the importance of record keeping.
B Carry out pre-grooming activities to maintain animals' coats, feet, pads, claws and ears	**B1** Pre-grooming assessment **B2** Maintaining animals' feet, pads, claws and ears	A portfolio evidencing practical skills in bathing and grooming animals, including different animals and coat types. A report discussing pre-grooming and grooming decisions and approaches during practical tasks.
C Carry out the safe bathing and grooming of animals to meet welfare needs and grooming requirements	**C1** Bathing and drying animals **C2** Grooming and styling animals **C3** Maintaining grooming equipment	

Content

Learning aim A: Understand the grooming requirements of animals with different needs

A1 Types of coat and their grooming requirements

- Different types of animal coat:
  - animal coat types, e.g. wool/curly, non-shedding, double-dense, silky, long, short, wire, and their care requirements
  - unusual coat types, including Mexican hairless dog, Sphynx cat and skinny pig (hairless guinea pig), and their care requirements.
- Problems associated with the care of animals' skin and coats:
  - health problems associated with different coat types, including moulting, eczema, parasites (e.g. fleas and ear mites), skin conditions, allergies, effects of neutering on coat, animal lifestyle.
- Requirements for show grooming:
  - grooming for show and competition standards – breed club standards, e.g. the Kennel Club breed standards.

A2 Restraint equipment and methods of handling

- Correct handling and restraint for grooming to ensure the welfare and safety of the animal and groomer, and to promote an accurate and balanced groom.
- Types and uses of physical restraining equipment, including collars, leads, neck, muzzles (including fabric, mesh, tape, and air), belly straps, harnesses and alternative equipment which can be used, e.g. crush cages and grooming blocks.
- Handling and restraint for different physiological states and life stages for dogs, cats and small animals, including old, young, ill and pregnant.

A3 Record-keeping requirements

Client grooming records:

- reasons for keeping client grooming records – data protection legislation, current relevant veterinary legislation and codes of practice
- types of record-keeping systems, e.g. manual and electronic record-keeping systems
- animal grooming records, including coat type, health notes, when groomed, animal-safe products, e.g. shampoos, conditioners
- veterinary referral, reporting procedures.

Learning aim B: Carry out pre-grooming activities to maintain animals' coats, feet, pads, claws and ears

B1 Pre-grooming assessment

Preparation of an animal for grooming, including the assessment of temperament, health and grooming needs.

- Initial assessment of animal, to ensure correct approach:
  - temperament and body language, e.g. aggressive, nervous, friendly
  - assessment of health indicators, including eyes, nose, mouth, ears, skin, coat, bodyweight, limbs, gait, genital area and demeanour.
- Assessment of coat type and equipment needed to carry out grooming safely and effectively.
- Selection and use of grooming equipment for small animals, including bowl, cup, toothbrush, silk cloth, slicker bush, comb, bristle brush.

- Grooming out of a coat, brushing techniques, dealing with mats and skin conditions.
- Trimming requirements for small animal species, including requirements for animal health, and for show standards.

B2 Maintaining animals' feet, pads, claws and ears

Appropriate techniques adopted in the care and preparation of the animal for grooming.

- Ear care, including cleaning, ear plucking (according to breed requirements), equipment and procedure.
- Nail care, including cutting, filing and stemming blood.
- Foot care, including sore pads, removal of knots between the pads, cracked pads, application of paw butter, grass seeds, veterinary referral.
- Select and apply different grooming equipment and techniques for dogs, cats and small animals.
- Safe handling of small animals for grooming and use of personal protective equipment (PPE), e.g. towels, specialist collars, and gauntlets.
- Problems encountered with poor handling, including injuries to animal (e.g. spinal injuries, fractures), and injuries to groomer (e.g. bites, scratches).

Learning aim C: Carry out the safe bathing and grooming of animals to meet welfare needs and grooming requirements

C1 Bathing and drying animals

Bathing procedures:

- use of PPE, including apron, gloves, masks and goggles
- equipment used to bathe dogs, cats and small animals, including dog-grooming baths, improvisation of a bath for small animals, crush cages and cat grooming bags
- selection of animal-safe shampoos for dogs, cats and small animals, including general purpose, colour enhancing, veterinary, medicated, conditioning, anti-parasitic, and products for animal sensitivities, e.g. cats' sensitivities to tar and sulfur shampoos
- use of appropriate restraint and approach methods, to maintain human safety and animal welfare
- drying methods, including blaster, flat, cabinet and fluff
- methods to ensure animal welfare during procedures, e.g. protection from dryer noise, monitoring time in cabinet, reassuring animal.

C2 Grooming and styling animals

- Safe grooming of dogs, cats and small animals by electrical means, including:
  - o selection of clipper blades and comb attachments for different purposes
  - o use of different clipping techniques, e.g. reverse clipping, for different coat types and styles, such as the lay of the coat
  - o fine clipping, body clipping according to breed.
- Safe grooming of dogs, cats and small animals by non-electrical means, including:
  - o removal of excess coat using brushes, stripping tools, combs, de-matting tools, de-shedding tools, and grooming rakes.
- Breed requirements for specific styling of paws in order to enhance characteristics of a breed, including natural feet, cat feet, tight round feet, round feet and clean feet to ensure an effective groom.

C3 Maintaining grooming equipment

Clean and maintain equipment to ensure its safe and effective use.

- Types of equipment:
  - o non-electrical equipment used, including baths, slicker (firm and soft), pin, greyhound comb, poodle comb, hound glove, bristle brush, de-matting tools, nail clippers, stripping knives, scissors (feet, face, thinners, straight, curved and chunkers), ear plucking forceps, nail clippers and files
  - o electrical equipment, including clipping/trimming equipment, e.g. clippers, trimmers, blades and blade attachments
  - o grooming furniture, including grooming tables, hydraulic and non-hydraulic, trolleys
  - o drying equipment, including blaster, stand, hand-held and cabinet.
- Risks associated with incorrect maintenance of equipment, e.g. scissors being blunt and ineffective, equipment becoming rusty and stiff, bath may block/leak water, electrical equipment may fail and be unsafe for use.
- Maintenance of grooming equipment, including checking that scissors are sharp, checking equipment that may need oiling, checking baths and other equipment for removed hair or leaks, checking electrical equipment for portable appliance testing (PAT).
- Cleaning electrical and non-electrical equipment to ensure hygiene and safe use:
  - o methods of sterilisation, e.g. UV light, liquid, heat, animal safe disinfectants
  - o risks associated with incorrect cleaning of equipment, e.g. spread of disease and parasites.
- Health and safety considerations, including:
  - o compliance with current relevant legislation, e.g. Health and Safety at Work etc Act 1974, Control of Substances Hazardous to Health (COSHH) Regulations 2002, Reporting of Injuries, Diseases, and Dangerous Occurrences Regulations (RIDDOR) 2013, environmental protection and the safe disposal of waste.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Understand the grooming requirements of animals with different needs		**A.D1** Evaluate the methods available to meet the grooming needs of different animals.
A.P1 Explain the methods available to meet the grooming needs of different animals.	**A.M1** Analyse the methods available to meet the grooming needs of different animals.	
Learning aim B: Carry out pre-grooming activities to maintain animals' coats, feet, pads, claws and ears		**BC.D2** Perform grooming techniques proficiently for different animals.
B.P2 Demonstrate safe handling and preparation of dogs for grooming. **B.P3** Demonstrate safe handling and preparation of small animals for grooming.	**B.M2** Demonstrate the correct techniques for handling and preparing dogs for grooming.	**BC.D3** Justify selected grooming techniques used to meet grooming and welfare needs of different animals.
Learning aim C: Carry out the safe bathing and grooming of animals to meet welfare needs and grooming requirements		
C.P4 Demonstrate safe techniques for bathing different animals. **C.P5** Demonstrate safe techniques for drying and styling different animals according to grooming requirements.	**C.M3** Demonstrate correct techniques for bathing to meet grooming and welfare needs of different animals. **C.M4** Demonstrate correct techniques for drying and styling different animals according to grooming and welfare requirements.	

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.M1, A.D1)

Learning aims: B and C (B.P2, B.P3, C.P4, C.P5, B.M2, C.M3, C.M4, BC.D2, BC.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to grooming facilities and animals, including:

- electrical and battery-operated clippers with a range of blades
- scissors (thinning, straight, feet and face, curved and texturising)
- stripping knives (coarse and fine)
- brushes (pin, slicker, hound glove and bristle)
- dogs with different coat types (wool, corded, unusual, double type 1 and 2, silky and wire)
- cats with different coat types
- small mammals, e.g. rats, hamsters
- breeds of rabbit with different coat types (lionhead, rex, angora, Dutch)
- breeds of guinea pig, e.g. sheltie, Peruvian, short-haired.

Essential information for assessment decisions

Learning aim A

Learners must base their assignment on the following animal types: three different dog coat types, one cat and two from the following: guinea pig, rabbit or small rodent.

For distinction standard, learners will argue concisely and professionally to evaluate the grooming needs of dogs, cats and small animals, taking into account species and breed requirements, temperament and health needs. Learners will discuss a range of simple and complex coat types, and the issues and health problems associated with them. There will be clear and relevant examples of the coat types and the associated issues. Learners' reports will explore the handling and restraint approaches available when grooming, and will evaluate the suitability of different methods for a range of different animals, needs and situations. Learners will explain the importance and types of records that groomers keep, and give examples of the different record-keeping methods that can be used.

For merit standard, learners will make reasoned, analytical judgements on the different grooming requirements for the different coat types of dogs, cats and small animals. They will explore the different methods available for grooming different coat types and give reasoned arguments for the choice of methods for each. Learners will include discussions of health issues and other challenges presented by the coat type, linking this to grooming methods. Their report will explore the handling and restraint approaches available when grooming, and will suggest the suitability of different methods for a range of different animals, needs and situations. Learners will describe the types of records that groomers keep, with examples and record-keeping methods.

For pass standard, learners will recall knowledge to explain the reasons for grooming simple coats of different animals, and link these to grooming methods. Learners will show their understanding of the handling and restraint techniques that are adopted when grooming different animal types. Learners will demonstrate knowledge of record-keeping methods and an understanding of the reasons they are required.

Learning aims B and C

Learners must use their practical portfolio to record evidence of their practical activities.

Learners must be given a witness statement from a workplace supervisor that describes, in sufficient detail for the assessor to make a judgement, how learners carried out the required activity. Alternatively, learners should be given an assessor observation record that details how learners have carried out the required activity and how it has met the assessment criteria.

Learners must base this assignment on the following animal types: three different coat types in dogs and two from the following: cat, guinea pig, rabbit or rodent. These can be the same animals looked at in the first assignment, or different animals.

For distinction standard, learners will argue concisely and professionally as to the importance of assessment prior to bathing and grooming animals. Learners will demonstrate considered and effective selection and use of grooming techniques appropriate for the animal's grooming needs. They will make valid judgements about the risks or limitations of the techniques used in relation to meeting the animal's needs. The practical portfolio will show how learners capably handled and restrained animals in different situations and with varying temperaments, with due consideration for their own health and safety and the welfare of the animal. Learners will demonstrate grooming techniques in advanced situations, such as the safe removal of excess coat by electrical means, and the trimming of paws and pads to breed coat style and condition. They will show a considered selection of brushing techniques, according to need, style and coat type, using equipment safely and effectively, and maintaining it after use. Learners' consideration of animal welfare must be evident throughout the practical element.

For merit standard, learners will make reasoned, analytical judgements as to why assessment of the animal is needed prior to bathing and grooming. They will provide reasoned support for the practical activities carried out, including pre-grooming and grooming activities, assessing the appropriateness of grooming techniques in relation to the grooming and welfare needs of the animal. The practical portfolio will show how learners appropriately handled and restrained animals in different situations, with due consideration for their own health and safety and the welfare of the animal. Learners will demonstrate grooming techniques in different situations, such as the safe removal of excess coat by non-electrical means, and the trimming of paws and pads to breed coat style and condition. Learners will demonstrate appropriate brushing according to need, style and coat type and with effective and safe use of equipment that is cleaned and maintained after use. Learners will select and apply appropriate grooming techniques and skills, modifying techniques as appropriate to the situation and/or to deal with contingencies. Learners will select brushing techniques according to need, style and coat type and will demonstrate effective use of equipment. Learners will record evidence in their practical portfolio. They will explain why grooming techniques are dictated by the coat type and relate this to the condition of the coat. Learners will use their knowledge, skills and understanding of the maintenance of equipment to consider the problems that can occur if equipment is not cleaned and maintained. They will select appropriate maintenance methods in relation to realistic vocational contexts. Learners' consideration of animal welfare must be evident throughout the practical element.

For pass standard, learners will work appropriately to pre-groom and groom the animals, carrying out tasks fully and safely to achieve required outcomes. In their plan on the safe use and maintenance of non-electrical and electrical equipment, learners will provide feasible solutions to identified problems. The practical portfolio will show how learners handled and restrained animals in different situations, with due consideration for their own health and safety and the welfare of the animal. Learners will demonstrate grooming techniques in different situations, such as bathing, drying and brushing according to breed coat style and condition, using equipment and products effectively and safely. Learners will demonstrate the safe cleaning of equipment after use. Learners' consideration of animal welfare must be evident throughout the practical element.

Links to other units

This unit links to *Unit 4: Practical Animal Husbandry*.

Employer involvement

This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local animal businesses
- contribution of ideas to unit assignment/project materials
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Unit 17: Principles of Animal Nursing

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners will explore the work of a veterinary practice, including staff roles, responsibilities, procedures, basic nursing skills, and the role of governing bodies.

Unit introduction

Veterinary practices in the UK play a vital role in promoting the health care of animals, including pet animals, working animals and wild animals. Veterinary practices provide a range of services, including educating pet owners, providing specialist clinics and classes (for example obesity clinics, puppy socialisation classes) and, in some cases, retail facilities and dog-grooming salons.

This unit gives you an insight into the skills, knowledge and responsibilities of veterinary nurses. You will learn about the care and treatment provided by veterinary nurses for animals with infectious and medical diseases, and animals that require surgery. You will learn the responsibilities of veterinary nurses in relation to client care, and practice administration and management. You will also study the rehabilitation methods commonly used with recovering animals.

This unit will enable you to progress to employment in a veterinary practice, or to further study to become a registered veterinary nurse.

Learning aims

In this unit you will:

A Understand the staff roles and operational procedures required in a successful veterinary practice

B Investigate veterinary nursing methods, procedures and resources necessary to provide patient care

C Explore rehabilitation methods and procedures used to promote the recovery of animal patients.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Understand the staff roles and operational procedures required in a successful veterinary practice	**A1** Governing bodies and legislation **A2** Organisational structure **A3** Operational practices	A report discussing the relationship between the organisation of a specific practice and regulatory requirements.
B Investigate veterinary nursing methods, procedures and resources necessary to provide patient care	**B1** Nursing methods for medical cases **B2** Nursing methods for surgical cases **B3** Nursing methods for infectious disease cases	A report based on case studies of animal patient care to include: • a medical case • a surgical case • an infectious disease case. Each case study must include initial assessment, treatment and recovery planning.
C Explore rehabilitation methods and procedures used to promote the recovery of animal patients	**C1** Complementary therapies for the animal patient **C2** Procedures used to promote the recovery of animal patients	

Content

Learning aim A: Understand the staff roles and operational procedures required in a successful veterinary practice

A1 Governing bodies and legislation

The role of regulatory bodies and legislation in ensuring high standards of work and welfare.

- Legislation relating to animal welfare.
- Codes of practice, e.g. Royal College of Veterinary Surgeons (RCVS), British Veterinary Nursing Association (BVNA).
- Continuing professional development, e.g. British Veterinary Association (BVA), British Small Animal Veterinary Association (BSAVA).
- Health and safety, to include:
  o Control of Substances Hazardous to Health (COSHH) Regulations 2002, e.g. drugs, anaesthetics, radiography
  o Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 2013, e.g. zoonotic disease, injuries
  o Environmental Protection Act 1990, e.g. disposal of biological waste.

A2 Organisational structure

Roles, responsibilities and limitations of veterinary practice staff.

- Veterinary surgeons, to include diagnosing, prescribing medication, performing surgical procedures.
- Registered veterinary nurses, to include second vaccinations, blood sampling, preparing animals for surgical treatments, feeding and grooming animals, weight management clinics.
- Veterinary care assistant, to include maintaining animal accommodation, feeding and grooming animals, restraining animals during consultations.
- Practice manager, to include regulatory compliance, hiring staff, daily management.
- Administrative staff, to include booking appointments, pet insurance administration.

A3 Operational practices

Policies and procedures informed by regulatory requirements and professional standards.

- Risk assessments and standard operating procedures relating to health and safety, e.g. use of x-rays, anaesthetics, medical waste.
- Veterinary pharmaceuticals – ordering, storing and stock control.
- Registering new clients/taking on new cases, e.g. second opinion, referrals.
- Admission for treatment, to include consent forms, case histories.
- Release procedures, to include aftercare instructions and appointments.
- Client records and confidentiality, data protection.

Learning aim B: Investigate veterinary nursing methods, procedures and resources necessary to provide patient care

B1 Nursing methods for medical cases

Tasks carried out by veterinary nurses under direction of veterinary surgeons.

- Preparation for diagnosis or initial assessment, to include case histories, clinical signs, sampling of blood, skin scrapings, urine and faeces, health checks, temperature, pulse and respiration, x-ray, ultrasound scanning.
- Treatment and care methods, to include fluid therapy, assisted feeding and nutrition, catheterisation, enemas, administration of medications, including topical, oral, intravenous and subcutaneous.
- Safe handling and restraint for veterinary procedures, e.g. vaccination, anaesthesia and administering medication, to include collar, lead, muzzle, head collar, harness, dog catcher, cat grasper, cat bag, crush cage, snake bag, snake hook, Elizabethan collar and towel.

B2 Nursing methods for surgical cases

- Preparation for diagnosis or initial assessment, to include case histories, clinical signs, sampling of blood, urine and faeces, health checks, temperature, pulse and respiration.
- Preparation for surgical procedures, e.g. skin clipping, withholding food, x-ray, ultrasound scanning, pre-operative procedures, administering pre-meds, preparation of the patient.
- Treatment and care methods, to include:
  - pre- and post-operative monitoring procedures, e.g. monitoring condition of the patient during surgery and recovery
  - fluid therapy
  - assisted feeding and nutrition
  - catheterisation
  - enemas
  - drug administration, including topical, oral, intravenous and subcutaneous, wound care and management, e.g. cleaning and bandaging wounds
  - types of wounds, e.g. incised, lacerated and puncture.
- Preparation of the theatre and sterilisation techniques, post-operative care of surgical instruments.

B3 Nursing methods for infectious disease cases

- Preparation for diagnosis or initial assessment, to include:
  - case histories
  - clinical signs
  - sampling of blood, urine, faeces, temperature, pulse and respiration.
- Treatment and care methods to include:
  - isolation and barrier nursing
  - convalescent carriers, e.g. cat flu and Leptospirosis
  - fluid therapy
  - assisted feeding and nutrition
  - catheterisation
  - enemas
  - drug administration including topical, oral, intravenous and subcutaneous
  - disinfection techniques.

Learning aim C: Explore rehabilitation methods and procedures used to promote the recovery of animal patients

C1 Complementary therapies for the animal patient

- Rehabilitation methods to promote recovery of animal patients, to include three of the following: acupuncture, behavioural therapy, physiotherapy, hydrotherapy, magnetic therapy and aromatherapy.
- Procedures for referral.
- Personal protective equipment (PPE) and health and safety.

