Pearson BTEC Nationals in Animal Management

Delivery Guide

BTEC National Level 3 Extended Certificate in Animal Management

BTEC National Level 3 Foundation Diploma in Animal Management

BTEC National Level 3 Diploma in Animal Management

BTEC National Level 3 Extended Diploma in Animal Management

First teaching September 2016

Edexcel, BTEC and LCCI qualifications

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Welcome to your BTEC National delivery guide

This delivery guide is a companion to your BTEC Level 3 National specifications, Authorised Assignment Briefs (AABs) and Sample Assessment Materials (SAMs). It contains ideas for teaching and learning, including practical activities, realistic scenarios, ways of involving employers in delivery, ways of managing independent learning and how to approach assessments. The aim of this guide is to show how the specification content might work in practice and to inspire you to start thinking about different ways to deliver your course.

The guidance has been put together by tutors who have been close to the development of the qualifications and so understand the challenges of finding new and engaging ways to deliver a BTEC programme in the context of the new qualifications from 2016.

Guidance around what you will need to consider as you plan the delivery of the qualification(s) has been provided. You will find information around the structure of your course, how you may wish to build the course for your learners, suggestions for how you could make contact with employers and information around the other support and resources available to you.

Unit-by-unit guidance has been provided and includes suggestions on how to approach the learning aims and unit content, as well as ideas for interesting and varied activities. You will also find coverage of assessments, including useful advice about external assessment, as well as tips and ideas around how to plan for and deliver your assignments.

You will also find a list of carefully selected resources for each unit. The lists include suggestions for books, websites and videos that you can either direct your learners to use or that you can use as a way to complement your delivery.

We hope you will find this guidance relevant and useful.

Enjoy your course!

What's new

The BTEC Level 3 Nationals 2016 are the result of more than three years' consultation with employers, higher education institutions, and many thousands of tutors and managers in colleges and schools. Our aim has been to ensure the BTEC Level 3 Nationals continue to allow a recognised and well-respected route into employment or higher education by meeting the needs of these key stakeholders, and that learners continue to enjoy a stimulating course of study and develop the skills and attributes that will enable them to progress.

As a result of this consultation, and on the advice of employers, higher education and most importantly of those of you who teach BTEC, some key changes have been made to the BTEC Level 3 Nationals. These are described through this delivery guide and include the following.

- **Updated content and a larger proportion of mandatory content** – both employers and universities said they wanted a greater consistency in coverage of the subject for BTEC learners. Employers wanted to see systematic coverage of core knowledge and skills for their sector, and for the Nationals to reflect up-to-date industry practice.
- **The re-introduction of external assessment** – employers were keen to see an element of rigour and consistency across the country in terms of

assessment, while HEIs wanted learners to be better prepared for meeting deadlines and preparing for formal exams, where appropriate. Both were keen to see learners applying their knowledge and skills to new contexts through synoptic projects and assessments.

- **A focus on employability skills** – the BTEC approach to learning, through projects, self-directed assignments, group work and work placements has always supported the development of employability skills, such as self-management. In the new Nationals the balance of cognitive and skills work has been carefully calibrated to ensure learners get a range of different opportunities across their course.
- **Broader assessment in internal units** – the assessment criteria for each unit are carefully structured to set a clear level of demand. Distinction criteria encourage and require depth of study, including demonstration of the application of knowledge and understanding as well as a synoptic element for the learning aim or unit.
- **Alignment with DfE criteria for performance measures for 16–19 year olds in England** – all new BTECs are designed as either Applied General qualifications or Tech Levels to fulfil criteria for inclusion in 2018 performance tables and funding for 16–19 year old and 19+ learners.

To support transition to the BTEC Level 3 Nationals 2016 we are providing an enhanced support programme with exemplar and practice materials available from the end of 2015 and training from April 2016. Please see the *Support and resources* section for details of the support and the link to sign up to training, which continues from 2016 and throughout the lifetime of the qualification.

Notes:

The specification tells you what must be taught and what must be assessed. This delivery guide gives suggestions about how the content could be delivered. The suggestions given in this delivery guide link with the Authorised Assignment Briefs provided by Pearson but they are not compulsory. They are designed to get you started and to spark your imagination.

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1 BTEC LEVEL 3 NATIONALS

Introduction

With a track record built over 30 years of learner success, BTEC Level 3 Nationals are widely recognised by industry and higher education as the signature vocational qualification at Level 3, providing progression into 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 learners apply to UK universities every year and their BTEC Level 3 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.

The Pearson BTEC Level 3 National Animal Management suite is a range of Tech Level qualifications designed to provide innovative vocational learning for learners wanting to progress to higher education, an apprenticeship or employment.

There are four qualifications in the suite that are equivalent in size to a specific number of A-levels. They range from the Extended Certificate that is equivalent to one A-level, to the Extended Diploma that is equivalent to three A-levels. This flexibility enables centres to determine whether to deliver them full-time or as part of a broader learner package alongside other qualifications.

One of the aims for their development was to increase the confidence in these qualifications, so the whole suite carries UCAS points and is well recognised by Higher Education providers and employers. With a focus on progression, the learners develop the skills and knowledge to move into Higher Education, Apprenticeships or employment and build a valuable portfolio of work.

A key difference between the old style QCF qualifications and the new RQF is the inclusion of an external assessment component. The format of this externally-assessed component varies between the units, but is always an assessment that is set and marked by Pearson.

All RQF qualifications contain mandatory units and then a selection of optional units, totalling the appropriate Guided Learning Hours (GLH) for the size of the qualification. Each unit is allocated a number of GLH, clearly documented within the specification. Mandatory units are designed to cover the essential information for learners choosing to move into any aspect of the industry and provide a rigorous platform for progression. Optional units help to accommodate a variety of progression routes.

The combination of mandatory units and external assessment will drive the quality the of learning experience. It will also help learners take increased responsibility for their own development. The demands within industry mean learners need to be able to manage deadlines well and communicate their ideas in different ways. This assessment methodology now more closely matches experiences learners will have in employment and thus increases their chances of successful progression.

The units provide valuable ways for learners to develop highly transferable skills that are recognised by both employers and Higher Education providers. The structure of the new qualification also allows for learners to be assessed synoptically. All of the units can contain opportunities for stakeholder or employer engagement to stimulate learning experiences.

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The combination of mandatory content and optional units, mean that the qualification in Animal Management can be tailored to suit all sector needs from domestic animals to conservation and nutrition to science.

Structure

In order to maximise the quality of the learning experience, the structure of the suite of BTEC Nationals in Animal Management has been developed with significant input from a range of stakeholders including a breadth of employers, Higher Education institutions and delivery centres.

Learners who begin their study through the successful completion of one of the smaller qualifications such as the Extended Certificate, or Foundation Diploma, can, if they wish, progress to the larger qualifications such as the Diploma or Extended Diploma, without the need to repeat units or assessments.

The mandatory units common to all Level 3 Nationals in Animal Management ensure development of key areas such as health and safety, practical husbandry, animal behaviour and disease, all of which are vital in all animal related careers. The mandatory component in the larger qualifications focuses on developing core knowledge with the intention of giving learners a solid foundation for moving into Higher Education.

The range of optional units available for selection allows learners to gain either a broad spectrum of knowledge and skills by selecting a wide variety of units or focus on one main area by selecting units which have a common theme.

Mandatory units (externally assessed units 1-3)

Unit (number and title)	Extended Certificate	Foundation Diploma	Diploma	Extended Diploma
1 – Animal Breeding and Genetics				✓
2 – Animal Biology		✓	✓	✓
3 – Animal Welfare and Ethics	✓	✓	✓	✓
4 – Practical Animal Husbandry	✓	✓	✓	✓
5 – Animal Behaviour	✓	✓	✓	✓
6 – Animal Health and Diseases	✓	✓	✓	✓
7 – Work Experience in the Animal Sector	✓	✓	✓	✓
8 - Investigative Research Project			✓	✓

The externally assessed units within the qualification are those that are critical to the overall purpose of qualification within the suite. The external assessments

help produce the skills needed for progression to Higher Education, as well as providing skills learners can use in their progression to employment.

BTEC RQF qualifications place a strong emphasis on the relevance of learning through employer engagement and each of the qualifications provides ideas for how this can be achieved. Most of the units highlight where employer involvement would benefit the learning and make useful suggestions for how to initiate this participation.

The Tech Level qualifications at all sizes require meaningful employer involvement that is relevant to the industry, sector or occupation. This can include:

- work experience and placements
- projects set by employers
- co-delivery of units with employers
- industry guests that contribute to learner practice.

An 'at a glance' summary table of the structure of the qualifications has been provided below, but ensure that you use the full structure found in *Section 2* of the specification when planning your course:

Qualification	Size – Guided Learning Hours	Size - number of units	Equivalent in size to
Pearson BTEC Level 3 National Extended Certificate in Animal Management	**360**	**5 units**	**1 A-level**
Pearson BTEC Level 3 National Foundation Diploma in Animal Management	**540**	**7 units**	**1.5 A-levels**
Pearson BTEC Level 3 National Diploma in Animal Management	**720**	**10 units**	**2 A-levels**
Pearson BTEC Level 3 National Extended Diploma in Animal Management	**1080**	**15 units**	**3 A-levels**

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Making the right choice for your learners

The suite of qualifications is designed to be inclusive and support individuals in their progression. The prior achievement and aspirations of learners is key to advising them on most appropriate study programme. This would ideally combine in depth discussion and qualification review.

For learners that wish to progress directly to Higher Education, the Extended Diploma with Science qualification in particular ensures that they will have the skills to cope with the academic and independent learning. In recognition of some of the highly specialised areas within the industry, the smaller qualifications provide opportunities for learners to have the vocational experience in parallel with other specialist qualifications. The Tech Level qualifications support progression into industry at entry or apprenticeship levels with the understanding required to progress in their careers.

Below are some examples of learners' potential progression routes:

16 year old learner choice		
Progression intention	**Prior achievement**	**Potential BTEC National route**
Animal related subject at Higher Education Institute • animal technician • animal welfare centre manager, in a range of industries including boarding establishment, sanctuaries and city farms • pet store manager • animal nutritionist • kennel and cattery manager • rescue centre manager • assistant zoo keeper	5 GCSEs 4 or above with Maths, English and Science	BTEC Extended Diploma
Veterinary assistant • animal technician, in an animal breeding or educational centre, or research organisation • animal welfare centre manager, in a range of industries, including boarding • establishments, sanctuaries and city farms • pet store manager	5 GCSEs 4 or above with Maths, English and Science	Extended Diploma with A-levels, e.g. English/ Maths/Science

• animal nutritionist • kennel and cattery manager • rescue centre manager • assistant zoo keeper • zoologist • animal officer/inspector • livestock manager		
Entry level employment or apprenticeship • animal carer in a veterinary practice or educational establishment • trainee animal keeper or ranger in zoos or safari parks • animal technician • wildlife assistant • trainee dog warden	5 GCSEs 4 or above with Maths and English	BTEC Diploma
Animal related subject at Higher Education Institute • animal carer in a veterinary practice or educational establishment • trainee animal keeper or ranger in zoos or safari parks • animal technician • wildlife assistant • trainee dog warden	4 GCSEs 4 or above with Maths and English	BTEC Diploma
• rescue centre/animal sanctuary assistant • zoo or wildlife park worker • animal/dog groomer • animal charity worker	BTEC Level 2 First Diploma in Animal Care - Distinction	BTEC Extended Diploma
• animal attendant • dog walker	BTEC Level 2 First Diploma in Animal Care –	BTEC Diploma

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• assistant groomer • animal handler	Pass / Merit	

19+ learner choice		
Progression	**Prior achievement**	**Potential BTEC National route**
Animal related subject at Higher Education Institute	5 GCSEs 4 or above including Maths, English and science	BTEC Extended Diploma
Animal related subject at Higher Education Institute	4 GCSEs 4 or above with Maths and English	BTEC Diploma

Making contact with employers

Employer contact can be one of the most cherished experiences BTEC National learners can have, by ensuring realistic and valuable learning. The commitment of teaching teams and time costs can be offset by the increase in responsibility taken by learners due to employer engagement.

Partnerships between companies, freelance practitioners and National courses can often build an annual collaboration that reduces bureaucracy and eases any preparation. Here are some ideas that may support centres expanding their employer engagement:

- For case studies of the range of employment opportunities availab e and as a basis for the assessment scenarios.
- Invite self-employed practitioners in as guest speakers to carry out demonstrations.
- Invite small companies in to support learners through experiences including mock interviews and presentations.

- For work experience placements.
- Learner visits to the bus ness to evaluate the set up and to see 'behind the scenes'.
- Invite a range of employees in as guest speakers to discuss the range of job roles within each business.
- Contact w th local authorit es to discuss the roles of Animal Health officers and licensing requirements
- Contact w th government agencies to discuss legal and health and safety requirements.

- Contact ocal charities who are often keen on the publicity learners can generate about their cause.
- For work experience placements.
- Learner visits to examine the role of the charity and to see 'behind the scenes'.
- nvite a range of employees in as guest speakers to discuss the range of job roles within each charity.
- nvite guest speakers in the form of people who have benef ted from a charity's work, eg a Guide Dog for the Blind owner, a park ranger.
- Work with the education department at local museums, zoos, children's farms etc who need to attract attention to forthcoming events.
- Engage with national init atives, eg National Pet Week or RSPB Big schools bird watch.

- For support in teaching and workshops contact previous learners who have moved into the industry.
- Use pr or learners who have moved into the industry as guest speakers to provide real examp es of where the qualification can lead to.

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2 PLANNING THE DELIVERY OF YOUR COURSE

How should the units be delivered for specific programmes?

We understand that each centre is different and that it is not possible to have a 'one size fits all' strategy when delivering BTEC Level 3 Nationals. Indeed, one of the key features of the qualifications is that their delivery, and to a large extent, assessment, can be tailored to meet the constraints of individual centres in terms of curriculum time, availability of space, equipment and staff expertise and availability. There are, however, requirements that must be met in relation to assessment plans and the teaching and learning prior to assessments being issued.

Each centre is able to create assessment plans and schemes of work to meet the needs of their own organisation, choosing to teach the units as long and thin or short and fat or as a combination of both. None of the units in this suite have prerequisite units, which allows them to be taught in any order although some units may work well taught alongside each other (e.g. *Unit 21: Exotic Animal Husbandry* and *Unit 23: Zoological Animal Health & Husbandry*). Whereas other units may have a natural follow on (e.g. *Unit 2: Animal Biology* taught prior to *Unit 10: Animal Metabolism* or *Unit 11: Advanced Animal Nutrition*).

Mandatory Units

Due to the inclusion of internally assessed units with centralised assessment dates there are some restrictions on the planning of these units. Extended Diploma mandatory *Unit 1: Animal Breeding and Genetics* is assessed as a formal examination and learners must have completed the teaching for the unit prior to the assessment. It would also be expected that learners have been allocated revision time and mock assessments prior to the assessment. Similarly with *Unit 2: Animal Biology* and *Unit 3: Animal Welfare and Ethics*, all teaching must be completed prior to the assessment date.

All the qualifications in the Animal Management suite contain the mandatory work experience unit (*Unit 7: Work Experience in the Animal Sector*). As such, there is a requirement for learners to complete a set number of hours work experience across the program of study, varying according to the size of qualification undertaken. The number of hours required is detailed below.

Qualification	Extended Certificate	Foundation Diploma	Diploma	Extended Diploma
Work experience hours	75	150	275	300

The structure of the work experience placement may be dictated by the number of hours to be completed but should be decided by each centre. Depending on the centre's constraints, work experience may be completed across the whole year for a day or half-day release, one or two large block release periods, or one week a term. For many centres it would seem logical to deliver learning aims A and B prior to any work experience being undertaken. The work experience

module is a key area for developing links with employers and emphasis should be placed on learners having a real working experience rather than acting as a passive observer.

Optional Units

The wide range of optional units available allows centres to build a course specific to their own needs. Many centres will want to deliver courses that build on the strengths of their own practitioners, or they may want to support progression into a specific local area or market or provide a range of modular 'streams' creating a choice of options for the candidates. It is important to recognise the flexibility of the suite to provide a relevant and tailored learning experience.

Assessments

The BTEC RQF qualifications have clear guidance on the types of assessment methods which could be used. There are example assignment briefs provided by Pearson which can be used directly, tweaked to suit the centre's needs or not used at all, allowing centres to devise their own assignments. If a centre is creating their own assessments, it is important that a range of assessment methods and presentation styles are utilised in order to meet the needs of the learners, reflect the needs of the industry and develop transferable skills. Assignments briefs should encourage learners to use a wide range of skills and not rely solely on report writing. Examples of assessment methods include the below.

- Interviews with employers – recorded through video, email conversations or recorded video calling.
- Recorded interviews or presentations can replace long written evaluations and reports.
- Poster presentations.
- Fact files or leaflets.
- Reflective logs – can be written, audio or audiovisual.
- Short answer tests.
- Multiple choice tests can be easily designed to cover knowledge based learning such as legislation and health and safety.
- Assessor observations of practical demonstrations give a real sense of the workplace, for example asking learners to restrain and health check a range of animals.

Regardless of the assessment method used, an effective scenario is essential to all assignments. The scenario should be vocationally relevant and appropriate to the level of qualification and potential career. For example, it would not be appropriate to use a scenario where a learner was working as a veterinary surgeon in an Extended Certificate assignment brief, a far more authentic scenario would be a kennel, grooming or zoo environment. Where appropriate, collaboration with local businesses to use as case studies helps learners develop an awareness of working within a larger industry. Any assignments created by the centre can be submitted to the assignment checking team for free support and guidance. Once allocated, the standards verifier will also be able to offer

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guidance as they will be sampling assignment briefs as part of the quality assurance process.

All assignment briefs **must** contain the following information:

- Learner name and **declaration**.
- Assessor name.
- Assignment title.
- **Duration of assessment – including submission date.** All deadlines must be clearly set. The submission dates must be for summative submission only. The submission date should allow a suitable timescale for the completion of the task, including any practical components. Assessors are not required to accept work that was not completed by the date in the assessment plan. Learners may be given authorised extensions for legitimate reasons. Late work cannot be down graded, but does not have to be accepted.
- Qualification and units covered.
- Learning aims addressed – allowing achievement to distinction level and **covering the whole aim.** Assignments can cover a whole unit, parts of a unit or several units, however a learning aim must be covered in its entirety and allow completion to distinction standard.
- Vocational scenario – the scenario should be related directly to the industry and why completing this type of task or having this knowledge is essential when working in industry. The scenario helps to highlight the vocational focus of BTEC qualifications.
- Task and type of evidence required – when writing the task, it is important to make sure it is relevant, valid, sufficient, authentic and appropriate. The tasks should be written clearly in language appropriate to the learners and the evidence required should link directly to the criteria of the learning aim. The information required should be current, where possible reflecting recent developments and issues.
- Assessment criteria.
- Potential sources of information.

All assignment briefs must be internally verified prior to being issued to the learners. When using briefs provided by Pearson, the verification will look at issue and submission details. For verification of the centre's own assignments, internal verifiers will also have to ensure the tasks are clear and have not misinterpreted the specification, and that the assessment is consistent with national standards with regard to level, content and duration.

Each mandatory externally-assessed unit covers key knowledge required when working with animals. Being externally assessed provides added rigour to the assessment process. To enable learners to perform to the best of their ability in these assessments it would be worth considering using these assessment models within optional units to prepare learners, and instil the responsibility they need to take for deadlines and personal learning.

The skills and learning required to successfully complete the externally set units include retaining knowledge and information, applying and transferring knowledge and synthesising information. These skills underpin many of the vocational projects learners will be routinely undertaking through the rest of their qualification. Incorporating these activities into other assessments will give learners a chance to develop the skills and successfully fulfil the requirements of

the external assessments. It also means that learners see how essential transferable and underpinning skills are to all future projects.

On most two year Extended Diplomas it is likely that one externally assessed unit will be set in the first year and two in the second to avoid issues with logistics, but also to help develop relevant skills within projects before the assessments are undertaken.

BTEC Level 3 National Extended Certificate

Centres may deliver a BTEC National Certificate in Animal Management in combination with other qualifications, for example GCSEs. This course is designed to cover the core knowledge and skills required by anyone aiming for a career in animal care and husbandry.

BTEC Level 3 National Foundation Diploma

Centres may deliver a BTEC National Foundation Diploma in combination with other qualifications or as a standalone one-year program. While there are a significant number of mandatory units, the qualification can easily be flavoured to support some specialisation depending on the centres facilities and expertise. Along with the six optional units, centres can select and deliver one additional optional unit.

BTEC Level 3 National Diploma

The National Diploma in Animal Management is likely to be a standalone, one-year qualification. It contains seven mandatory units and three optional units.

The following are some examples of unit choices that could be made to focus the courses:

National Diploma	
Focus	**Optional units**
Practical skills	Unit 16 – Animal Grooming Unit 19 – Farm Livestock Husbandry Unit 22 – Practical Estate Planning, Construction & Maintenance
Exotic Animals	Unit 18 – Aquatic Animal Health and Husbandry Unit 21 – Exotic Animal Husbandry Unit 23 – Zoological Animal Health & Husbandry
Pet Industry	Unit 13 – Animal Management in a Retail Environment Unit 14 – Animals in Boarding Establishments Unit 15 – Developing an Enterprise in the Animal Sector

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BTEC Level 3 National Extended Diploma

The National Extended Diploma in Animal Management can be taught as a two-year standalone programme. It contains 11 mandatory units and four optional units. As with the National Diploma these units can be selected to follow a particular theme or can cover a wide variety of topics.

3 EMPLOYABILITY

Employability skills

Helping learners to progress into employment has always been a cornerstone of BTEC qualifications. Equipping learners with the skills they will use in the workplace is at the very heart of BTEC and remains an important driver in determining the content of each qualification. When developing our qualifications, we work closely with employers to understand the skills they are looking for in new entrants to their industries. Employers are often not looking only for technical skills, knowledge and understanding but also for those attributes that can be termed **employability skills**. These are the skills which underpin the different tasks and duties which a person can be expected to undertake in their role and which are applicable across sectors.

Unlike technical skills, which may become outdated over time, employability skills enable learners to adapt to the ever-changing roles needed to survive in the global economy.

The Confederation of British Industry (CBI) definition of employability skills is based on a positive attitude (readiness to take part, openness to new ideas and activities, desire to achieve) which underpins seven characteristics.

1 **Self-management**: readiness to accept responsibility, flexibility, time management, readiness to improve own performance.

2 **Team working**: respecting others, co-operating, negotiating or persuading, contributing to discussions.

3 **Customer awareness in the sector**: basic understanding of the key drivers for success in the sector and the need to provide customer satisfaction.

4 **Problem solving**: analysing facts and circumstances and applying creative thinking to develop appropriate solutions.

5 **Communication and literacy**: application of literacy, ability to produce clear, structured written work, and oral literacy (including listening and questioning).

6 **Application of numeracy**: manipulation of numbers, general mathematical awareness and its application in practical contexts.

7 **Application of information technology**: basic IT skills including familiarity with word-processing, spreadsheets, file management and use of internet search engines.

In the annual CBI/Pearson education and skills survey, *Inspiring Growth 2015*, it was noted that employers (+65 per cent) expect to need more employees with higher skills. They also report that there needs to be more done around skills in basic literacy (50 per cent), numeracy (50 per cent) and IT skills (46 per cent).

The development of employability skills has been considered during the creation of this BTEC Business suite of qualifications – further detail around these can be found in the qualification specifications.

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4 myBTEC

myBTEC is an online tool designed to support the administration of delivering BTEC courses. This service will be available free to centres offering supported qualifications.

Control all your BTEC provision from one place

Complete visibility of all courses, assessment, internal verification and results at your centre.

- See the complete assessment schedule for every course at your centre.
- See all assessment decisions and verification processes.
- Track the progress of every learner throughout their course.
- 90 per cent of BTEC Firsts (next generation) and Nationals (QCF) supported.

Built by Pearson, for BTEC

Designed specifically for BTEC qualifications, so you know you're doing it right.

- Designed to help you meet all requirements of BTEC assessment and awarding, including next generation.
- Courses automatically checked against rules of combination.
- Design your own assignments, or use the pre-loaded Authorised Assignment Briefs.
- Calculates scores and predicted grades automatically.

Access for the full team

Full access for the entire delivery team, whatever their department or role.

- Access for the full team, whatever their role, in as many BTEC subjects as they deliver.
- Login with your Edexcel Online password.
- Quality Nominee has ultimate control over access.

Saves you time

Enter your information once. Download and export at will.

- Automatically generates the documents and tracking screens you need.
- Export and download data and documents or data whenever you need to – no need to copy it out again.

Easy to use and fully supported

Step-by-step wizards for the key tasks, walkthrough videos and other resources available on-demand.

- Browser based, so it works from anywhere.
- Step-by-step wizards for the key tasks
- Walkthrough videos and help content on our website and in the platform.

To get started, all you need is an Edexcel Online account (your centre's Exams Officer can set one up) and for the myBTEC profile box to be ticked.

To log in to the service, go to http://mybtec.pearson.com.