C2 Procedures used to promote the recovery of animal patients

- Diagnosis of condition, frequency of treatments, contraindications, care plans, recording and monitoring of treatments.
- Passive and active exercise and respiratory physiotherapy.
- Equipment used and health and safety implications, e.g. acupuncture needles, hydrotherapy pool.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Understand the staff roles and operational procedures required in a successful veterinary practice		
A.P1 Explain the organisation structure and roles and responsibilities in a veterinary practice. **A.P2** Explain the influence of legislation and governing bodies on the roles, responsibilities and operational practices of a veterinary practice.	**A.M1** Analyse the impact of legislation and governing bodies on the roles, responsibilities and operational practices of a veterinary practice.	**A.D1** Evaluate the impact that legislation and governing bodies have on the roles, responsibilities and management of a veterinary practice.
Learning aim B: Investigate veterinary nursing methods, procedures and resources necessary to provide patient care		
B.P3 Explain the symptoms of different animals with medical and surgical issues and infectious diseases. **B.P4** Discuss the nursing requirements for different animals undergoing veterinary treatment.	**B.M2** Analyse the nursing approaches taken for different animals with differing health care needs by a veterinary practice.	**BC.D2** Justify the nursing approaches taken for different animals with differing health care needs by a veterinary practice. **BC.D3** Evaluate the impact of regulations on veterinary nursing and rehabilitation methods and procedures.
Learning aim C: Explore rehabilitation methods and procedures used to promote the recovery of animal patients		
C.P5 Discuss the benefits of complementary therapies for animal patients **C.P6** Explain the care plans put in place for the recovery of different animals by veterinary practices.	**C.M3** Analyse the approach taken by veterinary practices for the recovery of different animals.	

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, C.P5, C.P6, B.M2, C.M3, BC.D2, BC.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- at least one species from three of the animal groups: farm livestock, companion animals, exotic animals, zoo animals, British wildlife
- animal veterinary facilities, including
  - o organisational structure
  - o job roles/descriptions
  - o animal case studies.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will argue concisely and professionally to evaluate why it is important that those working in veterinary practices understand the link between the organisation of the practice and legislative and regulatory requirements. Learners will include the organisational structure of a typical veterinary practice, a description of the roles and responsibilities of staff and the qualifications that are required for those roles. Learners will relate how staff in a veterinary practice are organised with how veterinary regulations influence the management of the practice.

Learners will assess the impact of veterinary regulations on the management of the veterinary practice. They will include clear details with relevant examples of the impact of health and safety regulation on staff and visiting public.

For merit standard, learners will make reasoned, analytical judgements on the impact of legislative and regulatory requirements on the management of the veterinary practice. Learners will include information, in some detail, on the different legislation and regulations in place. Learners will select and apply knowledge and understanding of the organisation of the practice and its staff, the qualifications required, and how veterinary regulations influence the management of the practice.

Learners will show the impact of veterinary regulations on the management of the veterinary practice. They will include an analysis of the impact of regulations, with relevant examples, such as the impact of health and safety regulations on staff and visiting public.

For pass standard, learners will recall knowledge to explain the roles and responsibilities of those working in the veterinary practice and how the practice is structured. Learners must include the qualifications required by staff in the veterinary practice. They will include an explanation of how regulations and legislation influence the management of the veterinary practice and relate this to well-defined situations.

Learning aims B and C

This assignment must be based on case studies for three different animals (for example mammal, bird, reptile), and cover a medical nursing case, a surgical nursing case and an infectious disease nursing case. The report will contain clear detail and show understanding of the requirements for initial assessment, ongoing treatment and recovery planning for each case. At least one of the case studies will give clear details on how rehabilitation methods and procedures can promote the recovery of the patient.

For distinction standard, learners will articulate arguments concisely and professionally to justify the nursing approaches for animals with different health care needs. They will give reasons for the care selected. Learners will show depth of understanding by including clear details of the requirements for initial assessment, ongoing treatment and recovery planning for each case, applying their knowledge to less familiar or well-defined situations. Learners will include a detailed explanation of the reasons why recovery plans are used for different animals in different situations.

Learners must draw on their knowledge and understanding from across all the learning aims to evaluate the impact of legislation and regulations on nursing and rehabilitation practice and procedures, showing the use of detailed analysis and research.

For merit standard, learners will select and apply knowledge to focus on the nursing approaches that are taken for animals with different health care needs. Learners will include details on the initial assessment, ongoing treatment and recovery planning for each case, making analytical judgements involving comparison and discussion. Learners will include an explanation of the use of recovery plans in some detail, applying their knowledge to more complex or less familiar situations.

For pass standard, learners will recall knowledge to consider the symptoms and nursing requirements of different animals with different health care needs. Learners will explain the use of care plans for the recovery of each of the animals, applying their knowledge to familiar and well-defined situations to demonstrate their understanding. Learners will also discuss the benefits of different complementary therapies.

Links to other units

This unit links to *Unit 6: Animal Health and Diseases*.

Employer involvement

This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local animal businesses
- contribution of ideas to unit assignment/project materials
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Unit 18: Aquatic Animal Health and Husbandry

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners study aquatic welfare needs and husbandry methods to manage the welfare of aquatic animals in captivity.

Unit introduction

Captive aquatic species can be found in a wide variety of situations. They are extremely popular as pets and are often a significant part of zoological collections for the purposes of education and conservation. Aquariums can even form part of the interior design of commercial or public premises, because of the calming effect that observing aquatics can have on people.

Good aquatic husbandry and management is very important for the health and wellbeing of aquatic species. In this unit, you will learn about the physiological and nutritional needs of aquatic species, and ways to create and maintain environments and feeding regimes that meet those needs. You will learn about common diseases and abnormal behaviours that can affect captive species, along with ways to prevent or manage them. You will develop practical skills in promoting good health for aquatic species, including disease prevention, feeding regimes and maintenance of aquatic systems for optimum health.

This unit will prepare you for further study in animal or fishery management. It will also prepare you for employment in areas such as pet retail, zoos and aquariums, or for specialist businesses that manage the welfare of display aquariums.

Learning aims

In this unit you will:

A Examine the biology and associated diseases of aquatic species in order to manage their health and welfare

B Investigate foods and feeding techniques for aquatic species to meet dietary requirements

C Establish and maintain aquatic systems to meet the environment and welfare needs of captive aquatic species.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Examine the biology and associated diseases of aquatic species in order to manage their health and welfare	**A1** Commonly kept species of fish **A2** Anatomy of fish **A3** Breeding strategies **A4** Fish health and disease prevention	A report on selected aquatic species, including: • maintaining health of selected species • preventing disease • meeting dietary requirements.
B Investigate foods and feeding techniques for aquatic species to meet dietary requirements	**B1** Diets and feeding **B2** Feeding mechanisms	
C Establish and maintain aquatic systems to meet the environment and welfare needs of captive aquatic species	**C1** Aquatic systems **C2** Maintenance of systems **C3** Health and safety	Demonstration of methods and processes to maintain selected aquatic systems with signed witness statements and/or observation records.

Content

Learning aim A: Examine the biology and associated diseases of aquatic species in order to manage their health and welfare

A1 Commonly kept species of fish

- Types of fish that are suitable to be kept together in the same aquarium.
- Types of fish that are not suitable to be kept together in the same aquarium.
- Recognition of fish species that can be housed together in tropical, marine, freshwater, brackish and saltwater aquariums.
- Recognition of tropical fish species, such as tetra, guppies, mollies, platies, cichlids, bettas and gouramis, and types that can be housed together.
- Recognition of marine fish species, such as clownfish, damselfish, tangs and puffers, and types that can be housed together.
- Recognition of freshwater fish species, such as goldfish, barbs and koi.
- Recognition of brackish fish species, such as archer fish, and types that can be housed together.

A2 Anatomy of fish

- Structure and function of the external anatomy of a fish, e.g. eye, nares, operculum, dorsal fin, caudal fin, peduncle, lateral line, anal fin, vent, scales, pelvic fins, pectoral fins and mouth.
- Structure of the internal anatomy of a fish, e.g. gills, heart, liver, stomach, intestines, vent, muscle, kidney, gonads, pyloric caeca, spinal cord, spine and brain.

A3 Breeding strategies

- Breeding strategies such as mouthbrooders, livebearers, egg scatterers, egg hiders, nest builders.
- Sex determination in different species for breeding purposes and cues to sexual maturation, e.g. temperature and light, and ways to care for broodstock.

A4 Fish health and disease prevention

- Recognition of normal and abnormal signs of health such as swimming actively, good appetite, fins fully open, no spots on scales.
- Common causes of ill health, such as stress, presence of pathogens, predators.
- Common conditions, nutritional problems, diseases and parasitic infections.
- Signs of normal and abnormal behaviour, such as loss of appetite, fighting, fin nipping, hiding.
- Diseases in species of fish, to include:
  o viral diseases
  o bacterial infections
  o fungal infections
  o parasitic infections.
- Methods of prevention and treatment, such as medication, water treatment, isolation, quarantine, environmental management, hygiene and sources of specialist advice.
- Maintenance routines to prevent disease and control the species environment, including keeping records and maintaining health and safety.

Learning aim B: Investigate foods and feeding techniques for aquatic species to meet dietary requirements

B1 Diets and feeding

- Types and preparation of food, such as live, dry, frozen, fresh and freeze-dried.
- Benefits of feeding each type of feed.
- Dietary requirements of different species of fish and how the feed should be presented, stored and maintained.

B2 Feeding mechanisms

- Different fish-feeding mechanisms, routines and feeding methods for:
  - filter feeding
  - herbivores
  - piscivores.
- Quality and quantity of the feed and associated welfare issues, such as effects of overfeeding or underfeeding, fish welfare issues such as health, death and water quality deterioration.

Learning aim C: Establish and maintain aquatic systems to meet the environment and welfare needs of captive aquatic species

C1 Aquatic systems

- Recognition of aquarium types for marine, freshwater, tropical and temperate fish species.
- Differences between the requirements of marine, freshwater, tropical and temperate aquariums.
- Methods and processes involved with aquarium set-up:
  - location and sitting
  - size requirements
  - temperature control
  - lighting
  - filtration
  - aeration
  - furnishings, e.g. plants
  - substrates, e.g. gravel, sand, rock
  - filling the system
  - pH control.

C2 Maintenance of systems

Practical maintenance of aquatic systems and fish husbandry using associated methods and processes to include:

- stocking regime
- stocking density
- sources of system instability
- water-quality factors and measurements, e.g. dissolved oxygen, temperature, pH, ammonia, nitrate, nitrite, the use of testing kits, benefits of water testing and knowing when to complete a water change
- stabilising and maintaining water quality to suit the requirements and needs of the aquarium
- cleaning the systems and methods used, why this needs to be completed and the impact if systems are not fully maintained
- maintenance routines involved in maintaining aquariums and promoting good health and welfare for fish species.

C3 Health and safety

- Safe working practices considered, such as water and electricity, handling glass, wet floors, having measures in place to reduce injuries.
- Use of personal protective equipment (PPE), such as gloves, goggles and safety boots.

Assessment criteria

Pass		Merit	Distinction
Learning aim A: Examine the biology and associated diseases of aquatic species in order to manage their health and welfare			
A.P1 Explain the characteristics of internal and external features of a given fish species. **A.P2** Explain breeding strategies and sex determination in selected fish. **A.P3** Discuss normal and abnormal conditions and behaviour in fish.		**A.M1** Assess the impact of associated diseases in species of fish and how they may affect the aquarium.	**AB.D1** Evaluate the remedial actions to be taken in case of disease, and abnormal conditions and behaviour in fish. **AB.D2** Evaluate associated welfare issues to given fish species in relation to quality and quantity of feed and the contributing factors.
Learning aim B: Investigate foods and feeding techniques for aquatic species to meet dietary requirements			
B.P4 Discuss types of feed available to given fish species. **B.P5** Explain methods of presenting food to fish in an aquarium.		**B.M2** Analyse the contributing factors involved with fish-feeding mechanisms and methods.	
Learning aim C: Establish and maintain aquatic systems to meet the environment and welfare needs of captive aquatic species			
C.P6 Demonstrate correct management techniques of aquariums. **C.P7** Explain the benefits and drawbacks of own aquarium management on the health and welfare of the managed stock.		**C.M3** Demonstrate correct management techniques of complex aquariums, adapting and modifying techniques for different situations and assessing the impact of this management on the health and welfare of the managed stock.	**C.D3** Evaluate the success of maintenance techniques in ensuring welfare of aquatic species, in relation to specific aquatic systems.

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aims: A and B (A.P1, A.P2, A.P3, B.P4, B.P5, A.M1, B.M2, AB.D1, AB.D2)

Learning aim: C (C.P6, C.P7, C.M3, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- suitably well-stocked aquariums
- water-quality test kits
- equipment for the establishment and maintenance of aquariums.

Essential information for assessment decisions

Learning aims A and B

For distinction standard, learners will articulate arguments concisely and professionally to justify remedial action that will prevent disease in fish species. Learners will carefully consider causes of ill health, methods of prevention, treatment and the maintenance routines that should be carried out to prevent and control the species environment.

Learners will use detailed research and analysis of associated welfare issues of the given fish species in relation to the quality and quantity of feed provided. Learners will consider the effects of overfeeding, underfeeding and water-quality deterioration and make suitable recommendations.

For merit standard, learners will apply knowledge of associated diseases, including viral, bacterial, fungal and parasitic, to consider the impact of these diseases on fish species. Learners will make reasoned analytical judgements about the causes of the diseases, how they can be prevented, and the welfare of the fish species and aquatic system maintained.

Learners must analyse fish-feeding mechanisms and methods. Learners must include feeding routines and give the advantages and disadvantages of each method. They must show that they have extended their knowledge to less familiar contexts and relate the suitability of the fish-feeding method to the fish's welfare.

For pass standard, learners will recall knowledge to explain the importance of internal and external features of a given fish species. Learners will explain breeding strategies and sex determination for selected fish. Learners will carefully consider signs of normal and abnormal conditions or behaviour and how they relate to the welfare of the fish.

Learners will discuss the types of feed available to given fish species and the benefits of each feeding type. Learners must consider preparation and presentation methods as well as the dietary requirements for different species of fish.

Learning aim C

For distinction standard, learners will demonstrate their knowledge of aquarium management through the selection and use of appropriate management techniques and equipment in a range of situations, such as creating new environments, and solving problems in existing environments. They will perform management tasks in a highly competent, time- and resource-efficient manner. Learners will demonstrate a thorough and detailed understanding of the welfare needs of the managed stock and the impact of their management decisions, techniques and approaches on those needs. Learners will justify their management decisions and situational constraints and will carefully consider the merits of alternatives.

For merit standard, learners will select and apply appropriate methods and processes of aquarium management, modifying them to suit different situations and to meet contingencies. Learners will demonstrate sound knowledge of the welfare needs of the fish they manage and the implications of their management decisions and processes on those needs. Learners will consider the implications of alternative approaches.

For pass standard, learners will select and apply appropriate methods and processes in well-defined situations. They will demonstrate an awareness of the welfare needs of the fish they manage, and consider how their management approaches meet those needs. Learners can demonstrate an awareness of alternative management approaches and give reasons for their choices.

Links to other units

This unit links to *Unit 23: Zoological Animal Health and Husbandry*.

Employer involvement

This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local animal businesses
- contribution of ideas to unit assignment/project materials
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Unit 19: Farm Livestock Husbandry

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners study the breadth and purposes of farm livestock in the UK, including husbandry techniques required to maintain animal welfare and aid productivity.

Unit introduction

Supplying the world with animal products such as meat, dairy and wool requires knowledge about how to raise, care and handle a variety of farm livestock successfully. The successful farmer needs to balance productivity with high standards of animal welfare.

In this unit, you will explore a range of farming systems and develop specialist knowledge and understanding of farmed livestock handling and husbandry. You will explore farm livestock nutrition and feed systems, creating balanced diets that meet the needs of the animal and the producer. You will develop the skills and experience needed to confidently and safely manage large and sometimes unpredictable animals.

This unit will support your progression to employment with common farm livestock, or to further study in an apprenticeship or higher education establishment.

Learning aims

In this unit you will:

A Understand the production systems used for farm livestock in the UK

B Explore the nutritional needs of farm livestock in order to maintain good standards of health

C Carry out handling and routine husbandry of farm livestock to meet current standards.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Understand the production systems used for farm livestock in the UK	**A1** Farm livestock types and breeds **A2** Production systems	An illustrated report/essay examining the common and unconventional farm livestock species, and how these are produced.
B Explore the nutritional needs of farm livestock in order to maintain good standards of health	**B1** Nutrition for farm livestock **B2** Feeding and watering regimes and equipment **B3** Feed ration formulation	Portfolio of evidence relating to the practical handling, feeding, watering and husbandry of farm livestock species. A report examining feeds and composition, equipment, methods and techniques of feeding and watering.
C Carry out handling and routine husbandry of farm livestock to meet current standards	**C1** Health and safety requirements when working with farm livestock **C2** Animal health checks prior to handling common species **C3** Practical animal handling techniques and equipment for common farm livestock species **C4** Farm animal accommodation	

Content

Learning aim A: Understand the production systems used for farm livestock in the UK

A1 Farm livestock types and breeds

Characteristics and purposes of livestock breeds in the UK, including native and imported.

- Sheep for food, wool and by-products, including pure-bred and cross-bred sheep, e.g. Border Leicester, Suffolk, Jacob, Lincoln Longwool, Texel, Charollais.
- Pigs for food and by-products, including hybrid and pure breeds, e.g. Tamworth, Saddleback, Gloucestershire Old Spot, Large White, Landrace, Duroc.
- Poultry for meat, eggs and by-products, hybrid and pure breeds, e.g. Buff Orpington, Araucana, Legbar, Faverolles, Aylesbury ducks.
- Cattle for beef, dairy, and by-products, e.g. Hereford, Red Poll, Longhorn, Angus, Welsh Black, Galloway, Jersey, Limousin.
- Goats for milk, meat and by-products, including hybrid and pure breeds, e.g. Bagot, British Toggenburg, Golden Guernsey, Angora and British Primitive goats, Saanens.
- Unconventional livestock diversification, e.g. ostriches for meat, alpacas for fleece, crocodiles for skins.

A2 Production systems

- Variety and characteristics of common production systems for common livestock and standards of welfare and quality of product produced:
  o intensive, organic, semi-intensive, extensive
  o poultry (broilers, laying hens)
  o cattle (beef and dairy)
  o pigs (breeding stock, pork, bacon, heavy pigs, alternative breeds)
  o sheep (lowland, upland, hill)
  o fish (extensive and intensive)
  o mega-farming systems – dairy, pork, poultry and beef
  o sustainability and suitability of systems – water conservation, pollution and impact of each on animal/human health
  o slaughter practices for each group, including cultural and ethical issues
  o welfare monitoring and measuring, legal obligations for all systems.
- Unconventional livestock production systems and standards of welfare and quality of product produced, e.g. ostrich, alpaca, crocodile.
- Impact on production and welfare of supply and demand, time constraints, costs.
- Class of stock, ages of stock, length of time animals are in production.

Learning aim B: Explore the nutritional needs of farm livestock in order to maintain good standards of health

B1 Nutrition for farm livestock

The purpose of understanding feeds, composition and nutritional requirements of species to maximise the value of the animal, including:

- feed types, straights, blends, compound feed, concentrates, forage and fodder
- hay, haylage, silage and straw production
- nutrient requirements for farm species
- absorption and utilisation of nutrients in feed by species
- palatability of feeds and impact on behaviour.

B2 Feeding and watering regimes and equipment

- Feeding and watering equipment from protocols for livestock species, including:
  - automatic drinkers
  - plastic and metal troughs
  - buckets and bucket feeders
  - mobile and fixed hay racks
  - automatic feeding systems.
- Developing productive feeding protocols for livestock species to maximise the value of the animal, to include:
  - planning nutrition
  - charts and records
  - storage of feeds, including regulations and practical considerations
  - preparation of feed
  - hygiene
  - personal protective equipment (PPE).

B3 Feed ration formulation

Methods and techniques in ration formulation.

- Balancing rations using algebraic methods, Pearson's squares and computer formulation software, e.g. Format International.
- Creating the 'least cost' rations.
- Testing the results for accuracy and making adjustments to feeding of the species, if needed.

Learning aim C: Carry out handling and routine husbandry of farm livestock to meet current standards.

C1 Health and safety requirements when working with farm livestock

- Health and safety legislation related to eliminating hazards and controlling risks.
- Risk assessments, including identifying health and safety requirements for self, other people and animals, when working with livestock.
- PPE.
- Principles of handling livestock safely and securely in a farm environment.

C2 Animal health checks prior to handling common species

- Visual health assessments.
- Behavioural assessments, including species-specific behaviour, patterns, interaction with other animals.

C3 Practical animal handling techniques and equipment for common farm livestock species

- Cattle, sheep, pigs, poultry – handling safely and humanely.
- Restraining and handling equipment and systems, including tethers, halters, ropes, bull poles, pig boards, paddles, flat slap sticks, electric fencing, crushes, yoke units, pens, hurdles, crates, cattle races.
- Use of weighing scales.
- Handling animals in different locations inside and in the open, loading and unloading for transport, e.g. for sale and slaughter.
- Body condition scoring/assessment.

C4 Farm animal accommodation

Accommodation considerations, including:

- indoor and outdoor accommodation
- types, structure, materials
- maintenance of accommodation for security and safety of animals and humans
- disposal of organic and inorganic waste
- impact of accommodation considerations on production and production costs
- impact of accommodation on animal welfare, including stress
- requirements for animals at different life stages
- legislation and codes of practice specific to common farm livestock
- application of the five welfare needs.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Understand the production systems used for farm livestock in the UK		
A.P1 Explain the characteristics of different production systems. **A.P2** Explain why different production systems for different breeds can affect animal welfare in different ways.	**A.M1** Assess the different factors of livestock production systems for different species of farm livestock.	**A.D1** Evaluate the suitability of livestock production systems for different species, giving recommended changes.
Learning aim B: Explore the nutritional needs of farm livestock in order to maintain good standards of health		
B.P3 Explain the nutritional requirements for different species of farm livestock. **B.P4** Carry out procedures to balance and record animal rations for different species. **B.P5** Explain the correct feeding and watering equipment for farm livestock species.	**B.M2** Analyse and record correct feed ingredients for nutritional composition of feed for different species of farm livestock.	**BC.D2** Carry out techniques proficiently, to evaluate diets and feeding strategies designed and recorded for different species of farm livestock, making coherent recommendations for improvement to promote higher welfare. **BC.D3** Evaluate use of husbandry techniques in maintaining livestock to meet current standards.
Learning aim C: Carry out handling and routine husbandry of farm livestock to meet current standards.		
C.P6 Demonstrate correct techniques for routine cleaning, maintenance, feeding and watering of different livestock species. **C.P7** Demonstrate correct standard health and safety practices when assessing and handling farm livestock.	**C.M3** Demonstrate proficient handling techniques and use of equipment to assess condition, clean and maintain different species of farm livestock.	

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aims: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, B.P5, C.P6, C.P7, B.M2, C.M3, BC.D2, BC.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have:

- regular access to farm livestock, sheep, pigs, cattle (beef and dairy), poultry (chickens and ducks) and alternative livestock species, as per content
- species-specific handling equipment (cattle crush and race, sheep turner, pig boards, hurdles, electric fencing, sheep handling system (mobile or fixed), halters and crates)
- personal protective equipment appropriate for species
- livestock weighing scales
- computer ration formulation software.

Essential information for assessment decisions

Learning aim A

Learners must base this assignment on four species of conventional farm livestock, as listed in the content.

For distinction standard, learners will articulate arguments concisely and professionally to competently evaluate common production systems, including intensive, extensive and organic systems, giving detailed lines of reasoning for justifications made. Learners will use detailed analysis and research to independently suggest improvements, and assess the advantages and disadvantages for each production system. Learners will include clear examples of how each system impacts on the welfare of the four species of livestock and the breeding of specific animals.

For merit standard, learners will carefully consider the suitability of livestock production systems, including intensive, extensive and organic systems for the species of farm livestock. They will include why the systems are appropriate for each type of livestock, drawing suitable conclusions. Learners should be independent in their approach, showing that they have used research to extend their understanding to less familiar contexts.

For pass standard, learners will recall knowledge and understanding to clearly explain intensive, extensive and organic production systems, including the advantages and disadvantages of each system. Learners will explain the differences in breeds of four species of conventional farm livestock and the benefits of keeping those species, considering costs (animals, feed, and equipment), ease of handling, safety and how humans can use breed characteristics to their advantage.

Learning aims B and C

Learners must base this assignment on four different species of livestock. These can be the same livestock considered in learning aim A, or four different species.

Learners must be given a witness statement from a workplace supervisor that describes, in sufficient detail for the assessor to make a judgement, how learners carried out the required skills and techniques. Alternatively, they should be given an assessor observation record that details how the learner carried out the required skills and techniques, and how it met the assessment criteria.

For distinction standard, learners will show how they used the most appropriate techniques to competently handle and successfully assess the body conditions of four conventional farm livestock species, in order to justify the diets and feeding strategies for the different species. They will show that they can use practical skills in complex situations and that they are capable of performing and evaluating safely while handling livestock, demonstrating safe and correct use of common handling equipment. Learners will also communicate clearly and concisely in a professional discussion, or in a professional manner during the practical assessment.

They will explore the advantages and disadvantages of handling techniques and systems used for the four species being assessed, highlighting areas of concern and referring to health, hygiene and safety of handler and animal. Learners will independently select and evaluate diets and feeding strategies for the four species of farm livestock, making significant and relevant recommendations for improvement to promote higher welfare. Learners will demonstrate an understanding of nutritional requirements, and demonstrate methods and techniques to accurately balance feed rations in at least four animals to meet the required purpose, independently using manual and computer-based ration formulation techniques.

Learners will draw together knowledge and understanding from across the learning aims to evaluate how their use of techniques has contributed to meeting current standards of livestock, making suitable justifications and recommendations.

For merit standard, learners will select and use appropriate techniques to analyse and record feed ingredients for nutritional composition. They will assess the condition of, and competently handle, four species of farm livestock using the correct handling techniques and selection of equipment. Learners will demonstrate and communicate, in a structured and defined way, the advantages and disadvantages of handling techniques and systems used for the four species being assessed. Learners will be able to demonstrate a structured approach to balancing rations for the four animals and an awareness of the nutritional needs for the breed/species.

For pass standard, learners will practically select and use appropriate routine cleaning and maintenance techniques on animal accommodation for four species of farm livestock species. Learners will work safely and correctly, following protocols given. Learners will accurately demonstrate and communicate, using some technical language, the correct health and safety practices when working with farm livestock to meet current legislative requirements. Learners will recall knowledge to outline the nutritional requirements of four farm livestock species and will correctly balance rations for the given species, recording the information in appropriate ways. Learners will explain the correct feeding and watering equipment needed for four farm livestock species, relating their knowledge to well-defined situations.

Links to other units

This unit links to:

- Unit 3: Animal Welfare and Ethics
- Unit 9: Practical Animal Husbandry
- Unit 11: Advanced Animal Nutrition.

Employer involvement

This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local animal businesses
- contribution of ideas to unit assignment/project materials
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Unit 20: Human and Animal Interaction

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners will develop their skills in animal training. Learners will design and implement a training programme to meet a desired goal.

Unit introduction

Animals have been a part of human society for thousands of years. Humans use animals in a wide variety of ways, ranging from food production to working animals and pets. Therefore, the relationship between animals and humans is varied and complex. Understanding how to interact with animals in different situations is important in ensuring the best possible outcome from the given relationship. One of the ways to achieve the optimum outcome of a human–animal relationship is through animal training. This unit gives you some of the fundamental skills you need to be able to undertake simple animal training, taking human safety and animal welfare into account.

In this unit, you will explore relationships between humans and animals, and consider some of the benefits for both animals and humans. You will learn about tools used when training animals, and how to plan and implement a training programme to achieve a specific goal.

The ability to train animals effectively is a skill in all aspects of the animal management sector. This unit will help you to progress to higher education courses such as animal behaviour science, or, following further training, employment as an animal trainer in a zoo, kennel or cattery, or working with assistance animals.

Learning aims

In this unit you will:

A Examine the relationship between humans and animals, and the role of animals in human society

B Understand the use of training aids in an animal training programme

C Undertake an animal training programme, using the principles of learning theory to achieve simple training goals.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Examine the relationship between humans and animals, and the role of animals in human society	**A1** Human attitudes towards animals **A2** The uses of animals in human society **A3** The human–animal bond	A report investigating the uses of animals in human society.
B Understand the use of training aids in an animal training programme	**B1** Animal temperament and psychology **B2** Training aids	A report on the implementation of a training programme to achieve a specific goal.
C Undertake an animal training programme, using the principles of learning theory to achieve simple training goals	**C1** Training goals **C2** Training plans **C3** Monitoring progress	

Content

Learning aim A: Examine the relationship between humans and animals, and the role of animals in human society

A1 Human attitudes towards animals

Factors affecting attitudes towards animals and the consequent effects on animal welfare:

- tradition, culture and religion
- mythology and animal worship
- economic factors, such as trade and value
- education
- media and public perception
- legislation

A2 The uses of animals in human society

Understand the importance to humans of the different ways animals are used, and the impact these uses have on the welfare of the animals.

- Commercial uses, including agricultural production, breeding for the pet industry, testing of products and medical procedures on animals.
- Working animals, including herding dogs; assistance animals, e.g. guide dogs, hearing dogs; sniffer or security dogs; medical detection dogs; draught animals; animals in the military or police force.
- Sport and leisure uses, including pets; hunting; angling; horse trekking; riding and eventing; racing, e.g. dogs and horses; dog sports, e.g. sledding; animal collections for display, e.g. zoos; wildlife parks; aquariums; aviaries; circuses.

A3 The human–animal bond

Aspects of the human and animal relationship.

- Benefits to humans, including calming effects, such as lowered blood pressure and stress reduction; companionship, e.g. child development, reducing social isolation, animal role in grieving, education and learning.
- Benefits to animals, e.g. care and safety, welfare.
- Problems with human–animal relationship, e.g. animal hoarding, neglect and abuse.

Learning aim B: Understand the use of training aids in an animal training programme

B1 Animal temperament and psychology

- The importance of assessing animal behaviour and temperament before training, to include animal health, behaviour, breed, temperament, body language, e.g. showing whites of eyes, position of tail or ears.
- The influence of learning theories in determining modes of training, learning theories to include: classical and operant conditioning, social learning, insight learning, associative learning, latent learning, habituation, sensitisation.

B2 Training aids

- Use of training aids, with the associated benefits and drawbacks:
  - human sources, such as voice, physical contact and body language
  - specialist equipment, to include collars, lead, halter, harness, clicker, bridle and bit, whistle, long line.

- Factors to consider when selecting training aids:
  o understanding correct usage
  o impact on animal welfare, e.g. stress, pain
  o risks to handler
  o efficiency of learning
  o ethical and moral issues, including use of negative reinforcement, e.g. loud noises, shock and spray collars, cattle prods
  o motivational role of positive reinforcement, e.g. food, toys, praise.

Learning aim C: Undertake an animal training programme, using the principles of learning theory to achieve simple training goals

C1 Training goals

Common training goals associated with different animals and what they involve:

- socialisation of dogs, e.g. puppy socialisation classes
- obedience training in dogs, including recall, sit, down, stay, walking at heel, distance control, scent work, retrieving
- house training, e.g. room boundaries, urination and defecation
- other common training goals in wild captive animals, e.g. to allow health examinations, giving medication, handling.

C2 Training plans

Designing training plans; planning appropriate training sessions using SMART (specific, measurable, achievable, realistic, time-bound) targets:

- length of sessions, frequency of sessions, training environment, aims and objectives, training methods, training aids, reinforcement methods.

C3 Monitoring progress

Monitoring and reviewing a training programme to retain positive interactions with animals.

- Recognising problems and applying modifications:
  o lack of focus, distractions, e.g. environment, hunger, other animals
  o ineffective training aids/methods, inexperienced trainer, e.g. inconsistent in approach
  o inappropriate training environment
  o unachievable/unrealistic goals.
- Review and evaluation:
  o aims and objectives
  o progress made by animal and trainer
  o training goals achieved
  o modifications to plan – length of sessions, frequency of sessions, training environment.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Examine the relationship between humans and animals, and the role of animals in human society		**A.D1** Evaluate the role of animals in human society, with reference to attitudes informing that role and its impact on both animals and humans.
A.P1 Explain the uses of animals in human society and the factors influencing attitudes towards animals. **A.P2** Explain the human-animal bond, with examples of benefits and drawbacks.	**A.M1** Analyse the relationship between humans and animals, in terms of the advantages and disadvantages to each.	
Learning aim B: Understand the use of training aids in an animal training programme		**BC.D2** Evaluate the effectiveness of an animal training programme to achieve a specific goal in terms of learning theories, training aids and own animal management. **BC.D3** Demonstrate appropriate and competent training methods of animal training in a programme informed by a learning theory designed to achieve specific goals.
B.P3 Explain the principles of learning theories used in an animal training programme. **B.P4** Explain the correct use of training aids and methods in an animal training programme.	**B.M2** Assess the contribution to an animal training programme of learning theories and training aids.	
Learning aim C: Undertake an animal training programme, using the principles of learning theory to achieve simple training goals		
C.P5 Demonstrate animal training methods in a programme designed to achieve specific goals. **C.P6** Demonstrate ongoing monitoring of an animal training programme to achieve specific goals.	**C.M3** Demonstrate appropriate training methods and active monitoring of an animal training programme designed to achieve specific goals.	

Essential information for assignments

The recommended structure of assessment is shown in the unit summary, along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, C.P5, C.P6, B.M2, C.M3, BC.D2, BC.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- animals for training, for example dogs, cats, horses
- training aids, including appropriate food treats, handling equipment, toys
- examples of punitive training aids for learners to view.

Essential information for assessment decisions

Learning aim A

Learners are expected to produce an individual essay, using examples to describe the uses of animals in human society and the factors influencing attitudes towards animals. The way in which animals are used should be evaluated from both sides of the human–animal relationship. Examples should be used to describe and compare the benefits and drawbacks of the human–animal bond.

For distinction standard, learners will articulate their arguments and views concisely and professionally, to justify the conclusions that they reach in relation to the role of animals in human society. Learners will explore the factors that inform human and animal relationships, such as tradition, culture and economics. Learners will relate these factors to how animals are used in society and the impact this has on both human society and animal welfare. Learners will support their coherent views with multiple, appropriate examples.

For merit standard, learners will show that they have selected and applied relevant knowledge to reach reasoned, analytical judgements on the role of animals in human society. Learners will explore the uses and roles of animals, linking them to current and historical human attitudes towards them. Learners will reach conclusions on the benefits and drawbacks from the perspectives of both humans and animals. Learners' views will be supported by appropriate examples.

For pass standard, learners will recall knowledge and understanding to give an account of the role of animals in human society. Learners will give examples of animal roles and uses, giving reasoned views on the benefits and drawbacks to both humans and animals. Learner must show an understanding of how this use is affected by human attitudes.

Learning aims B and C

Learners are expected to design, implement and monitor a training programme for a specific animal. Learners should be supported in choosing a realistic training goal and an appropriate animal. Photographic or video evidence will need to be gathered to document the training programme undertaken, with evidence of the animal having achieved the goal.

For distinction standard, learners will train an animal effectively to meet an agreed training goal of suitable complexity, for example, training a dog that has never walked at heel on a loose lead, or training a dog to lie down at a distance. A simple lie-down response from a dog would be too simplistic; however, teaching a cat to lie down is naturally more challenging and may be considered suitably complex.

Learners will provide an analysis of the training programme in light of learning theories, demonstrating clear links to the methods and tools used and the way in which the programme was successful. The programme should be monitored throughout and adjusted accordingly as required, with the inclusion of a justification for any modifications and an analysis of any consequent success.

For merit standard, learners will design and implement a training programme of some complexity, e.g. multi-staged, or without the use of physical resources, for example using only hand signals. Learners must show that they have analysed multiple training aids and methods, clearly explaining why they have selected those chosen over alternatives. Learners should provide clear evidence of monitoring the training plan, implementing modifications where required to achieve the desired results.

For pass standard, learners will design and implement a training programme to achieve a simple, specific goal, for example, obtaining a given response, or a series of responses, to auditory stimuli. Learners will provide evidence of having monitored the plan and adapting it where appropriate to obtain the desired outcome. Learners will explain the uses of selected training tools and methods, and demonstrate that they have used them as intended.

Links to other units

- This unit links to *Unit 5: Animal Behaviour*.

Employer involvement

This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local animal businesses
- contribution of ideas to unit assignment/project materials
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Unit 21: Exotic Animal Husbandry

Level: **3**
Unit type: **Internal**
Guided learning hours: **60**

Unit in brief

Learners study the husbandry needs of exotic animals to ensure their health and welfare. Learners will also study the governing regulations that apply to exotic animals in the UK.

Unit introduction

Exotic animals are becoming increasingly popular in the UK, both as pets and in educational and commercial settings. To create the specialised environments they need, detailed knowledge of their natural environments and welfare is required, along with specialist equipment.

In this unit, you will study the legal definitions of exotic species and gain an understanding of the regulations that govern them in the UK. You will learn about the natural habitat of many exotic species now popular in the UK and, in order to maintain the animals' health and welfare, learn how these habitats can be replicated artificially in specialised accommodation. You will undertake the feeding and watering needs of exotic animals and maintain their accommodation. You will explore its suitability in terms of the health and welfare needs of the species.

This unit will help you to progress to higher education courses, for example in animal science, or to employment in establishments that keep exotic species, such as zoos or pet shops.

Learning aims

In this unit you will:

A Understand the implications of keeping exotic animals in the UK

B Understand the environmental needs of exotic animals to maintain their health and welfare

C Undertake the husbandry needs of different exotic animals in order to maintain their health and welfare.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Understand the implications of keeping exotic animals in the UK	**A1** Exotic animals in the UK **A2** Regulatory bodies, legislation and codes of practice	A case study of two exotic animals in the UK.
B Understand the environmental needs of exotic animals to maintain their health and welfare	**B1** Natural environments **B2** Artificial environments **B3** Health and welfare issues	Portfolio of the practical husbandry of two exotic animals, with a report on accommodation design and husbandry management.
C Undertake the husbandry needs of different exotic animals in order to maintain their health and welfare	**C1** Handling and restraint **C2** Management of accommodation **C3** Feeding and watering regimes	

Content

Learning aim A: Understand the implications of keeping exotic animals in the UK

A1 Exotic animals in the UK

- Complexities in defining exotic animals:
  - o legal definitions, e.g. animal welfare laws, dangerous animal laws
  - o animal sector definitions, e.g. zoos, pet industry.
- Methods of sourcing exotic animals:
  - o long-term captive, e.g. dependent on human intervention, adapted to life in captivity
  - o captive farming, e.g. collecting animals from wild populations as young or as eggs and raising in captivity
  - o captive bred, e.g. breeding history
  - o wild caught, e.g. taken from the wild as a juvenile and raised in captivity.
- Impact of introduced exotic species in the UK:
  - o benefits to UK
    - – education, e.g. veterinary training, public education of global conservation issues
    - – commercial, e.g. pet industry, textile industry, food industry
  - o drawbacks for UK
    - – negative impact on native flora and fauna, e.g. when a captive species becomes naturalised through release or escape
    - – disease or injury to human population, unfamiliar with the needs and habits of introduced species.
- Impact of exotic species being kept in UK:
  - o conservation of species
  - o removal from natural environment, e.g. imbalance of biodiversity
  - o reduction of wild population.

A2 Regulatory bodies, legislation and codes of practice

- Purposes of regulatory bodies concerned with exotic animals, e.g. Department for Environment, Food, and Rural Affairs (DEFRA).
- Consideration of codes of practice and relevant national and international laws specifically governing exotic animals, including:
  - o sourcing and trading, e.g. legal and illegal trades, endangered species
  - o licensing, e.g. zoo licensing, dangerous animal licensing
  - o Convention on International Trading in Endangered Species of Wild Fauna and Flora (CITES)
  - o transport within UK and EU, e.g. International Air Transport Association (IATA) regulations for transporting live animals
  - o consequences of contravening laws and regulations.