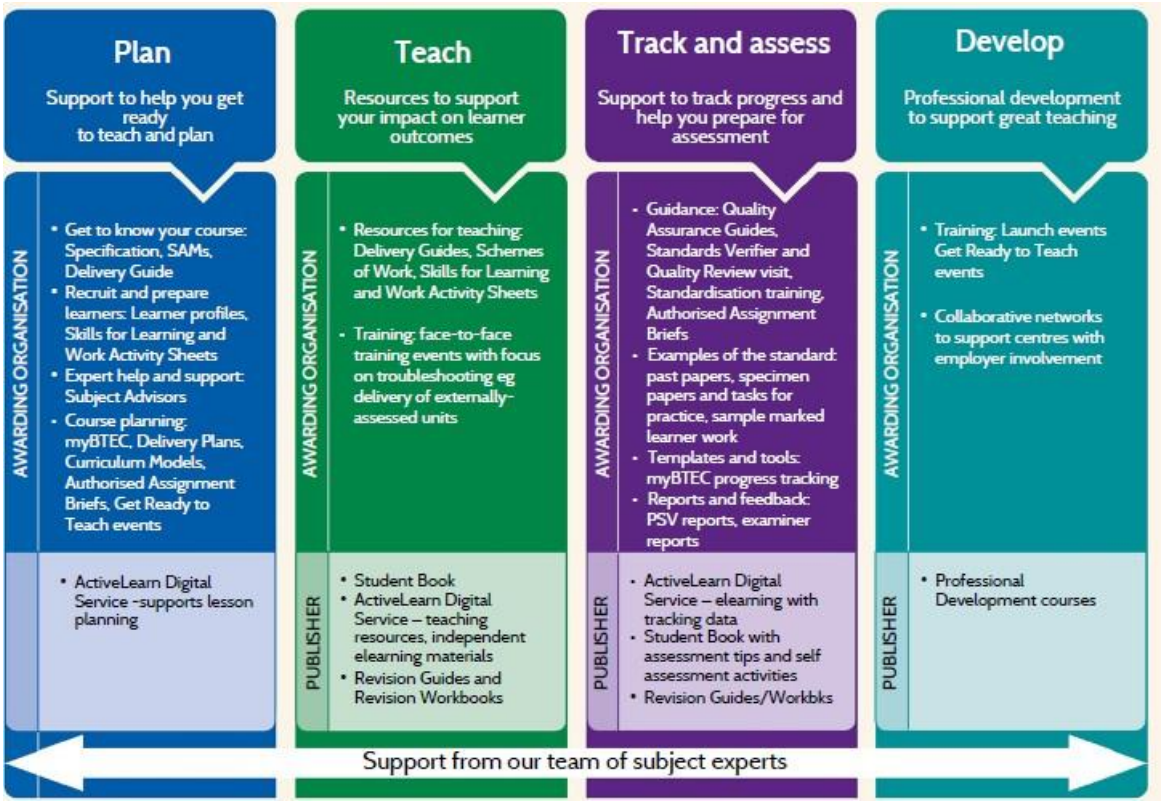
For help, support and user guides, or to sign-up for a free online training event, go to http://quals.pearson.com/mybtec.

5 SUPPORT AND RESOURCES

There is a wealth of resources available to ensure you feel confident delivering your BTEC National qualification throughout your entire course. Refer to the Pearson website for a full list of resources available http://qualifications.pearson.com/en/qualifications/btec-nationals/animal-management-2016.html

As well as the free resources supporting the qualification, provided by Pearson as an Awarding Organisation, Pearson Learning Services ('Publisher' in the tables below) provides a range of engaging resources to support BTEC Level 3 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.



In addition to the 'publisher' resources listed above, other publishers in addition to Pearson may produce textbooks that are endorsed for BTEC. Check the Pearson website (http://qualifications.pearson.com/en/support/published-resources.html) for more information as titles achieve endorsement.

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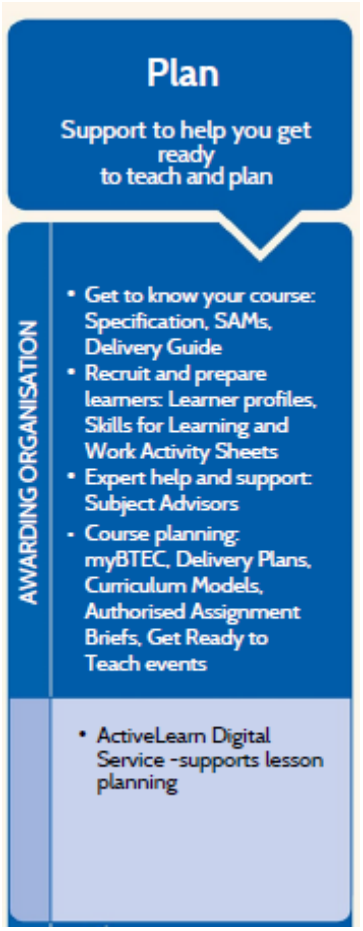


Sample assessment materials: sample assessments, complete with mark schemes, to help you plan how to prepare learners for the external assessments.

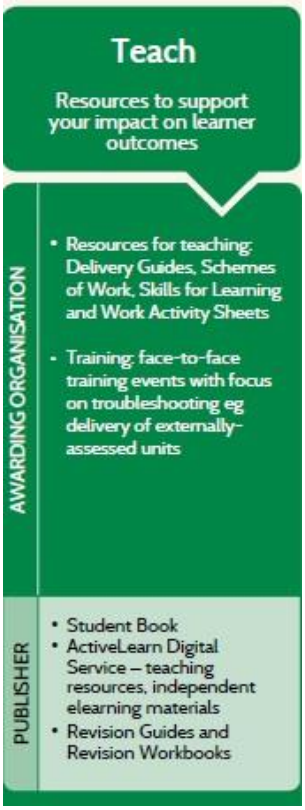
Delivery plans: an example of how you could structure your course at different sizes of qualification over one or two years, with details of which units would suit teaching together and highlighting key dates.

Authorised assignment briefs: assignments approved by Pearson Standards Verifiers (remember that they must still be verified at every use) available through the Pearson website and on myBTEC.

Mapping documents: will provide a resource as to where the new 2016 qualification retains the same or similar content as the 2010 qualification.

Schemes of work: available as customisable Word™ files for all mandatory units in each sector to provide ideas for teaching and learning activities.

Skills for learning and work: activity sheets to be used during the induction process, introducing learners to their BTEC course and helping them think about learning strategies and how best to approach their work.



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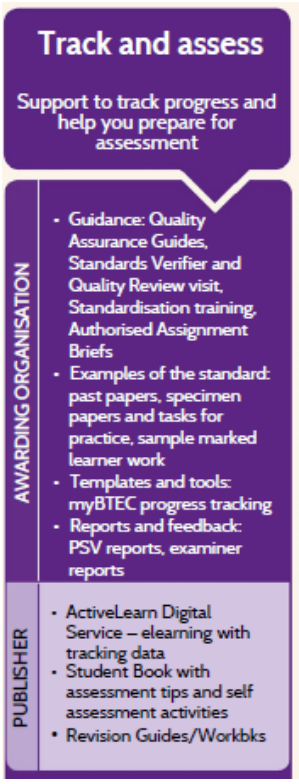

Sample marked learner work: exemplar marked learner work for selected internal and external units to help you understand the expectations of the standard for each grade.

Sample assessment materials: additional sample papers will be available from September 2016 for units that are first assessed in Summer 2017. For units first assessed in 2018, additional SAMs will be available from 2017. Past papers will be published following each assessment, complete with mark schemes, on or before results day for that series. Examiner's reports will also be available from 2017. Further assessment materials will be made available as the course progresses. These materials can be found on Edexcel online.

Training: we have a range of events to help you in every aspect of planning, teaching and assessing your BTEC. To make it as easy as possible for you to benefit from our training, many of our face-to-face events are available as online sessions, and you can request for any of our events to be delivered in your centre.

There are also a number of people who are available for you to speak to:

Subject advisor
UK: 020 7010 2173 TeachingLandBasedStudies@pearson.com

- **Standards Verifiers** – they are subject specialists who can support you with ensuring that your assessment plan is fit for purpose and whose role is to confirm that you are assessing your learners to national standards as outlined in the specification by 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 for the new BTEC Level 3 Nationals can be found on the Pearson website here:
http://qualifications.pearson.com/en/support/training-from-pearson-uk.html

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Unit 1: Animal Breeding and Genetics

Delivery guidance

Approaching the unit

This unit is designed to give learners a broad understanding of animal breeding and genetics. Learners will also develop the skills to use this information and apply it to a range of real-world scenarios. There is scope for learners to undertake practical activities to support their theoretical learning and build their practical skills in assessing and handling animals.

A working knowledge of animal breeding and genetics is applicable to many areas of animal management. Give your learners the opportunity to explore the range of principles and practices before they have to apply them to a range of work-based scenarios.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units, and this allows them to be taught in any order. It is intended that you should take a holistic approach to the delivery of the units. You could set tasks that enable learners to gain practice and acquire skills relevant to several related units at the same time. For example, this unit could be delivered alongside *Unit 2: Animal Biology* or *Unit 9: Practical skills in Animal Science*.

Delivering the topics

You could introduce this unit by presenting a range of high-profile case studies demonstrating the practical value of the unit. Select your teaching strategies carefully, ensuring that they will best facilitate learning and encourage your learners to apply the knowledge that they gain during this unit.

You could deliver topic A using a mix of presentations, independent research, small group tasks and practical activities. Learners could begin by researching the mate recognition systems for a given species and presenting this information to the class. Learners could then go on to explore the factors that influence breeding programmes before constructing their own breeding programmes in small groups.

Guest speakers could give learners information about breed profiles and animal evaluations, while visits to animal centres would allow learners to practise animal evaluations. Give learners the opportunity to conduct independent research and 'flipped learning'. Ensure that learners also do enough hands-on activities to develop the practical skills required within the industry. You could use either the centre's own animal collection or external facilities such as farms and petting zoos.

Topic B allows for a range of group and individual tasks. This should encourage learners to apply the knowledge that they have gained throughout the unit so far. You could arrange for guest speakers from a variety of animal breeding roles, such as those with veterinary or genetic engineering experience. You could also arrange visits to animal centres to allow learners to develop an understanding of the practical application of animal breeding. During tutor-led activities, you could direct learners to information regarding conception,

parturition and neonate care. Learners could research around this and produce display material for each aspect. Small group tasks could include creating care plans and recording system templates for neonate animals. Use 'jigsaw' activities to encourage learners to research together and present information to other learners on common problems within animal breeding.

Topic C covers a lot of specific scientific concepts. You may wish to give detailed presentations to ensure that all key aspects are covered, followed by activities that will test and develop learners' understanding of the given information. You could incorporate class debates into your delivery on topics such as ethical issues and evaluating different techniques. Learners could then go on to research reproductive technologies and produce leaflets explaining the different technologies. You could also use practical activities to demonstrate gene interactions and the techniques used in genetic manipulation. Give learners case studies of monohybrid and dihybrid crosses, as this will help to contextualise the given information and improve their understanding of Mendelian genetics.

Assessment guidance

This unit is externally assessed, so sustained formative assessment is essential. This will help you to ensure that each learner really understands each topic. Learners will also need to become familiar with assessment-style questions, which could be done through completing regular knowledge-checking quizzes or by incorporating mock-assessment questions into lessons.

In addition to knowledge checks, give learners plenty of opportunities to practise answering scenario-based questions. This will ensure that they can analyse different situations and apply their knowledge in a practical or work-based context, by making justified recommendations for animal breeding management.

Two weeks before the external assessment, the pre-release scenario will be made available. Learners are expected to spend approximately six hours gathering information related to the scenario. It should be noted that while a scenario is given ahead of time, the assessment will also review knowledge from across the whole unit, so you may wish to advise learners to include key areas in their notes.

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Getting started

This gives you a starting place for one way of delivering the unit. Activities are suggested in preparation for the external assessment.

Unit 1: Animal Breeding and Genetics

Introduction

This unit will help learners to move directly to employment where active animal breeding programmes are managed.

Good practices in animal breeding and knowledge of genetics are pivotal in effective animal husbandry. Recent developments in this field have allowed people to understand techniques used for centuries and to refine breeding processes. This unit aims to give learners the knowledge and skills to manage captive animal breeding successfully, so you could introduce the unit by emphasising its industry relevance.

Expect to give learners sustained support throughout the topic, in order to ensure that they have access to key information as listed in the unit content. You could do this by giving tutor presentations, holding directed 'flipped learning' sessions or issuing set research tasks.

If it is possible to arrange, this unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local zoos or farms
- contribution of ideas to unit assignments/projects
- opportunities for observation during work experience
- support as mentors.

Previous learners of the BTEC Animal Management course could also be invited to share their experiences with the class and act as mentors.

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

- You could introduce this topic by discussing the importance of mate recognition strategies, using case studies as examples. You could allocate a species to each learner and ask them to research the mate recognition strategies of their given species.
- Lead a group discussion on the survival strategies of different animals and the success of each one. You could allocate small groups of learners taxa to investigate in detail and feed back to the class on. Differentiation could be through the taxa allocated to each group and questioning when the information is discussed as a group.
- Split the group into pairs or small groups. Give each pair or small group a case study about the neonatal care strategies used by a given taxa of animals. Learners can produce an activity based on this information to be used by the rest of the group. Learners could be encouraged to develop exam style questions differentiating between the command terms listed in the unit content.
- Guest speakers may help to contextualise the principles and practices of breeding in the real world. For example, you could invite a judge from an agricultural show to offer their perspective on selection, breed requirements and breed profiles.
- As a piece of independent learning, learners could apply their knowledge to a real-world scenario by developing their own breeding programmes. They could base their breeding programme on given herd profiles and a desired characteristic. Alternatively, you could ask learners to trace the breeding history of specified

individuals (e.g. racehorses or show dogs), or give them examples of breeding programmes to compare and evaluate.

- Practical experience would also be useful. You could visit animal centres to evaluate their handling techniques and strategies. If you cannot arrange a visit, you could use the animal care unit at your centre and/or video clips of a variety of species instead.
- In order to ensure that learners become familiar with the format of the external assessment, give them scenarios and ask them to answer questions on these given scenarios. You could decrease the level of support you give during these tasks until learners are working under external assessment conditions.

Topic B – Investigate management practices of breeding and young animals and how these contribute to successful breeding management

- You could start this topic by asking learners to discuss the reasons for breeding animals, including examples of selective breeding. In small groups, learners could choose an area to research, including the potential economic impact of breeding management and then work together to collate their information into a class fact-file.
- This topic offers plenty of potential for 'flipped learning', small group tasks and individual research tasks. You could set 'jigsaw' tasks on particular topics by directing learners towards specific resources on different topics and asking them to feed their findings back to the group.
- Learners could work in small groups or pairs to devise a suitable recording document, and then contribute their ideas to a whole group discussion. You and the group could then create a final recording document based on their ideas and suggestions.
- If possible, learners could take part in practical parturition (e.g. lambing, hatching chicks, etc).
- Learners could read and answer questions on a range of case studies of common problems in neonates (e.g. deformities, hereditary conditions). These case studies should also include descriptions of how these neonates were cared for.
- As a research topic, learners could compare the legal requirements for breeding livestock, endangered species, laboratory animals and dogs.
- Help learners to recognise the practical relevance of their research. You could do this by supporting them to develop care plans for given species, giving them time for related practical work on the animal care unit. You could also invite guest speakers such as animal breeders (e.g. herptile or agricultural breeders) to discuss their own experiences and industry trends.
- Building on learners' practical experience from topic A, you could revisit the same animal centres and ask learners to reassess animals in more detail or for a specific purpose. You must ensure that all specification points are covered. Learners could also have the opportunity to carry out care plans.
- Sustained formative assessment is essential, as this will allow you to monitor learners' progress and promote success in the final external assessment. You could do this through a mixture of activities, such as quizzes, scenarios and case studies, short-answer questions, question and answer sessions, and small group work to devise questions for other groups to answer.

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

- You could begin delivery of this topic by asking each learner to investigate one reproductive technology currently used in the industry. They should present their findings to the rest of the group, and the group can discuss them to evaluate the purpose and limitations of each technology.

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- Practical activities will help to ensure that learners will see the relevance of their classroom-based study. They could include cross-breeding strains of common fruit fly (*Drosophila melanogaster*), carrying out DNA extraction and gel electrophoresis. You could also show learners video clips of genetic mutation occurring within a cell.
- Learners must practise completing monohybrid and dihybrid crosses as listed in the unit specification. You could facilitate this through scenarios and case studies such as the role of the agouti gene in horse colouring.
- Guest speakers on the subjects in this topic could include genetic engineers discussing how technologies are used in industry for animal breeding.
- As a research task, learners could investigate different types of mutations and the characteristics that result from these mutations.
- Hold a debate on the ethics of gene manipulation.
- Formative assessment throughout learning C could incorporate the whole unit content and should assess whether learners have retained what they have learned so far and have the ability to apply it. It would be useful for learners to sit a mock assessment, so that they are familiar with the format of the assessment and working under exam conditions. Feedback on this should encourage learners to distinguish between command words and the level of detail required for each.

Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 2: Animal Biology*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Journals

- *Journal of Animal Breeding and Genetics* (Blackwell)
  Current research into animal breeding and genetics with examples for case studies.

Videos

- www.youtube.com/playlist?list=PL3FEEBA5664A1B338
  Guidance on farm safety, including the safe handling of farm animals, from the Irish Health and Safety Authority.

Websites

- www.biologycorner.com/bio2/genetics/notes_dihybrid.html
  Genetics teaching resource, including practice questions.
- http://randd.defra.gov.uk/
  DEFRA's science and research portal. Use the navigation menu to find research into a variety of topics (see especially Fields of study > Livestock).

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Unit 2: Animal Biology

Delivery guidance

Approaching the unit

An understanding of animal biology is essential in order to give appropriate care and maintain high levels of animal welfare. This unit explores the fundamental ways in which birds and mammals that are in good health function and interact with their environment and gives examples of how disorders in systems can lead to poor health. It also outlines the ways in which animals are classified so they can be studied in an organised way and to gives clues to the evolutionary relationships between species.

The study of animal biology offers many diverse learning opportunities including visits to animal collections, visits by guest speakers from specialist fields in industry, research and higher education, laboratory activities, hands-on problem-solving activities and development of critical-thinking skills. A varied approach is encouraged in order to allow learners to fully engage with, and develop a deep understanding of, the biological issues within the unit.

Be flexible. Learners do not all learn at the same pace or in the same way so you will need to adapt or extend lessons according to the learning that is taking place. Some learners may require additional tutorial sessions. There is scope within the guided learning hours for the unit to accommodate this outside of the suggested scheme of work. It is essential that you give learners guidance on how to approach examination papers and offer plenty of practice to ensure that learners are able to convey their understanding in the external examination at the end of the course.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order. It is intended that you should take a holistic approach to the delivery of the mandatory units, for example you could deliver this unit alongside *Unit 10: Animal Metabolism*, *Unit 11: Advanced Animal Nutrition* or *Unit 17: Principles of Animal Nursing*.

Delivering the topics

Topic A deals with the biological systems that make up animals and allow them to function. Be careful to use resources that are relevant to animals rather than just humans. Learners are more likely to develop a deep understanding of these systems if they are able to engage in a concrete way with the content. When delivering material on the musculoskeletal system, for example the use of model skeletons learners can handle, along with physically handling animals, will be far more effective than simply labelling diagrams or viewing animations in isolation. Wherever possible and the content allows, learners should interact with living animals.

Dissection work forms a large part of the suggested learning approaches for many of the systems. Where this occurs, learners must not just 'dive in' to the practical, and need to develop their dissection skills and be aware of which structures they are looking at. A clear protocol to follow with helpful photographs and checkpoints will keep learners on track. Questions that make the experience meaningful will also help to do this. There are some websites containing virtual dissection simulations but, though these are helpful, it is the hands-on, practical investigations that really engage learners and help make the link between biological theory and reality.

It is important for learners to be able to quantify processes taking place in the animal body. However, learners frequently encounter difficulty when constructing and analysing graphs, understanding units and conversions and relating these to events taking place in the body. It may be worthwhile spending some time ensuring learners can construct and interpret simple graphs before embarking on the potentially more complex biological data found throughout the unit. Use exam-style questions for both formative and summative assessment. Learners working together to improve their ability in conveying what they mean under exam conditions is a very useful tool. Inviting local vets or animal physiotherapists to visit can give a positive contextualisation of the purpose of learning about these systems, but make sure that you, and they, are clear about their role prior to the lesson or visit.

For topic B, establish the level of learners' prior knowledge about cell structure. They will have covered this from Key Stage 3 onwards and it is useful to build on what they already know. Making links between the cellular, tissue and system organisation of animals will help learners develop and maintain an understanding of the context in which they are learning. Learners could carry out research into tissue types and work together in groups to teach one another, but will need to be thoroughly prepared for how to go about this in order to pull out the relevant points and level of detail.

Learning how to use a light microscope can be a frustrating process, so make sure that you are very familiar with the common potential pitfalls and how to correct these. Images from scanning electron microscopes (SEM) are interesting to learners, although they are often unaware that SEM images are greyscale. Explaining this can lead to an informative debate about the presentation of images (e.g. how they end up being coloured and, separately, how much of what you can see should be believed).

A useful starting point for topic C could be for learners to examine the observable differences between animals and to appreciate the proportions of each class of vertebrate in existence today. The uses of classification systems in, for example, conservation biology and evolutionary biology should be explored and the modern uses of genetic and biochemical analyses introduced from here. A frequent misconception in this area is that mutations are **caused** by selection pressures, which then leads to natural selection. It is important to be explicit when explaining how natural selection takes place and to test learners' understanding of the process. There are websites that have learner-friendly, interactive content for the teaching of this topic, but you should check the reliability of website content in advance to prevent learners inadvertently accessing websites that actively teach that evolution has not occurred.

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Assessment guidance

This unit is externally assessed by an examination lasting 1 hour 30 minutes, with 80 marks available. There will be a variety of question types, including objective questions, short-answer questions and extended writing opportunities. Background and stimulus information, including images, text and data, will be present in some questions and sub-questions.

You should make sure learners are familiar with the question command words and how they are expected to respond to these in different question types. Make it clear to learners that they will need to be able to demonstrate the links between structure and function and that many questions, especially longer responses, will require them to organise and communicate their understanding coherently.

Reinforce scientific terminology relevant to each topic during lessons. Encourage learners to make their own glossaries and to practise using terminology correctly and in context. Learners require practice in responding to questions under examination conditions so include mock examinations at appropriate points in the course. Show learners examples of responses that are at different levels so they can become familiar with what is required. Give learners the responsibility of actively reflecting on their performance in each assessment: this will allow them to understand how they can make improvements to their own responses in the future.

Getting started

This gives you a starting place for one way of delivering the unit. Activities are set out in preparation for the external assessment.

Unit 2: Animal Biology

Introduction

Begin by outlining the structure of the unit, its topics and the nature of the examined assessment. Give learners the opportunity to think about and discuss how they will approach developing their knowledge and understanding of the unit within the context of the overall qualification.

This unit will provide learners with the detailed biological knowledge that contributes to successful animal management, and will provide grounding for further study in the biological sciences or a career in veterinary medicine.

If possible, engagement with local employers, such as veterinary staff, zookeepers or animal laboratory technicians will benefit learners by providing opportunities for learners to observe them at work or by acting as mentors.

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

- Ask learners to manage their own time to complete a series of tasks, e.g. using labelled diagrams to locate bones on model animal skeletons, using textbooks or other resources to identify different methods of locomotion and adaptations of different animals, attaching labels to diagrams of animal skeletons, using the internet and other resources to research the structure and function of different joint types.
- Ask learners to work in small groups to research a particular type of animal digestive system and prepare to teach the key points of their research to learners in other groups.
- Give learners a circus of activities linking external stimuli with senses, e.g. boxes of items with different textures, smells, sounds, colours. Ask learners to complete structured worksheets based around the function and importance of the nervous system to the health and survival of animals in detecting stimuli, in order to interact with the external environment.
- Involve learners in organising the room into sections representing parts of the circulatory system, including chambers of the heart. Use large format cards to name each section. Ask learners to simulate the passage of a red blood cell around the double circulatory system. Use coloured balls to represent oxygen and carbon dioxide and ask learners to exchange the balls as gases would be exchanged in the lungs and respiring tissues.
- Ask learners to prepare a fact file based on the reproductive processes in a species of animal. Learners present their fact file in small groups, giving constructive feedback to each other for future improvements.
- Give learners a kidney dissection protocol to follow. Ask learners to dissect a kidney, identifying the relevant structures and answering questions about the structure and function of excretory systems.
- Ask learners to research the thermoregulatory systems of an animal of their choice. Learners could then create large posters summarising their findings. Display these around the room and ask learners to examine one another's posters and give

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constructive feedback on the quality of information communication. Learners can then make notes on the thermoregulatory systems of mammals or birds that they did not research themselves.

- Ask learners to work in pairs to assess sample responses to exam-style questions.