Learning aim B: Understand the environmental needs of exotic animals to maintain their health and welfare

B1 Natural environments

Characteristics of the natural environments native to exotic animals, including:

- aquatic (saltwater and freshwater)
- semi-aquatic
- land-based (aerial, arboreal and ground)
- ecosystem variations, including rainforest, desert, savannah, woodland.

B2 Artificial environments

- Types and characteristics of artificial accommodation, including:
  - vivarium, terrarium, aquarium, aviary, indoor and outdoor enclosures/accommodation.
- Creating artificial environments for exotic animals, to include:
  - animal adaptations to different natural environments
  - size of enclosure
  - material construction
  - temperature, e.g. thermal gradients, heat lamps, heat mats
  - humidity
  - ventilation
  - lighting, e.g. ultraviolet lamps, night and twilight replication
  - substrate, e.g. peat, bark, sphagnum moss
  - furnishings, e.g. trees, hides, plants
  - feeding methods and watering systems
  - waste disposal
  - social or solitary species
  - species compatibility
  - improving environments through enrichment, e.g. exercise, food, natural behaviour and displays
  - health and safety of humans, e.g. owners, keepers, viewing public.
- Suitability of materials used in the construction of accommodation, in relation to animal welfare and human health and safety, e.g. wood, glass, plastic and fibreglass.

B3 Health and welfare issues

Problems with keeping exotic animals in artificial environments.

- Stress and anxiety, leading to stereotypic or aggressive behaviour, arising from issues including:
  - location of accommodation, e.g. noise, smells, predator proximity
  - poor handling, over-handling
  - overcrowding, or lack of socialisation
  - prevention of natural behaviour.
- Susceptibility to disease, arising from issues including:
  - animal and accommodation hygiene
  - presence of pathogens
  - inappropriate environment
  - poor nutrition.

Learning aim C: Undertake the husbandry needs of different exotic animals in order to maintain their health and welfare

C1 Handling and restraint

- Special handling and restraint issues relating to exotic animals.
- Reasons for handling or restraint of exotic animals, including:
  - health care, including bathing, preventative treatments and sexing
  - accommodation maintenance
  - transport.
- Reasons to avoid handling or restraint:
  - possibility of animal escape
  - preservation of animal's natural instinct
  - animal safety
    - stress
    - risk of injury
    - following feeding, when digesting
    - health status, e.g. shedding, breeding cycle
    - life stage
  - human safety, including risk of injury owing to:
    - toxicity
    - aggression or temperament
    - inexperience.
- Scheduling accommodation maintenance in view of an animal's sleep/wake cycle, i.e. diurnal, crepuscular or nocturnal.
- Methods of capture and approach, including assessment of animal's behaviour, planning to minimise stress, health and safety of self and others.
- Use of specialist handling equipment, to include temporary holding boxes; snake hooks and bags; graspers; nets; blankets/towels; personal protection equipment (PPE), e.g. gauntlets and goggles.

C2 Management of accommodation

Management of exotic animal accommodation, to include the following.

- Cleaning routines, including:
  - type of cleaning routine required, e.g. full clean, spot clean
  - obtaining and using cleaning equipment
  - obtaining and using animal-safe disinfectants and products
  - sterilisation methods, e.g. chemical, heat, ultraviolet light
  - correct waste-disposal methods
  - safe working methods of practice, e.g. PPE, safety signs, hygiene.
- Maintenance of accommodation, including:
  - safety and security checks
  - repairs and replenishing of furnishings
  - replacement of items replicating natural environment
  - replenishing of substrates.
- Monitoring environment, including temperature, lighting, humidity, ventilation, water quality/filtration.
- Monitoring of the animal during maintenance and cleaning:
  - checking animal is in accommodation
  - correct method of temporarily securing the animal before and during accommodation maintenance.

C3 Feeding and watering regimes

- Awareness of dietary needs:
  - o diet type, e.g. insectivores, herbivores, omnivores
  - o specialist diets relating to health status or life stage, including young, preparation for hibernation/brumation, breeding, activity level.
- Feed for exotic animals, including:
  - o food types and storage, including frozen, dried, fresh and live, including gut loading
  - o preparation, e.g. thawing, drying, chopping
  - o nutritional and essential supplements
  - o presentation, to include replicating natural sourcing activities, such as digging, agitating food to mimic life, hidden environments for live food to encourage hunting
  - o feeding frequency
  - o watering methods, e.g. automatic, trough, spray.
- Feeding problems, e.g. competition, food refusal, possessiveness and aggression.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Understand the implications of keeping exotic animals in the UK		**A.D1** Evaluate the impact of exotic animals in the UK and the necessity of their regulation through legislation.
A.P1 Explain the benefits and drawbacks of keeping exotic animals in the UK. **A.P2** Explain the importance of aspects of legislation, relating to exotic animals.	**A.M1** Analyse the impact of keeping exotic animals, in the UK, on the UK and its legislation.	
Learning aim B: Understand the environmental needs of exotic animals to maintain their health and welfare		**BC.D2** Justify how the health and welfare of exotic species are met by the suitability of accommodation design and own husbandry practices. **BC.D3** Evaluate the management of exotic animals in the UK through accommodation design, own husbandry and legislation.
B.P3 Explain the environmental needs of exotic animals. **B.P4** Explain ways of replicating natural environments, to ensure the health and welfare of exotic animals in captivity.	**B.M2** Analyse the environmental considerations needed to maintain the health and welfare of exotic animals in captivity.	
Learning aim C: Undertake the husbandry needs of different exotic animals in order to maintain their health and welfare		
C.P5 Perform safe handling and restraint of exotic animals. **C.P6** Perform the correct feeding and accommodation management of exotic animals.	**C.M3** Demonstrate confident, safe handling, restraint and management of exotic animals that minimises animal stress.	

Essential information for assignments

The recommended structure of assessment is shown in the unit summary, along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, C.P5, C.P6, B.M2, C.M3, BC.D2, BC.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- a commercial exotic animal collection
- at least one of the following exotic animal collections: zoological, wildlife, educational
- a range of exotic animals, to include at least two of the following animal classes: mammal, bird, herptile, invertebrate.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will argue concisely and professionally to evaluate the impact on the UK of sourcing and keeping two exotic species. Learners will consider the different purposes for which exotic animals are kept in the UK and the effectiveness of UK laws in protecting public health, the UK environment and the species, both here and in their native environment. Consideration will be given to sourcing methods, both ethical and non-ethical, commercial and educational benefits, and the potential impact on native flora and fauna populations through species mismanagement.

For merit standard, learners will make reasoned, analytical judgements that demonstrate their understanding of the current legislation and regulations governing the sourcing, transporting and keeping of exotic animal species in the UK, and the impact on individuals and organisations that keep them. They must discuss the significance of legislation in protecting the species both here and in their country of origin, through the development of captive breeding programmes and ethical sourcing. Learners will consider the impact of keeping exotic species on education, the UK economy and the environment, and how this is managed through legislation and regulation.

For pass standard, learners will recall knowledge to consider the purpose and benefits of keeping exotic animals in the UK, along with any negative aspects should the species escape into the environment. Learners will identify legislative issues relating to the sourcing, transporting and keeping of exotic animals and explain how they impact on the individuals and organisations that keep them.

Learning aims B and C

For distinction standard, learners will reflect on the impact of accommodation design on the health and welfare of two exotic species, taking into account the characteristics of the animals' native environments and the effectiveness of the accommodation in replicating them. Learners will fully explain the impact of husbandry decisions relating to feeding, handling and accommodation maintenance in light of the animals' needs, including life stages, health and normal behaviours. Learners' accounts of handling and husbandry practices will be supported by detailed photographic evidence, husbandry logs or diaries, and animal management plans.

For merit standard, learners will provide evidence of the confident and competent safe handling of at least two exotic species, which minimises distress to the animals while ensuring the health and safety of both animal and handler. Husbandry tasks, including feeding and accommodation maintenance, will be conducted in an appropriate manner that is both time- and resource-efficient. Learners can work autonomously and act on their own initiative.

For pass standard, learners will provide evidence demonstrating their capacity to correctly and safely handle at least two exotic species, with due consideration given to minimising distress to the animals, and to the health and safety of the handler. Learners will provide evidence of their ability to undertake correct, regular feeding regimes that meet the animals' needs, and accommodation maintenance and management. Evidence can take the form of logs and photographic or video records, supported by tutor observations and witness testimony.

Links to other units

This unit links to:

- Unit 4: Practical Animal Husbandry
- Unit 6: Animal Health and Diseases
- Unit 23: Zoological Animal Health and Husbandry.

Employer involvement

This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local animal businesses
- contribution of ideas to unit assignment/project materials
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Unit 22: Practical Estate Planning, Construction and Maintenance

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners develop the skills and knowledge needed to maintain and repair the built and natural environment where animals are managed.

Unit introduction

Estate skills is the collective term for the skills needed to install and maintain gates, surfaces and other elements of the fabric required to manage animals on a large or commercial scale. People managing animals need to know how to provide good, safe accommodation, maintained fields and habitats, and to ensure that water and other services are suitable. This unit equips you with the skills needed to manage and carry out essential installation, maintenance and repair tasks.

In this unit, you will learn how to follow a repair, maintenance, construction or installation task from the initial assessment of the situation, to the completion and evaluation of the task. You will also develop management and supervisory skills to prepare you for leading small teams.

Completion of the unit will help you with further study in the field of animal or estate management, and will give you the skills to progress to employment in the sector in areas where large collections of animals are managed, such as farms or zoological collections.

Learning aims

In this unit you will:

A Understand the nature and scope of estate planning, construction and maintenance for animal management

B Manage effective planning of estate construction and maintenance projects to aid animal management

C Carry out practical estate construction and maintenance for animal management.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Understand the nature and scope of estate planning, construction and maintenance for animal management	**A1** The nature and scope of estate skills for animal management **A2** Regulations, guidance and risk assessment	A portfolio of evidence that plans for estate management projects in relation to animal management. The portfolio must include:
B Manage effective planning of estate construction and maintenance projects to aid animal management	**B1** Assessing needs **B2** Planning estate skills tasks **B3** Supervising estate skills tasks	• a survey of a location where animal management is the primary concern • relevant legislation and codes of practice that relate to tasks identified in the survey • a plan of scheduled tasks • supervision of scheduled tasks.
C Carry out practical estate construction and maintenance for animal management	**C1** Practical repair, maintenance, construction and installation tasks	Demonstration of having carried out specific estate skills tasks with logbooks, signed witness statements and/or observation records.

Content

Learning aim A: Understand the nature and scope of estate planning, construction and maintenance for animal management

A1 The nature and scope of estate skills for animal management

Understanding the types, composition and characteristics of elements that make up estates where animals are managed.

- Boundaries to contain animals:
  - field boundaries, including electric fencing, stock fencing and post and rail fencing
  - pens, cages or stalls.
- Surfaces, including those used by animals:
  - paths, tracks, runs, arenas and accommodation flooring
  - drainage of surfaces including field drains.
- Structures to provide for animal management:
  - field structures, e.g. field shelters, stiles and way markers, including gates and water troughs
  - internal structures, e.g. drinkers, stall furniture and feeders.
- Environments containing animals:
  - field environments, e.g. grassland, heather moorland, hedgerows
  - wildlife habitats, both natural, e.g. woodlands and rivers, and controlled, e.g. pens, enclosures and compounds
  - environments for small or exotic animals, e.g. reptile tanks and aquariums.
- Supply, distribution or storage of mains services and utilities:
  - water, gas, including bottled gas, electricity, fuel oil
  - sewerage, including mains, cesspit and septic tank.
- Materials, tools and construction methods used for estate skills tasks:
  - basic construction materials, e.g. wood, concrete, wood chip, tarmac, type 1 aggregate, fencing, galvanised sheets, polypropylene piping
  - common and specialist tools and basic test equipment, e.g. circuit tester
  - fixtures and fittings, e.g. hinges, locks, ball valves, pipe connections
  - selection, transport, maintenance and storage of tools, materials and equipment.

A2 Regulations, guidance and risk assessment

The application of regulations and

- specific, current regulations and guidance notes relevant to estate skills for animal management, including Health and Safety at Work etc Act 1974 and those relating to animal welfare
- government welfare codes of practice for specific animals, including codes of recommendations for the welfare of livestock
- use of risk assessments, their purpose and types including static, dynamic, qualitative and quantitative.

Learning aim B: Manage effective planning of estate construction and maintenance projects to aid animal management

B1 Assessing needs

- Inspecting boundaries, surfaces, structures and environments for their repair and maintenance requirements.
- Inspection and basic fault-finding of electrical circuits and devices.
- Inspection of drainage, gas, and water services.
- Reporting inspection requirements both verbally and in writing, including the use of appropriate maps, plans and diagrams.

B2 Planning estate skills tasks

- Assessing the task, including, e.g. measuring, estimating, use of maps.
- Creating and using job sheets or task specifications.
- Processes and aids to planning tasks, including budgets, schedules and flow charts.
- The use of ICT in raising and monitoring repair and maintenance tasks.
- Communications with contractors and employees to ensure efficient task completion.

B3 Supervising estate skills tasks

- Formulating and issuing written and oral instructions to direct contractors and estate management teams in repair and maintenance tasks.
- Supervising repair and maintenance tasks.
- Evaluating the progress and completion of estate skills tasks including compliance with specifications, regulations, codes of practice and risk assessments.
- Identification of improvements to both the process of task completion and the product or outcome.

Learning aim C: Carry out practical estate construction and maintenance for animal management

C1 Practical repair, maintenance, construction and installation tasks

- Repair, maintenance or construction of:
  - boundaries, to include post and rail fencing, electric fencing and strained fencing, e.g. stock or chain link fencing
  - surfaces, to include aggregate or concrete, wood chip, wood, sand or artificial products, e.g. rubber or fibre for equestrian surfaces
  - structures, e.g. animal shelters or accommodation, gates, stalls or pens, troughs, feeders, stiles
  - a basic drainage system, e.g. unblocking drains or field drains, clearing an open ditch.
- Practical management of habitats or environments for domesticated animals, wild animals or animals held in captivity in accordance with their needs.
- Isolation of mains services in the event of leaks or for maintenance and repair tasks.
- Basic repair of electrical appliances or circuits, e.g. changing a plug or fuse, resetting a circuit.
- Use of basic equipment to locate underground or hidden services.
- Installation of temporary electrical supply for both indoor and outdoor power requirements, including the use of small generators.
- Repair, maintenance or installation of systems to supply water, e.g. to a water trough or to allow a tap and hose to be connected to an existing system.
- Waste disposal in accordance with regulations.
- Assessing the outcomes of maintenance and installation work carried out.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Understand the nature and scope of estate planning, construction and maintenance for animal management		
A.P1 Explain the need for efficient estate skills in relation to the management of a specific location. **A.P2** Explain regulations, codes of practice and risk assessments to specific estate skills animal management tasks.	**A.M1** Assess the need for efficient estate skills in relation to the management of a specific location, with reference to regulations, codes of practice and risk assessments.	**AB.D1** Justify the planned estate skills tasks in managing a specific situation relating to animal management. **AB.D2** Evaluate the effectiveness of own estate management skills in managing estate construction and maintenance tasks performed by others.
Learning aim B: Manage effective planning of estate construction and maintenance projects to aid animal management		
B.P3 Plan scheduled estate skills tasks for animal management. **B.P4** Perform the management of estate skills tasks through overseeing the work of others.	**B.M2** Demonstrate efficient planning, management and supervision of specific maintenance, construction and installation tasks to successfully manage animals in the given location.	
Learning aim C: Carry out practical estate construction and maintenance for animal management		
C.P5 Carry out maintenance or construction, and installation tasks relevant to animal management. **C.P6** Review how successfully estate management skills met the aims of the plan.	**C.M3** Demonstrate the repair, maintenance, construction and installation of estate skills tasks to an agreed specification and timescale, adapting skills for different situations. **C.M4** Assess the impact of own estate management skills on animal management.	**C.D3** Evaluate the importance of planning and carrying out estate skills tasks in managing animals in a specific location.

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aims: A and B (A.P1, A.P2, B.P3, B.P4, A.M1, B.M2, AB.D1, AB.D2)

Learning aim: C (C.P5, C.P6, C.M3, C.M4, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- a range of common and specialist hand tools, including power tools and testing equipment
- suitable personal protective equipment (PPE)
- a wide range of suitable estate skills tasks, including the provision of mains and temporary services.

Essential information for assessment decisions

Learning aims A and B

For distinction standard, learners will apply knowledge and understanding to an extensive range of situations that require estate skills in the chosen location, and demonstrate the capacity to analyse complex tasks. They will apply relevant legislation to the tasks and be able to use detailed research and analysis to locate resources, particularly from online official sources, that can be used to ensure compliance. Learners will plan complex tasks, in terms of skills required, budgets, organisation and scheduling, justifying the recommended estate skills and showing how they will successfully manage animals in the location. It is essential that learners focus on tasks directly relevant to animal management. They will demonstrate good management and supervisory skills and evaluate their own management performance.

For merit standard, learners will demonstrate familiarity with a broad range of tasks requiring estate skills, selecting the most appropriate to successfully solve issues identified through their survey of an environment. They will select and apply knowledge of relevant legislation and understand the need for a regulatory framework. Learners will show how they have identified solutions through practical exploration. Learners will give evidence that they can oversee the work of others in complex tasks. It is essential that learners focus on tasks directly relevant to animal management.

For pass standard, learners will recall knowledge to explain tasks that are based on estate skills. Learners will show that they understand that the tasks identified in their survey should be carried out with due regard to current relevant legislation, and they must be able to accurately assess the risks a task presents. Learners will plan for short-, medium- and long-term estate skills maintenance, and give evidence that they can instruct and oversee others, including contractors, specialists and other workers in straightforward tasks. It is essential that learners focus on tasks directly relevant to animal management.

Learning aim C

For distinction standard, learners will demonstrate proficient use of estate skills in carrying out tasks. They will demonstrate a professional approach to developing these skills and be aware of their limitations and those of others, particularly where more hazardous tasks are involved, for example involving electrical or gas installations. They will make valid judgements about the risks and limitations of the techniques and skills used, in relation to the desired outcomes and their own skills development. They will justify decisions made in relation to outcomes, showing how they used knowledge from across the learning aims to reach solutions relating to the tasks.

Learners will recognise when tasks have been completed to a professional standard and what improvements are needed to meet this standard.

For merit standard, learners will select and apply appropriate estate skills in complex situations. Learners will carry out basic repairs within their level of competence and demonstrate the capacity to transfer their skills from familiar to less familiar situations. They will demonstrate good problem-solving skills, a level of autonomy, and complete tasks to specification and within the timescale. Learners will be able to relate the quality and outcome of their work to the successful management of animals.

For pass standard, learners will select and apply appropriate estate skills. They will progress from being closely supervised to being unsupervised for practical assessments. Learners will work appropriately and achieve planned outcomes, working safely and taking responsibility for themselves, others and the environment, and will maintain high standards of animal welfare. Learners will apply their skills to familiar or well-defined tasks, such as different types of fencing, surfaces, structures and habitats, simple plumbing, drainage, electrics and gas fault-finding and isolation, or the installation of temporary or portable mains services, in particular water and electricity supplies. They will select, transport, maintain and store tools, materials and equipment safely and correctly. Learners will show awareness of the link between the quality of their work and the management of animals.

Links to other units

This unit links to *Unit 7: Work Experience in the Animal Sector*.

Employer involvement

This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local animal businesses
- contribution of ideas to unit assignment/project materials
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Unit 23: Zoological Animal Health and Husbandry

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners study the specialist husbandry skills needed to work with zoo collections, including accommodation, safe handling methods, and maintenance of animal health and welfare.

Unit introduction

Zoos in the UK and around the world play a very important role in the conservation and breeding of diverse and often endangered species. They also play a role in the travel and leisure industries, providing informative experiences that educate people about the great diversity of life on earth, and enabling them to experience, at close quarters, species they might otherwise never encounter.

This unit will give you the knowledge you need to be able to house, handle and restrain zoological animals safely. You will examine the physical, mental and nutritional needs of animals kept in zoological establishments in order to ensure the ongoing success of zoos' work in education, conservation and the breeding of wild animals in captivity.

Following on from this unit, you may be able to progress to employment as a keeper in a zoo or other animal collection environment. Also, you could choose to undertake further study in higher education, for example courses in zoological animal management, wildlife conservation and animal behaviour research.

Learning aims

In this unit you will:

A Understand legislative requirements to meet animal welfare and human safety needs in zoological collections

B Examine the approaches used to maintain the health and welfare of animals in zoological collections

C Investigate the techniques required for the safe and competent handling and restraint of animals in zoological collections.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Understand legislative requirements to meet animal welfare and human safety needs in zoological collections	**A1** Legislative requirements **A2** Requirements for record keeping, monitoring and reporting	Case study reports on animal management in different zoological collections.
B Examine the approaches used to maintain the health and welfare of animals in zoological collections	**B1** Accommodation requirements for zoo animals **B2** Managing the welfare of zoo animals **B3** Managing the physical health of zoo animals **B4** Diseases in zoo animals	
C Investigate the techniques required for the safe and competent handling and restraint of animals in zoological collections	**C1** Planning for the safe handling and restraint of zoo animals **C2** Handling and restraint methods	A report on safe handling and restraint procedures for different animals.

Content

Learning aim A: Understand legislative requirements to meet animal welfare and human safety needs in zoological collections

A1 Legislative requirements

- UK licensing requirements for establishing and maintaining a zoological collection:
  - current relevant legislative requirements, including applying for and renewing a zoo licence, meeting the requirements of a zoo licence, meeting the requirements of legislation for dangerous and rare wild animals, inspections
  - legislation relating to the acquisition of wild animals for zoos.
- Legislative requirements relating to the transfer of animals between zoos, both in the UK and internationally.
- Legislative requirements governing the welfare of animals in zoological collections, including the provision of basic welfare needs:
  - suitable environment
  - suitable diet
  - capacity to exhibit normal behaviour patterns
  - housing with, or apart from, other animals (as appropriate to the species)
  - freedom from pain, suffering, injury and disease.
- Safety of humans working in a zoological collection: current legislative requirements for employers and employees, roles and responsibilities in the work place, awareness of zoonoses, risks and hazards associated with working with zoological specimens.

A2 Requirements for record keeping, monitoring and reporting

Records required and the format in which they can be kept:

- legislative requirements for record keeping
- zoological information management systems and the purposes for which they are kept, e.g. online systems of record keeping (e.g. ZIMS) and records (e.g. stud books, livestock and animal counts, sources of animals, nutrition, health, control measures, and records of conservation and euthanasia).

Learning aim B: Examine the approaches used to maintain the health and welfare of animals in zoological collections

B1 Accommodation requirements for zoo animals

Design of accommodation for zoological collections in order to meet animal welfare needs, legislative requirements and human safety needs.

- Planning accommodation, including location, proximity to other animals, space allowance (e.g. future planning and developments, provision for offspring, access to and from accommodation), display areas and exposure to public, proximity to utilities (e.g. water, electricity), materials and costs.
- Structures and types, including indoor and outdoor spaces, fixtures and fittings, safety and security, secondary barriers, viewing areas.
- Properties of accommodation and building materials, including materials (e.g. substrates and properties, protection from weather and environment, provision of heat and light), boundaries (e.g. fences, moats).
- Growth in housing zoo animals in natural environments, e.g. mini-habitats, parks and the role of safari parks as accommodation for zoo animals, aviaries that allow birds to fly.
- Risks and issues, including health and safety concerns for animals, keepers and the public.

B2 Managing the welfare of zoo animals

- Enrichment opportunities for zoo animals, including socialisation (e.g. family and social groups), environmental factors (e.g. provision of enough space to fly, space for freedom to roam).
- Predator/prey relationships and proximities.
- Signs of abnormal behaviour, e.g. behaving abnormally in a herd, withdrawal in solitary species, how an animal stands, position of head and tail, loss of appetite.
- Actions to take if signs of abnormal behaviour are observed, including monitoring, recording, remedial action.

B3 Managing the physical health of zoo animals

- Awareness of the role diet and disease management plays in the health of zoo animals.
- Signs of good and ill health in zoo animals.
- Parasite management, including identification, prevention and control.
- Nutrition and feeding of zoo animals, including provision of a balanced diet, supplementation where appropriate, feeding close to natural diet, access to food and water, feeding behaviour, preparation of food, hygiene and cross-contamination, presentation of food, equipment needed, use of food as enrichment.
- Record keeping, including feeding plans and feeding records, and the importance of record keeping for the animal.

B4 Diseases in zoo animals

Signs, symptoms, prevention and treatment of sick animals kept in zoological establishments. What to look for and reporting protocols.

- Common types of disease in zoo animals, including:
  - bacterial, including salmonella, tetanus bacterial spores
  - anthrax bacterial spores
  - viral, including distemper, influenza
  - fungal, including ringworm
  - clinical signs of disease, prevention and treatment
  - zoonotic diseases, e.g. rabies, salmonella, including clinical signs, prevention and treatment
  - notifiable diseases in zoo animals, e.g. anthrax, foot and mouth disease, including clinical signs, prevention and treatment, recording and reporting.
- Disease management in zoo animals, including isolation and quarantine procedures, health care records.

Learning aim C: Investigate the techniques required for the safe and competent handling and restraint of animals in zoological collections

C1 Planning for the safe handling and restraint of zoo animals

- Reasons for restraint, including medical, movement, isolation, pregnancy and birth complications, sexing, health checking and monitoring.
- The importance of using trained personnel competent in restraint techniques, the use of handling equipment and the use of emergency equipment, e.g. firearms.
- The importance of using the appropriate techniques for both species and situation, e.g. to avoid stress and/or injury.
- Selection of the appropriate handling and restraint techniques for different purposes, e.g. channels, races, confinement runs, crooks, mist nets, bags and crates.
- Methods of approaching a zoo animal, to include health and safety and risk assessments prior to approach, initial assessment of the animal's behaviour, approach according to animal type/species and situation.

- Reasons not to handle/restrain, e.g. animal health or behavioural issues, animal showing signs of stress.
- Emergency situations, including personnel needed, responsibility of firearms-trained person, ensuring a firearms-trained person is on site at all times.
- Recording restraint activities, including use of records to record restraint activities, importance of restraint records, maintenance and recording of restraint equipment and chemicals and their uses.

C2 Handling and restraint methods

The variety of equipment and methods that can be used for the safe restraint and handling of animals kept in zoological establishments.

- Physical restraint, including crush cages, crates, catch poles, traps, hooks, trap containers, gates and hurdles, vehicles, according to the type/species/health status of the animal.
- Chemical restraint, including sedation or anaesthesia according to the type/species/health status of the animal, types of chemicals used and their effects, relevant health and safety legislation, monitoring animals during restraint, stress and behavioural changes to animals.
- Training animals to present a limb, e.g. to check hooves/feet or to take a blood sample.

Assessment criteria

Pass		Merit	Distinction
Learning aim A: Understand legislative requirements to meet animal welfare and human safety needs in zoological collections			
A.P1 Explain how the animal management approaches of zoological collections meet legislative requirements. **A.P2** Explain the importance of record keeping in zoological collections.		**A.M1** Assess how meeting legislative requirements impacts on the animal management approaches of different zoological collections.	**AB.D1** Evaluate how different zoological collections manage legislative requirements and welfare needs for different animals through accommodation design and animal husbandry.
Learning aim B: Examine the approaches used to maintain the health and welfare of animals in zoological collections			
B.P3 Explain how the design of accommodation in different zoological collections affects the health and welfare of different animals. **B.P4** Explain how the husbandry approaches of different zoological collections affect the health and welfare of different animals.		**B.M2** Assess the impact of both accommodation design and husbandry approaches on the health and welfare of different animals in different zoological collections.	
Learning aim C: Investigate the techniques required for the safe and competent handling and restraint of animals in zoological collections			**C.D2** Justify the handling and restraint procedures for different animals in different situations. **C.D3** Evaluate the impact that properly meeting housing, health, welfare, handling and restraining requirements, as required by law, has on the welfare of zoo animals.
C.P5 Explain the importance of planning for the safe handling and restraint of zoo animals. **C.P6** Explain the methods and procedures for the safe handling and restraint of different animals in different situations.		**C.M3** Analyse the reasons for selecting different handling and restraint procedures for different animals in different situations.	

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aims: A and B (A.P1, A.P2, B.P3, B.P4, A.M1, B.M2, AB.D1)

Learning aim: C (C.P5, C.P6, C.M3, C.D2, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- a variety of zoos, wildlife parks or collections containing zoo animals
- appropriate examples of restraint and handling equipment and relevant legislation as required by the learning aims and unit content
- information on the husbandry approaches of zoos, wildlife parks or collections
- animals from at least three of the following groups – mammal, avian, herptile, invertebrates and fish.

The animals learners choose to focus on should be different from those they have chosen to study for other units.

Essential information for assessment decisions

Learning aims A and B

This assignment must be based on the accommodation of animals in two different establishments. A minimum of three different types of enclosure must be described (for example mammal, bird, and reptile).

For distinction standard, learners will argue concisely and professionally in order to evaluate why it is important to provide animals with appropriate accommodation, giving reasons for providing accommodation to a high standard. Learners will include examples of how to improve the welfare of animals kept in at least two different zoological collections, and show understanding and consideration for animal welfare. Learners will make clear links to a range of licensing requirements and the importance of record keeping. The report will contain clear details on all aspects of the planning and design of zoo animal accommodation, with relevant examples to show how and why the maintenance of good health and the provision of good nutrition is important to the health and welfare of zoo animals. Case studies will focus on the benefits of monitoring and maintaining excellent health and welfare in zoo animals, including enriching the lives of these captive animals.

For merit standard, learners will select and apply knowledge in some detail in order to focus on how legislative requirements can affect the design and management of zoological collections. Learners will carefully consider the requirements for record keeping and the different systems that are available. The animal enclosure design will be broadly justifiable in terms of the animal's health and welfare. Learners should focus on how enrichment, through the provision of good nutrition and the maintenance of good health, will enhance the health and welfare of zoo animals.

For pass standard, learners will recall and relate knowledge in order to explain the accommodation requirements of animals in two different establishments, referencing relevant legislation and the importance of record keeping. Learners will include a design for an animal enclosure with some correct assumptions. Learners will look at the nutritional and welfare needs of three animals from different animal groups (some of which must be different from those studied in other units). Learners will focus on animal health, identify good and ill health in zoo animals and demonstrate how this is linked to the provision of good nutrition.

Learning aim C

This assignment must be based on a minimum of three different types of animal (for example mammal, bird and reptile).

For distinction standard, learners will show a depth of understanding, giving relevant examples of how to safely approach and restrain zoo animals, and how this can be effective in supporting high standards of health and welfare. Learners will provide detailed examples of how monitoring and record keeping can help to plan for the safe restraint and handling of zoo animals in other situations, reaching reasoned and valid judgements.

For merit standard, learners will make reasoned, analytical judgements, comparing the effectiveness of different techniques for the handling and restraint of three different types of zoo animal. Detailed examples of different methods and techniques will be provided.

For pass standard, learners will recall knowledge in order to explain the importance of planning for how zoo animals could be safely approached and restrained, and the equipment and techniques that can be used. Learners will provide information on when zoo animals should not be handled and the reasons why. Learners will include reference to the need for record keeping when approaching and restraining zoo animals. Learners will show some consideration of the impact that handling captive animals can have on enriching their lives.

Links to other units

This unit links to:

- Unit 3: Animal Welfare and Ethics
- Unit 4: Practical Animal Husbandry
- Unit 6: Animal Health and Diseases
- Unit 21: Exotic Animal Health and Husbandry.

Employer involvement

This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local animal businesses
- contribution of ideas to unit assignment/project materials
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Unit 24: Wildlife Ecology and Conservation Management

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners study the methods and skills needed to investigate habitats, and to carry out wildlife habitat improvements and wildlife rehabilitation.

Unit introduction

Wildlife responds to changes in its habitat. Good animal management will be able to assess those changes, plan habitat improvements and carry them out for the benefit of the wildlife. Sometimes it may be necessary to rehabilitate wildlife. This unit will give you the practical skills you need to carry out a range of wildlife habitat and rehabilitation tasks.

You will learn how to survey and assess habitats in relation to wildlife needs, develop and follow a plan for improvements, and monitor the outcomes. You will also learn to assess wildlife for rehabilitation – for example following loss of habitat through development – and create and follow a plan to reintroduce the wildlife to a suitable habitat.

Whether you move into employment or to further study, the skills you develop in this unit will be invaluable. The study of wildlife and habitat is essential for good animal management. It is an integral part of a wide variety of careers, including conservation and environmental monitoring and planning.

Learning aims

In this unit you will:

A Understand the characteristics of ecosystems for wildlife habitat planning and rehabilitation

B Carry out field studies into wildlife populations and their habitats for the purpose of planning for wildlife management

C Undertake practical wildlife and conservation management to affect biodiversity.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Understand the characteristics of ecosystems for wildlife habitat planning and rehabilitation	**A1** Distribution of ecosystems **A2** Relationships in ecosystems **A3** Human interactions with ecosystems	A portfolio of evidence, such as maps, diagrams, flow charts and reports from investigative fieldwork.
B Carry out field studies into wildlife populations and their habitats for the purpose of planning for wildlife management	**B1** Habitat surveys for wildlife management **B2** Monitoring wildlife populations **B3** Planning for wildlife habitat management and rehabilitation	A survey report, using survey, monitoring and other research information to develop animal- and habitat-specific plans to manage a wildlife population, including maps, task lists, cost–benefit analysis and schedules. Evidence that demonstrates management tasks for habitat change and rehabilitation, which could be a photo log, signed witness statements and/or observation record(s).
C Undertake practical wildlife and conservation management to affect biodiversity	**C1** Interpretation of habitat management and wildlife rehabilitation plans **C2** Carrying out practical habitat management and wildlife rehabilitation **C3** Monitoring the outcomes of practical habitat management and wildlife rehabilitation	

Content

Learning aim A: Understand the characteristics of ecosystems for wildlife habitat planning and rehabilitation

A1 Distribution of ecosystems

- Geographical distribution of ecosystems:
  - o scale of ecosystems, including biome, habitat, microhabitats and ecological niches
  - o standard methods of mapping and classification, e.g. Phase 1 survey methodology and nomenclature.
- Factors affecting the distribution of ecosystems:
  - o abiotic factors that influence the distribution of ecosystems at a range of scales, including global (e.g. atmospheric energy flows and climate zones), regional (e.g. distance from the sea and altitude), local (e.g. aspect and soil type) and micro (e.g. shade and slope)
  - o biotic factors, including the modifying influence of plant, animal and human activity.
- Characteristics of major land biomes and habitats:
  - o world biomes, to include the five major types: aquatic, desert, forest, grassland and tundra
  - o UK habitats, to include coastal, lowland grassland and heathland, freshwater and lowland wetlands, upland, woodland
  - o characteristics, to include altitude, latitude, distance from the sea, rainfall, wind speed and direction, temperature, aspect, soil type, fauna and flora.

A2 Relationships in ecosystems

- Energy flows in ecosystems:
  - o the flow of energy through an ecosystem, including energy loss, for example, through respiration and excretion
  - o trophic levels, food chains and pyramids
  - o natural cycles, including carbon, nitrogen, oxygen, phosphorus and water.
- Wildlife in ecosystems:
  - o relationships between animals and other species (including plants) to include predator/prey, symbiosis and parasitism
  - o interactions in ecosystems to provide for animal needs, e.g. food, shelter, protection, migration, reproduction and competition.

A3 Human interactions with ecosystems

- Human impacts on ecosystems:
  - o impact of human activities, including positive, negative, historical, present and future, e.g. Neolithic woodland clearance, creation of the Forestry Commission, the Common Agricultural Policy
  - o main threats to ecosystems at global, national and local scales, e.g. climate change, depletion of fish stocks and Ash dieback.
- Protection and conservation strategies:
  - o the use of planning and other environmental legislation
  - o funding for habitat stewardship
  - o the role of charitable and volunteer organisations
  - o rehabilitation of wildlife and its impact on biodiversity, including licensing of rehabilitation
  - o the range of conservation strategies, e.g. catch and release, captive breeding, maintaining genetic diversity, habitat management.

Learning aim B: Carry out field studies into wildlife populations and their habitats for the purpose of planning for wildlife management

B1   Habitat surveys for wildlife management

Methods and considerations required to carry out habitat surveys:

- planning a survey, choice of survey area, equipment
- sampling techniques, e.g. random, systematic, stratified
- health and safety considerations, e.g. lone working, working near water and use of personal protection equipment, e.g. in dense undergrowth
- survey techniques, e.g. quadrat, transect, kick methodologies
- recording of results, e.g. tally charts and mapping, including field use of ICT.

B2   Monitoring wildlife populations

Methods and considerations required to carry out the monitoring of wildlife populations:

- planning animal monitoring or population surveys, e.g. equipment, scheduling, methodology
- direct methods, including catch and release, estimation techniques, e.g. of bird populations
- legislation, including health and safety, licensing of live capture programmes
- indirect, non-invasive methods, including tracks and signs, use of tracking tunnels, moving transects, e.g. butterfly walks
- recording and reporting of data.

B3   Planning for wildlife habitat management and rehabilitation

Developing a rehabilitation or habitat plan for targeted wildlife species:

- using survey data to develop a species and habitat plan with measurable outcomes
- task allocation and schedules, taking into account, e.g. seasonality of operations
- tools, materials and equipment used for practical tasks, including suitable general tools (e.g. billhooks, bowsaws), and species-specific tools (e.g. nesting boxes)
- health and safety considerations, including compliance with relevant legislation
- use of monitoring programmes to evaluate outcomes, e.g. species counts, marking, clay pads
- assessing the viability of rehabilitating specific wildlife in terms of survival and recovery
- developing a species-specific rehabilitation plan to include standard release factors that influence a successful outcome
- the development of monitoring strategies that will enable the success of rehabilitation to be evaluated.

Learning aim C: Undertake practical wildlife and conservation management to affect biodiversity

C1 Interpretation of habitat management and wildlife rehabilitation plans

Implementing habitat and rehabilitation plans:

- translating plans into tasks
- scheduling taking account of seasonality
- job specifications
- identification of tools, materials and equipment
- ordering materials
- risk assessments
- identification of relevant legislation, codes of practice and licensing
- identifying skill sets, e.g. suitably qualified chainsaw operators.

C2 Carrying out practical habitat management and wildlife rehabilitation

Safe completion of planned tasks required to manage project, including:

- task allocation
- time management
- correct selection, transport, use, maintenance and storage of tools, materials and equipment
- working safely, assessing risks
- compliance with relevant legislation, codes of practice and planning guidelines
- minimising environmental damage and disturbance.