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

- Ask learners to use their knowledge of cellular ultrastructure to make a 3D model of an animal cell using coloured modelling clay, constructing it from the centre outwards. They can then slice the 'cell' open to simulate how cells are cut at different angles when making slides for viewing under a microscope.
- Introduce the light microscope and how it is used. Give learners a range of slides of cells and tissues prepared with different stains to study. Ask learners to draw sections of tissues, labelling these with the magnification and sizes of structures they observe.
- Ask learners to create a feature article for an online magazine describing how cells are studied. It should cover the process from slide preparation and staining to the use of different types of microscopes.
- Give learners thinly sliced discs of carrot and differing concentrations of sugar solution. Learners investigate the process of osmosis, measuring masses before and after soaking in each solution. They can then construct graphs allowing them to estimate the internal concentration of the carrot discs.
- Ask learners to carry out research on the locations and functions of each tissue type.
- Ask learners to create storyboards illustrating the transmission of an action potential across a synapse.
- Give learners exam-style questions to answer. Once complete, ask them to work in pairs, discussing and identifying how to improve their answers.

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

- Discuss with learners how they could theoretically breed terriers from wolves.
- Give learners a range of animals. Ask them to discuss the adaptations each animal has and to suggest how these are suited to the diet and lifestyle of the animal.
- Give learners sequences of DNA from three different hypothetical animals. Ask learners to compare the sequences, identifying similarities and differences between them. Learners can then decide how closely related the animals are to one another and link this to how comparisons of amino acid sequences are used in a similar way.
- Learners use information on the armadillo, bat, duck-billed platypus, whale and pangolin in order to try to classify them into vertebrate classes. Discuss their findings and talk about how observable features and genetic and biochemical analyses are used to assess the evolutionary relationships between animals and resulting phylogenetic tree construction.
- Learners work in pairs to mark each other's responses to a mock exam, identifying areas of strength and weakness. They can then discuss how their approaches to revision and exam technique affected their performance.

Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 1: Animal Breeding and Genetics*
- *Unit 3 Animal Welfare and Ethics*
- *Unit 4: Practical Animal Husbandry*
- *Unit 5: Animal Behaviour*
- *Unit 6: Animal Health and Diseases*
- *Unit 9: Practical Skills in Animal Science*
- *Unit 10: Animal Metabolism*
- *Unit 11: Advanced Animal Nutrition*
- *Unit 17: Principles of Animal Nursing*
- *Unit 19: Farm Livestock Husbandry*

The previous QCF Level 3 BTEC National in Animal Management also has units that link to this and resources produced or purchased for those units may be suitable for use in this unit. Many AS and A-level Biology qualifications will have some significant linkages to the unit content.

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

- Aspinall V, Cappello M – *Introduction to Veterinary Anatomy and Physiology Textbook, 3rd edition* (Butterworth-Heinemann, 2015) ISBN 978-0702057359.
  Diagrams and text for animal anatomy and physiology in a learner-friendly format.
- Lawrence E – *Henderson's Dictionary of Biology, 15th edition* (Benjamin Cummings, 2011) ISBN 978-1408234303.
  Definitions of key biological terms. Useful throughout the course and in glossary compilation.
- Weyers J, Reed R, Jones A – *Practical Skills in Biology, 5th edition* (Pearson, 2012) ISBN 978-1408245477.
  A useful guide to common practical skills undertaken while studying biology.

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Journals

- *Biological Sciences Review* (The University of Manchester).
  Articles are relevant and engaging for all aspects of biological sciences and aimed at level 3 learners. It is useful for general background, reference and research tasks.

Videos

David Attenborough's BBC documentaries, including *The Life of Mammals* and *The Life of Birds*.
Many short clips from these could be used to illustrate adaptations and natural selection and to contextualise the unit content.

Websites

- www.animalearn.org/links.php#.Vh5CDHpViko
  This *Animalearn* website has links to many virtual dissection resources, organised by animal.
- www.bigpictureeducation.com/
  The resources page on this *Wellcome Trust* site includes some educational resources for post-16 learners and biology tutors.
- www.bscb.org/learning-resources/softcell-e-learning/
  This *British Society for Cell Biology* site has many cell biology educational resources.
- www.dairy.ahdb.org.uk/technical-information
  This site from the *Agriculture and Horticulture Development Board (AHDB)* gives technical information on a range of subjects related to dairy cattle.
- www.merckvetmanual.com/mvm/index.html
  The Merck Veterinary Manual is a useful source of information about animal systems and animal health.
- www.outreach.mcb.harvard.edu/animations/checkpoints.swf
  This is a cell cycle animation from the *Harvard University Outreach* program.
- www.projectbeak.org/adaptations/start.htm
  This *Nebraska Bird Partnership* site gives information on body systems in birds.
- www.ucmp.berkeley.edu/taste/
  This resource from the *University of California Museum of Paleontology* is an interactive-learning module on evolutionary relationships and cladistics.

Unit 3: Animal Welfare and Ethics

Delivery guidance

Approaching the unit

This unit forms a crucial part of the qualification as all aspects of managing and keeping animals involve considering animal welfare and ethics. The UK is well known for its love of animals and keeping pets, and it has played an important part in the history of animal welfare. All those working with animals need to know how best to look after the animals in their care, keeping them safe and in the best health according to their particular needs at all times.

Learners need to have a sound working knowledge of animal welfare and associated current legislation in preparation for their future work in the animal industry. A major part of keeping animals in captivity is paying close and careful attention to their environment, ensuring they are kept in satisfactory conditions and that their individual needs are met. Learners must be fully aware of the key aspects of animal welfare so that they can learn to identify good and bad practice and promote high standards of welfare when working with animals in the workplace and with pets at home.

Animal welfare and ethics also covers a range of controversial areas, e.g. killing animals for food, use of animals for different purposes and keeping animals in captivity. It is important that learners have good underpinning knowledge and understanding of the facts and issues that they can use to argue for or against different practices, rather than arguing simply from an uninformed emotional standpoint.

Studying animal welfare and ethics usually prompts plenty of discussion. Many of the issues do not have straightforward or correct answers. Learners should have as many opportunities as possible to use their developing knowledge to discuss the issues. For some issues, such as keeping animals in captivity, there is no right or wrong answer, but it is important that learners are able to explore these issues under your expert guidance. You should guide learners through these discussions and ensure that they are aware of all the ethical dilemmas associated with keeping animals.

Learners often find the legislative and theoretical aspects of welfare less engaging, so you will need to include plenty of examples that learners can identify with and which demonstrate the relevance of the topic.

You should deliver this unit as practically as possible, using a wide variety of delivery methods to reflect the diversity of the content of the unit. The first topic has a theoretical base, but the second topic is more practical and should allow learners the opportunity to assess how the welfare needs for a range of animals are met. You should encourage debate and explore a range of ideas and approaches to keeping animals. This will help learners to enjoy learning about welfare and to be confident about voicing their own views on the ethical and perhaps more controversial issues. They will learn industry-specific skills, such as how to recognise good and bad practice in animal care. They will also gain transferable skills such as how to research information and to use it to debate, weigh up facts and draw conclusions from them.

You can use a range of delivery methods in this unit, for example:

- discussions, both as a whole class and in small groups, on aspects of animal welfare
- case studies to illustrate animal enterprise and different aspects of care and welfare
- individual or group presentations covering case study results or presenting findings to others
- research activities in preparation for the external assessment, examples of research activities include collecting data, analysing data, drawing conclusions and making recommendations and report writing
- visits to local animal enterprises or businesses to observe practice; learners should be encouraged to be active, posing questions devised beforehand, rather than passive
- DVDs or videos to give information on some aspects of animal welfare that might not be immediately accessible to visit, such as the work of RSPCA inspectors.

Group work is useful but you must ensure that learners individually produce evidence that is good enough to help with revision for the external assessment, supported by handouts from you or from peer groups.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order. It is intended that you should take a holistic approach to the delivery of the mandatory units, for example this unit could be taught alongside *Unit 9: Practical skills in Animal Science* or *Unit 23: Zoological Animal Health and Husbandry* and it has links to all other units in the qualification.

Delivering the topics

As this unit is a synoptic unit and, as such, makes links with much of the rest of the content of the course, it is worth delivering it earlier in the course rather than later. This will heighten learners' awareness of animal welfare issues, and you can develop this further throughout the rest of the course.

Topic A is concerned with ethical issues in animal welfare. It will help to engage learners and ensure that they understand the practical relevance of the theory behind animal welfare and the associated legislation. You should teach this topic before going on to topic B.

In order to engage learners, you will need to create opportunities for them to practise researching and gathering information, evaluating and then recording it and drawing conclusions as appropriate. This will help prepare them for the external assessment process. They will also need to rehearse their ideas and views through discussion, both in small groups and with the whole class.

The second topic focuses on welfare appraisals for assessing the health and wellbeing of animals, and has a more practical emphasis. You can encourage learners to put the more theoretical aspects into practice through visiting animal

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environments. Learners could assess the suitability for purpose of the different animal environments using focused tasks designed to investigate particular aspects of animal care, e.g. the five freedoms. Learners could make visits to animals at a local centre, at a workplace or in commercial units.

Assessment guidance

This mandatory synoptic unit requires learners to apply learning from across the qualification to complete one defined vocational task.

For this synoptic unit, learners complete the pre-released part A task, individually preparing up to four sheets of A4 of notes to use with part B. Learners will have two weeks to prepare for part A. Part B is completed under controlled conditions, with learners using their own notes and the separate stimulus materials made available. They complete part B under supervision, using knowledge and understanding from their own studies of the sector and their research gathered during part A, and by applying both transferable and specialist knowledge and skills.

When delivering the unit, you must make sure learners understand that the assessment will draw on content from across the qualification.

Learners should be encouraged to think about the breadth of their learning across the course when completing the assessment, as well as in practice-assessment activities, because animal welfare and ethics impinge on **all** aspects of animal management. Reassure learners that synoptic assessment does not mean they will have to answer a question on a subject not associated with this unit, but that they need to demonstrate a wide understanding of the course. You could discuss with learners how synoptic assessment can support access to higher education, with the assessment exemplifying knowledge gained across the whole course.

Learners must have experience of conducting their own research during the delivery of this unit, before the assessment activity, so they are familiar with gathering, using and evaluating information. This research process will help learners to use evidence in order to justify the conclusions they have reached or suggested.

The more practice learners have at researching and using information, the better prepared they will be for this time-controlled assessment. You could give them a timed mock assessment activity once all the teaching is completed prior to undertaking individual research on the pre-release material.

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Getting started

This gives you a starting place for one way of delivering the unit. Activities are suggested in preparation for the external assessment.

Unit 3: Animal Welfare and Ethics

Introduction

Begin by introducing the unit through a group discussion exploring some concepts of animal welfare with which learners are familiar. What are the issues? Why are they so important? What controls are there to prevent cruelty? Who polices animal welfare? What happens if cruelty and poor welfare practices are identified?

You could then outline the topics and the delivery of the unit, with information about the details of the external assessment. Each topic will occupy about half of the delivery time. This will include time allocated for revision and practising for the external assessment.

This unit will prepare learners for any role in the animal sector where they will be working directly with animals, for example zoos, farms, pet shops, animal charities or welfare organisations.

If possible to arrange, this unit would benefit from engagement with local employers such as pet shop owners, farmers, zookeepers, staff from animal welfare charities or the police. Representatives from these organisations could be invited to be guest speakers, run workshops, become mentors or provide opportunities for learners to observe them at work.

Topic A – Ethical issues in animal welfare

- Ask learners individually to record which aspects of animal welfare and ethics they think are the most crucial and why. Learners should briefly report these finding back to the class.
- Learners to collaborate and work together in small groups to investigate how ethical beliefs are shaped, what ethical theories are and what frameworks exist or can be evolved for ethical decision making, what consumer ethics are and how ethics impact on legislation.
- Learners should collaborate and work together in small groups to come up with examples of different aspects of animal welfare they have experienced, both good and bad.
- Each learner or small group could contribute to a class discussion on the nature and scope of these different aspects, giving their own views. This whole class discussion can bring together overall findings and result in a list of key welfare issues.
- Using the learners' examples, lead a discussion on different forms of animal ownership. Ask learners to consider who would be the key stakeholders and why.
- Research individual legislation and the impact it has on maintaining animal welfare standards.

Topic B – Welfare appraisals for assessing the health and wellbeing of animals

By this stage, about halfway through the unit, learners will be developing a good knowledge and understanding of the issues linked to animal welfare and ethics.

- Ask learners to work in small groups to carry out research into the requirements of different animal environments and how to assess these environments. Each small

group could research one or more different animal groups. This could be through online research or visits to local animal units. Different groups of learners could visit different, and contrasting, animal units in the area with a view to gathering a variety of information across the class.

- Ask learners to prepare a checklist that can be used to assess animal premises.
- Learners can prepare and deliver a presentation with professionally presented slides to give their findings to the class.
- Use the learners' presentations to lead a discussion on the suitability of different types of environment for different types of animals.
- Learners could research the nutritional requirements for an allocated animal group across a range of life stages, identifying how a poor diet can affect welfare.
- Discuss the link between animals exhibiting natural behaviours and good welfare.
- Research activity - investigate the five animal needs and how they are implemented for an allocated animal. Learners present findings to the rest of the class.
- Practically appraise animal welfare in a range of situations.
- Role play – carry out an RSPCA inspection for a specific scenario.

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Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Animal welfare and ethics are fundamental to all aspects of animal management and therefore link with almost all units in this qualification.

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

The following books on animal welfare are useful as library copies to give sources of information for learners and tutors. Legislation often changes so it is important to refer to the latest edition of textbooks.

- Waldau P – *Animal Rights: What Everyone Needs to Know* (Oxford University Press, 2011) ISBN 978-0199739967
  This book is organised round a series of probing questions and gives a complete, even-handed, survey of the animal rights movement.
- Appleby M C, Hughes B O, Mench J A and Olsson, A – *Animal Welfare, 2nd edition* (Cabi Publishing, 2011) ISBN 978-1845936594
  This book gives a broad introduction to the key topics in the welfare of large, small, farm, companion, wild and zoo animals.
- Broom D M – *Sentience and Animal Welfare* (Cabi Publishing, 2014) ISBN 978-1780644035
  An invaluable resource for learners and researchers of animal welfare and biology, but also an engaging and informative read for vets and the general public.
- Grandin T – *Improving Animal Welfare: A Practical Approach* (Cabi Publishing, 2009) ISBN 978-1845935412
  A very practical book which aims to help those working with animals to apply methods for improving animal welfare, bridging the gap between practice and scientific principles.
- Hosey G, Melfi V and Pankhurst S – *Zoo Animals: Behaviour, Management and Welfare, 2nd edition* (Oxford University Press, 2013) ISBN 978-0199693528
  Draws on the authors' extensive experience of zoo research, practice and teaching. They blend theory with a broad range of mammalian and non-mammalian examples to give a readable overview of this area.
- Radford M – *Animal Welfare Law in Britain: Regulation and Responsibility* (Oxford University Press, 2001) ISBN 978-0198262459
  This book is a detailed and authoritative analysis of the state of animal welfare law in Britain to date. It includes full coverage of key topics such as agricultural production, transportation, scientific procedures, entertainment, domestic pets, wildlife, hunting and enforcement.

- Robertson I A – *Animals, Welfare and the Law: Fundamental Principles for Critical Assessment* (Routledge, 2015) ISBN 978-0415535632
  This book explains the criteria by which the lawful use of animals is determined and how these have led to standards of animal protection and the responsibilities of people in their interactions with animals.
- Sandoe P, Corr S and Palmer C – *Companion Animal Ethics (UFAW Animal Welfare)* (Wiley-Blackwell, 2015) ISBN 978-1118376690
  This book explores the important ethical questions and problems that arise as a result of humans keeping animals as companions.
- Spedding C – *Animal Welfare* (Routledge, 2000) ISBN 978-1853836725
  A comprehensive guide to animal welfare issues, suitable for all levels of reader.
- Stamp Dawkins M – *Why Animals Matter: Animal consciousness, animal welfare and human well-being* (Oxford University Press, 2012) ISBN 978-0199587827
  In this book the author argues that we need to place less emphasis on the conscious experience of suffering in animals, and more emphasis on the practical importance of animal welfare to human health and wellbeing.
- Webster J – *Animal Welfare: Limping Towards Eden (UFAW Animal Welfare), 2nd edition* (John Wiley & Sons, 2005) ISBN 978-1405118774
  An authoritative guide and source of information on worldwide developments, current thinking and best practice in the field of animal welfare.

Websites

- http://awionline.org/
  Since 1951, the *Animal Welfare Institute* has been dedicated to reducing animal suffering caused by people. They seek better treatment of animals everywhere: in the laboratory, on the farm, in commerce, at home and in the wild.
- www.gov.uk/government/policies/animal-welfare
  Information on government policy on animal welfare.
- www.rspca.org.uk/home
  The *RSPCA* is the oldest welfare charity around, the first to introduce a law to protect animals and works hard to ensure that all animals can live a life free from pain and suffering. They campaign to raise standards of care and awareness of issues for the animals who have no voice.
- www.worldanimalprotection.org/
  World Animal Protection education courses and materials help learners worldwide to understand the importance of animal welfare.

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Unit 4: Practical Animal Husbandry

Delivery guidance

Approaching the unit

This mostly practical unit allows learners to develop husbandry skills for a range of animal species. Your practical sessions should demonstrate and inspire good practice in animal husbandry, while theory sessions should encourage independent research and teamwork. Learners must have access to a variety of species and handling equipment in order to develop their confidence and skills with a range of species.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order. It is intended that you should take a holistic approach to the delivery of the mandatory units, for example this unit could be delivered alongside *Unit 19: Farm Livestock Husbandry*, *Unit 23: Zoological Animal Health and Husbandry* or *Unit 24: Wildlife Ecology and Conservation Management*.

Delivering the learning aims

For learning aim A, it would be good to give learners a thorough introduction to working with animals and the specific animals kept at your centre. This will give them an insight into the safety issues that can arise when working in animal care. Learning aim A focuses on handling, moving and restraining animals, so it is vital to ensure that the relevant equipment is available. Always demonstrate how to handle, move or restrain animals before allowing learners to practise the same techniques, and always be sure that each learner is confident before allowing them to carry out practical handling. This will maintain the health, safety and welfare standards for both learner and animals.

For learning aim B, allow learners to develop their independent research skills by encouraging them to develop their own accommodation plans. Tutor-led discussions help to enhance learners' knowledge, but ensure that all learners have the opportunity to engage in question and answer sessions, as this will help to build their confidence. During practical activities, always demonstrate the correct methods of accommodation maintenance before allowing learners to complete the same task, to ensure that they follow best practice.

For learning aim C, learners will plan and implement a dietary regime for a range of species. Remind them to think about justifications for every choice that they make. Ensure that learners have access to relevant feeding, exercise and grooming equipment and have seen a demonstration of the equipment in use. They must be confident before you allow them to complete these tasks independently. Learners should also have the opportunity to practise visual health checking. You could do this by giving them access to the animal unit, showing them images of healthy and unhealthy animals, and/or making trips to animal collections. This will give them the chance to experience a large range of species on which to practise their visual health checks.

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	

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Assessment guidance

This unit is internally assessed. Learners must complete practical husbandry assessments, and it is recommended that learners collect a portfolio of evidence to demonstrate practical husbandry activities for a range of animal groups. Across the assignments, learners must produce evidence of essential husbandry activities, including handling, moving, restraining, accommodation maintenance, dietary requirement provision, grooming and bathing, exercising and health checking. Learners must also collect evidence to show that they have justified the selected equipment and techniques. This could be in the form of a presentation, report, or question-and-answer session during practical assessments.

For any practical assessments, learners must complete practical tasks for at least three out of the four listed animal groups: mammal, avian, herptile and invertebrates. Any species that fall within these groups can be selected.

You could also choose to assess learners through written tasks. Developing written feeding plans and accommodation maintenance plans will allow learners to develop their use of ICT, communication skills and independent study techniques.

There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments for *Unit 19: Farm Livestock Husbandry* or *Unit 23: Zoological Animal Health and Husbandry* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

Try to be imaginative in your assessment approach so as to engage learners and to make the method of assessment relevant to the learning aim being assessed. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- interviews with employers – recorded through video, email conversations or recorded video calling
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 4: Practical Animal Husbandry

Introduction

Good practice in animal husbandry allows an animal to be healthy and to live in an environment with high welfare standards. Animal husbandry encompasses various aspects of the daily routines for different species. The main aim of this unit is to instil in learners the animal husbandry skills and knowledge that they will need to maintain high animal welfare standards.

This unit will prepare learners 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.

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 such as zoos, farms or veterinary practices
- contribution of ideas to unit assignments/projects
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Previous learners of the BTEC Animal Management course could also be invited to share their experiences with the class and act as mentors.

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

- You need to give learners a sound foundation of knowledge about health and safety while working with animals. Learners should only begin practical sessions once they understand the importance of health and safety when working with animals.
- Discuss the definitions of 'risk' and 'hazard', and ask learners to think about risks and hazards that they may face when handling a range of animals. In groups or in pairs, learners could then investigate control measures for the hazards identified for a given species. When they have finished, each group or pair should feed their findings back to the whole group.
- Creating and filling out their own risk assessment forms will develop learners' cognitive and problem-solving skills, and will help them to identify risks and explain their decisions. If done in groups, this activity will also develop their interpersonal skills.
- Demonstrate techniques for handling, moving and restraining a variety of animals. This will allow learners to observe best practice and to see the techniques used in industry. You should also demonstrate the use of related equipment where applicable, such as snake hooks and cat bags. You could also discuss the different reasons for handling animals, perhaps by simulating different animal handling scenarios to demonstrate handling and restraint techniques.
- Encourage learners to familiarise themselves with handling, moving and restraining several species from the animal groups given, to allow a more advanced level of skills and experience.

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- You could incorporate an introduction to giving opportunities for exercise (topic C3) into practical sessions on handling, moving and restraining animals.

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

- Introduce animal welfare needs and how these needs link to choosing the accommodation and environment for each species (the five freedoms). You could give learners a range of specific species to discuss in order for them to talk about these considerations in detail. Tutor input can be minimal to allow learners to demonstrate research and independent study.
- In pairs or small groups, learners could inspect the accommodation and housing in the animal care unit and evaluate the materials and designs used. You could then take learners' recommendations and create a plan of proposed improvements for the animal care unit.
- Throughout this learning aim, ensure that learners consider their health and safety and the health, safety and welfare of the animals they work with. You could pause at key points in the process of assessing and maintaining animal accommodation and ask learners to consider the key factors in maintaining health, safety and welfare.
- You could integrate mathematics skills into the delivery of this unit by introducing stocking density calculations. Learners could also develop their independent study skills by researching the minimum size recommendations of accommodation for different species.
- Using physical samples of different beddings and substrates, ask learners to compare the materials for suitability for a range of species.
- Discuss the importance of record keeping and other administrative tasks when working in an animal setting. Learners must understand the roles and responsibilities of staff in the professional environment. To help them achieve this, you could identify roles within a given scenario or environment in the sector and ask learners to identify the responsibilities of each role.
- Give learners plenty of opportunities to practise their practical accommodation maintenance on a variety of accommodation and environment types. Give learners the opportunity to set up an animal's accommodation and repair or maintain it, as well as asking them to practise spot cleaning, full cleaning and disinfecting accommodation. Learners should do this both individually and in groups. They could also implement enrichment activities and change their accommodation around for enrichment purposes.

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

- You could start by revising the responsibilities of the roles in the animal care sector that you discussed in the previous learning aim, but this time including responsibilities relating to animals' dietary needs. You could enhance this by giving learners some detailed animal feeding plans and allowing them to discuss factors contributing to each animal's dietary needs.
- Learners could be encouraged to develop their cognitive and problem-solving skills, as well as interpersonal skills further, by developing species-specific dietary plans that they have access to.
- Encourage learners to practise their practical monitoring skills by asking them to implement dietary plans over a short period and carefully monitor the input of food and water (adapting as necessary), recording the outcome.

- Show learners a variety of the methods of giving food and discuss how to choose appropriate methods of presenting food and water. You should also discuss the importance of using methods of presenting food to allow for enrichment.
- Give learners the opportunity to develop their grooming and bathing skills. Demonstrate a variety of grooming and bathing tasks with a variety of species, and ensure that learners have access to and can use the appropriate equipment.
- Practical sessions on exercise will allow learners to continue practising their skills in handling and restraining animals (topic A2). When learners are planning exercise, ask them to consider the overall needs of the animals. They should then go on to consider whether the planned exercise and the expected handling and restraint techniques meet these needs.
- Visits to different animal care establishments would offer opportunities for learners to perform visual health checks on a wider variety of species than may be possible at your centre. You could enhance this by showing learners images and videos of a variety of animals in both good and poor states of health. When learners make a judgement as to the health of an animal, ask them to justify their reasons to ensure that they understand what you have taught. Where possible, you should also allow learners time with the animals in the centre to assess their health using visual health checks.