C3 Monitoring the outcomes of practical habitat management and wildlife rehabilitation

Determining the impact of practical habitat management and rehabilitation:

- reporting the outcomes of practical habitat management and rehabilitation
- measuring actual outcomes against predicted outcomes, e.g. increase or decrease in target species or survivability
- use of monitoring programmes to track outcomes, e.g. use of dormouse boxes to track population change
- analysis of strengths and weaknesses
- opportunities for improvement, e.g. extending the area of habitat improvement.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Understand the characteristics of ecosystems for wildlife habitat planning and rehabilitation		**A.D1** Evaluate human impacts on wildlife ecosystems and the range of responses to mitigate or enhance those impacts.
A.P1 Explain the distribution of ecosystems. **A.P2** Explain different relationships within ecosystems.	**A.M1** Analyse the relationships between named UK animal species and their interactions with their habitats.	
Learning aim B: Carry out field studies into wildlife populations and their habitats for the purpose of planning for wildlife management		**BC.D2** Justify a specific habitat or rehabilitation plan using survey and monitoring data. **BC.D3** Evaluate the impact of the rehabilitation plan and tasks carried out on biodiversity and the wildlife habitat.
B.P3 Perform wildlife habitat surveys and monitor wildlife populations. **B.P4** Prepare a clear located habitat management or rehabilitation plan for a named UK animal, using the findings of habitat and animal population surveys.	**B.M2** Analyse survey and monitoring data to produce, for a named UK animal species, a located habitat management or rehabilitation plan.	
Learning aim C: Undertake practical wildlife and conservation management to affect biodiversity		
C.P5 Demonstrate the proficient completion of habitat management tasks in accordance with an agreed plan. **C.P6** Demonstrate, under supervision, wildlife rehabilitation in accordance with an agreed plan.	**C.M3** Demonstrate appropriate techniques for habitat management and wildlife rehabilitation, adapting techniques for changing circumstances.	

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, C.P5, C.P6, B.M2, C.M3, BC.D2, BC.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- a range of habitats suitable for detailed survey work
- wildlife animal species suitable for population studies
- a licensed animal rehabilitation programme.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will show a depth of understanding by evaluating how human impacts on ecosystems can be both positive and negative. They will apply knowledge to less familiar situations and include impacts at a variety of scales and from different historical periods. Their evaluation will be based on properly referenced case studies and will include original fieldwork. Learners will be able to demonstrate the complexity of human impacts and include both intentional and unintentional outcomes. They will show through their analysis, that cost–benefit factors can influence outcomes.

Learners will show that they understand that planned outcomes are often difficult to predict and that the scientific basis for decision making can be ambivalent, for example when examining badger culls.

Learners will justify their conclusions by linking impacts to the change or breakdown of specific relationships through human intervention, rather than by explaining them in general terms.

For merit standard, learners will demonstrate their understanding of specific named habitats and species. Learners will show clearly the relationships between different species, including both the nature of the relationship and the energy flow demonstrated. They will make reasoned analytical judgements, showing that they understand how the habitat provides for the needs of the animal, and applying their knowledge to less familiar situations. For example, honeysuckle is the preferred nesting material for the dormouse and it also provides nectar.

For pass standard, learners will recall knowledge to explain basic world biomes and UK habitats. They will include the ways in which biotic and abiotic factors control the distribution of habitats, and demonstrate awareness that these factors can operate on the very smallest scales. Learners will include specific examples, referring to well-defined situations in order to demonstrate understanding. They will relate natural cycles to specific plant and animal species and to named habitat examples.

Learners will demonstrate their understanding of the different relationships in ecosystems – including energy flows, wildlife and the impact of humans – exploring well-defined situations and structuring their knowledge in order to reach suitable conclusions.

Learning aims B and C

For distinction standard, learners will be able to articulate arguments concisely and professionally in order to justify their habitat management or wildlife rehabilitation plan. They will be able to relate their plan to measurable outcomes and should describe a monitoring plan to use detailed analysis and research in order to justify recommendations made in the plan. Their rationale should be based on relevant primary data, supported with additional, referenced research.

Learners will confidently show that their plan will address specific relationships between the target species and its environment. For example, planting hazel coppice will provide mid-layer transport pathways, overhead cover from predators and a valuable food source for the dormouse.

Learners will draw on knowledge from across the learning aims to reflect on the success of their plan and the tasks they have undertaken. They will use detailed analysis to make objective judgements on both the process and product of the tasks. Learners will predict the impact their tasks will have on the wildlife environment and, specifically, the relationships between the target species and its environment. They will also show awareness of the difficulty of making definitive predictions.

Learners will demonstrate awareness that the tasks they have undertaken may have negative impacts on the target species and other relationships in the environment; for example, rehabilitation of a predator species may alter the equilibrium of the environment. Improvements identified should include better ways of working, as well as improved outcomes.

For merit standard, learners will make reasoned analytical judgements on the outcomes of their surveys and produce a located plan for habitat improvements or rehabilitation based on their analysis. The plan should detail the tasks required, as well as identifying appropriate solutions and explaining how these tasks will impact on one or more named target animal species.

Learners will select appropriate solutions in order to react to changing circumstances during the completion of tasks, identifying these solutions from practical exploration. Where tasks need to be modified, learners will be able to modify techniques to ensure that the agreed outcomes will still be realised.

For pass standard, learners will select and competently demonstrate a range of appropriate survey techniques targeting specific animal species and their habitats. They will carry out survey techniques correctly and safely. The surveys must be species specific, for example surveying the amount of honeysuckle used as bedding by the dormouse. Learners should be similarly competent in investigating wildlife populations, although it is unlikely that this will be carried out through licensed catch and release methods unless undertaken as part of an authorised programme. More appropriate will be the use of direct observation, for example population counts, good identification of tracks and signs, tracking tunnels and other less invasive methods. Recording of data will be comprehensive and accurate, and findings will be presented in an appropriate format including, for example, graphs, tables and maps.

Learners will select and demonstrate competent practical skills for both habitat improvement and wildlife rehabilitation. They will show that they can work safely and efficiently, and with due regard for other people, animal welfare and the environment. The correct and safe selection, transport and use of tools, materials and equipment is essential.

For rehabilitation, learners will act under supervision to ensure good animal welfare. For all of the practical tasks, learners will be expected to show that they can minimise environmental impacts.

Links to other units

This unit links to *Unit 7: Work Experience in the Animal Sector*.

Employer involvement

This unit would benefit from employer involvement in the form of:
- guest speakers
- technical workshops involving staff from local animal businesses
- contribution of ideas to unit assignment/project materials
- opportunities for observation during work experience
- support from local animal business staff as mentors.

4 Planning your programme

How do I choose the right BTEC National qualification for my learners?

BTEC Nationals come in a range of sizes, each with a specific purpose. You will need to assess learners very carefully to ensure that they start on the right size of qualification to fit into their 16–19 study programme, and that they take the right pathways or optional units that allow them to progress to the next stage.

Some learners may want to take a number of complementary qualifications or keep their progression options open. These learners may be suited to taking a BTEC National Certificate or Extended Certificate. Learners who then decide to continue with a fuller vocational programme can transfer to a BTEC National Diploma or Extended Diploma, for example for their second year.

Some learners are sure of the sector they want to work in and are aiming for progression into that sector via higher education. These learners should be directed to the two-year BTEC National Extended Diploma as the most suitable qualification.

As a centre, you may want to teach learners who are taking different qualifications together. You may also wish to transfer learners between programmes to meet changes in their progression needs. You should check the qualification structures and unit combinations carefully as there is no exact match among the different sizes. You may find that learners need to complete more than the minimum number of units when transferring.

When learners are recruited, you need to give them accurate information on the title and focus of the qualification for which they are studying.

Is there a learner entry requirement?

As a centre it is your responsibility to ensure that learners who are recruited have a reasonable expectation of success on the programme. There are no formal entry requirements but we expect learners to have qualifications at or equivalent to Level 2.

Learners are most likely to succeed if they have:

- five GCSEs at good grades and/or
- BTEC qualification(s) at Level 2
- achievement in English and mathematics through GCSE or Functional Skills.

Learners may demonstrate ability to succeed in various ways. For example, learners may have relevant work experience or specific aptitude shown through diagnostic tests or non-educational experience.

What is involved in becoming an approved centre?

All centres must be approved before they can offer these qualifications – so that they are ready to assess learners and so that we can provide the support that is needed. Further information is given in *Section 8*.

What level of sector knowledge is needed to teach these qualifications?

We do not set any requirements for teachers but expect that centres will assess the overall skills and knowledge of the teaching team to ensure that they are relevant and up to date. This will give learners a rich programme to prepare them for employment in the sector. As part of the requirements of the programme are to involve employers in delivery this should support centres in ensuring that they are following up to date practices when delivering the programme.

What resources are required to deliver these qualifications?

As part of your centre approval you will need to show that the necessary material resources and work spaces are available to deliver BTEC Nationals. For some units, specific resources are required. This is indicated in the units.

How can myBTEC help with planning for these qualifications?

myBTEC is an online toolkit that supports the delivery, assessment and quality assurance of BTECs in centres. It supports teachers with activities, such as choosing a valid combination of units, creating assignment briefs and creating assessment plans. For further information see *Section 10*.

Which modes of delivery can be used for these qualifications?

You are free to deliver BTEC Nationals using any form of delivery that meets the needs of your learners. We recommend making use of a wide variety of modes, including direct instruction in classrooms or work environments, investigative and practical work, group and peer work, private study and e-learning.

What are the requirements for meaningful employer involvement?

Requirements

This BTEC National Extended Diploma in Animal Management has been designed as a Tech Level qualification. As an approved centre you are required to ensure that during their study, every learner has access to meaningful activity involving employers. Involvement should be with employers from the animal management sector and should form a significant part of the delivery or assessment of the qualification. Each centre's approach to employer involvement will be monitored in two ways. It will be monitored at centre level in the first term each year as part of the annual quality management review process that addresses centre strategy for delivery, assessment and quality assurance, when we will ask you to show evidence of how employer involvement is provided for all learners. You will need to show evidence in order to gain reporting clearance for certification. It will be monitored also at programme level as part of the standards verification process to confirm that plans for employer involvement meet the requirements of the specification. These approaches are designed to ensure additional activities can be scheduled where necessary so learners are not disadvantaged (see *Section 8 Quality assurance*).

We know that the vast majority of programmes already have established links with employers. In order to give you maximum flexibility in creating and strengthening employer involvement, we have not specified a particular level of input from employers. However, meaningful employer involvement, as defined below, should contribute significantly to to **three** units of which one must be the mandatory unit: *Unit 7: Work Experience in the Animal Sector*.

There are suggestions in many of the units about how employers could become involved in delivery and/or assessment. These suggestions are not exhaustive and there will be other possibilities at local level.

Employer involvement in these units is subject to verification as part of the standards verification process (see *Section 8*).

Definition

Activities that are eligible to be counted as meaningful engagement are:

- structured work experience or work placements that develop skills and knowledge relevant to the qualification
- projects or assessments set with input from industry practitioners
- masterclasses or guest lectures from industry practitioners
- 'expert witness' reports from practitioners that contribute to the assessment of a learner's work.

There may be other ways in which learners can benefit from contact with employers or prepare for employment, such as listening to careers talks or working in simulated environments. While they provide benefits to learners they do not count as meaningful engagement.

Support

It is important that you give learners opportunities that are high quality and directly relevant to their study. We will support you in this through guidance materials and by giving you examples of best practice.

What support is available?

We provide a wealth of support materials, including curriculum plans, delivery guides, authorised assignment briefs, additional papers for external assessments and examples of marked learner work.

You will be allocated a Standards Verifier early on in the planning stage to support you with planning your assessments. There will be extensive training programmes as well as support from our Subject Advisor team.

For further details see *Section 10*.

How will my learners become more employable through these qualifications?

All BTEC Nationals are mapped to relevant occupational standards (see *Appendix 1*).

In the mandatory content and the selected optional units that focus on technical preparation learners will be acquiring the key knowledge and skills that employers need. Also, employability skills such as team working and entrepreneurialism, and completing realistic tasks, have been built into the design of the learning aims and content. This gives you the opportunity to use relevant contexts, scenarios and materials to enable learners to develop a portfolio of evidence that demonstrates the breadth of their skills and knowledge in a way that equips them for employment.

5 Assessment structure and external assessment

Introduction

BTEC Nationals are assessed using a combination of *internal assessments*, which are set and marked by teachers, and *external assessments* which are set and marked by Pearson:

- mandatory units have a combination of internal and external assessments
- all optional units are internally assessed.

We have taken great care to ensure that the assessment method chosen is appropriate to the content of the unit and in line with requirements from employers and higher education.

In developing an overall plan for delivery and assessment for the programme, you will need to consider the order in which you deliver units, whether delivery is over short or long periods and when assessment can take place. Some units are defined as synoptic units (see *Section 2*). Normally, a synoptic assessment is one that a learner would take later in a programme and in which they will be expected to apply learning from a range of units. Synoptic units may be internally or externally assessed. Where a unit is externally assessed you should refer to the sample assessment materials (SAMs) to identify where there is an expectation that learners draw on their wider learning. For internally-assessed units, you must plan the assignments so that learners can demonstrate learning from across their programme. A unit may be synoptic in one qualification and not another because of the relationship it has to the rest of the qualification.

We have addressed the need to ensure that the time allocated to final assessment of internal and external units is reasonable so that there is sufficient time for teaching and learning, formative assessment and development of transferable skills.

In administering internal and external assessment, the centre needs to be aware of the specific procedures and policies that apply, for example to registration, entries and results. An overview with signposting to relevant documents is given in *Section 7*.

Internal assessment

Our approach to internal assessment for these qualifications will be broadly familiar to experienced centres. It offers flexibility in how and when you assess learners, provided that you meet assessment and quality assurance requirements. You will need to take account of the requirements of the unit format, which we explain in *Section 3*, and the requirements for delivering assessment given in *Section 6*.

External assessment

A summary of the external assessment for this qualification is given in *Section 2*. You should check this information carefully, together with the unit specification and the sample assessment materials, so that you can timetable learning and assessment periods appropriately.

Learners must be prepared for external assessment by the time they undertake it. In preparing learners for assessment you will want to take account of required learning time, the relationship with other external assessments and opportunities for retaking. You should ensure that learners are not entered for unreasonable amounts of external assessment in one session. Learners may resit an external assessment to obtain a higher grade of near pass or above. If a learner has more than one attempt, then the best result will be used for qualification grading, up to the permitted maximum. It is unlikely that learners will need or benefit from taking all assessments twice so you are advised to plan appropriately. Some assessments are synoptic and learners are likely to perform best if these assessments are taken towards the end of the programme.

Key features of external assessment in animal management

In animal management, after consultation with stakeholders we have developed the following.

- *Unit 1: Animal Breeding and Genetics*, learners undertake a written task assessing their knowledge of genetics, genetic manipulation and breeding management and technologies. The knowledge and mode of assessment provides key experience for those who may progress to further study in the biological sciences.
- *Unit 2: Animal Biology*, learners complete a written examination of the fundamental biological knowledge required for successful animal management. The knowledge and mode of assessment provides key experience for those who may progress to further study in the biological sciences.
- *Unit 3: Animal Welfare and Ethics*, learners complete a written assessment demonstrating key skills in the assessment of animal welfare, along with their understanding of the complex ethical questions facing those working in animal management. The unit is externally assessed as it provides underpinning knowledge that informs all aspects of the qualification.

Units

The externally-assessed units have a specific format, which we explain in *Section 3*. The content of units will be sampled across external assessments over time, through appropriate papers and tasks. The ways in which learners are assessed are shown through the assessment outcomes and grading descriptors. External assessments are marked and awarded using the grade descriptors. The grades available are Distinction (D), Merit (M), Pass (P) and Near Pass (N). The Near Pass (N) grade gives learners credit below a Pass, where they have demonstrated evidence of positive performance which is worth more than an unclassified result but not yet at the Pass standard.

Sample assessment materials

Each externally-assessed unit has a set of sample assessment materials (SAMs) that accompanies this specification. The SAMs are there to give you an example of what the external assessment will look like in terms of the feel and level of demand of the assessment. In the case of units containing synoptic assessment, the SAMs will also show where learners are expected to select and apply from across the programme.

The SAMs show the range of possible question types that may appear in the actual assessments. They give you a good indication of how the assessments will be structured. While SAMs can be used for practice with learners as with any assessment, the content covered and specific details of the questions asked will change in each assessment.

A copy of each of these assessments can be downloaded from our website. An additional sample of each of the Pearson-set units will be available before the first sitting of the assessment to allow your learners further opportunities for practice.

6 Internal assessment

This section gives an overview of the key features of internal assessment and how you, as an approved centre, can offer it effectively. The full requirements and operational information are given in the *Pearson Quality Assurance Handbook*. All members of the assessment team need to refer to this document.

For BTEC Nationals it is important that you can meet the expectations of stakeholders and the needs of learners by providing a programme that is practical and applied. Centres can tailor programmes to meet local needs and use links with local employers and the wider vocational sector.

When internal assessment is operated effectively it is challenging, engaging, practical and up to date. It must also be fair to all learners and meet national standards.

Principles of internal assessment

Assessment through assignments

For internally-assessed units, the format of assessment is an assignment taken after the content of the unit, or part of the unit if several assignments are used, has been delivered. An assignment may take a variety of forms, including practical and written types. An assignment is a distinct activity completed independently by learners that is separate from teaching, practice, exploration and other activities that learners complete with direction from, and formative assessment by, teachers.

An assignment is issued to learners as an assignment brief with a defined start date, a completion date and clear requirements for the evidence that they need to provide. There may be specific observed practical components during the assignment period. Assignments can be divided into tasks and may require several forms of evidence. A valid assignment will enable a clear and formal assessment outcome based on the assessment criteria.

Assessment decisions through applying unit-based criteria

Assessment decisions for BTEC Nationals are based on the specific criteria given in each unit and set at each grade level. To ensure that standards are consistent in the qualification and across the suite as a whole, the criteria for each unit have been defined according to a framework. The way in which individual units are written provides a balance of assessment of understanding, practical skills and vocational attributes appropriate to the purpose of qualifications.

The assessment criteria for a unit are hierarchical and holistic. For example, if an M criterion requires the learner to show 'analysis' and the related P criterion requires the learner to 'explain', then to satisfy the M criterion a learner will need to cover both 'explain' and 'analyse'. The unit assessment grid shows the relationships among the criteria so that assessors can apply all the criteria to the learner's evidence at the same time. In *Appendix 2* we have set out a definition of terms that assessors need to understand.

Assessors must show how they have reached their decisions using the criteria in the assessment records. When a learner has completed all the assessment for a unit then the assessment team will give a grade for the unit. This is given simply according to the highest level for which the learner is judged to have met all the criteria. Therefore:

- to achieve a Distinction, a learner must have satisfied all the Distinction criteria (and therefore the Pass and Merit criteria); these define outstanding performance across the unit as a whole
- to achieve a Merit, a learner must have satisfied all the Merit criteria (and therefore the Pass criteria) through high performance in each learning aim
- to achieve a Pass, a learner must have satisfied all the Pass criteria for the learning aims, showing coverage of the unit content and therefore attainment at Level 3 of the national framework.

The award of a Pass is a defined level of performance and cannot be given solely on the basis of a learner completing assignments. Learners who do not satisfy the Pass criteria should be reported as Unclassified.

The assessment team

It is important that there is an effective team for internal assessment. There are three key roles involved in implementing assessment processes in your centre, each with different interrelated responsibilities, the roles are listed below. Full information is given in the *Pearson Quality Assurance Handbook*.

- The Lead Internal Verifier (the Lead IV) has overall responsibility for the programme, its assessment and internal verification to meet our requirements, record keeping and liaison with the Standards Verifier. The Lead IV registers with Pearson annually. The Lead IV acts as an assessor, supports the rest of the assessment team, makes sure that they have the information they need about our assessment requirements and organises training, making use of our guidance and support materials.
- Internal Verifiers (IVs) oversee all assessment activity in consultation with the Lead IV. They check that assignments and assessment decisions are valid and that they meet our requirements. IVs will be standardised by working with the Lead IV. Normally, IVs are also assessors but they do not verify their own assessments.
- Assessors set or use assignments to assess learners to national standards. Before taking any assessment decisions, assessors participate in standardisation activities led by the Lead IV. They work with the Lead IV and IVs to ensure that the assessment is planned and carried out in line with our requirements.

Effective organisation

Internal assessment needs to be well organised so that the progress of learners can be tracked and so that we can monitor that assessment is being carried out in line with national standards. We support you through, for example, providing training materials and sample documentation. Our online myBTEC service can help support you in planning and record keeping. Further information on using myBTEC can be found in *Section 10* and on our website.