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Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 3: Animal Welfare and Ethics*
- *Unit 5: Animal Behaviour*
- *Unit 6: Animal Health and Diseases*
- *Unit 13: Animal Management in a Retail Environment*
- *Unit 16: Animal Grooming*
- *Unit 21: Exotic Animal Husbandry*
- *Unit 23: Zoological Health and Husbandry*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

- Dallas S and Jewell E – *Animal Biology and Care 3rd edition* (Wiley-Blackwell, 2014) ISBN 9781118276068.
  Good sections on animal husbandry and handling for a range of species.
- Gott L, Lumbis R, and Varga M (editors) – *BSAVA Manual of Exotic Pet and Wildlife Nursing* (British Small Veterinary Association, 2012) ISBN 9781905319350.
  Information about the care of exotic pets and wildlife.
- Warren D – *Small Animal Care and Management 4th edition* (Cengage Learning, 2015) ISBN 9781285425528.
  Detailed sections on husbandry for a range of species.

Journals

- *Animal Welfare Journal*
  Relevant scientific research published surrounding animal welfare.

Websites

- www.gov.uk/government/organisations/department-for-environment-food-rural-affairs
  Department for Environment, Food and Rural Affairs (DEFRA) – policies and information on safeguarding the UK's natural environment.

- www.rspca.org.uk
  RSPCA – basic husbandry advice for a wide range of domestic animals.
- www.ufaw.org.uk
  Universities Federation for Animal Welfare (UFAW) – up-to-date information about animal welfare.

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Unit 5: Animal Behaviour

Delivery guidance

Approaching the unit

Animal behaviour is a fundamental topic in animal management. It has a vast array of applications, from understanding simple animal behaviours to developing complex training programmes which means having the ability to interpret animal behaviours is invaluable. The unit assumes no prior understanding, but does make obvious links to animal biology and practical skills in science. It can stretch and challenge all abilities.

Initially you should focus on allowing learners to explore normal and abnormal behaviours in a range of animals, along with how these behaviours develop over life stages and in specific scenarios. You can then develop more detailed underlying theory as learners progress through the unit. As they progress, you could bring in more detailed learning theory, and interpretation and evaluation work.

To complete the unit, learners will need access to a range of research materials, which could include the internet, journals or magazines, science equipment and books. Learners should also have access to a range of animals for observations.

You should use a range of assessment methods that will allow learners to develop theory and practice as well as critical thinking and analytical skills. These could include case studies and scenarios, reviewing real-life cases, group discussions and plenty of observational and analytical opportunities.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order. It is intended that you should take a holistic approach to the delivery of the mandatory units, for example it could be taught alongside *Unit 20: Human and Animal Interaction*, *Unit 2: Animal Biology* and *Unit 3: Animal Welfare and Ethics*. There are also links with *Unit 9: Practical skills in Animal Science, Unit 15: Developing an Enterprise in the Animal Sector* and *Unit 23: Zoological Animal Health and Husbandry*.

Delivering the learning aims

For learning aim A, introduce the topic by asking learners to discuss what behaviour is generally. It would be worthwhile to question learners to assess any prior knowledge of the subject. Learners can then spend time researching the many learning theories perhaps using case studies, including video clips and/or audio recordings.

Once they have grasped the learning theories you should identify normal and abnormal behaviours in a range of species and learners can do a similar activity, deciding on how normal and abnormal behaviours develop, along with the types, causes and characteristics of each. A good way to do this is for learners to

develop ethograms to observe a range of behaviours and then hold group discussions, deliver presentations to the class or write a scientific report of their findings on behaviours in different species.

Following this observational phase, learners can then work collaboratively on how the behaviours they have witnessed indicate health and welfare and how they could be managed, reviewing the different factors and methods they may implement or use. It would be helpful to bring in external speakers such as zoo keepers, animal trainers and behaviourists to demonstrate effective behaviour management in the industry with more exotic species.

Learning aim B requires learners to expand the topic by using the knowledge and understanding they have gained from learning aim A to examine behaviour patterns and factors that cause or influence these. Learners should carry out discovery-based learning, using case studies of animals in zoos, rescue centres, aquariums or even common pets to observe and determine behaviour patterns seen in captive species. Using observations and exploration of a range of different species' communication strategies, learners can explore different aspects of communication across species. They should then complete 'compare and contrast' activities with wild animals of the same or similar species where data is available.

You should direct learners by allocating a topic each week to give direction and structure to their research, allowing them to develop more structured and detailed observations or comparisons. You can give learners species and defined factors that influence behaviour, allowing learners to work in groups on project-based studies.

For learning aim C, learners have to pull together everything they have learned from learning aims A and B as well as skills from other units. You can start by recapping topics learned so far that link into learning aim C by asking learners to carry out review activities or do a short quiz.

Learning aim C requires learners to undertake behavioural monitoring as a measure of animal welfare. You could approach this by giving access to a range of species of animals that are exhibiting very different behaviours. You could achieve this through off-site visits or an investigative field trip to a zoological collection, animal laboratory or mixed or multiple livestock farms, where learners can carry out evaluative observational work. You could give clear direction for the research, give each learner or group of learners a set of words, such as observe and interpret, and a list of sampling methods. Prior to any visit, allow planning time for learners to plan their research study.

Before making visits, you should develop the learners' understanding of key terms and techniques in monitoring and measuring behaviour and the implications behaviour has on welfare. It would be good to link into national schemes such as RSPCA Assured and Red Tractor label for food assurance schemes, reviewing how these assess welfare using behavioural observation.

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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 portfolio 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	

Assessment guidance

This is a mandatory unit, which is internally assessed through a number of independent tasks. The recommended assessment method consists of two tasks, one of which should be a report that covers learning aim A and the other should be evidence of performing sampling to monitor animal behaviour, which covers both learning aims B and C. The evidence of performing sampling could be through use of observational assessments made by learners where they use sampling and associated techniques, followed by a written scientific report in standard scientific format with a formal presentation.

However, you should try to be imaginative in your assessment approach in order to engage learners and to make the method of assessment relevant to the learning aim being assessed. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

Observation records alone are not sufficient sources of evidence. The original learner-generated evidence must also support them. When assessing presentations, assessors should remember that they are assessing the content of the presentation against the learning aim and not the skill with which the presentation is delivered.

All learners must independently generate individual evidence that can be authenticated. The main sources of evidence are likely to be written reports and scientific reports in standard scientific format, or articles for a journal. Learners should incorporate in-depth research that is corroborated by a fully-referenced bibliography.

Project-based units can present opportunities for combining assignments into a single project that provides evidence for more than one unit. For example, it may be useful to have a project that combines two project-based units such as *Unit* or *Unit*. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

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Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 5: Animal Behaviour

Introduction

Start the unit with a discussion on what behaviour is. It is a good idea to question to learners to assess any prior knowledge.

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.

If possible to arrange, this unit would benefit from employer involvement in the form of:

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

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

- Divide learners into groups and allocate a learning theory to each group. Each group will then carry out research into the allocated learning theory and give feedback to the class in a class discussion.
- Ask learners to evaluate case studies on different species in different environments and then apply the learning theories they deem suitable.
- Use video clips of animals in training programmes and again apply the learning theories learners deem suitable.
- Learners can create a poster of learning theories or deliver presentations to the class for wider discussion.
- Carry out a mini research project (which prepares learners for learning aim C later) on animal learning. Learners can be given QR codes for guidance and the use of segmented reality software/equipment. This can be an e-learning project, where learners use webinars and deliver the topic to the class.
- Ask learners to draw a mind map of normal behaviours and discuss the likely causes of these normal behaviours in relation to species-specific environments. This can become a wider class discussion or involve production of information leaflets including a comparison or evaluation task with abnormal and normal behaviours. Ask the question: What is normal?
- Once learners have developed a good level of knowledge and understanding, the use of review and recap exercises and activities would be beneficial.
- Ask learners to develop management plans for animals exhibiting abnormal behaviours. Using animals of various species, with atypical behaviour gives scope for stretch and challenge.
- Learners can carry out compare and contrast activities on management options, for example medical or pharmacological versus environmental enrichment. Wider class discussion or presentation can be useful.

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

- Many learners may have pets of their own or live on farms, depending on your area of the country, so draw own their own experiences of animal behaviour. Encourage learners to make video recordings of their pets that they can show to the rest of the group to promote discussion. You could even run this as a competition.
- There have been many wildlife documentaries shown on the BBC in recent years, many of which are available on the internet, so you could show clips some of these as an introduction to this learning aim.
- Ask learners about animal lifestyles: How do animals live? What do they need? How do they communicate? Organise wider class discussion or poster making.
- Give learners case studies of the same or similar species with behavioural differences, considering the causes and the effects of environments.
- Ask learners to identify species with different sleep/wake cycles and how the behaviour of these animals is affected by the relevant cycles.
- Learners could collect animal communication sound recordings and visual evidence through use of images or observations within collections, or secondary sources, and examine the language and communication strategies used. Learners could break down the sounds into individual mini sound clips and produce a game or presentation about animal communication and interpretation.
- Discuss factors that influence behaviour and follow up with a quiz or voting system game.
- Give learners a list or cards of internal and external factors and ask them to divide the factors by type. Follow this with peer discussion or marking.

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

- Learners should work in small groups to identify visual cues and vocalisations in a range of allocated species.
- Ask learners to compare visual cues, olfactory cues and vocalisations in species over the different life stages and write a short report on animal communication or produce a mini documentary.
- You may be able to set up remote cameras (possibly with thermal imaging) so that you can record and then watch the behaviour of birds, nocturnal animals etc.
- Demonstrate sampling methods including continuous, instantaneous, ad-libitum, focal, scanning and zero. Ask learners to match methods to suitable scenarios and give explanations as to their choice. Wider class discussion could follow.
- Give learners published data and ask them to produce graphical interpretations of it in different formats (e.g. bar chart or pie chart, or time budgets).
- Learners should carry out an evaluation of the effectiveness of pre-existing welfare assurance schemes, highlighting how they use behavioural monitoring to inform on matters of welfare in food production. Alternatively, this could apply to pet animals and those in zoos or other collections.
- Ask learners to plan, undertake and report on an animal behavioural project over a period of three to six weeks, culminating in a final scientific report and formal presentation. Learners discuss presentation styles and ways of reporting results. Ask learners to present their findings in a suitable format in groups or as individuals.

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Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 2: Animal Biology*
- *Unit 3: Animal Welfare and Ethics*
- *Unit 9: Practical Skills in Animal Science*
- *Unit 20: Human and Animal Interaction*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

- Alcock J – *Animal Behaviour: An Evolutionary Approach, 10th edition* (Sinauer Associates, 2013) ISBN 9780878939664.
  Includes coverage of recent work in animal behaviour and features a major reorganisation as well as many new photographs and scientific references.
- Barnard C – *Animal Behaviour: Mechanism, Development, Function and Evolution* (Prentice Hall, 2003) ISBN 9780130899361.
  A good and informative book for the whole topic that is highly recommended for students of animal behaviour.
- Hosey G – *Zoo Animals: Behaviour, Management and Welfare, 2nd edition* (Oxford University Press, 2013) ISBN 9780199693528.
  An essential for zoo animal behavioural study.
- Manning A, Stamp Dawkins M – *An Introduction to Animal Behaviour*, *6th edition* (Cambridge University Press, 2012) ISBN 9780521165143.
  A good book for starting out and for those learners who find large books daunting.
- Martin P – *Measuring Behaviour: An Introductory Guide*, *3rd edition* (Cambridge University Press, 2007) ISBN 9780521535632.
  Gives techniques and methods that can be used in measuring behaviour.

Journals

- *Animal Behaviour* (Elsevier)
  This journal has wide appeal and contains critical reviews, original papers, and research articles on all aspects of animal behaviour; it contains valuable research.
- *Applied Animal Behaviour Science* (Elsevier)
  A journal devoted to the study of behaviour of animals managed by humans.

Videos

- David Attenborough's BBC documentary series are highly valuable as many of the episodes/series are about animal behaviour.

Websites

- www.abtcouncil.org.uk/
  The *Animal Behaviour and Training Council* has some educational resources for learners.
- www.bbc.co.uk/nature
  The *BBC* offers natural history content on its website, as well as links to documentaries on BBC iPlayer®.

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Unit 6: Animal Health and Diseases

Delivery guidance

Approaching the unit

Many animals will become ill at some time in their lives. People working with animals must be able to recognise signs of illness in the animals they work with and be able to reduce the risk of illness.

This unit explores the types and role of pathogens and parasites in disease, such as Salmonella spp, parvovirus, Aspergillus spp, bovine spongiform encephalopathy, protozoa and helminths, fleas, ticks and lice. Methods of prevention and treatment will be discussed along with ways to reduce the risk of transmission. Learners will explore health assessment techniques and gain experience in implementing these. They will also consider the importance of planning for and monitoring health.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order. It is intended that you should take a holistic approach to the delivery of the mandatory units, for example this unit could be taught alongside *Unit 2: Animal Biology*, *Unit 10*: *Animal Metabolism*, *Unit 11: Advanced Animal Nutrition* or *Unit 17: Principles of Animal Nursing*.

Delivering the learning aims

You could introduce learning aim A through a practical activity where learners have access to specimens of parasites, bacteria, yeast and virions. Learners could work in small groups to produce wall charts explaining the key features of each. Learners can develop research techniques through investigating a particular pathogen or parasite and then explaining their findings to others. They can present information through a range of media. Encourage their critical thinking through analysis of case studies and practical research. Learners could undertake practical research into the routes of transmission using a UV handwash kit and findings could be considered with reference to specified pathogens. Video clips and cell/tissue slides could be available for learners to view the effect of pathogens, along with case studies exploring the impact on the whole organism. Small groups of learners could work together to research and produce and deliver a presentation on a particular type of immunity to the class.

Encourage learners to engage in practical activities throughout learning aim B. This could link to *Unit 3: Animal Welfare and Ethics,* learning aim B. You could find opportunities for learners to visit different animal centres to assess the health of a range of animals. You should demonstrate suitable monitoring and handling techniques for each species being assessed, explaining any conditions which may alter the health-checking procedure. You could give learners case studies of symptoms and ask them to research possible illnesses and appropriate treatments. This will also help to promote team work. Learners can improve

communication skills through researching named pathogens and disseminating their findings to the group. Based on their findings, learners could create factsheets for the diseases and disorders identified in the specification, then create their own quizzes for the class to take part in based on the factsheets. A veterinary surgeon could deliver a session on common animal diseases and disorders.

You could begin learning aim C by asking learners to discuss methods of preventing disease transmission. Learners could engage in a debate on the effectiveness of each method. They could then use this information to develop their own health and hygiene plans. For learning aim C, learners will require sustained and regular access to animals in order to plan, monitor and report on their health plans. You could give learners examples of poor health and hygiene plans to encourage them to assess the suitability of these plans in promoting health. Develop their research skills through investigating treatment administration routes and suggest instances where each would be appropriate.

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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 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 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 application of basic animal treatments **C3** Preventative health assessment, recording and monitoring	A portfolio of evidence, including: • practical activities of implementing preventative health strategies with signed witness statement and/or observation record • written preventative care plans and monitoring documents.

Assessment guidance

This unit is internally assessed through independent assignments. An entire learning outcome must be covered within each assignment.

For assignment 1, learners are advised to produce a report exploring the structure, growth, reproduction and transmission of pathogens and parasites of different animals along with defence mechanisms the animal can use to protect itself from them. Example species could be used to highlight differences in processes used by different pathogens and parasites. Diagrams and images could be employed to highlight key points.

A portfolio of evidence supported by a report of findings is recommended for assignment 2. Evidence could be in the form of photographs, videos, peer assessments, witness statements or observation records. Learners must ensure they have sufficient evidence. The supporting report could include case studies and images.

In assignment 3, learners must give evidence of planning for health, implementing health strategies and monitoring health. Again, learners could give evidence of practical activities through photographs, videos, witness statements and observation records. Accompanying written documentation should analyse the purpose and effectiveness of planning for, monitoring and recording health.

There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments for *Unit 2: Animal Biology* or *Unit 17: Principles of Animal Nursing* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

Try to be imaginative in your assessment approach so as to engage learners and to make the method of assessment relevant to the learning aim being assessed. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- interviews with employers – recorded through video, email conversations or recorded video calling
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

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Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 6: Animal Health and Diseases

Introduction

You could introduce this unit through video clips and case studies of a range of illnesses in animals. Discuss the unit content together with assessment methods.

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

Learners would benefit from engagement with local employers, such as veterinary staff, farmers or zookeepers, who could provide opportunities for learners to observe them at work or to act as mentors. They could also assist in setting assignment briefs.

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

- You could give learners a range of parasite, bacteria, virion and fungi samples to view, along with supporting information sheets. Learners could use these together with independent research to produce a wall chart describing each one.
- Learners could carry out a sorting task where they distinguish and correctly sequence events in the reproduction of different pathogens and parasites.
- Learners could undertake practical experiments to investigate the effect of environmental factors on the growth of micro-organisms. Micro-organisms with a range of optimum conditions would be most effective. You could generate a set of data for learners to analyse for each condition, which can then be linked to animal environments.
- Learners could research and then create video clips explaining pathogen transmission routes. This could be for a named pathogen or cover all transmission routes.
- Organise jigsaw research (each learner researches a particular aspect, they then feed back to make a complete picture). Learners can research a pathogen or parasite and produce a presentation on the effects it causes and can then show it to the group.
- Lead sessions exploring the role of the immune system and types of immunity. Following this, small groups of learners could carry out research and produce display material for a specific type of immunity.
- You could give learners case studies of allergies or hypersensitivities and/or vaccinations and ask them to produce a flow diagram explaining the processes involved.

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

- Ask learners to discuss the indicators of health in animals, including general and specific indicators. You could then arrange practical activities so that learners can health check a range of animals.
- Give learners a range of case studies of animal illnesses. Ask them to research which disease could be the cause and recommend a suitable treatment. Learners

could also do this as a matching task. You could then lead a class discussion on requirements for the zoonotic and notifiable diseases.

- Ask learners to research given common disorders (as listed in the unit content) and produce informative leaflets for each. Based on these, learners can then generate quiz questions for the rest of the group to answer.

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

- Ask learners to discuss, as a class, management techniques for preventative health strategies. Make a range of resources available for learners to evaluate. They could use this information to produce instructional videos for people working with animals.
- You could lead a class discussion on the factors to include in animal health and hygiene plans, such as vaccination schedules and rotational grazing. Learners can then develop their own recording systems and use them to monitor a range of animals.
- Give learners case studies requiring a range of treatments (as listed in the unit content) then ask them to research and justify appropriate treatments including the route of treatment administration.
- You could show video clips for a range of administration routes and then lead class discussions on why each route would be appropriate to different situations.
- Learners can work in small groups to discuss the importance of record keeping and monitoring as well as discussing what key data should be recorded. Make sample record documents available for learners to review. You should make case studies available to cover instances where monitoring was not frequent and records not accurate. Discuss the impact of these on the animal's welfare. Learners could use this information to produce display material for animal centres, explaining the need for detailed and accurate recording and monitoring.
- Arrange opportunities for learners to carry out practical monitoring and recording of animals.

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Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 2: Animal Biology*
- *Unit 3: Animal Welfare and Ethics*
- *Unit 4: Practical Animal Husbandry*
- *Unit 9: Practical Skills in Animal Science*
- *Unit 11: Advanced Animal Nutrition*
- *Unit 17: Principles of Animal Nursing*
- *Unit 21: Exotic Animal Husbandry*
- *Unit 23: Zoological Animal Health and Husbandry*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

- Williams J – *The Complete Textbook of Animal Health & Welfare* (Elsevier, 2009) ISBN 9780702029448.
  This book gives general information on animal health and welfare including disease transmission and husbandry measures.

Journals

- *Animal Health Research Reviews* (Cambridge University Press)
  This journal contains current information on animal health and disease management.
- *Journal of Veterinary Medicine and Animal Health* (Academic Journals)
  This journal contains current research on veterinary medicine and procedures including reviews of treatment efficacy.

Websites

- www.nadis.org.uk
  This *National Animal Disease Information Service* website gives current information on diseases affecting livestock species.
- www.peteducation.com
  This website gives information about disease identification in a range of animal species.

- www.youtube.com
  This website has a range of videos about pathogens and parasites, including their life cycles and transmission routes.

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Unit 7: Work Experience in the Animal Sector

Delivery guidance

Approaching the unit

This unit focuses on building skills to prepare learners for the working environment. They must have access to ICT so they can search for careers in the sector and create relevant documents that will promote their skills and attributes. As their tutor, you should demonstrate how to create successful CVs and letters of application, as well as showing them good interview techniques. This is an excellent and exciting opportunity for learners as they gain skills and knowledge in an area in which they would like to train or work. You should prepare learners for going out into the workplace by giving them sufficient information and guidance on issues such as health and safety, expectations and target setting.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order. It is intended that you should take a holistic approach to the delivery of the mandatory units, for example it could be taught alongside *Unit 12: Business management in the Animal Sector*, *Unit 14: Animals in Boarding Establishments* or *Unit 15: Developing an Enterprise in the Animal Sector*.

Delivering the learning aims

Introduce learning aim A by focusing on progression opportunities within the sector. Encourage learners to investigate areas of interest as well as different career paths, including looking at both university and career progression as well as other opportunities such as apprenticeships. This learning aim offers learners the opportunity to develop research and ICT skills, and the independence to search for careers. It is important that you give detailed information on legislation and other relevant information that learners may require in the working environment. It might be useful to ask guest speakers to deliver in-depth information concerning legislation such as the Health and Safety at Work Act 1974, or enlist the help of someone with sound knowledge on aspects of human resources.

You could introduce learning aim B by looking at the process of getting work within the sector. For example, you could start by evaluating existing examples of documentation (e.g. CVs and letters of application), allowing learners to decide whether they would use a similar template or design their own. Encourage learners to develop their own skills and allow time to ensure all relevant documentation is included. It is important to emphasise good communication.
You could invite a guest speaker to cover the topic or watch videos of good communication and focus on interview techniques. You might try role plays here to build confidence and develop techniques further. Be sure to emphasise the

links to learning aim A so that all of the skills and knowledge required for learning aim B are relevant to the sector and the career path in which learners are interested.

Learning aim C is based on gaining practical experience in the workplace. You could introduce this by linking back to learning aim A and investigating a particular area of interest. This should be an independent learning aim with learners carrying out research and contacting placements within the sector. They should be encouraged to set themselves targets, and it would be useful to give them a presentation on how to do this. Allow enough time so that learners can complete adequate hours of practical experience in an area of interest. You will also need to show learners how to review their placement and allow for further development, for example by completing relevant evaluation forms, or question and answer sessions, and learners could also reflect on targets they have set themselves. Customer service skills should be built using role-play activities and clarifying how to deal with difficult situations in the work place.

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.

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Assessment guidance

This is an internally assessed unit. Learners should build a portfolio of work experience related documentation, including current progression routes, interview documentation, a CV and letter of application. It would be useful for tutors to develop links with external animal-related businesses to allow for a range of work experience opportunities. It could also be helpful for learners to have opportunities that allow them to develop independent working and interpersonal skills. About 40 hours contact time should be completed as a minimum to allow sufficient time to gain independence in the working environment.

The portfolio could include a range of material such as leaflets, posters, question and answer sessions or observation records. Learners could produce a final report incorporating what they have achieved while on placement and include feedback from tutors or placement managers.

Learners can be imaginative in the way they present their evidence for assessment. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- interviews with employers – recorded through video, email conversations or recorded video calling
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments for *Unit 13: Animal Management in a Retail Environment* or *Unit 16: Animal Grooming* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 7: Work Experience in the Animal Sector

Introduction

Learners need to be aware of the opportunities in the animal sector. Start by assessing their knowledge of areas of interest and then broaden this by introducing further progression and information on universities. Learners will benefit from completing independent research and gaining practical experience.

The skills acquired in this unit are essential for learners to progress into employment in the animal sector, either immediately following the qualification (for example, pet shop assistant or veterinary care assistant), 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).

It is essential to build up links with local businesses and organisations that may be willing to take on learners on work placements. You could invite representatives from these organisations to talk to your learners about their job roles before they organise their work placements. They may also give opportunities for learners to observe them at work or act as mentors.

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

Discuss the learning aim with learners and encourage them to consider possibilities for their futures.

- Ask learners to think about three areas of interest. They should look at how they could reach their selected destinations. Learners could create flow charts to show progression routes and opportunities. Class discussion should cover a variety of areas so learners have the opportunity to find out about new or unfamiliar areas.
- Lead a discussion identifying different progression routes, including apprenticeships, higher education, employment and self-employment and discuss the skills and requirements for each.
- Discuss how UCAS works and what entry requirements are. You could demonstrate how to search for relevant qualifications and allow learners to complete a similar task. Help learners to use their predicted grades and convert these to the points used in the UCAS system.
- Demonstrate the methods available for searching for jobs in the animal sector. This could include generic search methods, e.g. newspapers or www.gov.uk, and more specific methods, for example www.lantra.co.uk.
- Introduce learners to legislation and the relevant legal requirements of working practices, with reference to the animal sector. External speakers could give learners extensive knowledge of the legal requirements. Alternatively, learners could complete research activities to develop their research and ICT skills.

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

You will need to give learners examples of the relevant documentation required during the application process and help them to develop their own skills.

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- Tutors should make a range of job adverts available for learners to review. Discuss with learners the importance of reviewing requirements and requested information. Encourage learners to search for their own advert and review its suitability.
- Discuss CVs and letters of application and give some examples for learners to review. Allow learners to create their own, watch over their production and give help where necessary. It is important to ensure that high-quality documents are produced to support a successful application process.
- Allow learners to participate in role-play activities focused on interviewing and communication. A guest speaker can help to broaden skills and knowledge.
- You could carry out mock interviews with each learner. This will prepare them for assessment and real interviews in the animal sector.

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

Learners will gain valuable experience while taking part in work experience (40 hours minimum) in the animal sector. Introduce this learning aim by allowing learners to express their interest in areas within the sector.

- You should start by asking learners to complete independent research into areas of interest in order to gain work experience. Learners are required to arrange work placements based on interests and meeting health and safety requirements. You need to give support to ensure that each placement is suitable.
- Learners should adapt their current CVs and letters of application to suit their intended work placement destination. You can support learners in creating independent SMART targets and carrying out a SWOT analysis.
- Introduce customer service skills by using role-play activities and videos of good and poor customer service. Learners should be clear on how to deliver good customer service in a range of settings. It would be helpful to ask learners for examples of when they have given good customer service – link to work experience or previous job roles they have completed.
- You must ensure rules and regulations are covered while learners are on placement.
- Allow learners sufficient time for their work placements. Encourage learners to complete a diary of tasks and activities during their time on placement.
- Once all learners have completed their work placements, encourage them to review how their own skills and abilities have developed during this time.

Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

This unit links to all units in the Pearson BTEC Level 3 Nationals in Animal Management (NQF), but particularly:

- *Unit 12: Business Management in the Animal Sector*
- *Unit 13: Animal Management in a Retail Environment*
- *Unit 14: Animals in Boarding Establishments*
- *Unit 15: Developing an Enterprise in the Animal Sector*
- *Unit 16: Animal Grooming*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

- Innes J – *The Interview Book: Your Definitive Guide to the Perfect Interview, 2nd edition* (Prentice Hall, 2012) ISBN 9780273776628.
  Good examples of how to prepare yourself for interview and what to expect.
- James J – *You're Hired! Interview: Tips and Techniques for a Brilliant Interview* (Trotman, 2009) ISBN 9781844551781.
  A book which offers practical tips to prepare you for interviews. It focuses on the mind as well as the body, covering the image you present and first impressions.
- Mills C – *You're Hired! CV: How to Write a Brilliant CV* (Trotman, 2015) ISBN 9781844551774.
  Contains templates as well as many tips to ensure you produce the best possible CV.

Websites

- www.gov.uk
  This *UK government* website is a good tool to use to perform current job searches.
- https://www.gov.uk/topic/further-education-skills/apprenticeships

  This *UK government* website focuses specifically on apprenticeship and this route of progression.
- www.lantra.co.uk
  This website offers career information on land-based and environmental industries.
- www.ucas.com
  This education website can be used to search and apply for courses, and track applications.

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Unit 8: Investigative Research Project

Delivery guidance

Approaching the unit

The investigative research project is a mandatory unit and offers learners a unique opportunity to explore an aspect of animal management that appeals to them. The learner could shape the project to reflect personal interests, intellectual challenges or even use it to explore career opportunities within the animal sector. Learners will find the skills they develop through this unit invaluable to their chosen career. The ability to research, prepare and present reports is an essential part of management.

Learners will work independently to conduct a detailed investigation. They will develop an expertise in their chosen topic that should reflect a professional knowledge of the subject.

To complete this unit, learners will need access to a variety of research sources including primary and secondary data. They will need to ensure that their research project reflects an area of study within the animal sector in general. You may want to ask learners to focus on areas that they have already covered or will cover on the rest of their course.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order. It is intended that you should take a holistic approach to the delivery of the mandatory units, for example *Unit 5: Animal Behaviour, Unit 2: Animal Biology, Unit 10: Animal Metabolism, Unit 11: Advanced Animal Nutrition, Unit 15: Developing an Enterprise in the Animal Sector, Unit 19: Farm Livestock Husbandry* and *Unit 24: Wildlife Ecology and Conservation Management* could all be taught alongside this unit.

Delivering the learning aims

For learning aim A, one successful starting strategy is to invite previous learners to pass on their experiences of the research projects they completed. If this is not possible, then sample projects from a previous intake can be a useful starting point. This learning aim culminates in learners choosing a research project, so make sure that you use every opportunity to reflect on a variety of potential investigations and use strategies to consider their feasibility. It is important that learners appreciate the complexity of this unit and the need to understand and give evidence of the process of undertaking a research project as well as the final product. Learners need to be aware that there are well-established principles that can be followed when undertaking investigations and should be introduced to the scientific method, hypothesis testing and statistical analysis where appropriate.

Learners must demonstrate that their final choice of project was made after reasoned decision making rather than as a result of superficial or random methodology. The object of learning aim A is to give learners suitable methodologies to achieve a reasoned conclusion.

Learning aim B is primarily concerned with ensuring that learners develop strategies that will allow them to plan, monitor, complete and present their project. They should use every opportunity to explore the range of methodologies so they are thoroughly prepared when they need to apply their learning to the actual project.

Learners can tend to focus on completing the project, so you need to ensure they understand the importance of planning, monitoring presentation and evaluation. Through learning aim B, learners will develop comprehensive methodologies that can be applied to their project and that will show the rigour needed. You should create opportunities for learners to experiment and become familiar with different strategies to plan, monitor and present their project.

The conclusion of learning aim B is the successful completion and presentation of the report using an appropriate format for both.

In learning aim C, learners will develop an evaluation framework that will allow them to critically review a project. The framework needs to take account of the process of undertaking a research project as well as the completed project, in whatever format it is presented.

The evaluation framework should also allow learners to apply the outcomes of a project to the wider animal sector, in particular the relevance of the findings and the opportunities for their application or development. Learning aim C concludes with learners gaining an appreciation of the role of research in professional development. It will be of direct benefit for those who want to work in the sector.

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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** Plan 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	

Assessment guidance

This unit is internally assessed through a number of independent tasks. Each task should cover at least one entire learning aim and it is essential that a learning aim is assessed as a whole and not split into tasks or sub-tasks per criterion.

All learners must independently generate individual evidence that can be authenticated. This is particularly important where learners may be researching similar projects. For this reason, it is unlikely that a standard response to the type of evidence will be generated since this would require tutor input that would detract from the needs of the assessment.

For learning aim A, the evidence should show that the learner has considered alternative possible projects and that the final decision has been arrived at through a combination of a qualitative and quantitative decision-making processes. This must include evidence that they have considered not just the scope of the project but also the way they intend to proceed.

For learning aim B, the main sources of evidence are likely to be written reports with supporting process-related documentation, e.g. project diaries, lists of tasks or timelines. Learners should be encouraged to offer alternative forms of evidence where this is more appropriate. This might include artefacts or web content.

For learning aim C, the evidence given by learners should show they have developed an evaluation framework that has then been applied to their own or another learner's project. This should include subjective and objective criteria. The review could be through self, peer or expert input in either formal or informal settings.

The assessment for this unit requires a high degree of autonomy and independent learning. This means that learners may require guided learning hours that are not specified. These could be used, for example, where a learner requires the assessor to conduct a monitoring review devised by the learner or to assess a presentation.

Learners must undertake a research project. They should be encouraged to be imaginative in their research and aim to conduct unique investigations. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- interviews with employers – recorded through video, email conversations or recorded video calling
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

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There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments for *Unit 5: Animal Behaviour* or *Unit 2: Animal Biology* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 8: Investigative Research Project

Introduction

The investigative research project allows learners to explore an area of interest independently and develop a detailed knowledge of it. In addition, learners will develop the research skills needed for a successful career in the animal sector. The aim of this unit is to research, present and review a project.

From the outset, the tutor should introduce the unit by emphasising the holistic nature of the evidence required. Learners must be clear that the process is just as important as the product. Using suitably anonymised good and bad examples of this would be a good starting point.

This unit provides leaners with valuable skills that can be applied to a wide range of careers within the animal management sector.

If possible to arrange, the unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local animal businesses such as zoos, farms, veterinary practices, animal boarding establishments or animal charities
- contribution of ideas to unit project
- opportunities for observation during work experience
- support from local animal business staff as mentors.

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

You could begin by emphasising the uniqueness of this unit in allowing learners the freedom to explore an aspect of animal management about which they feel passionate.

- Learners could see the range of projects that can be submitted and topics that are suitable to explore, for example by allowing them to talk with former learners about their projects if possible or inviting guest speakers from local animal businesses.
- Learners need to understand the different research methodologies available. These can be investigated with initial input from you followed by paired or small group activities to explore them in more detail. The opportunity for independent activity will allow learners to relate the methodologies to their own chosen area of study.
- Learners need to quickly realise that success in this unit will depend on the level of work they put in and their personal qualities, such as time management and motivation. They will need to achieve a balance between the needs of this unit and other demands on their time so introducing a project diary at an early stage will encourage them to be analytical.
- Learners should be introduced to a range of different research sources and should be aware of how to assess the validity and reliability of those sources. This could be done through structured class activities such as an introductory presentation by the tutor followed by a paired task. Pairs of learners are given examples of statements that are reliable, unreliable, valid or invalid and rate them.

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- Learners must appreciate that the **process** of undertaking a research project is just as important for this unit as the project itself. Their decisions must be based on sound principles using some form of decision-making model, which is itself based on appropriate criteria which could be subjective, objective, numerical or value based. One strategy is to develop these techniques through small group activities that include everyday situations in animal management.
- It is essential to decide on a project title, aims and objectives as these are key to shaping the format and content of the project. Learners will find it useful to develop their skills by examining potential project titles to see how they could be improved. Similarly, learners should practise developing the broad aims of a project, together with the more specific objectives.
- Experts or professionals in the field are a very useful source of research for learners. They would benefit from testing their ideas out by interviewing a more experienced practitioner.
- By the end of this learning aim, learners should be able to draw together key research sources, present a short list of potential research projects and develop the title, aims and objectives for their chosen area of study. Learners should each give a presentation to illustrate this.

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

Learners will come to this learning aim with a commitment to a particular project. They will have the title, aims and objectives, together with a broad outline of relevant research. In learning aim B, learners will develop strategies and methodologies to plan, carry out, monitor and present their project. Class time will be needed to enable learners to carry out monitoring and other activities that may require tutor input. Alternatively, this could be done through tutorials.

- Learners need practice in developing strategies to fulfil the four components of this learning aim. Help learners to develop their skills with input and presentations from you followed by small group and individual activities.
- Learners must be able to demonstrate the process of undertaking a research project and need the opportunity to explore methods of record keeping that will detail the process. Examples of previous methods could be used to generate ideas. There are also commercially available project applications and paper-based systems developed to aid ideas or project management, e.g. Evernote® or Time Manager®.
- The conclusion of this learning aim will prepare the learner to present their completed project to a suitable audience. Practice presentations would allow a good opportunity to develop those skills. Learners need to appreciate that presenting the project is different from completing the project and that it will need careful consideration. Learners could work in pairs or small groups on activities to ensure they clearly understand the distinction.

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

Learning aim C is concerned with reviewing the two main aspects of the unit. These are, firstly, the outcomes of the investigative project itself and, secondly, the process of undertaking a research project. Learners should use a framework they have developed themselves to conduct the review.

- There is no set framework for reviewing the project. Encourage learners to investigate a number of methods before developing their own. These methods might include peer review, self-evaluation or assessor review. They could put them together in a comparison table, developed through discussions that you have led.

- A crucial part of the learning aim is to measure the outcomes of a project against its stated aims. You might give a presentation on validity and reliability of results followed by small group activities to encourage learners to appreciate the use of criteria in constructing a framework.
- Learners could lead discussions in small groups to see what links can be made between differing projects. This would help them to relate the recommendations of the research project to the animal sector.
- This learning aim is a good opportunity for learners to review their personal skills. A combination of checklist and 'critical friend' would be one way of investigating this area and this links to the requirement for research supporting continuing professional development. It also offers an opportunity for learners to consider developing their project more professionally by looking at the industry links with their chosen field of study.

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Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

This unit links with all others in the specification.

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

Learners will need to use the appropriate texts for their chosen field of study, however the references below offer a good introduction to basic research methodology.

- Dawson C – *Introduction to Research Methods, 4th edition* (How To Books, 2009) ISBN 9781845283674.
  This textbook is a good, easy to read explanation of the research process, aimed at the sixth form and first year undergraduate market but its clear language makes it accessible to a wider audience.
- Kumar R – *Research Methodology: A Step-by-Step Guide for Beginners, 4th edition* (Sage, 2014) ISBN 9781446269978.
  This academic textbook is aimed at those wanting a comprehensive guide to the research process.

Websites

- www.crlsresearchguide.org
  This *Cambridge Rindge and Latin School* website gives a good summary of the research process in language that is easy for learners to understand. There are numerous links giving greater detail.
- http://shop.timemanager.com/shop/UK/profile.html
  The *Time Manager International* website offers paper-based systems for project management.

Apps

There are apps freely available that can be used for project management. These can help your learners organise their thoughts and resources.

- https://evernote.com/?var=2
  Evernote is a popular app that will allow learners to store, organise and present information. There is a free version that would probably be suitable.

Unit 9: Practical Skills in Animal Science

Delivery guidance

Approaching the unit

This unit is designed to equip learners with the skills to carry out and report on effective investigations in animal science. Wherever possible, learners should be able to work with laboratory equipment so that they can become proficient in its use before assessment. You should aim for a holistic approach to both the study and assessment of the unit where possible, as there is great crossover in concepts and skills between learning aims. The development of scientific communication skills is equally important. Learners should report in a professional manner on the completion of each practical activity through an appropriate method (e.g. reflective summaries, presentations), not just in the full- blown investigation write-ups. There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors. Learners should complete *Unit 10: Animal Metabolism*, before studying this unit. If Unit 9 and Unit 10 are completed alongside one another, you must ensure that the relevant underpinning theory and mathematical concepts are taught at the correct point for learners to access the practical work covered in this unit.

Delivering the learning aims

You can deliver much of learning aim A through application of planning, recording and reporting on scientific investigations. Though not a requirement of the specification, it is valuable to spend some time with learners discussing the different roles of scientists. This should include the political, economic and other influences on how scientists carry out their work, along with the obstacles to objectivity that can be encountered in the real world. You could introduce standard scientific approaches to investigations through critiques of published and unpublished works, to show learners the different standard approaches to reporting and disseminating research.

It would be useful to expose learners to a range of different journal styles and discuss the process of peer review and impact factors on potential career pathways and progression in different scientific fields. There are many outreach programmes within scientific organisations and guest speakers can be matched to your learners if you contact organisations such as the Biotechnology and Biological Sciences Research Council (BBSRC), the Royal Society of Chemistry (RSC), See Science (in Wales) and local universities. Preparing and using risk assessments is integral to the unit and should be embedded in each lesson. It is essential that you carry out detailed risk assessments and explain hazard reduction policies before you start any practical activities.

You should give learners a basic glossary of scientific terms used in experimentation, which they can add to as they progress through the unit. Use written, illustrated and practical scenarios for learners to strengthen their awareness of improvements that could be made to methods, equipment or health and safety. When introducing scientific approaches to investigation, use

planning frameworks, along with key questions learners should be considering at each stage, to assist with planning, carrying out and analysing the results of investigations. Learners can draw on these as they become more independent in their writing up of investigations. You could use partial investigations for learners to practise their skills in each area before embarking on fuller investigations with decreasing tutor guidance.

Learners frequently have difficulty in applying mathematics and statistical techniques to the analysis of investigative data. Establish their mathematical ability early on and arrange for exercises that learners can work on independently to help support and strengthen individual weaknesses.

Learning aim B is concerned with microbiological techniques and investigation. Allow learners to identify different types of bacteria through photographs and the use of combined tests, but also give them cultured plates that they can use to see the different ways in which colonies appear in real life and how certain factors may affect their growth. This will assist them when it comes to pouring their own plates. You could also incorporate these into sessions by involving different counting methods, where learners are assisted in identifying the most appropriate method to use and then apply those methods.

Learners frequently require practice in using microscopes effectively. Independent study of online 'virtual microscopes' prior to hands-on use, as well as tutor demonstrations and individual assistance as necessary will ease this process. In early stages, you should try to give learners slides in which features are more readily seen, so they can gain confidence before in studying specimens in which the features are more difficult to distinguish.

When planning lessons, it is important to remember that cultures need to be monitored when there is any length of time between lessons. This might mean that you need to refrigerate samples so that learners are able to see them at the optimum point (i.e. before overgrowth makes it difficult to distinguish colonies). This is something you should also make clear to learners when they are planning their investigations.

Some of learning aim C can be incorporated throughout the unit. It may be useful to give learners a booklet from the first lesson, which they can refer to and annotate as necessary with units of measurement and scientific terminology. There are many links with the content of *Unit 10: Animal Metabolism*, so ask learners to bring and use their Unit 10 notes during these lessons. You should deliver both learning aims B and C in such a way that learners can hone their practical skills in obtaining valid and reliable data (including carrying out calculations and reporting results accurately in a range of different ways). It is therefore important to regularly encourage learners to reflect upon their skills development and to take action to make improvements where required.

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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 • presentations of investigative findings.
C Explore the skills necessary to work safely with chemicals to carry out experiments	**C1** Theoretical background to experimentation in animal science **C2** Investigating biochemical phenomena in animal science	

Assessment guidance

Whenever learners carry out practical work, they are developing their skills. It would be useful for them to record this practical work in their laboratory notebook, perhaps in the form of a checklist that records each time a skill is practised. It could also incorporate a summary by you of the skill level of the learner at the end of the unit. You could also use video evidence of their skills as this would be acceptable as part of a portfolio of evidence.

Learners need to investigate at least two conditions that affect bacterial growth and a minimum of two factors which affect biochemical reactions. At least two full investigations will need to form part of the portfolio, though learners will also identify individual components from partial investigations as demonstration of evidence towards the assessment criteria; for example graphs, tables or different ways of presenting findings for different audiences.

Evidence for meeting the assessment criteria for learning aim A is likely to be found throughout the processes of planning for investigations, presenting the findings of and evaluating the effectiveness of the investigations carried out for learning aims B and C.

Learners should spend assignment-writing lessons not only writing up investigations into the appropriate format to meet the assessment criteria, but also identifying where in their laboratory notebook (or elsewhere) the assessment criteria have been addressed.

Try to be imaginative in your assessment approach so as to engage learners and to make the method of assessment relevant to the learning aim being assessed. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- interviews with employers – recorded through video, email conversations or recorded video calling
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments for *Unit 10: Animal Metabolism* or *Unit 7: Work experience in the Animal Sector* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

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Getting started

This gives you with a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 9: Practical Skills in Animal Science

Introduction

You could introduce this unit by looking at the role of the scientist and the lives of animal scientists and technicians. Included within this should be a consideration of the reasons why the practical experiments learners will be exploring throughout this unit are carried out within the animal science industry. This unit will help learners to progress to higher education courses in the field of biological science or prepare them for work as laboratory assistants working with technicians in the animal industry.

Centres may involve employers or past BTEC Animal Management learners 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 laboratories or veterinary practices
- contribution of ideas to unit assignments/projects
- opportunities for observation during work experience
- support from local animal technicians as mentors.

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

- Learners need to be aware of the safety precautions required when working in the laboratory, the need for valid, reproducible and accurate investigations and how findings can be disseminated to both the scientific community and the general public.
- Put learners into groups to come up with the methods, hazards and safety considerations in different types of scientific investigation. These should be written on large pieces of paper, which learners can return to later for discussion and annotation.
- Give learners a range of scenarios that require a scientific investigation. Ask them to work in pairs to solve problems and plan an investigation, including how to record and analyse the results. Each pair should review the work of another pair, offering suggestions to make improvements to validity and reproducibility.
- Ask learners to review the quality of each step of their investigation using key questions that you give them. Expand this to the critique of published journal articles, beginning with an exploration of the standard layout of these.
- Give learners the introduction and results of one of a number of investigations. Ask them to work independently to analyse the data, draw conclusions and evaluate the investigation, including the limitations they encounter in doing so. Learners should work in small groups and must choose one investigation. They must then select three different audiences and present the investigative findings for each of them.
- Ask learners to continue to apply their knowledge and understanding from learning aim A to learning aims B and C.

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

- Learners will have an awareness of micro-organisms from studying *Unit 2: Animal Biology* and *Unit 6: Animal Health and Diseases*. You could begin by asking learners to discuss how the investigation of growth in micro-organisms fits into working with animals on a daily basis.
- Assign each learner a micro-organism. Ask them to carry out independent research to find out all they can about the micro-organism – give learners a template to follow (including structure, common names, taxonomy and optimum growing conditions as a minimum) so they can create a fully-rounded picture of the micro-organism.
- Allow learners to access a bacterial identification virtual laboratory, where they can reinforce the steps involved in using molecular methods to identify bacteria and also perform their own Basic Local Alignment Search Tool (BLAST) query.
- Ask learners to prepare for a microscopy session by accessing an interactive tutorial where they can familiarise themselves with the parts and function of a compound light microscope.
- Give learners the necessary equipment and instruction to heat-fix bacterial slides and carry out simple and differential staining techniques. They then use microscopes and oil immersion lenses to view and draw bacterial cells.
- Give learners cultures of different bacteria and ask them to use Bergey's manual to assist in their identification. Allow them to inoculate agar plates and broths with some of these bacteria.
- Ask learners to research, plan, carry out, analyse and evaluate investigations into bacterial growth, including pouring agar plates.

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

- Remind learners of the links to the study of *Unit 10: Animal Metabolism* – you may have to review some of the concepts and mathematical procedures before moving on to their practical applications.
- Ask learners to manage their own time to complete several practical and problem-solving tasks, e.g. serial dilutions, preparation of standard solutions, measuring accurate volumes and masses, selecting and using indicators, acid-base titrations and curve constructions, and evaluations of the levels of accuracy and precision they are able to achieve.
- Ask learners to research and review the factors affecting rates of chemical reactions, including the theory behind them and effects on rates.
- Give learners the equipment and protocols for investigating the salicylic acid content of aspirin, resulting in the calculation of percentage yield.
- Ask learners to research the characteristics of "Good's" biochemical buffers and plan an investigation into the effect of pH on enzyme activity, where they prepare and use the buffer solutions themselves. They should carry the investigation out in full.
- Put learners into groups and ask them to evaluate their investigations in turn, taking notice of the feedback and reflecting on it for future work.
- Ask learners to research, plan, carry out, analyse and evaluate investigations into biochemical reactions.

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Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 2: Animal Biology*
- *Unit 6: Animal Health and Diseases*
- *Unit 10: Animal Metabolism*
- *Unit 11: Advanced Animal Nutrition*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

- Bergey D, Holt J and Breed R – *Bergey's Manual of Determinative Bacteriology 9th edition* (Lippincott, Williams and Wilkins, 1993) ISBN 9780683006032.
  The industry reference for determinative bacteriology.
- Hutchings K, Osbourne C and Bertin I – *Classic Chemistry Experiments* (Royal Society of Chemistry, 2000) ISBN 9780854049196.
  Contains 100 chemistry experiments for use in teaching, including handouts and tutor/technician notes. Free downloads available from the RSC Learn Chemistry website.
- Madigan M, Martinko J, Bender K, Buckley D, Stahl D – *Brock Biology of Microorganisms 14th edition* (Pearson, 2014) ISBN 9781292018317.
  Packed with information and excellent illustrative material.
- Taber K, Pack M – *Chemical misconceptions – prevention, diagnosis and cure; Volume 1: theoretical background* (Royal Society of Chemistry, 2002) ISBN 9780854043866.
  Gives information and classroom activities to effectively teach chemical concepts and avoid learner misconceptions. Free downloads available from the RSC Learn Chemistry website.
- Taber K, Pack M – *Chemical Misconceptions – prevention, diagnosis and cure; Volume 2: Classroom resources* (Royal Society of Chemistry, 2002) ISBN 9780854043811.
  Gives information and classroom activities to teach chemical concepts effectively and avoid learner misconceptions. Free downloads available from the RSC Learn Chemistry website.
- Weyers J, Reed R, Jones A and Holmes D – *Practical Skills in Biomolecular Sciences 4th edition* (Pearson, 2012) ISBN 9781408245521.
  User-friendly guide to essential practical techniques in both microbiology and biochemistry.

Journals

- *Biological Sciences Review* (University of Manchester)
  A journal for learning and teaching biological sciences containing excellent resources for access by tutors and learners.
- *Chemistry Education Research and Practice* (Royal Society of Chemistry)
  A free journal with many useful ideas for how to teach chemistry.
- *Education in Chemistry* (Royal Society of Chemistry)
  A journal covering best practice and innovation in teaching chemistry with resources for teaching chemistry and helping learners to gain the most from their laboratory work.