It is particularly important that you manage the overall assignment programme and deadlines to make sure that learners are able to complete assignments on time.

Learner preparation

To ensure that you provide effective assessment for your learners, you need to make sure that they understand their responsibilities for assessment and the centre's arrangements.

From induction onwards, you will want to ensure that learners are motivated to work consistently and independently to achieve the requirements of the qualifications. Learners need to understand how assignments are used, the importance of meeting assignment deadlines and that all the work submitted for assessment must be their own.

You will need to give learners a guide that explains how assignments are used for assessment, how assignments relate to the teaching programme and how learners should use and reference source materials, including what would constitute plagiarism. The guide should also set out your approach to operating assessment, such as how learners must submit work and request extensions.

Setting effective assignments

Setting the number and structure of assignments

In setting your assignments, you need to work with the structure of assignments shown in the *Essential information for assignments* section of a unit. This shows the structure of the learning aims and criteria that you must follow and the recommended number of assignments that you should use. For some units we provide authorised assignment briefs. For all the units we give you suggestions on how to create suitable assignments. You can find these materials along with this specification on our website. In designing your own assignment briefs you should bear in mind the following points.

- The number of assignments for a unit must not exceed the number shown in *Essential information for assignments*. However, you may choose to combine assignments, for example to create a single assignment for the whole unit.

- You may also choose to combine all or parts of different units into single assignments, provided that all units and all their associated learning aims are fully addressed in the programme overall. If you choose to take this approach, you need to make sure that learners are fully prepared so that they can provide all the required evidence for assessment and that you are able to track achievement in the records.

- A learning aim must always be assessed as a whole and must not be split into two or more tasks.

- The assignment must be targeted to the learning aims but the learning aims and their associated criteria are not tasks in themselves. Criteria are expressed in terms of the outcome shown in the evidence.

- For units containing synoptic assessment, the planned assignments must allow learners to select and apply their learning using appropriate self-management of tasks.

- You do not have to follow the order of the learning aims of a unit in setting assignments but later learning aims often require learners to apply the content of earlier learning aims and they may require learners to draw their learning together.

- Assignments must be structured to allow learners to demonstrate the full range of achievement at all grade levels. Learners need to be treated fairly by being given the opportunity to achieve a higher grade if they have the ability.

- As assignments provide a final assessment, they will draw on the specified range of teaching content for the learning aims. The specified content is compulsory. The evidence for assessment need not cover every aspect of the teaching content as learners will normally be given particular examples, case studies or contexts in their assignments. For example, if a learner is carrying out one practical performance, or an investigation of one organisation, then they will address all the relevant range of content that applies in that instance.

Providing an assignment brief

A good assignment brief is one that, through providing challenging and realistic tasks, motivates learners to provide appropriate evidence of what they have learned.

An assignment brief should have:

- a vocational scenario, this could be a simple situation or a full, detailed set of vocational requirements that motivates the learner to apply their learning through the assignment
- clear instructions to the learner about what they are required to do, normally set out through a series of tasks
- an audience or purpose for which the evidence is being provided
- an explanation of how the assignment relates to the unit(s) being assessed.

Forms of evidence

BTEC Nationals have always allowed for a variety of forms of evidence to be used, provided that they are suited to the type of learning aim being assessed. For many units, the practical demonstration of skills is necessary and for others, learners will need to carry out their own research and analysis. The units give you information on what would be suitable forms of evidence to give learners the opportunity to apply a range of employability or transferable skills. Centres may choose to use different suitable forms for evidence to those proposed. Overall, learners should be assessed using varied forms of evidence.

Full definitions of types of assessment are given in *Appendix 2*. These are some of the main types of assessment:

- written reports
- projects
- time-constrained practical assessments with observation records and supporting evidence
- recordings of performance
- sketchbooks, working logbooks, reflective journals
- presentations with assessor questioning.

The form(s) of evidence selected must:

- allow the learner to provide all the evidence required for the learning aim(s) and the associated assessment criteria at all grade levels
- allow the learner to produce evidence that is their own independent work
- allow a verifier to independently reassess the learner to check the assessor's decisions.

For example, when you are using performance evidence, you need to think about how supporting evidence can be captured through recordings, photographs or task sheets.

Centres need to take particular care that learners are enabled to produce independent work. For example, if learners are asked to use real examples, then best practice would be to encourage them to use their own or to give the group a number of examples that can be used in varied combinations.

Making valid assessment decisions

Authenticity of learner work

Once an assessment has begun, learners must not be given feedback on progress towards fulfilling the targeted criteria.

An assessor must assess only learner work that is authentic, i.e. learners' own independent work. Learners must authenticate the evidence that they provide for assessment through signing a declaration stating that it is their own work.

Assessors must ensure that evidence is authentic to a learner through setting valid assignments and supervising them during the assessment period. Assessors must take care not to provide direct input, instructions or specific feedback that may compromise authenticity.

Assessors must complete a declaration that:

- the evidence submitted for this assignment is the learner's own
- the learner has clearly referenced any sources used in the work
- they understand that false declaration is a form of malpractice.

Centres can use Pearson templates or their own templates to document authentication.

During assessment, an assessor may suspect that some or all of the evidence from a learner is not authentic. The assessor must then take appropriate action using the centre's policies for malpractice. Further information is given in *Section 7*.

Making assessment decisions using criteria

Assessors make judgements using the criteria. The evidence from a learner can be judged using all the relevant criteria at the same time. The assessor needs to make a judgement against each criterion that evidence is present and sufficiently comprehensive. For example, the inclusion of a concluding section may be insufficient to satisfy a criterion requiring 'evaluation'.

Assessors should use the following information and support in reaching assessment decisions:

- the *Essential information for assessment decisions* section in each unit gives examples and definitions related to terms used in the criteria
- the explanation of key terms in *Appendix 2*
- examples of assessed work provided by Pearson
- your Lead IV and assessment team's collective experience, supported by the standardisation materials we provide.

Pass and Merit criteria relate to individual learning aims. The Distinction criteria as a whole relate to outstanding performance across the unit. Therefore, criteria may relate to more than one learning aim (for example A.D1) or to several learning aims (for example DE.D3). Distinction criteria make sure that learners have shown that they can perform consistently at an outstanding level across the unit and/or that they are able to draw learning together across learning aims.

Dealing with late completion of assignments

Learners must have a clear understanding of the centre policy on completing assignments by the deadlines that you give them. Learners may be given authorised extensions for legitimate reasons, such as illness at the time of submission, in line with your centre policies.

For assessment to be fair, it is important that learners are all assessed in the same way and that some learners are not advantaged by having additional time or the opportunity to learn from others. Therefore, learners who do not complete assignments by your planned deadline or the authorised extension deadline may not have the opportunity to subsequently resubmit.

If you accept a late completion by a learner, then the assignment should be assessed normally when it is submitted using the relevant assessment criteria.

Issuing assessment decisions and feedback

Once the assessment team has completed the assessment process for an assignment, the outcome is a formal assessment decision. This is recorded formally and reported to learners.

The information given to the learner:

- must show the formal decision and how it has been reached, indicating how or where criteria have been met
- may show why attainment against criteria has not been demonstrated
- must not provide feedback on how to improve evidence
- must be validated by an IV before it is given to the learner.

Resubmission of improved evidence

An assignment provides the final assessment for the relevant learning aims and is normally a final assessment decision, except where the Lead IV approves one opportunity to resubmit improved evidence based on the completed assignment brief.

The Lead IV has the responsibility to make sure that resubmission is operated fairly. This means:

- checking that a learner can be reasonably expected to perform better through a second submission, for example that the learner has not performed as expected
- making sure that giving a further opportunity can be done in such a way that it does not give an unfair advantage over other learners, for example through the opportunity to take account of feedback given to other learners
- checking that the assessor considers that the learner will be able to provide improved evidence without further guidance and that the original evidence submitted remains valid.

Once an assessment decision has been given to the learner, the resubmission opportunity must have a deadline within 15 working days in the same academic year.

A resubmission opportunity must not be provided where learners:

- have not completed the assignment by the deadline without the centre's agreement
- have submitted work that is not authentic.

Retake of internal assessment

A learner who has not achieved the level of performance required to pass the relevant learning aims after resubmission of an assignment may be offered a single retake opportunity using a new assignment. The retake may only be achieved at a Pass.

The Lead Internal Verifier must only authorise a retake of an assignment in exceptional circumstances where they believe it is necessary, appropriate and fair to do so. For further information on offering a retake opportunity, you should refer to the *BTEC Centre Guide to Assessment*. We provide information on writing assignments for retakes on our website (www.btec.co.uk/keydocuments).

Planning and record keeping

For internal processes to be effective, an assessment team needs to be well organised and keep effective records. The centre will also work closely with us so that we can quality assure that national standards are being satisfied. This process gives stakeholders confidence in the assessment approach.

The Lead IV must have an assessment plan, produced as a spreadsheet or using myBTEC. When producing a plan, the assessment team may wish to consider:

- the time required for training and standardisation of the assessment team
- the time available to undertake teaching and carry out assessment, taking account of when learners may complete external assessments and when quality assurance will take place
- the completion dates for different assignments
- who is acting as IV for each assignment and the date by which the assignment needs to be verified
- setting an approach to sampling assessor decisions though internal verification that covers all assignments, assessors and a range of learners
- how to manage the assessment and verification of learners' work so that they can be given formal decisions promptly
- how resubmission opportunities can be scheduled.

The Lead IV will also maintain records of assessment undertaken. The key records are:

- verification of assignment briefs
- learner authentication declarations
- assessor decisions on assignments, with feedback given to learners
- verification of assessment decisions.

Examples of records and further information are given in the *Pearson Quality Assurance Handbook.*

7 Administrative arrangements

Introduction

This section focuses on the administrative requirements for delivering a BTEC qualification. It will be of value to Quality Nominees, Lead IVs, Programme Leaders and Examinations Officers.

Learner registration and entry

Shortly after learners start the programme of learning, you need to make sure that they are registered for the qualification and that appropriate arrangements are made for internal and external assessment. You need to refer to the *Information Manual* for information on making registrations for the qualification and entries for external assessments.

Learners can be formally assessed only for a qualification on which they are registered. If learners' intended qualifications change, for example if a learner decides to choose a different pathway specialism, then the centre must transfer the learner appropriately.

Access to assessment

Both internal and external assessments need to be administered carefully to ensure that all learners are treated fairly, and that results and certification are issued on time to allow learners to progress to chosen progression opportunities.

Our equality policy requires that all learners should have equal opportunity to access our qualifications and assessments, and that our qualifications are awarded in a way that is fair to every learner. We are committed to making sure that:

* learners with a protected characteristic are not, when they are undertaking one of our qualifications, disadvantaged in comparison to learners who do not share that characteristic
* all learners achieve the recognition they deserve for undertaking a qualification and that this achievement can be compared fairly to the achievement of their peers.

Further information on access arrangements can be found in the Joint Council for Qualifications (JCQ) document *Access Arrangements, Reasonable Adjustments and Special Consideration for General and Vocational Qualifications*.

Administrative arrangements for internal assessment

Records

You are required to retain records of assessment for each learner. Records should include assessments taken, decisions reached and any adjustments or appeals. Further information can be found in the *Information Manual.* We may ask to audit your records so they must be retained as specified.

Reasonable adjustments to assessment

A reasonable adjustment is one that is made before a learner takes an assessment to ensure that they have fair access to demonstrate the requirements of the assessments. You are able to make adjustments to internal assessments to take account of the needs of individual learners. In most cases this can be achieved through a defined time extension or by adjusting the format of evidence. We can advise you if you are uncertain as to whether an adjustment is fair and reasonable. You need to plan for time to make adjustments if necessary.

Further details on how to make adjustments for learners with protected characteristics are given on our website in the document *Supplementary guidance for reasonable adjustment and special consideration in vocational internally-assessed units.*

Special consideration

Special consideration is given after an assessment has taken place for learners who have been affected by adverse circumstances, such as illness. You must operate special consideration in line with our policy (see previous paragraph). You can provide special consideration related to the period of time given for evidence to be provided or for the format of the assessment if it is equally valid. You may not substitute alternative forms of evidence to that required in a unit, or omit the application of any assessment criteria to judge attainment. Pearson can consider applications for special consideration in line with the policy.

Appeals against assessment

Your centre must have a policy for dealing with appeals from learners. These appeals may relate to assessment decisions being incorrect or assessment not being conducted fairly. The first step in such a policy could be a consideration of the evidence by a Lead IV or other member of the programme team. The assessment plan should allow time for potential appeals after assessment decisions have been given to learners. If there is an appeal by a learner, you must document the appeal and its resolution. Learners have a final right of appeal to Pearson but only if the procedures that you have put in place have not been followed. Further details are given in the document *Enquiries and appeals about Pearson vocational qualifications and end point assessment policy*.

Administrative arrangements for external assessment

Entries and resits

For information on the timing of assessment and entries, please refer to the annual examinations timetable on our website.

Access arrangements requests

Access arrangements are agreed with Pearson before an assessment. They allow students with special educational needs, disabilities or temporary injuries to:

- access the assessment
- show what they know and can do without changing the demands of the assessment.

Access arrangements should always be processed at the time of registration. Learners will then know what type of arrangements are available in place for them.

Granting reasonable adjustments

For external assessment, a reasonable adjustment is one that we agree to make for an individual learner. A reasonable adjustment is defined for the individual learner and informed by the list of available access arrangements.

Whether an adjustment will be considered reasonable will depend on a number of factors, to include:

- the needs of the learner with the disability
- the effectiveness of the adjustment
- the cost of the adjustment; and
- the likely impact of the adjustment on the learner with the disability and other learners.

Adjustment may be judged unreasonable and not approved if it involves unreasonable costs, timeframes or affects the integrity of the assessment.

Special consideration requests

Special consideration is an adjustment made to a student's mark or grade after an external assessment to reflect temporary injury, illness or other indisposition at the time of the assessment. An adjustment is made only if the impact on the learner is such that it is reasonably likely to have had a material effect on that learner being able to demonstrate attainment in the assessment.

Centres are required to notify us promptly of any learners who they believe have been adversely affected and request that we give special consideration. Further information can be found in the special requirements section on our website.

Conducting external assessments

Centres must make arrangements for the secure delivery of external assessments. External assessments for BTEC qualifications include examinations, set tasks and performance.

Each external assessment has a defined degree of control under which it must take place. Some external assessments may have more than one part and each part may have a different degree of control. We define degrees of control as follows.

High control

This is the completion of assessment in formal invigilated examination conditions.

Medium control

This is completion of assessment, usually over a longer period of time, which may include a period of controlled conditions. The controlled conditions may allow learners to access resources, prepared notes or the internet to help them complete the task.

Low control

These are activities completed without direct supervision. They may include research, preparation of materials and practice. The materials produced by learners under low control will not be directly assessed.

Further information on responsibilities for conducting external assessment is given in the document *Instructions for Conducting External Assessments*, available on our website.

Dealing with malpractice in assessment

Malpractice means acts that undermine the integrity and validity of assessment, the certification of qualifications, and/or that may damage the authority of those responsible for delivering the assessment and certification.

Pearson does not tolerate actions (or attempted actions) of malpractice by learners, centre staff or centres in connection with Pearson qualifications. Pearson may impose penalties and/or sanctions on learners, centre staff or centres where incidents (or attempted incidents) of malpractice have been proven.

Malpractice may arise or be suspected in relation to any unit or type of assessment within the qualification. For further details regarding malpractice and advice on preventing malpractice by learners, please see Pearson's *Centre guidance: Dealing with malpractice and maladministration in vocational qualifications*, available on our website.

The procedures we ask you to adopt vary between units that are internally-assessed and those that are externally assessed.

Internally-assessed units

Centres are required to take steps to prevent malpractice and to investigate instances of suspected malpractice. Learners must be given information that explains what malpractice is for internal assessment and how suspected incidents will be dealt with by the centre. The *Centre Guidance: Dealing with Malpractice* document gives full information on the actions we expect you to take.

Pearson may conduct investigations if we believe that a centre is failing to conduct internal assessment according to our policies. The above document gives further information, examples and details the penalties and sanctions that may be imposed.

In the interests of learners and centre staff, centres need to respond effectively and openly to all requests relating to an investigation into an incident of suspected malpractice.

Externally-assessed units

External assessment means all aspects of units that are designated as external in this specification, including preparation for tasks and performance. For these assessments centres must follow the JCQ procedures set out in the latest version of *JCQ Suspected Malpractice in Examinations and Assessments Policies and Procedures* (www.jcq.org.uk).

In the interests of learners and centre staff, centres need to respond effectively and openly to all requests relating to an investigation into an incident of suspected malpractice.

Learner malpractice

Heads of Centres are required to report incidents of any suspected learner malpractice that occur during Pearson external assessments. We ask that centres do so by completing a *JCQ Form M1* (available at www.jcq.org.uk/exams-office/malpractice) and emailing it and any accompanying documents (signed statements from the learner, invigilator, copies of evidence, etc.) to the Investigations Team at candidatemalpractice@pearson.com. The responsibility for determining appropriate sanctions or penalties to be imposed on learners lies with Pearson.

Learners must be informed at the earliest opportunity of the specific allegation and the centre's malpractice policy, including the right of appeal. Learners found guilty of malpractice may be disqualified from the qualification for which they have been entered with Pearson.

Teacher/centre malpractice

Heads of Centres are required to inform Pearson's Investigations Team of any incident of suspected malpractice by centre staff, before any investigation is undertaken. Heads of centres are requested to inform the Investigations Team by submitting a *JCQ Form M2(a)* (available at www.jcq.org.uk/exams-office/malpractice) with supporting documentation to pqsmalpractice@pearson.com. Where Pearson receives allegations of malpractice from other sources (for example Pearson staff or anonymous informants), the Investigations Team will conduct the investigation directly or may ask the head of centre to assist.

Incidents of maladministration (accidental errors in the delivery of Pearson qualifications that may affect the assessment of learners) should also be reported to the Investigations Team using the same method.

Heads of Centres/Principals/Chief Executive Officers or their nominees are required to inform learners and centre staff suspected of malpractice of their responsibilities and rights; see Section 6.15 of the *JCQ Suspected Malpractice in Examinations and Assessments Policies and Procedures* document.

Pearson reserves the right in cases of suspected malpractice to withhold the issuing of results and/or certificates while an investigation is in progress. Depending on the outcome of the investigation results and/or certificates may be released or withheld.

You should be aware that Pearson may need to suspend certification when undertaking investigations, audits and quality assurances processes. You will be notified within a reasonable period of time if this occurs.

Sanctions and appeals

Where malpractice is proven we may impose sanctions or penalties.

Where learner malpractice is evidenced, penalties may be imposed such as:

* mark reduction for external assessments
* disqualification from the qualification
* being barred from registration for Pearson qualifications for a period of time.

If we are concerned about your centre's quality procedures we may impose sanctions such as:

* working with you to create an improvement action plan
* requiring staff members to receive further training
* placing temporary blocks on your certificates
* placing temporary blocks on registration of learners
* debarring staff members or the centre from delivering Pearson qualifications
* suspending or withdrawing centre approval status.

The centre will be notified if any of these apply.

Pearson has established procedures for centres that are considering appeals against penalties and sanctions arising from malpractice. Appeals against a decision made by Pearson will normally be accepted only from Heads of Centres (on behalf of learners and/or members of staff) and from individual members (in respect of a decision taken against them personally). Further information on appeals can be found in our *Enquiries and appeals about Pearson vocational qualifications and end point assessment policy*, which is on our website. In the initial stage of any aspect of malpractice, please notify the Investigations Team by email via pqsmalpractice@pearson.com who will inform you of the next steps.

Certification and results

Once a learner has completed all the required components for a qualification, even if final results for external assessments have not been issued, then the centre can claim certification for the learner, provided that quality assurance has been successfully completed. For the relevant procedures please refer to our *Information Manual*. You can use the information provided on qualification grading to check overall qualification grades.

Results issue

After the external assessment session, learner results will be issued to centres. The result will be in the form of a grade. You should be prepared to discuss performance with learners, making use of the information we provide and post-results services.