Websites

- www.biochemistry.org/Education.aspx
  The *Biochemical Society* website contains resources for learning and delivering biochemistry to UK learners. In addition to virtual resources, the Biochemical Society runs a school outreach programme.
- http://imascientist.org.uk/
  This Gallomanor/Wellcome Trust website, *I'm a scientist. Get me out of here*, links practising scientists with learners. Tutors can book online events for their learners, who submit questions and take part in a 30 minute chat room event interacting with scientists.
- www.microbiologyonline.org.uk
  This *Microbiology Society* website has online resources for teaching and learning about microbiology, including an excellent handbook for assistance in planning and carrying out practical investigations in schools and colleges.
- www.pbslearningmedia.org
  PBS Learning Media offers a range engaging and challenging resources for teaching and learning. Resources can be filtered by subject and age range.
- www.rsc.org
  The *Royal Society of Chemistry* has many educational resources for teaching and learning chemical concepts, including support for outreach in schools.

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Unit 10: Animal Metabolism

Delivery guidance

Approaching the unit

The study of animal metabolism allows learners to appreciate the complex chemistry that goes on in the cells, tissues and fluids of animal bodies. Learners will study how chemical compounds are formed and interact, modelling the processes of equilibrium that are set up to maintain normal function. They will then examine the importance of this in the production of energy for vital reactions to take place.

There are many opportunities for practical experimentation throughout the unit and learners must be given the time and necessary equipment to develop laboratory skills, which will be important in both the animal health industry and in progression to higher-level study of biochemistry.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order and it is intended that you should take a holistic approach to the delivery of the mandatory units. This unit relies on learners having knowledge of animal biology from studying *Unit 2: Animal Biology* and has links with *Unit 11: Advanced Animal Nutrition*. These units could be delivered alongside each other so that tasks set as projects could allow learners to acquire skills for all three units simultaneously.

Delivering the learning aims

For learning aim A, encourage learners to use kinaesthetic methods, such as using molecular modelling kits, to help them visualise the ways in which chemicals compounds are formed and interact with one another, in addition to diagrams and animations. It is important that learners are secure in the theoretical knowledge and understanding presented in this learning aim before they go on to apply the knowledge in the other learning aims. There are many practical activities available from the Royal Society of Chemistry and interactive resources which work well to engage learners.

For learning aim B, learners should take part in as much practical work as possible, carrying out experiments involving rates of reaction, equilibria and enzyme action to illustrate the concepts they are learning. Many learners find some of the concepts in learning aim B to be difficult, so using assessment for learning will be fruitful. This is especially relevant where calculations of pH and pK_a are involved. It may be valuable to spend some time ensuring learners have the appropriate underpinning mathematical skills, including graph construction, to carry these out with confidence.

Wherever possible, remind learners of the relevance of the chemical concepts to the biochemical processes taking place in the animal body. A virtual learning

environment is particularly useful here for learners to share their results and communicate their findings to one another.

For learning aim C, learners need to draw together their knowledge and understanding from the rest of the unit and other units. They will have covered very basic respiration previously in mandatory *Unit 2: Animal Biology*, make sure they do not hold the common misconception that breathing and respiration are the same thing. There are many online resources for this learning aim which can be helpful. Some learners can find some parts of respiration pathways difficult to grasp (the electron transport chain in particular), so they should be able to access these resources at any time outside lessons – again a virtual learning environment is of great use here.

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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	

Assessment guidance

Assessment for learning aim A will most likely be in the form of an illustrated report, essay or presentation about atomic and molecular structure and bonding in biochemical reactions, covering both intermolecular and intramolecular forces and including electronic configuration notation. Two examples should be used to illustrate each description or explanation. This should be supported by evidence gathered through research or practical experimentation, which should be referenced in the report.

Learning aims B and C will utilise practical work for part of the evidence. Learners must ensure that they accompany this with an appropriate level of detailed background theory to meet the assessment criteria. Learners should make sure they reference the page numbers of laboratory books to indicate where to find the raw data. The overarching theme for the portfolio must be clear throughout. Learners should include at the beginning a document detailing the structure of the portfolio and indicate where each of the assessment criteria have been met.

It is recommended that you read the *Essential information for assessment decisions* section of the specification in association with this guidance. It would be useful to share guidance with learners, perhaps in a simplified format, so they are aware of what is expected of them.

There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments for *Unit 2: Animal Biology* or *Unit 11: Advanced Animal Nutrition* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

Try to be imaginative in your assessment approach so as to engage learners and to make the method of assessment relevant to the learning aim being assessed. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- interviews with employers – recorded through video, email conversations or recorded video calling
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

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Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 10: Animal Metabolism

Introduction

You could introduce the unit by linking it to many other units, the way that animals function in good health is a result of the tightly controlled biochemical reactions that take place within the body. To understand these, it is essential that learners can relate atomic structure and bonding to how reactions take place and what affects them. The most important pathways are those that give animals the energy to carry out processes vital to life.

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

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 laboratories or veterinary practices
- contribution of ideas to unit assignments/projects
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Previous learners of the BTEC Animal Management course could also be invited to share their experiences with the class and act as mentors.

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

You will need to give learners many opportunities to gain understanding of the structure of the atom and how it allows the formation of compounds.

- Give learners molecular modelling kits and ask them to make simple molecules, representing atoms and bonds within them. Use this to discuss how the atoms are able to maintain the structure of the molecules they have formed.
- Use an interactive periodic table alongside printed periodic tables and explore the arrangements of elements within it. Show learners one mole of a range of elements and molecules for them to see the difference between the same number of molecules of different substances.
- Ask learners to research the properties of biologically important elements and isotopes.
- Learners can work in small groups to define key terms relating to atomic structure, bonding and compound formation.
- Give learners structured worksheets to complete with a range of approaches such as labelling diagrams, completing cloze procedures and questions, linking electron configuration, ionisation and placement in the periodic table.
- Give learners the necessary data and practice in constructing graphs of ionisation energies of different elements.

- Allow learners to watch specified online video tutorials on electronegativity and bonding, asking them to create posters illustrating these concepts.
- Give learners the equipment and instructions necessary to carry out practical experimentation into redox reactions.

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

- There are many mathematical requirements in this learning aim and you may have to give learners support initially. Ensuring learners are secure in their knowledge of these will allow them to gain a deeper understanding of the practical elements that follow and aid their analytical skills development.
- Learners can carry out calorimetry experiments to establish the heat of formation of magnesium oxide using Hess's Law, linking this to biochemical reactions in vivo.
- Learners can carry out model-based enquiry activities to investigate the effect of changing concentration on the rates of reactions.
- Give learners the choice of practical investigations into other factors affecting rates of reactions. After carrying this out, they then analyse their data and draw conclusions.
- Give learners access to interactive tutorials on Gibb's free energy, which they can work through at their own pace and from which they can take notes.
- Demonstrate a range of reactions that are reversible, non-reversible, at equilibrium or have gone to completion. Learners need to access simulations of equilibria experiments to investigate the effects of changing factors on the position of equilibrium.
- Give learners plain paper with the general equation for acid-base equilibrium at its centre. They can then annotate this with notes, including key terms and diagrams.
- Make a range of household substances available to learners. Ask them to first predict and then investigate the pH of each. After a session on pH and pKa calculations, ask learners to calculate the relative molarities of each substance they tested.
- Ask learners to assemble notes from other units (e.g. *Unit 2: Animal Biology* and *Unit 11: Advanced Animal Nutrition*). Using these as a starting point, ask learners to access textbooks and online resources to carry out their own research on blood composition and the effects of changes to pH on blood, cells and tissues. They can then draw on these when discussing the buffering systems of blood.
- Ask learners to carry out titrations of acids and bases, accessing titration simulations as part of the preparation. Ask them to identify and explain the pKa values they obtain.
- Put learners into small groups and ask them to produce large format poster presentations based on the role of blood in regulating equilibria. Ask them to present their posters while other learners complete constructive feedback forms.
- Ask learners to draw storyboards illustrating the stages of enzyme action, with associated key term definitions.
- Give learners equipment and protocols to investigate the effects on enzyme activity of one of the following: temperature, pH, substrate concentration or enzyme concentration. Facilitate the sharing of results between learners, for example by using a virtual learning environment. Ask learners to analyse the results of the investigations, drawing relevant graphs and carrying out relevant calculations, in order to draw conclusions about the effects of each factor on enzyme activity.

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- Within small groups, assign individual learners two types of enzyme inhibition. They should become 'experts' in these before teaching the group. Ask them to illustrate and explain each inhibition, including how they might infer the type of inhibition from data on enzyme activity investigations.

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

Introduce the topic with a discussion on the energy requirements of animals.

- Give learners card-sorting activities to organise showing the word and chemical equations of the overall reaction for respiration. Demonstrate the combustion of cornflour and discuss the need to release energy in smaller steps.
- Present learners with three different practical demonstrations or activities showing features of the process of respiration. Give them structured worksheets to direct their learning.
- Ask learners to make molecular models of the intermediates and products of the Kreb's cycle, taking photographs of each stage of completion.
- Show learners an online video summarising the steps in aerobic and anaerobic respiration as stimulus material for a question and answer session.
- Ask learners to complete an online quiz activity to assess their knowledge of respiration and respiratory substrates. Then ask them to make their own quiz questions with answers that can be used for revision purposes.
- Ask learners to carry out independent research on parts of respiratory pathways and associated processes. Assign learners to groups and ask them to work together to produce a presentation and handouts for their particular section. Each group gives their presentation and other learners can ask questions. After all presentations are given, provide constructive feedback and address any issues with the content.

Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 2: Animal Biology*
- *Unit 4: Practical Animal Husbandry*
- *Unit 5: Animal Behaviour*
- *Unit 6: Animal Health and Diseases*
- *Unit 9: Practical Skills in Animal Science*
- *Unit 11: Advanced Animal Nutrition*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

- Bender D – *Introduction to Nutrition and Metabolism 5th edition* (CRC Press, 2014) ISBN 9781466572249.
  Useful information on the basic biochemistry of nutrition and metabolism for both learners and tutors.
- Hutchings K, Osborne C, Bertin I – *Classic Chemistry Experiments* (Royal Society of Chemistry, 2000) ISBN 9780854049196.
  Contains 100 chemistry experiments for use in teaching, including handouts and tutor/technician notes. Free downloads available from the RSC Learn Chemistry website.
- Salway J – *Metabolism At A Glance 3rd edition* (Wiley-Blackwell, 2003) ISBN 9781405107167.
  A great book linking together metabolic processes in mammals, very accessible for learners and tutors.
- Taber K, Pack M – *Chemical misconceptions – prevention, diagnosis and cure; Volume 1: theoretical background* (Royal Society of Chemistry, 2002) ISBN 9780854043866.
  Gives information and classroom activities to effectively teach chemical concepts and avoid learner misconceptions. Free downloads available from the RSC Learn Chemistry website.
- Taber K, Pack M – *Chemical Misconceptions – prevention, diagnosis and cure; Volume 2: Classroom resources* (Royal Society of Chemistry, 2002) ISBN 9780854043811.
  Gives information and classroom activities to teach chemical concepts effectively and avoid learner misconceptions. Free downloads available from the RSC Learn Chemistry website.

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Journals

- *Biological Sciences Review* (University of Manchester)
  A journal for learning and teaching biological sciences containing excellent resources for access by tutors and learners.
- *Chemistry Education Research and Practice* (Royal Society of Chemistry)
  A free journal with many useful ideas for how to teach chemistry.
- *Education in Chemistry* (Royal Society of Chemistry)
  A journal covering best practice and innovation in teaching chemistry with resources for teaching chemistry and helping learners to gain the most from their laboratory work.
- *International Journal of STEM Education* (Springer)
  Contains useful ideas for evidence-based approaches to teaching and learning in STEM subjects.

Videos

- www.youtube.com/user/crashcourse/featured
  A *YouTube* channel with excellent videos including some on aspects of biology, biological molecules and chemistry.

Websites

- www.biochemistry.org/Education.aspx
  The *Biochemical Society* offers resources for learning and delivering biochemistry to UK learners. In addition to virtual resources, the Biochemical Society runs a school outreach programme.
- www.pbslearningmedia.org
  A range of teaching and learning resources from *PBS Learning Media*. The engaging and challenging resources for teaching and learning can be filtered by subject and age range.
- www.rsc.org
  The *Royal Society of Chemistry* website includes many education resources for teaching and learning chemical concepts, including support for outreach in schools.

Unit 11: Advanced Animal Nutrition

Delivery guidance

Approaching the unit

This unit will give learners an understanding of the biochemical basis of nutrition, allowing them to actively manage the nutritional requirements of animals at different stages of life and health. This is essential knowledge for learners wishing to eventually progress into careers in animal nutrition, one of the largest animal-related industries. Learners should have some previous knowledge of chemistry, biology and animal husbandry before studying this unit, but be prepared to be flexible with lesson time should you need to revisit underpinning concepts to enable successful study. Learners will build on their knowledge and understanding from *Unit 2: Animal Biology* and, in turn, the study of this unit complements the study of *Unit 10: Animal Metabolism*.

Where possible, deliver this unit in a vocational context, using site visits, industrial experience and supervised laboratory practical activities.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order and it is intended that you should take a holistic approach to the delivery of the mandatory units. This unit requires learners to have an understanding of animal biology and animal metabolism from studying *Unit 2: Animal Biology* and *Unit 10: Animal Metabolism* and could be taught alongside these units so that some of the tasks that learners are set can enable them to acquire the skills for all three units simultaneously.

Delivering the learning aims

Learning aim A forms the fundamental basis of understanding biochemical concepts. Many learners struggle with the intangible nature of chemical structures so it is a very good idea to use models and animations to help learners form links between the 3D nature of molecules, how they can make or break bonds and the different ways in which they can be represented.

Learning aim B examines the major food groups in animal feeds and their biochemical structures, features and roles in animal biology. You can use analytical techniques here, as learners begin to apply the theoretical background of molecular structure and behaviour to the real-world application of identifying groups of compounds.

Much of learning aim C may be delivered practically, both through laboratory analysis of the nutritional content of different feeds, and through the practical aspects of planning and preparing diets for different animals. It is worthwhile visiting locations within and outside your centre to demonstrate the different ways in which animal feeds are produced, stored and presented to animals. It is important that learners understand how to construct suitable dietary plans for given animals, but they must also be able to apply their knowledge to the assessment of the diets of living animals or those described in a case study.

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 feedstuff	A portfolio of evidence, including: • analytical reports of 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.

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Assessment guidance

For learning aims A and B, learners will need to use examples of biological molecules, looking at the different ways these are represented, their structures and importance in balanced animal nutrition, including how they are digested and absorbed. A consideration of the roles of organic and inorganic compounds will also be necessary to complete this successfully.

For learning aim C, learners could compare the results of their feed analysis to the nutritional labelling. They should produce dietary plans for each animal, accompanied by explanations of where the nutritional requirements are met. They should also highlight the importance of giving the right amounts of different feed compositions and types, as well as the requirements for feed preparation, storage and presentation (including, for example, timing intervals).

You could give learners deliberately unsuitable dietary plans for particular animals, and case studies of animals with different health statuses. Learners could then prepare reports or presentations highlighting deficiencies, excesses or potential toxicities faced by the animals, drawing on their learning for learning aims A and B. Relevant research should be included and fully referenced.

A portfolio of evidence is suitable for assessing the learning aims for this unit - ensure that learners understand how to structure their portfolios to demonstrate that they have met the assessment criteria. Allow a variety of approaches, such as short illustrated reports, practical write-ups and video recordings of particular aspects (e.g. presentations). Tutor observations and witness statements of informal question and answer sessions should also be included within the portfolio. However, each component must fit within the overarching context of the nutritional requirements and biochemical composition of specific animals.

There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments for *Unit 2: Animal Biology* or *Unit 10: Animal Metabolism* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 11: Advanced Animal Nutrition

Introduction

A balanced diet is key to maintaining the good health and welfare of animals in a captive environment. The nutritional analysis of feeds and an understanding of the nutritional requirements of different animals is the basis of the animal feed industry and this may offer a vocational pathway for some learners in the future.

This unit will allow learners to progress to higher education courses in the field of biological science or prepare them for work in animal health and nutrition or in any role that requires managing animal diets.

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 food manufacturers, farmers, zookeepers or veterinary practices
- contribution of ideas to unit assignments/projects
- opportunities for observation during work experience
- support from local animal business staff as mentors.

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

You should begin by establishing the level of knowledge and understanding learners already have of the chemical basis of life, discussing what chemicals are and where they are found. A brief discussion of organic and non-organic often starts learners thinking about the positive and negative associations between chemicals and food.

- Show learners animations of 3D molecules and link these to the ways in which biological molecules are represented.
- Give learners molecular modelling kits to build representations of biological molecules. This can be used throughout the learning aim, for example:
  - allowing learners to visualise how the standard representations of biological molecules are linked to their 3D nature
  - common shapes of molecules
  - the nature of isomerism
  - how similarities and differences between molecules are linked to their physical and chemical properties.
- Ask learners to carry out independent research on the biochemical make-up of different animals. Use this research to stimulate group discussions on how lifestyle, nutrition and biochemical make-up of animals are linked together.
- Use structured worksheets to consolidate understanding of the structure and function of biological molecules, for example allowing learners to practise drawing molecules in standard formats and develop their understanding of energy profiles when making or breaking bonds.

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

Remind learners of their own need for a balanced diet and ask them to list the basic food groups required for a balanced diet. Describe the teaching structure for this learning aim.

- Discuss the structure of carbohydrates and recap the ways in which carbohydrates are broken down in different digestive systems. Explore the structure of different carbohydrates using molecular modelling kits. Explain the roles and features of different carbohydrates, including how redox reactions take place.
- Use practical work to investigate the use of Benedict's solution for identifying the presence of reducing and non-reducing sugars in feedstuffs, with the use of colorimetry to extend qualitative analysis into quantitative analysis.
- Give learners different feeds that have a high fibre content, discuss the ability of animals with different digestive systems to gain energy from each feedstuff. Discuss the role of bacteria and link this to the different natural feeding patterns of different animals, along with the roles of soluble and insoluble fibre in animal nutrition.
- Learners should make observations on a range of lipids and their properties at room temperature. Investigate the structure of different lipids by giving learners molecular modelling kits and cut-and-stick activities to illustrate differences between fatty acid chains and their importance in triglyceride structure.
- Allow learners to investigate the fat content of different feeds using the emulsion test and Sudan Red. Link the structure of different digestive systems to the utilisation of lipids, with focus on production of volatile fatty acids by bacteria in herbivores.
- Demonstrate the use of titration techniques to examine the effect of acids and alkalis on pH. Make equipment and protocols available for learners to investigate how amino acid buffer solutions can prevent pH fluctuations within a certain range. Learners should carry out independent research on essential and non-essential amino acids in animal nutrition; they can make presentations on these amino acids in small groups.
- Give learners beads and string to simulate the production of proteins from amino acids. Use large format cards with amino acid structures on them, along with cards representing water, then ask learners to work together to form the primary sequence of insulin.
- Use 3D animations to illustrate how the structure of proteins is built on the amino acid sequence and that the secondary, tertiary and quaternary structure is dependent on the interaction of different parts of the polypeptide chain along with the interaction of two or more chains. Link this to the specific nature of enzymes and enzyme action.
- Ask learners to research the roles of proteins in animals and put together short presentations demonstrating the links between structure and function.
- Use ice, water at room temperature and a kettle to demonstrate the different physical states of water. Give learners modelling clay of different colours and coloured sticks and ask them to put together models that show the bonding within and between water molecules.
- Show learners video clips and animations discussing how the properties of water allow life to exist, and its importance to animal nutrition. Ask learners to put together key-word glossaries of technical terms and to consider the ways in which water is absorbed in different digestive systems.

- Ask learners to carry out research on each of the nutrient groups as they are taught, to include the effects of excessive intake.
- Divide learners into small groups and allocate the ten micronutrients given in the unit content between group members. Give learners a template showing the features they need to research for each micronutrient (structure, storage, solubility, absorption, roles in the body, requirements in different animals and effects of excessive intake). Ask learners to carry out research so they become 'experts' on their micronutrients before feeding back to the rest of their group.

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

You could begin this learning aim by discussing how the knowledge and understanding from learning aims A and B can be drawn together and applied in a vocational context.

- Show learners a range of differing feedstuffs and ask them to consider the similarities and differences they can establish, either visually or by applying prior knowledge. Ask learners to carry out combinations of qualitative and quantitative analytical techniques for nutrient analysis to establish the nutrient content of each. (These are the same analyses they have previously carried out in isolation.) Ask learners to write up their results.
- Discuss the role of an animal nutritionist in industry and how animal feeds are regulated. Give learners the nutrition labels from the feeds that they previously analysed and ask them to compare the declared nutritional contents to their results. This could lead to much wider discussions on more accurate testing, what happens if contamination occurs etc.
- Ask learners to use the labelling on feeds to work out which to combine when planning a nutritionally balanced diet for given animals. (They should use information that you make available on nutritional requirements.)
- Discuss how dry matter content is decided on and the purpose of using the dry matter for analysis. Give learners a protocol to follow and a range of feeds, ask them to prepare samples for dry-matter analysis. They can then carry out further analysis on these and compare their results to the nutritional labels.
- Ask learners to mix a number of different breakfast cereals in a bowl. Ask them to separate them back into their original components to illustrate how animals may selectively remove certain components. Ask learners to crush the cereals and attempt the task again. Discuss how feeds are prepared and made palatable to ensure that animals attain a nutritionally-balanced diet.
- Give learners a case study on a malnourished animal. In pairs, they could discuss the symptoms and potential causes of the malnutrition, and how the situation could be rectified.
- Put learners into groups of five. Ask them to choose five from a range of animals with different digestive systems. Learners manage their own time to review their course notes and carry out additional research into the requirements of the different animals at different ages and health statuses. Each group then produces a poster presentation for each animal and these are displayed in the room. Give learners a constructive feedback form to use and ask them to assess at least two of the posters and take notes from the other groups' posters.
- Give learners scenarios of different situations such as feeding animals at a veterinary clinic or managing nutrition at a zoo. Ask learners to carry out research to assess the suitability, advantages and disadvantages of different feeds within that scenario. Give them a checklist from the unit content to ensure all areas are covered. They should then make a leaflet to advise the person in charge of the nutrition of the animals of the options available to them.

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- Ask learners to construct nutritional plans for a given scenario, such as a dairy herd. The plans should be constructed using different priorities, for example managing nutrition, resources and cost.
- Show learners different feeds and different storage options. Take learners to feed-storage areas on site or as part of a visit. Ask them to think about the requirements for feed storage to avoid contamination, waste and spoilage, and to assess provision in a range of photographs or printed vignettes.
- Ask learners to use their knowledge gained throughout the unit to put together an animal nutrition management plan for an individual animal. They should take into account the considerations and practical decisions that need to be made in planning and preparing, storing and presenting feed for that animal.
- Take learners to visit an animal collection or a food production site where they can learn about management of animal nutrition in a real-world setting.

Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 2: Animal Biology*
- *Unit 4: Practical Animal Husbandry*
- *Unit 5: Animal Behaviour*
- *Unit 6: Animal Health and Diseases*
- *Unit 9: Practical Skills in Animal Science*
- *Unit 10: Animal Metabolism*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

- Callaway T, Ricke S – *Direct-Fed Microbials and Prebiotics for Animals: Science and Mechanisms of Action, 1st edition* (Springer, 2012) ISBN 9781493900572.
  A useful text dealing with additives in feeds and their effects.
- Hosey G, Melfi V, Pankhurst S – *Zoo Animals: Behaviour, Management and Welfare, 2nd edition* (Oxford University Press, 2013) ISBN 9780199693528.
  Many aspects of zoo animal management are covered, including the practicalities of animal nutrition.
- McDonald P, Greenhalgh J, Morgan C, Edwards R, Sinclair L, Wilkinson R – *Animal Nutrition, 7th edition* (Benjamin Cummings, 2011) ISBN 9781408204238.
  A comprehensive text covering all animal nutrition basics from biological molecules to dietary planning requirements.
- McNamara J – *Principles of Companion Animal Nutrition, 2nd edition* (Prentice-Hall, 2013) ISBN 9780132706704.
  An accessible text dealing with the nutrition of companion animals.

Journals

- *Journal of Animal Physiology and Animal Nutrition* (Wiley)
  This journal is useful for tutors to keep up to date with current research in animal physiology and animal nutrition.

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- *Journal of Applied Animal Nutrition* (Cambridge University Press)
  This journal is useful for tutors to keep up to date with current research in applied animal nutrition.
- *Biological Sciences Review* (The University of Manchester)
  This contains many useful articles for tutors and learners alike.

Videos

- https://www.youtube.com/user/crashcourse/featured
  A YouTube channel with excellent videos including those on aspects of biology, biological molecules and chemistry.

Websites

- www.animal-nutrition.basf.com/web/global/animal-nutrition/en_GB/
  This *BAS* website is a good starting point for looking at feed additives.
- http://bigpictureeducation.com/
  This *Wellcome Trust* website covers general biology and has some nutrition resources.
- www.fediaf.org/facts-figures/
  The European Pet Food *Industry* website gives general information on pet food production and regulation in Europe, with some educational resources.
- www.merckvetmanual.com/mvm/management_and_nutrition.html
  The *Merck Veterinary Manual* is a well-organised and easy to read guide on managing animals and their nutrition.

Unit 12: Business Management in the Animal Sector

Delivery guidance

Approaching the unit

Learners will come to this unit with some knowledge of businesses, gained through their experiences as consumers, customers or perhaps as employees.

Encourage learners to research and learn about local, national and international businesses in the animal sector. They should look at the key ingredients for business success – how businesses are organised, how they communicate and the characteristics of the environment in which they operate. They should also look at how these key ingredients shape businesses and their activities as well as the importance of innovation and enterprise to the success and survival of businesses, and the associated risks and benefits.

To complete this unit, learners will need access to a range of research materials, which could include the internet, journals or magazines and books.

You can use a range of delivery methods in this unit, for example:

- discussions – class and small group discussions on business types and associated businesses
- individual or group presentations – covering stakeholders and their importance
- case studies – illustrating the physical and human resources needed to support the objectives of the organisation
- videos – talks on innovation and effective resource management.

Group work is an acceptable form of delivery but you must ensure that learners individually produce evidence that is sufficient for assessment.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order and it is intended that you should take a holistic approach to the delivery of the units. You could set tasks that enable learners to gain practice and acquire skills relevant to several related units at the same time. For example, this unit could be delivered alongside *Unit 15: Developing an Enterprise in the Animal Sector* or *Unit 13: Animal Management in a Retail Environment*.

Delivering the learning aims

For learning aim A, introduce the topic by asking learners to share stories about their experiences and knowledge of different animal sector businesses and what they believe contributes to the success of a business. You could give learners some initial input on the different types of associated businesses and how these relate to the operation of the animal sector business. In small groups your learners could then carry out secondary research of businesses using their websites, many of which have an 'about us' page that contains useful information regarding activities, ownership and size.

Learners could follow up this initial research with primary research consisting of independent or accompanied visits to different businesses. It is important that learners understand the influences of a range of stakeholders and the importance of communicating with them appropriately. You could also arrange a visiting speaker to help learners understand stakeholder involvement and the importance of managing stakeholder relationships and expectations, including professional and regulatory bodies.

For learning aim B, you could invite guest speakers from local and national businesses to visit your centre. Ask them to present and discuss the structure, organisation and functional areas that exist in their business. Alternatively, you might hand out case studies of appropriate businesses for learners to interrogate. In small groups, learners could carry out website research into the physical and human resources within well-known businesses in the private and not-for-profit sectors. This will help prepare them to write their own improvement plan for a business in the animal sector such as a chain pet store or an animal charity.

When they are researching the businesses learners can decide which they would like to select for their improvement plan and should gain an understanding of the differing physical and human resource needs of different types of organisation. Learners may also be able to gather information from work experience placements or part-time jobs.

For learning aim C, you could start with a presentation that explains the key types of records needed in business and their importance when measuring success. Learners could take part in group discussions that clarify these records further. Small groups can carry out research and become 'experts' on financial records, staff development or physical resources; they should look at real organisational examples and the impact of these factors on businesses. Groups could conduct research on each of these factors or you could give them appropriate case studies. Following their research, they should form new groups containing an 'expert' for each of the areas so they can exchange knowledge with their peers.

You could introduce learners to situational analysis tools via case studies of different businesses. In small groups or pairs, learners can perform an analysis on a given business and report back to the class. The aim is for the learners to understand the importance of analysing financial data to monitor the performance of the organisation and see how the use of well-trained employees and the right physical resources can affect the success of the organisation.

Learning aims B and C should help learners to understand the implications of having poorly trained staff, using incorrect financial data or mismanaging physical resources. This will help them to identify areas for improvement so that they can create a written improvement plan.

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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	

Assessment guidance

This unit is internally assessed through two summative assignments. The first is a report on one specific animal sector business and how it relates to other businesses in the sector, this will cover learning aim A. The second assignment covers learning aims B and C and is an improvement plan for a chosen business in the animal sector, related to staff skills and business performance. It is essential that a learning aim is assessed as a whole and not split into tasks or sub-tasks per criterion.

All learners must independently generate individual evidence that can be authenticated. The main sources of evidence are likely to be written reports or articles for a journal. Learners should incorporate in-depth research together with a fully referenced bibliography.

Learners could also produce presentations. Suitable forms of evidence for a presentation are, for example slides, preparation notes, a script, cue cards, peer assessment records and an observation record. BTEC assessors could complete observation records and a learner's colleagues in placements or part-time work could complete witness statements. Observation records alone are not sufficient sources of learner evidence; the original learner-generated evidence must also support them. Assessors should remember that they are assessing the content of the presentation against the learning aim and not the delivery skills of the learner.

There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments *Unit 15: Developing an Enterprise in the Animal Sector* or *Unit 13: Animal Management in a Retail Environment* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

Try to be imaginative in your assessment approach so as to engage learners and to make the method of assessment relevant to the learning aim being assessed. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- interviews with employers – recorded through video, email conversations or recorded video calling
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

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Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 12: Business Management in the Animal Sector

Introduction

Begin by introducing the unit to learners through a group discussion exploring businesses they know. Then you can outline the learning aims of the unit.

This unit will prepare learners for a wide range of roles in the animal sector, including working in a pet shop, an animal boarding establishment or an animal grooming parlour.

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 such as zoos, farms, animal boarding establishments or pet shops
- contribution of ideas to unit assignments/projects
- opportunities for observation during work experience
- support from local animal business staff as mentors.

Previous learners of the BTEC Animal Management course could also be invited to share their experiences with the class and act as mentors.

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

- Ask learners to collaborate in small groups to offer examples of different animal sector businesses that they have experienced. Each learner could then contribute to a class discussion on the size, scope, purpose and activities of each business along with the sector in which they belong.
- Ask learners to individually write down the businesses they think are successful. Then, in small groups, learners should list what they consider to be the three key ingredients for business success. Learners should report these findings back to the class, with the result being a list of key ingredients. As a class, learners can then discuss their findings.
- Using the learners' examples from earlier, lead a discussion on different forms of ownership and the associated businesses to which they are linked. Ask learners to consider what the key associated businesses are, e.g. suppliers, and why they are important.
- Discuss how interrelationships and the influence of associated businesses inevitably affect a business. For the latter point, learners should consider the effects of the costs and distribution of live animal stock.
- Give learners a list of professional and statutory bodies associated with the animal sector. In small groups, learners should consider how businesses and charitable organisations work with them and the role they play.

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

- Ask learners to work in small groups to research and gather information on the structure and organisation of a number of businesses. This could be through online research or visits to local businesses. Learners could visit a number of contrasting

businesses in the locality with a view to gathering information on different types of structures, including staffing structures.

- Ask learners to prepare and deliver a presentation of their findings to the class. (This should include professionally presented slides and speaker notes.) The presentation should consider the skills needed by the staff in the organisations.
- Use the learners' presentations to lead a discussion on the suitability of different types of structure and organisation for different businesses. The discussion should include the range of skills needed by employees and why that affects the success of the organisation.
- Give learners three case studies each detailing the resources for an organisation (one private, one public and one not-for-profit), including their mission statements. Lead the class in a discussion to ensure that learners understand the physical and human resources needed for each organisation. You could divide the class into three groups (private, public, not-for-profit) and ask them to select another organisation within their sector and carry out research into its physical and human resources. Learners should then identify the staffing structure, the skills needed and how the employees help to meet the mission/business objectives. Additionally, learners should identify any areas for improvement. These could include too many or too few employees, lack of training, lack of understanding by employees of their role in achieving the organisational objectives. (Researching customer complaints for a company might be a good place for learners to start.)
- Encourage learners to look at employee motivation and how this can affect the success of an organisation. Consider the role of good people management and training opportunities to show employees they are valued. Learners could discuss the impact this can have on a business, based on their own experience as a consumer or as an employee.

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

- You could begin by introducing the types of records businesses have to keep, how these records can be used to measure success or performance against competitors and why managers need to understand the capabilities of staff in order to achieve business objectives.
- Explain to learners how businesses can use financial records to examine trends, the cost of employing staff compared to income generation and alternative ways to carry out business using online technology.
- You could outline the process for managing employees and the potential impact of ignoring poor performance from employees. Learners could discuss how individual employees need to know how they contribute to the success of the organisation and how incentive schemes can motivate staff and improve performance. By contrast, they could discuss how poor staff management can have an impact on an organisation and the motivation of employees.
- Ask learners to work in small groups to carry out a physical resource audit for a local business. It may be possible to invite a guest speaker who owns a local business to discuss how they operate. Learners can complete an analysis on a business of their choice, with each learner or pair identifying the physical resources for that organisation, any livestock and how the organisation is currently managing these resources. This analysis could include things such as maintenance and repairs, opening hours and access for customers. It should also involve identifying any areas that could be improved. Ask each group to report on the strengths and weaknesses of each business and compare it to its competitors for analysis.
- You should encourage learners to research a chosen business and carry out a situational analysis. This should include finding out about best practice for that

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business type and the competitive environment in which that business operates. (Ensure that the group together covers a broad range of businesses.) This will help learners to identify possible improvements for a chosen business and allow for innovative approaches.

- For assessment, learners should research one business, looking at its physical and human resources, its purpose, the sector it operates in, the scope of its activities and reasons why it is successful. You should also encourage learners to research the structure, organisation and any areas that could potentially be improved, e.g. the use of social media, accessibility for customers etc.
  Learners will be required to report on how the organisation could be improved, and should be able to make an evaluation on the reasons for the success of each business. Improvement suggestions may focus on things such as staff skills and the organisational performance compared to competitors. Learners also have to demonstrate the types of records kept and how using that information can help them analyse the business's function and success.

Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 7: Work Experience in the Animal Sector*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Journals

- *Business Review* (Philip Allan Magazines, Hodder Education)
  A journal designed for Business Studies learners that includes relevant theoretical articles as well as information on companies and markets.
- *The Economist* (The Economist Group)
  The print edition is a weekly economics and business journal that has regular articles and features about issues related to public-sector businesses and the economy. It has an extensive archive of relevant materials.

Videos

- www.bbc.co.uk/schools/gcsebitesize/business/environment/stateofeconomyvid.shtml
  Experts talk about the impact of an economic downturn and what a business can do to stay afloat in hard times.
- www.ted.com
  TED offers online videos of short (18 minutes or less), powerful talks covering almost all topics, including business and global issues.

Websites

- www.bbc.co.uk/news/business/economy
  The *BBC* has news on the UK economy.
- www.businesscasestudies.co.uk
  The Times 100 Business Case Studies has economics and business case studies on topics such as Business Environment, the Economy, Ethics and External Influences. The site also has a selection of theory notes aimed at learners.
- www.economist.com
  The Economist online has an archive of articles about the UK economy. A subscription is required but it also includes the weekly editions of the newspaper.

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- www.gov.uk
  The government portal for government departments and policies. It will include the specific policies and licences required for businesses in the animal sector.
- www.investopedia.com
  Investopedia is an educational website that has many useful articles such as 'Economics Basics: Supply and Demand'.
- www.lantra.co.uk
  The *LANTRA* website contains information about land-based sector skills including animal management.
- www.mindtools.com/CommSkll/WritingSkills.htm
  Tips on human resources and how to develop good people management skills including skills audits.

Unit 13: Animal Management in a Retail Environment

Delivery guidance

Approaching the unit

Learners should be encouraged to use their knowledge of retail businesses gained through their experiences as consumers, customers or perhaps as employees.

Encourage learners to research and learn about local, national and international retail businesses in the animal sector. They should look at the range of designs to promote sales but also consider the welfare of the animals to be sold. The layout of any retail environment should encourage customers to have a positive experience. But when dealing with animals, welfare is key to reducing animal stress and encouraging customers to want to purchase from that business.

In a highly competitive industry, the way in which the business is marketed with promotional strategies can have an impact on its success or otherwise. Learners can use their own experience as consumers to observe good practice and understand how correct design, management and promotion can offer a competitive advantage to businesses.

To complete this unit learners will need access to a range of research materials, which could include the internet, journals or magazines and books.

You can use a range of delivery methods in this unit, for example:

- discussions – class and small group discussions on a range of retail business designs and welfare implications
- individual or group presentations – covering management of livestock and non-livestock
- case studies – marketing strategies and promotional methods to promote that animal retail sector
- video – exploring designs and best practice for animal welfare.

Group work is an acceptable form of delivery but you must ensure that learners individually produce evidence that is sufficient for assessment.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order and it is intended that you should take a holistic approach to the delivery of the units. You could set tasks that enable learners to gain practice and acquire skills relevant to several related units at the same time. For example, this unit could be delivered alongside *Unit 12: Business Management in the Animal Sector* or *Unit 15: Developing an Enterprise in the Animal Sector*.

Delivering the learning aims

You could introduce learning aim A by asking learners to share stories about their experiences and knowledge of different animal retail businesses, in relation to store layout designs and animal husbandry needs. You could then give them

some information on the factors affecting the location of stock and relevant legislation and how these relate to the operation of the business.

In small groups learners could carry out secondary research of businesses using their websites, many of which have 'about us' pages that contain useful information on their facilities, the stock which is kept and photographs of husbandry methods for animals on display. Learners could follow this up by primary research consisting of independent or accompanied visits to different retail businesses to investigate the layout and explore the accommodation requirements. It is important that learners understand the influences of legislation and welfare codes when examining layout and design, and the importance of appropriate husbandry methods to reduce stress and prevent ill health of livestock.

A visiting speaker could help learners understand management of a retail business and the importance of managing welfare, husbandry, stock control and customer expectations. Once learners have researched and potentially visited animal retail businesses, they could design their own retail business with a report to demonstrate they understand the concepts covered in this learning aim. This could range from the type of materials used to house animals on display, for example not keeping animals in a display window exposed to direct sunlight, to how the design would comply with legislation and welfare codes.

For learning aim B, you could invite guest speakers from local and national businesses to visit your centre to present and discuss the management of stock, and give examples of good and bad practice. Alternatively, you could make case studies for appropriate businesses available for learners to interrogate.

In small groups, learners could carry out website research into the stock management of a well-known business in the animal retail sector. This will help prepare learners to write their own report to accompany the design of a new retail business, including, for example stock control management systems, sourcing of livestock and risks associated with acquiring stock. When researching the business, learners can decide what aspects they could use for their own design plan. Researching other businesses will also enable learners to understand the range of differing layouts available. Learners may also be able to gather information from work experience placements or part-time jobs.

You could introduce learning aim C with a presentation that explains the main local types of marketing available and why marketing is needed in business. Learners could have group discussions to investigate which marketing campaigns they prefer and why. Small groups could research a range of promotional methods related to the scale of the business, budget and the intended audience. Groups could either research promotional methods or you could give them appropriate case studies or local marketing examples from local retail businesses. Learners could then form new groups to focus on marketing planning and how it meets the business objectives while complying with legislation; they should then share the information with their peers.

You could use case studies to introduce learners to different business objectives and how the marketing plans support the achievement of these objectives. Learners can work in pairs or small groups to perform an analysis on a given business and its marketing plan, and report back to the class. The aim is for learners to understand the impact of a successful marketing plan in relation to the performance of the organisation and how a well-planned marketing strategy can affect the success of the organisation.

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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.

Assessment guidance

This unit is internally assessed through two independent tasks. Learners could produce written assignments to cover the unit criteria.

Learning aims A and B are assessed together. Learning aim A could be partially considered from the perspective of a customer, with learners detailing how the design and layout meet their needs. Where possible, retail businesses should identify customer expectations, so a focus on their needs is a key factor when designing the layout and determining what stock to display.

For learning aim B learners should be able to critically assess a retail animal business and how it is managed, making any recommendations for improvements.

The marketing plan created for learning aim C could be presented to the group and peer assessments used to consider the choice of promotional activities being suggested within the plan.

All learners must independently generate individual evidence that can be authenticated. Suitable forms of evidence for a presentation are, for example slides, preparation notes, script, cue cards, peer assessment records and an observation record. BTEC assessors could complete observation records and a learner's colleagues in placements or part-time work could complete witness statements. Observation records alone are not sufficient sources of learner evidence; the original learner-generated evidence must also support them.

There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments *for Unit 12: Business management in the Animal Sector* or *Unit 15: Developing an Enterprise in the Animal Sector* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

Try to be imaginative in your assessment approach so as to engage learners and to make the method of assessment relevant to the learning aim being assessed. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- interviews with employers – recorded through video, email conversations or recorded video calling
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

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Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 13: Animal Management in a Retail Environment

Introduction

Begin by introducing the unit to learners through a group discussion exploring animal retail businesses they know and then outline the learning aims of the unit.

This unit will prepare learners for employment in retail environments involving animals, such as pet shops and other businesses where animals are sold.

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 such as pet shops
- contribution of ideas to unit assignments/projects
- opportunities for observation during work experience
- support from local animal business staff as mentors.

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

- Ask learners to collaborate in small groups to come up with examples of different animal retail businesses that they have experienced. Each learner could then contribute to a class discussion on the type of stock sold, type of business, layout and design of the business etc.
- Learners could visit a retail establishment and analyse the factors they felt influenced the design of the store and the location of the livestock.
- Ask learners to individually write down what they liked about the retail business and if it sold livestock, how they felt animal welfare needs were being met. In small groups learners should then list what they consider are the five key factors for animal retail businesses when designing their layout. Learners should report their ideas back to the class. This should result in a list of things to consider when designing a suitable layout for a retail business, which can form the basis of a class discussion. This can be expanded into a discussion of how the requirements of individual species can be met and the impact of not meeting these needs.
- Using the learners' examples, lead a discussion on different forms of layout and how they have to meet the needs of the business and the animals. Ask learners to consider challenges when designing a retail outlet such as available space, budget, access for customers, suitable environments for livestock, legal requirements etc.
- Learners could design a daily and weekly husbandry plan for the store.
- You could invite a store manager to visit to explain how their pet store meets all the legal requirements.

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

- Ask learners to work in small groups to research and gather information on the structure and layout of a number of retail businesses. This could be from online research or through visits to local businesses. Learners could visit a number of contrasting businesses in the locality with a view to gathering information on a variety of business structures including livestock and non-livestock.
- Ask learners to prepare and deliver a presentation, with professionally presented slides and speaker notes, on sourcing a range of stock (general and livestock)

highlighting potential risks. Learners can then give their findings to the class in a presentation that should consider how to manage stock, including meeting the requirements of any relevant legislation.

- Use the learners' presentations to lead a discussion on the suitability of different sources for stock. Highlight how factors such as cost, supply and demand, and seasonality can affect the stock management process.
- Give learners a case study of a poorly designed animal retail business (it is suggested that a fictitious business case study is created by the tutor). Lead the class in a discussion to ensure that learners understand the legal implications for an animal retail business with regard to animal welfare. Ask learners to analyse the case study and suggest what could be done to improve the sourcing and design of the animal retail business.
- Learners should research one retail business, looking at its design to critically assess if it is fit for purpose. They should 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. If there are any areas which are not fit for purpose learners should identify what needs altering, the impact that this may have and offer any suggestions for improvement.

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

- You could begin by introducing the types of marketing elements to consider, such as the marketing mix, and how these can be used to plan a marketing strategy to increase the success or performance of an animal retail business against competitors.
- Introduce how businesses can use marketing to encourage consumers to use a particular retail business rather than a competitor. Where possible give some local examples from newspapers etc. Learners can research local and national marketing campaigns within the animal retail sector and discuss how effective the examples have been.
- You could outline the process for creating a marketing plan and give example plans to learners to discuss in groups. Discuss a range of marketing methods so learners gain a broad understanding of how marketing can be used to benefit an animal retail business. By contrast they could discuss how poor marketing strategies can damage the reputation of a retail business. Learners can research examples of poor marketing strategies or you can give them some examples.
- Ask learners to work in small groups to carry out a marketing plan for a given local business. This will offer the opportunity for learners to research the business and identify what may attract customers. As part of the assessment, learners will have to complete a marketing plan to include pricing, promotion, risks and legal requirements.
- It may be possible to invite a guest speaker who owns a local animal retail business to discuss how they create a marketing plan and how it supports meeting the business objectives and legal requirements. Learners can complete an analysis on an animal retail business of their choice. Each learner should identify the need for correct sourcing of stock and how this also forms part of the marketing strategy.
- You should encourage learners to research a chosen business to find out about successful marketing plans for the animal sector and the competitive environment in which they operate. This will help learners to carry out their own plan with justifications for choices. Ensure that there a broad range of marketing methods are covered in the group. This will help support learners to identify possible improvements for a chosen business and allow for innovative approaches.

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Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 4: Practical Animal Husbandry*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

- Berman B, Evans J – *Retail Management: A Strategic Approach 12th edition* (Pearson, 2012) ISBN 9780273768562.
  A reader-friendly text showing a strategic, decision making approach that illustrates how retailers plan for, and adapt to, today's changing and complex retail environment.
- Down S – *Enterprise, Entrepreneurship and Small Business* (Sage Publications Ltd, 2010) ISBN 9781412910125.
  A thoughtful and reflective account of 'enterprise', offering meaningful and contextualised knowledge at all levels in an engaging and informative style.

Journals

www.marketingmagazine.co.uk (Haymarket Media Group)
A journal covering current marketing campaigns and marketing methods.

Videos

- www.bbc.co.uk/schools/gcsebitesize/business/environment/stateofeconomyvid.shtml
  Experts talk about the impact of an economic downturn and what a business can do to stay afloat in hard times.

Websites

- www.businesscasestudies.co.uk
  The Times 100 Business Case Studies has economics and business case studies on topics such as Business Environment, the Economy, Ethics and External Influences. The site also has a selection of theory notes aimed at learners.
- www.gov.uk
  The government portal for government departments and policies. This site contains information regarding licence agreements needed for selling and transporting livestock.
- www.investopedia.com/
  Investopedia is an educational website that has many useful articles such as 'economics basics: supply and demand'.

- www.lantra.co.uk
  The *LANTRA* website gives information about land-based sector skills including animal management.
- www.mindtools.com/CommSkll/WritingSkills.htm
  This site gives some suggested formats for promotional and marketing plans, customer satisfaction/expectations.
- www.retail-week.com/sectors/pets-market-what-do-retailers-need-to-know/5061137.article
  Retail business site with range of sectors and case studies for marketing campaigns.

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Unit 14: Animals in Boarding Establishments

Delivery guidance

Approaching the unit

Learners should be encouraged to use any prior knowledge of animal boarding gained through their experiences as customers or perhaps as employees.

Encourage learners to research and learn about a range of boarding businesses. They should look at the main design and welfare elements for business success: how boarding establishments are organised, how they are designed, the characteristics of the environment for the animals, and how this is managed. Learners should also look at the importance of meeting legal requirements to ensure the success and survival of businesses, plus the associated welfare considerations and management best practice.

To complete this unit learners will need access to a range of research materials, which could include the internet, journals or magazines and books.

You can use a range of delivery methods in this unit, for example:

- discussions – class and small group discussions on the types of boarding establishments
- individual or group presentations – covering husbandry and management procedures
- case studies – illustrating legislation and management practices of animal boarding establishments
- visits – to a range of different boarding establishments
- guest speakers – invite people involved in relevant businesses
- video – talks on boarding establishment designs and effective management.

Group work is an acceptable form of delivery but you must ensure that learners individually produce evidence that is sufficient for assessment.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order and it is intended that you should take a holistic approach to the delivery of the units. You could set tasks that enable learners to gain practice and acquire skills relevant to several related units at the same time. For example, this unit could be delivered alongside *Unit 3: Animal Welfare and Ethics*, *Unit 4: Practical Animal Husbandry* or *Unit 15: Developing an Enterprise in the Animal Sector*.

Delivering the learning aims

Introduce learning aim A by asking learners to share stories about their experiences and knowledge of different animal boarding establishments. You can then give learners information on the different types of boarding establishments and how these may have different purposes, for example a profit-making boarding kennel or an animal charity rescue centre.

In small groups, learners could carry out secondary research into animal boarding establishments using their websites, many of which have useful

information regarding their design, facilities, purpose and size. Learners could follow this by primary research consisting of independent or accompanied visits to different boarding establishments.

It is important that learners understand the legal requirements for animals to be boarded, and the importance of appropriate licensing. A visiting speaker could help learners understand more about the types of boarding establishment and why there is specific legislation in place for these organisations.

For learning aim B you could invite guest speakers from local businesses to visit your centre to present on and discuss the management, husbandry, and functional areas that exist in their boarding establishments. Alternatively, you could give out case studies on appropriate boarding establishment businesses for learners to interrogate.

In small groups, learners could carry out website research into the routine management procedures which take place within a boarding establishment business in the private and not-for-profit sectors. They could also compare the daily and weekly husbandry routines of different types of boarding establishments. This will help prepare them to understand the design and layout for their own boarding establishment, considering functional areas, size of accommodation etc. When researching the boarding establishments learners can decide which they would like to select for their own design. They need to be able to understand the differing designs for certain species, husbandry needs, welfare and legislative considerations, environmental enrichment, safety considerations etc. Learners may also be able to gather information from work experience placements or part-time jobs.

You could introduce learning aim C by outlining the range of animal welfare factors to consider when managing a boarding establishment and the impact they can have on the welfare of the animals housed there. Learners could then take part in group discussions that cover aspects of welfare, safety, behavioural impacts etc. Small groups can research good and poor examples of boarding establishment design and management. This could include boarding facilities in other countries that do not need to comply with UK legislation and which may have a lower standard of housing for animals.