Post-assessment services

Once results for external assessments are issued, you may find that the learner has failed to achieve the qualification or to attain an anticipated grade. It is possible to transfer or reopen registration in some circumstances. The *Information Manual* gives further information.

Changes to qualification requests

Where a learner who has taken a qualification wants to resit an externally-assessed unit to improve their qualification grade, you firstly need to decline their overall qualification grade. You may decline the grade before the certificate is issued. For a learner receiving their results in August, you should decline the grade by the end of September if the learner intends to resit an external assessment.

Additional documents to support centre administration

As an approved centre you must ensure that all staff delivering, assessing and administering the qualifications have access to this documentation. These documents are reviewed annually and are reissued if updates are required.

- *Pearson Quality Assurance Handbook*: this sets out how we will carry out quality assurance of standards and how you need to work with us to achieve successful outcomes.
- *Information Manual*: this gives procedures for registering learners for qualifications, transferring registrations, entering for external assessments and claiming certificates.
- *Lead Examiners' Reports*: these are produced after each series for each external assessment and give feedback on the overall performance of learners in response to tasks or questions set.
- *Instructions for Conducting External Assessments (ICEA)*: this explains our requirements for the effective administration of external assessments, such as invigilation and submission of materials.
- *Regulatory policies*: our regulatory policies are integral to our approach and explain how we meet internal and regulatory requirements. We review the regulated policies annually to ensure that they remain fit for purpose. Policies related to this qualification include:
  - adjustments for candidates with disabilities and learning difficulties, access arrangements and reasonable adjustments for general and vocational qualifications
  - age of learners
  - centre guidance for dealing with malpractice
  - recognition of prior learning and process.

This list is not exhaustive and a full list of our regulatory policies can be found on our website.

8 Quality assurance

Centre and qualification approval

As part of the approval process, your centre must make sure that the resource requirements listed below are in place before offering the qualification.

- Centres must have appropriate physical resources (for example, equipment, IT, learning materials, teaching rooms) to support the delivery and assessment of the qualification.
- Staff involved in the assessment process must have relevant expertise and/or occupational experience.
- There must be systems in place to ensure continuing professional development for staff delivering the qualification.
- Centres must have in place appropriate health and safety policies relating to the use of equipment by learners.
- Centres must deliver the qualification in accordance with current equality legislation.
- Centres should refer to the teacher guidance section in individual units to check for any specific resources required.

Continuing quality assurance and standards verification

On an annual basis, we produce the *Pearson Quality Assurance Handbook.* It contains detailed guidance on the quality processes required to underpin planning for delivery including appropriate employer involvement, and for robust assessment and internal verification.

The key principles of quality assurance are that:

- a centre delivering BTEC programmes must be an approved centre, and must have approval for the programmes or groups of programmes that it is delivering
- the centre agrees, as part of gaining approval, to abide by specific terms and conditions around the effective delivery and quality assurance of assessment; it must abide by these conditions throughout the period of delivery
- Pearson makes available to approved centres a range of materials and opportunities, through online standardisation, intended to exemplify the processes required for effective assessment, and examples of effective standards. Approved centres must use the materials and services to ensure that all staff delivering BTEC qualifications keep up to date with the guidance on assessment
- an approved centre must follow agreed protocols for standardisation of assessors and verifiers, for the planning, monitoring and recording of assessment processes, and for dealing with special circumstances, appeals and malpractice.

The approach of quality-assured assessment is through a partnership between an approved centre and Pearson. We will make sure that each centre follows best practice and employs appropriate technology to support quality-assurance processes, where practicable. We work to support centres and seek to make sure that our quality-assurance processes do not place undue bureaucratic processes on centres. We monitor and support centres in the effective operation of assessment and quality assurance.

The methods we use to do this for BTEC Level 3 include:

- making sure that all centres complete appropriate declarations at the time of approval
- undertaking approval visits to centres
- making sure that centres have effective teams of assessors and verifiers who are trained to undertake assessment
- assessment sampling and verification, through requested samples of assessments, completed assessed learner work and associated documentation
- an overarching review and assessment of a centre's strategy for delivering and quality assuring its BTEC programmes, for example making sure that synoptic units are placed appropriately in the order of delivery of the programme.

Centres that do not fully address and maintain rigorous approaches to delivering, assessing and quality assurance cannot seek certification for individual programmes or for all BTEC Level 3 programmes. An approved centre must make certification claims only when authorised by us and strictly in accordance with requirements for reporting.

Centres that do not comply with remedial action plans may have their approval to deliver qualifications removed.

9 Understanding the qualification grade

Awarding and reporting for the qualification

This section explains the rules that we apply in awarding a qualification and in providing an overall qualification grade for each learner. It shows how all the qualifications in this sector are graded.

The awarding and certification of these qualifications will comply with regulatory requirements.

Eligibility for an award

In order to be awarded a qualification, a learner must complete all units, achieve a Near Pass (N) or above in all external units and a pass or above in all mandatory units unless otherwise specified. Refer to the structure in *Section 2*.

To achieve any qualification grade, learners must:

- complete and **have an outcome** (D, M, P, N or U) for all units within a valid combination
- achieve the **required units at pass or above** shown in *Section 2*, and for the Diploma achieve a minimum of 600 GLH and Extended Diploma achieve a minimum 900 GLH at Pass or above (or N or above in external units)
- achieve the **minimum number of points** at a grade threshold.

It is the responsibility of a centre to ensure that a correct unit combination is adhered to. Learners who do not achieve the required minimum grade (N or P) in units shown in the structure will not achieve a qualification.

Learners who do not achieve sufficient points for a qualification or who do not achieve all the required units may be eligible to achieve a smaller qualification in the same suite provided they have completed and achieved the correct combination of units and met the appropriate qualification grade points threshold.

Calculation of the qualification grade

The final grade awarded for a qualification represents an aggregation of a learner's performance across the qualification. As the qualification grade is an aggregate of the total performance, there is some element of compensation in that a higher performance in some units may be balanced by a lower outcome in others.

In the event that a learner achieves more than the required number of optional units, the mandatory units along with the optional units with the highest grades will be used to calculate the overall result, subject to the eligibility requirements for that particular qualification title.

BTEC Nationals are Level 3 qualifications and are awarded at the grade ranges shown in the table below.

Qualification	Available grade range
Certificate, Extended Certificate, Foundation Diploma	P to D*
Diploma	PP to D*D*
Extended Diploma	PPP to D*D*D*

The *Calculation of qualification grade* table, shown further on in this section, shows the minimum thresholds for calculating these grades. The table will be kept under review over the lifetime of the qualification. The most up to date table will be issued on our website.

Pearson will monitor the qualification standard and reserves the right to make appropriate adjustments.

Learners who do not meet the minimum requirements for a qualification grade to be awarded will be recorded as Unclassified (U) and will not be certificated. They may receive a Notification of Performance for individual units. The *Information Manual* gives full information.

Points available for internal units

The table below shows the number of **points** available for internal units. For each internal unit, points are allocated depending on the grade awarded.

	Unit size	
	60 GLH	**90 GLH**
U	0	0
Pass	6	9
Merit	10	15
Distinction	16	24

Points available for external units

Raw marks from the external units will be awarded **points** based on performance in the assessment. The table below shows the **minimum number of points** available for each grade in the external units.

	Unit size	
	90 GLH	**120 GLH**
U	0	0
Near Pass	6	8
Pass	9	12
Merit	15	20
Distinction	24	32

Pearson will automatically calculate the points for each external unit once the external assessment has been marked and grade boundaries have been set. For more details about how we set grade boundaries in the external assessment please go to our website.

Claiming the qualification grade

Subject to eligibility, Pearson will automatically calculate the qualification grade for your learners when the internal unit grades are submitted and the qualification claim is made. Learners will be awarded qualification grades for achieving the sufficient number of points within the ranges shown in the relevant *Calculation of qualification grade* table for the cohort.

Calculation of qualification grade

Applicable for registration from 1 September 2018.

Extended Certificate		Foundation Diploma		Diploma		Extended Diploma	
360 GLH		540 GLH		720 GLH		1080 GLH	
Grade	Points threshold	Grade	Points threshold	Grade	Points threshold	Grade	Points threshold
U	0	U	0	U	0	U	0
Pass	36	P	54	PP	72	PPP	108
				MP	88	MPP	124
						MMP	140
Merit	52	M	78	MM	104	MMM	156
				DM	124	DMM	176
						DDM	196
Distinction	74	D	108	DD	144	DDD	216
				D*D	162	D*DD	234
						D*D*D	252
Distinction*	90	D*	138	D*D*	180	D*D*D*	270

The table is subject to review over the lifetime of the qualification. The most up-to-date version will be issued on our website.

Example 1: Achievement of an Extended Diploma with a PPP grade

	GLH	Type (Int/Ext)	Grade	Unit points	
Unit 1	120	Ext	Near Pass	8	The learner has achieved a Near Pass or higher in Units 1, 2 and 3 and a Pass or higher in Units 4 and 5.
Unit 2	120	Ext	Pass	12	
Unit 3	120	Ext	Pass	12	
Unit 4	60	Int	Merit	10	
Unit 5	60	Int	Pass	6	
Unit 6	60	Int	Pass	6	
Unit 7	60	Int	Merit	10	
Unit 8	60	Int	U	0	
Unit 9	60	Int	Merit	10	
Unit 10	60	Int	Pass	6	
Unit 11	60	Int	Pass	6	
Unit 12	60	Int	Pass	6	
Unit 13	60	Int	Pass	6	
Unit 14	60	Int	Pass	6	
Unit 15	60	Int	Merit	10	
Totals	**1080**		**PPP**	**114**	

The learner has sufficient points for a PPP grade

Example 2: Achievement of an Extended Diploma with a DDD grade

	GLH	Type (Int/Ext)	Grade	Unit points
Unit 1	120	Ext	Merit	20
Unit 2	120	Ext	Pass	12
Unit 3	120	Ext	Distinction	32
Unit 4	60	Int	Distinction	16
Unit 5	60	Int	Distinction	16
Unit 6	60	Int	Merit	10
Unit 7	60	Int	Distinction	16
Unit 8	60	Int	Distinction	16
Unit 9	60	Int	Merit	10
Unit 10	60	Int	Distinction	16
Unit 11	60	Int	Distinction	16
Unit 12	60	Int	Merit	10
Unit 13	60	Int	Merit	10
Unit 14	60	Int	Distinction	16
Unit 15	60	Int	Distinction	16
Totals	**1080**		**DDD**	**232**

The learner has sufficient points for a DDD grade

Example 3: An Unclassified result for an Extended Diploma

	GLH	Type (Int/Ext)	Grade	Unit points
Unit 1	120	Ext	Merit	20
Unit 2	120	Ext	Pass	12
Unit 3	120	Ext	Distinction	32
Unit 4	60	Int	Distinction	16
Unit 5	60	Int	Distinction	16
Unit 6	60	Int	Merit	10
Unit 7	60	Int	Distinction	16
Unit 8	60	Int	U	0
Unit 9	60	Int	Merit	10
Unit 10	60	Int	U	0
Unit 11	60	Int	U	0
Unit 12	60	Int	U	0
Unit 13	60	Int	Merit	10
Unit 14	60	Int	Distinction	16
Unit 15	60	Int	Distinction	16
Totals	**1080**		**U**	**174**

The learner has 240 GLH at U.

The learner has sufficient points for an MMM and has achieved N or higher in Units 1, 2 and 3 and a P or higher in Units 4 and 5 but has not met the minimum requirement for 900 GLH at Pass or above.

10 Resources and support

Our aim is to give you a wealth of resources and support to enable you to deliver BTEC National qualifications with confidence. On our website you will find a list of resources to support teaching and learning, and professional development.

Support for setting up your course and preparing to teach

Specification

This **specification** (for teaching from September 2018) includes details on the administration of qualifications and information on all the units for the qualification.

Delivery Guide

This free guide gives you important advice on how to choose the right course for your learners and how to ensure you are fully prepared to deliver the course. It explains the key features of BTEC Nationals (for example employer involvement and employability skills). It also covers guidance on assessment (internal and external) and quality assurance. The guide tells you where you can find further support and gives detailed unit-by-unit delivery guidance. It includes teaching tips and ideas, assessment preparation and suggestions for further resources.

Schemes of work

Free sample schemes of work are provided for each mandatory unit. These are available in Word™ format for ease of customisation.

Curriculum models

These show how the BTECs in the suite fit into a 16–19 study programme, depending on their size and purpose. The models also show where other parts of the programme, such as work experience, maths and English, tutorial time and wider study, fit alongside the programme.

Study skills activities

A range of case studies and activities is provided; they are designed to help learners develop the study skills they need to successfully complete their BTEC course. The case studies and activities are provided in Word™ format for easy customisation.

myBTEC

myBTEC is a free, online toolkit that lets you plan and manage your BTEC provision from one place. It supports the delivery, assessment and quality assurance of BTECs in centres and supports teachers with the following activities:

- checking that a programme is using a valid combination of units
- creating and verifying assignment briefs (including access to a bank of authorised assignment briefs that can be customised)
- creating assessment plans and recording assessment decisions
- tracking the progress of every learner throughout their programme.

To find out more about myBTEC, visit the myBTEC page on the support services section of our website. We will add the new BTEC National specifications to myBTEC as soon possible.

Support for teaching and learning

Pearson Learning Services provides a range of engaging resources to support BTEC Nationals, including:

- textbooks in e-book and print formats
- revision guides and revision workbooks in e-book and print formats
- teaching and assessment packs, including e-learning materials via the Active Learn Digital Service.

Teaching and learning resources are also available from a number of other publishers. Details of Pearson's own resources and of all endorsed resources can be found on our website.

Support for assessment

Sample assessment materials for externally-assessed units

Sample assessments are available for the Pearson-set units. One copy of each of these assessments can be downloaded from the website/available in print. For each suite an additional sample for one of the Pearson-set units is also available, allowing your learners further opportunities for practice.

Further sample assessments will be made available through our website on an ongoing basis.

Sample assessment materials for internally-assessed units

We do not prescribe the assessments for the internally-assessed units. Rather, we allow you to set your own, according to your learners' preferences and to link with your local employment profile.

We do provide a service in the form of Authorised Assignment Briefs, which are approved by Pearson Standards Verifiers. They are available via our website or free on myBTEC.

Sample marked learner work

To support you in understanding the expectation of the standard at each grade, examples of marked learner work at PM/MD grades are linked to the Authorised Assignment Briefs.

Training and support from Pearson

People to talk to

There are many people who are available to support you and provide advice and guidance on delivery of your BTEC Nationals. These include:

- Subject Advisors – available for all sectors. They understand all Pearson qualifications in their sector and so can answer sector-specific queries on planning, teaching, learning and assessment
- Standards Verifiers – they can support you with preparing your assignments, ensuring that your assessment plan is set up correctly, and support you in preparing learner work and providing quality assurance through sampling
- Curriculum Development Managers (CDMs) – they are regionally based and have a full overview of the BTEC qualifications and of the support and resources that Pearson provides. CDMs often run network events
- Customer Services – the 'Support for You' section of our website gives the different ways in which you can contact us for general queries. For specific queries, our service operators can direct you to the relevant person or department.

Training and professional development

Pearson provides a range of training and professional development events to support the introduction, delivery, assessment and administration of BTEC National qualifications. These sector-specific events, developed and delivered by specialists, are available both face to face and online.

'Getting Ready to Teach'

These events are designed to get teachers ready for delivery of the BTEC Nationals. They include an overview of the qualifications' structures, planning and preparation for internal and external assessment, and quality assurance.

Teaching and learning

Beyond the 'Getting Ready to Teach' professional development events, there are opportunities for teachers to attend sector- and role-specific events. These events are designed to connect practice to theory; they provide teacher support and networking opportunities with delivery, learning and assessment methodology.

Details of our training and professional development programme can be found on our website.

Appendix 1 Links to industry standards

BTEC Nationals have been developed in consultation with industry and appropriate sector bodies to ensure that the qualification content and approach to assessment aligns closely to the needs of employers. Where they exist, and are appropriate, National Occupational Standards (NOS) and professional body standards have been used to establish unit content.

In the animal management sector, the following approach has been used:

- the mandatory content aligns closely to the needs of employers, who have been consulted throughout the development of this qualification.

Appendix 2 Glossary of terms used for internally-assessed units

This is a summary of the key terms used to define the requirements in the units.

Term	Definition
Analyse	Learners present the outcome of methodical and detailed examination, either: • breaking down a theme, topic or situation in order to interpret and study the interrelationships between the parts and/or • of information or data to interpret and study key trends and interrelationships. Analysis can be through performance, practice, written or, less commonly, verbal presentation.
Assess	Learners present a careful consideration of varied factors or events that apply to a specific situation or, to identify those which are the most important or relevant and arrive at a conclusion.
Compare	Learners identify the main factors relating to two or more items/situations or aspects of a subject that is extended to explain the similarities, differences, advantages and disadvantages. This is used to show depth of knowledge through selection and isolation of characteristics.
Demonstrate	Learners' work, performance or practice evidences the ability to carry out and apply knowledge, understanding and/or skills in a practical situation.
Examine	Knowledge with application where learners are expected to select and apply to less familiar contexts.
Explain	Learners' work shows clear details and gives reasons and/or evidence to support an opinion, view or argument. It could show how conclusions are drawn (arrived at). Learners are able to show that they comprehend the origins, functions and objectives of a subject, and its suitability for purpose
Explore	Skills and/or knowledge, involving practical testing or trialling.

Term	Definition
Evaluate	Learners' work draws on varied information, themes or concepts, to consider aspects such as: • strengths or weaknesses • advantages or disadvantages • alternative actions • relevance or significance. Learners' enquiries should lead to a supported judgement showing relationship to its context. This will often be in a conclusion. Evidence of evaluations could be through visual explanations with annotations, as well as written work, presentation, performance or practice.
Investigate	Knowledge based on personal research and development.
Justify	Learners give reasons or evidence to: • support an opinion • prove something right or reasonable.
Perform	Learners carry out or execute what has to be done to complete a given activity.
Plan	Learners create a way of doing a task or series of tasks to achieve specific requirements or objectives showing progress from start to finish.
Reflect	Learners reflect on own skills and development and make suggestions for own development.
Review	Learners make a formal assessment of work produced. The assessment allows learners to appraise existing information or prior events, and reconsider information with the intention of making changes, if necessary.
Select	Learners choose the best or most suitable option whether this is of materials, techniques, equipment or processes. The options and choices should be based on specific criteria.
Understand	Learners demonstrate knowledge related to defined situations.
Undertake/carry out/develop	Learners demonstrate skills through practical activities.

This is a key summary of the types of evidence used for BTEC Nationals.

Type of evidence	Definition and purpose
Case study	A specific example to which all learners must select and apply knowledge. Used to show application to a realistic context where direct experience cannot be gained.
Development log	A record kept by learners to show the process of development. Used to show method, self-management and skill development.
Individual project	A self-directed, large-scale activity requiring, planning, research, exploration, outcome and review. Used to show self-management, project management and/or deep learning, including synopticity.
Log	A record made by learners of how a process of development was carried out, including experimental stages, testing, selection and rejection of alternatives, practice or development steps.
Plan	Learners produce a plan as an outcome related to a given or limited task.
Portfolio	Digital or physical showing a selection of work which contributes towards a project or for a specific purpose.
Practical task (artefact/outcome)	Learners carry out a defined or self-defined task to produce an outcome.
Presentation	To show presentation skills, including communication. To direct to a given audience and goal. To extract and summarise information.
Project	A large-scale activity requiring planning, research, exploration, outcome and review. Used to show self-management, project management and/or deep learning including synopticity.
Research	An analysis of substantive research organised by learners from secondary and, if applicable, primary sources.

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BTEC Level 3 Nationals
in
Animal Management

Extended Certificate in Animal Management

Foundation Diploma in Animal Management

Diploma in Animal Management

Extended Diploma in Animal Management

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