It is important for learners to see the impact of poor design and management on the animals' welfare. Learners could complete comparative analysis between a good practice and poor practice establishment and comment on the impact it has on the animals housed there and on the people working there. This task would be suitable for small groups or pairs. The aim is for the learners to understand the impact of boarding establishment design and how that and the management of the facility can impact on animal welfare.

You could invite a guest speaker to discuss management procedures for boarding establishments, or organise observational visits to different boarding establishments for a range of purposes. Whilst visiting establishments, learners could record the impact the environment has on animal welfare and behaviour. Videos could be taken to show examples of managing animal welfare. for example having sufficient exercise areas to reduce or prevent abnormal behaviour such as pacing.

The delivery of the three learning aims should help learners to understand the implications of poorly designed boarding establishments and show examples of good layouts. This will enable them to identify good management areas for their written report and a suitable design when creating their layout for a boarding establishment.

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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.

Assessment guidance

This unit is internally assessed. All learners must independently generate individual evidence that can be authenticated. Learners can use an appropriate case study to demonstrate the relevant laws and management practices required for two boarding establishments. The design and report to cover learning aim C needs to demonstrate that the learner understands why their design choice is suitable and has considered management principles which will support animal welfare.

There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments for *Unit 3: Animal Welfare and Ethics*, *Unit 4: Practical Animal Husbandry* or *Unit 15: Developing an Enterprise in the Animal Sector* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

Try to be imaginative in your assessment approach so as to engage learners and to make the method of assessment relevant to the learning aim being assessed. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- interviews with employers – recorded through video, email conversations or recorded video calling
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

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Getting started

This gives you a starting place for one way of delivering the unit, based around the suggested assignments and tasks in the specification.

Unit 14: Animals in Boarding Establishments

Introduction

Begin by introducing the unit to learners through a group discussion exploring boarding establishments they know and follow this by outlining the learning aims of the unit.

This unit will allow learners to progress to employment in animal boarding establishments, such as kennels, catteries, animal rescue or animal quarantine establishments.

If it is possible to arrange, this unit would benefit from employer involvement in the form of:

- guest speakers from local animal boarding establishments or from animal welfare charities
- technical workshops involving staff from local animal boarding establishments or from animal welfare charities
- contribution of ideas to unit assignments/projects
- opportunities for observation during work experience
- support as mentors.

Previous learners of the BTEC Animal Management course could also be invited to share their experiences with the class and act as mentors.

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

- Ask learners to collaborate in small groups to come up with examples of different boarding establishments that they have experienced. If learners have limited experience, you may need to give some examples. A class discussion could follow on the size, type of species housed, purpose, and whether it is a private business or charity etc.
- Using the examples discussed, ask learners to work individually and write down which boarding establishments they think are successful. In small groups learners should then list what they consider to be the main reasons for success under headings such as management, welfare, husbandry etc. Learners should report these findings to the class, resulting in a list of success factors. Learners can discuss their findings as a class.
- Using the learners' examples from earlier, lead a discussion on different types of boarding establishments and the purpose they serve. Ask learners to consider what would be the key factors when deciding which boarding establishment they would select if they had to board their pet or rescue an animal for rehoming.
- Discuss how UK laws and regulations affect the licensing of boarding establishments and how the influence they inevitably have can affect a business. For the latter point, learners should consider the effects of the costs of meeting regulatory requirements in terms of health and safety, welfare etc.
- Give learners legal and regulatory information affecting boarding establishments. In small groups, learners could consider how businesses and charitable organisations in the UK work within the legal framework and compare this to other countries that do not have such legislative requirements. Learners can then research the impact this may have on animal welfare, human safety etc.
- You could invite a centre manager in to explain how their organisation meets all the legal requirements.

- Give learners a case study or ask them to research the legislation and management of two boarding establishments. These need to be different types of organisations, for example one private boarding kennel and one rescue organisation. Learners can also make comparisons with a similar organisation in another country that does not have the same regulatory or legislative controls to analyse the impact on the animals.

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

- Ask learners to work in small groups to research and gather information on the management procedures of a number of boarding establishments. This could be through online research or visits to local businesses. Learners could visit a number of contrasting boarding establishments in the area with a view to gathering information about the management and husbandry practices of various establishments serving different purposes, including charities and private businesses.
- Ask learners to prepare and deliver a presentation of their findings to the class on the husbandry practices of different boarding establishments and why records are important for effective management. The presentation should include professionally presented slides and speaker notes.
- Use the learners' presentations to lead a discussion on the suitability of different husbandry practices and why areas such as quarantine are important for animals' health and welfare, especially in establishments that take in strays/= or rescued animals. This should also consider safe working practices and PPE for employees.
- Learners could design a daily and weekly husbandry plan for an allocated boarding establishment.
- Give learners two case studies (one private and one not-for-profit boarding establishment) which detail the design and management procedures for those organisations, including their safe working practices. Lead the class in a discussion to ensure that learners understand the need for clear management procedures to protect animal and human wellbeing for each organisation.
- Divide the class into two groups (private and not-for-profit) and ask them to select a boarding organisation to research to include the purpose, management procedures and, if possible, husbandry management. Then the learners should identify the systems in place, the records, the planning needed and how good management and husbandry are linked to animal welfare.
- Look at planning daily routines and recording of information for the animals being boarded and how this can affect the success of the organisation. Learners could discuss their own experiences, as a customer or as an employee, of the impact people's perceptions of a boarding establishment can have on a business.
- For assessment, learners should research two boarding establishments, looking at their management procedures and husbandry practices, and reasons why they are successful.

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

- You could begin by introducing types of boarding establishment layouts, giving example designs including materials used for the construction, exercise facilities etc.
- It is important to refer to the relevant legislation, licences and regulations that restrict the location of such establishments and what requirements are needed when at the planning stage.
- Introduce how boarding establishments need to take account of environmental considerations and waste management in addition to the requirements for animal

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welfare. These factors can have an impact on animal and human welfare so need to be included at the planning and operational stage.

- You could support learners to compare boarding establishments within the UK to those overseas that do not have the same regulatory requirements. This will broaden the learners understanding about how the legislation impacts on the management and husbandry within the UK. Learners should be aware of example designs for boarding establishments within the UK, but a comparison with those overseas will help demonstrate the impact legislation has on welfare.
- Ask learners to work in small groups to carry out a visit, listen to a guest speaker or use online research to look at differing boarding establishment designs to assess their suitability. It may be possible to have a guest speaker who owns a local business to discuss how they operate. Learners can complete an analysis on a business of their choice, each learner or pair identifying the management procedures and the welfare considerations in place for that organisation.
- Learners should research the layout and design of a boarding establishment, how animal welfare and reduction of stress is considered and any areas for improvement, e.g. size of exercise areas, accessibility for customers etc. They should then design their own animal boarding establishment using the findings from their research. They should consider all areas, such as the requirements for the five welfare needs of animals and include, for example such issues as appropriate materials for construction.
  You should encourage learners to research a chosen business to find out about best practice for that boarding establishment and observe management and husbandry practices to decide if there is a good level of animal welfare in place. Ensure the group covers a broad range of boarding establishments. This will help support learners to identify possible improvements for a chosen business and allow for innovative approaches in their own designs.

Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 4: Practical Animal Husbandry*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

- Cavill D – Running Your Own Boarding Kennels: The Complete Guide to Kennel and Cattery Management *4th Edition* (Kogan Page, 2008) ISBN 9780749453305.
  Gives detailed advice on every aspect of running a boarding kennel.
- Key D – Cattery Design: The Essential Guide to Creating Your Perfect Cattery (David Key Kennel and Cattery Design, 2006) ISBN 9780953800216.
  A complete reference and step-by-step cattery building guide with advice on plans, construction, materials, equipment and all aspects of cattery design.
- Key D – *Essential Kennel Design* (David Key Kennel and Cattery Design, 2000) ISBN 9780953800209.
  Plenty of information and detailed advice on kennel design.

Journals

- *The Whole Dog Journal* (Belvoir Media Group)
  This journal is available online at www.whole-dog-journal.com and includes information on all aspects of canine welfare.

Websites

- www.gov.uk/animal-boarding-establishment-licence
  The *UK Government* website for boarding licences.
- www.gov.uk
  The *UK Government* portal for government departments and policies.
- www.lantra.co.uk
  The *LANTRA* website has information about land-based sector skills including animal management.

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Unit 15: Developing an Enterprise in the Animal Sector

Delivery guidance

Approaching the unit

Learners will have some prior knowledge of businesses gained through experiences as consumers, customers or perhaps as employees. They will develop this knowledge and the practical skills required to start a new business in the animal sector.

Learners should be encouraged to research and learn about local, national and international businesses in the animal sector. They should look at the key ingredients for a potential new business, current businesses that show innovation, the role of the entrepreneur, the characteristics of the environment in which the business may operate, and how this shapes them and their activities. Learners should also look at factors to consider when setting up a business: opportunities, threats, and the need for motivation to succeed.

Learners will have the opportunity to create a micro-business within the animal sector and plan how it could be set up. This will allow learners to understand the process of creating a new enterprise and consider how it could be successful.

To complete this unit, learners will need access to a range of research materials, which could include the internet, journals or magazines, and books.

You can use a range of delivery methods in this unit, for example:

- discussions – class and small group discussions on enterprise and entrepreneurship looking at examples in industry
- individual or group presentations – covering possible ideas for micro-businesses and any associated barriers to success
- case studies – illustrating different business models which have failed and succeeded
- videos –talks on innovation and entrepreneurship.

Group work is an acceptable form of delivery but you must ensure that learners individually produce evidence that is sufficient for assessment.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order and it is intended that you should take a holistic approach to the delivery of the units. You could set tasks that enable learners to gain practice and acquire skills relevant to several related units at the same time. For example, this unit could be delivered alongside *Unit 12: Business Management in the Animal Sector* or *Unit 13: Animal Management in a Retail Environment*.

Delivering the learning aims

Introduce learning aim A by asking learners to discuss their experiences of different animal sector businesses, and their understanding of enterprise and entrepreneurship. You could then give some examples of different entrepreneurs

and the importance of the entrepreneurial mindset. Working in small groups learners could carry out online research into some businesses through their websites, many of these have 'about us' pages that contain useful information regarding activities, start up and why the business was developed.

They could follow this up with primary research consisting of independent or accompanied visits to different local businesses. It is important that learners understand the market demands that created the need for the business, the barriers that were present and the strategies that were used to overcome these barriers. Learners could also brainstorm potential ideas and then identify the barriers that would stop those ideas becoming realities. A visiting speaker could add information and first-hand experience of the difficulties they encountered when starting a new business and why motivation is essential for its success. Learners can also carry out research into a range of entrepreneurs and could watch interviews with them online to establish their mindset.

Learning aim B, could involve visits by guest speakers from local and national businesses to present and discuss how to generate ideas for a potential new micro-business and how LMI (labour market intelligence) reports may be useful. Alternatively, you could make case studies for appropriate businesses available for learners to interrogate, including the business models used.

In small groups, learners could carry out website research into the factors they should consider when setting up a micro-business. This will help prepare them to write their own business plan for a small business in the animal sector. When carrying out research, learners can decide which factors they need to consider when writing their own business plan. They need to be able to understand the different business models that could be appropriate for them. Learners might also be able to gather information from work experience placements or part-time jobs.

You could introduce learning aim C by explaining the key legal and financial aspects of a business and their importance when considering starting a new venture. Learners could then divide into small groups to carry out further research and become 'experts' on either the financial or legal aspects. They should look at real organisational examples and the impact of these factors on businesses. Groups can either conduct their own research into each of the factors or you could give them appropriate case studies. When each group has done this, new groups should be formed by putting together one 'expert' from each of the earlier groups. Learners can now share their knowledge with each other in these new groups.

You should introduce learners to market analysis and planning tools, for example PESTLE and SWOT analysis models. They could then work in pairs or small groups to perform an analysis on a given business and report back to the class. Learners must understand the impact of analysing the market before deciding to set up a business. They must know that there is a demand for a proposed business and that it is appropriate for the sector. Learners can carry out a similar analysis individually to develop their own business plan for a micro-business in the animal sector. Evidence from their analysis can demonstrate the demand for such a business.

The delivery of learning aims B and C should enable learners to understand the implications of developing a new enterprise business in the animal sector. They need to understand how incorrect market data, poor research or poor planning can affect the success of such a business. As learners complete the different activities, they should make links with their own business plans.

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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 for 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	

Assessment guidance

This unit is internally assessed. For the report to cover learning aim A, learners should find out about different entrepreneurs using case studies to examine how their mindset developed. Learners can also use case studies (these can be fictitious companies) to highlight micro- and macro-environmental factors to consider when starting any new business.

For learning aims B and C learners should produce a business plan. They can use existing business plans to demonstrate the component elements to be included and show why market research is important and how it can be obtained. All learners must independently generate individual evidence that can be authenticated. Learners could also produce presentations. Suitable forms of evidence for a presentation are, for example slides, preparation notes, a script, cue cards, peer assessment records and an observation record. However, observation records alone are not sufficient sources of learner evidence, the original learner-generated evidence must also support them.

There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments for *Unit 12: Business Management in the Animal Sector* or *Unit 13: Animal Management in a Retail Environment* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

Try to be imaginative in your assessment approach so as to engage learners and to make the method of assessment relevant to the learning aim being assessed. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- interviews with employers – recorded through video, email conversations or recorded video calling
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

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Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 15: Developing an Enterprise in the Animal Sector

Introduction

Introduce the unit by considering all the opportunities for setting up an enterprise in the animal sector. Ask learners to think of different possibilities and what they would need to do to develop these ideas into a small business of their own.

This unit will allow learners to decide whether they wish to set up their own businesses in the animal sector.

If it is possible to arrange, this unit would benefit from employer involvement in the form of:

- guest speakers from local animal businesses, such as pet shops, groomers, animal boarding establishments, breeders or farms
- technical workshops involving staff from local animal-related businesses
- contribution of ideas to unit assignments/projects
- opportunities for observation during work experience
- support as mentors.

Previous learners of the BTEC Animal Management course who have gone on to run their own businesses could also be invited to share their experiences with the class and to act as mentors.

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

- Ask learners to collaborate in small groups to come up with examples of different animal sector businesses that they have experienced. Each learner could then contribute to a class discussion on how the businesses are innovative in meeting the needs of customers.
- Ask learners to individually write down which businesses they think are successful in being creative and innovative. In small groups learners should then list what they consider to be the three key ingredients for business success. Learners should report these findings back to the class, resulting in a list of entrepreneurial animal sector businesses and the reasons they are successful. Learners should discuss their findings as a class.
- Using the learners' examples from earlier, lead a discussion on different forms of ownership and the associated businesses that they are linked to such as suppliers and distributors. Ask learners to consider who would be the key associated businesses, such as suppliers, and why they are important. This should include regulatory or professional bodies they could be linked to.
- Set a task for small groups to select one entrepreneur and carry out research to identify their characteristics, for example what motivates them and inspires them to succeed. Each group can then report back to the class on the traits and motivation for these individuals to see if there are any similarities in the entrepreneurial mindset.
- Discuss how motivation is a major aspect of being an entrepreneur and ask learners to identify what motivates them.
- You could link motivation to barriers to success. Learners could work in two groups: one could create a list of barriers and the other could explain how these barriers could be overcome and the role of motivation in this process.

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

- Ask learners to work in small groups to research and gather information on the definition of a micro-business. This could be through online research or visits to local businesses. Learners could visit a number of contrasting businesses in the locality with a view to gathering information about a range of animal sector businesses and identifying opportunities in the market for a new business. They can also carry out online research to inspire potential new innovative business ideas. The class can design a scoring system to decide the success factors for new business ideas.
- Ask learners to prepare and deliver a presentation to consider the range of models for businesses opportunities. Learners could work in pairs or do the presentation individually with professionally presented slides and speaker notes to give their findings to the class.
- Use the learners' presentations to lead a discussion on the suitability of different types of models and organisation for different businesses. It should include the range of structures and what may be appropriate, for example an online business compared to a retail outlet. This can be related to the learners' chosen business idea if appropriate.
- You could organise a Dragons' Den type activity where learners present their idea and it is scrutinised by their peers.
- Give learners two case studies (these can be fictitious) which detail the setup of two micro-businesses, including their business objectives. Lead the class in a discussion to ensure that learners understand the internal and external risks when setting up a micro-business and the resources needed for each organisation. Divide the class into two groups, ask them to use one case study per group and identify the resources that are needed, who the main stakeholders are and all the factors that should be considered when setting up a micro-business. Learners should then identify if the business in the case study is likely to succeed or not depending on those factors stated by the learners.

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

- You could begin by introducing the structure of a business plan, explaining the reasons to use data and research to build a realistic plan for a new enterprise. You could show learners videos of programmes such as *The Apprentice* or *Dragons' Den* to show how a poor business plan can stop a potentially good venture from being successful.
- Introduce how market research is key to identifying what consumers are looking for. Once they have decided on their new business idea, learners can design their own questionnaire for their proposed new venture and carry out their own primary research. You should ensure the questions are valid and offer the learner appropriate feedback to justify their choice of micro-business.
- Learners can also carry out secondary research into similar businesses to identify competitor behaviour, and research whether their new business will have a competitive advantage or unique selling point.
- After using market research to identify their proposed new enterprise, learners need to conduct a business analysis, for example SWOT, PESTLE etc. From this, learners should be able to identify any issues the new venture may face. They should also consider how to market the new enterprise and should use the marketing mix to add a marketing plan section to their business plan. This can also offer an opportunity for the learner to use innovative marketing approaches such as using social media.

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- Ask learners to work in small groups to carry out a financial and legal overview. They must find out what a new enterprise must do to comply with legal and financial requirements. Ask each group to report on the legal and financial aspects that are essential for a new animal sector enterprise.
- You should encourage learners to research analysis tools that can measure the success of their proposed new enterprise. Once their plan is completed, they will need to evaluate its potential success and justify any areas for improvement they have recommended. Learners could use their initial market research to ensure their proposal and final business plan delivers what customers stated they wanted from the new enterprise. Where possible learners should try to benchmark their own proposal to existing competitors and evaluate how successful their new venture might be within the animal sector market.

Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 12: Business Management in the Animal Sector*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

- Bangs D – *The Business Planning Guide: Creating a winning plan for success 9th edition* (Kaplan Trade, 2002) ISBN 9780793154098.
  Written by an entrepreneur and former banker, this is a classic guide to business planning.
- Levinson J – *Guerrilla Marketing: Easy and inexpensive strategies for making big profits from your small business 4th edition* (Houghton Mifflin Harcourt, 2007) ISBN 9780618785919.
  Written for all entrepreneurs – new ways of learning about market share and how to get it.
- McKnight T – *Will it Fly?: How to know if your new business idea has wings … before you take the leap* (FT Press, 2003) ISBN 9780130462213.
  An intuitive, practical tool for assessing and refining new business ideas.

Journals

- *Business Review* (Philip Allan Magazines, Hodder Education)
  A journal designed for Business Studies learners that includes relevant theoretical articles, as well as information on companies and markets.
- *The Economist* (The Economist Group)
  The print edition is a weekly economics and business journal that has regular articles and features about issues related to public-sector businesses and the economy. It has an extensive archive of relevant materials.

Videos

- www.bbc.co.uk/schools/gcsebitesize/business/environment/stateofeconomyvid.shtml
  Experts talk about the impact of an economic downturn and what a business can do to stay afloat in hard times.
- www.ted.com
  TED offers online videos of short, powerful talks (18 minutes or less) covering almost all topics, including business and global issues.

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Websites

- www.bbc.co.uk/news/business/economy
  The *BBC* gives news on the UK economy.
- www.bbc.co.uk/programmes/b006vq92
  Dragon's Den BBC programme to show new and innovative business ideas, products and concepts.
- www.businesscasestudies.co.uk
  The Times 100 Business Case Studies has economics and business case studies on topics such as Business Environment, the Economy, Ethics and External Influences. The site also has a selection of theory notes aimed at learners.
- www.economist.com
  The Economist online has an archive of articles about the UK economy. A subscription is required but it also includes the weekly editions of the newspaper.
- www.gov.uk
  The government portal for government departments and policies. It includes the specific policies and licences required for businesses in the animal sector.
- www.investopedia.com/
  Investopedia is an educational website that has many useful articles such as 'economics basics: supply and demand'.
- http://www.lantra.co.uk
  The *LANTRA* website gives information about land-based sector skills including animal management.

Unit 16: Animal Grooming

Delivery guidance

Approaching the unit

This practical unit focuses on the different elements surrounding the grooming of small mammals. Practical-based sessions should encourage learners to work with different species and breeds of small mammals to gain skills and knowledge. You could show the learners – and demonstrate where possible – a range of grooming equipment. On the other hand, theory sessions could delve into the reasons behind animal grooming, perhaps including animal styling and competitions.

Learners will benefit from visits to a grooming parlour or competition. It would also be useful for an external speaker to visit and discuss their experiences of animal grooming.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order and it is intended that you should take a holistic approach to the delivery of the units. You could set tasks that enable learners to gain practice and acquire skills relevant to several related units at the same time. For example, this unit could be delivered alongside *Unit 4: Practical Animal Husbandry*, *Unit 12: Business Management in the Animal Sector* or *Unit 14: Animals in Boarding Establishments*.

Delivering the learning aims

As a start to the unit, introduce learning aim A by looking at the aims and purposes of animal grooming. Outline the health problems associated with insufficient, or no grooming, focusing on both skin and fur conditions. Give learners case studies so they can familiarise themselves with the different conditions that may occur. They could work in groups to identify different coat types in the different species of small mammals. You could supply them with images to reflect the different coat types.

After familiarising learners with the different grooming requirements, you should detail handling and restraint methods for the different species. You could show learners the equipment that may be used during handling and restraint. You should also make learners aware of the techniques used for a range of species where no equipment is available.

Ask learners to detail the information that should be recorded before, after and during grooming sessions in order to maintain animal welfare and satisfy health and safety requirements. The focus should be on the importance of documenting this information. You could show learners a range of records that are used to detail information within a grooming setting, alternatively learners could be

asked to develop their own grooming records, which could be used during grooming sessions later in the unit.

It would be useful to allow learners to attend a competition, or view videos or images of the different competition types. You might focus on Crufts and Cat Fancy and it may be beneficial to introduce learners to competitions specifically for grooming, such as Premier Groom. Learners need to identify and 'get a feel' for the equipment that they may use (or can be used) in a grooming situation and they should have access to different grooming equipment suitable for the different species and coat types.

Introduce learning aim B by asking learners to identify pre-grooming activities. Learners should detail the importance of these activities and understand the significance of completing these. It is important to be sure that learners can identify the different ways to approach animals ready for grooming. You should ask learners to familiarise themselves with the practical aspects of the pre-grooming activities, and ensure they are confident with grooming assessments and preparation. The assessments and preparation should include all of the following: temperament, health, equipment selection, ear care, nail care, feet care and PPE.

You could give learners images of animals showing different temperaments and grooming conditions, and they could develop a guide for approach, handling and grooming. You should show learners how to complete pre-grooming activities and allow them to develop their own skills. This must include using the relevant equipment and following the approach and checks as detailed earlier.

You could introduce learning aim C by reviewing specialist equipment, including bathing equipment. Learners could work together to research the specialist bathing equipment as listed in the unit specification. Ensure you discuss how and why grooming and bathing equipment is maintained.

This is a practical learning aim and learners must be able to develop their own bathing and grooming skills. With this in mind, you should go through the full health and safety precautions so learners can meet these requirements.

Learners do not necessarily need to meet breed standards during their practical sessions, but it would be helpful to show them as many examples as possible. Videos, images and visits may enhance the experience for learners.

You should also encourage learners to create their own grooming records so they can show they have covered the necessary criteria.

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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 animals and drying **C2** Grooming and styling animals **C3** Maintaining grooming equipment	

Assessment guidance

Learners should devise a report to show their understanding of the grooming requirements for a range of animal needs. They should be encouraged to document images or references to the different needs or handling methods required. Within the report, learners should also discuss the types of animal grooming records, and the importance of keeping these records. They could present their evidence as a leaflet or poster to develop the use of ICT skills.

There is a large practical element to the assessment for animal grooming. Learners should produce a portfolio of work to document images and explanations of a range of animal grooming techniques. The portfolio could include witness statements or observation records. Learners could also create an electronic portfolio and present the evidence through a PowerPoint® presentation.

There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments for *Unit 4: Practical Animal Husbandry*, *Unit 12: Business Management in the Animal Sector* or *Unit 14: Animals in Boarding Establishments* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

Try to be imaginative in your assessment approach so as to engage learners and to make the method of assessment relevant to the learning aim being assessed. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- interviews with employers – recorded through video, email conversations or recorded video calling
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

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Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 16: Animal Grooming

Introduction

Introduce the unit by looking at the different species and breeds that require grooming. It would also be useful to look at the theory behind the need for grooming.

This unit will prepare learners for employment in a variety of establishments, such as grooming parlours, rescue centres and kennels, veterinary surgeries and pet shops, some of which may require learners to undertake further professional training.

If it is possible to arrange, this unit would benefit from employer involvement in the form of:

- guest speakers from local rescue centres, kennels, veterinary surgeries and pet shops
- technical workshops involving staff from local rescue centres, kennels, veterinary surgeries and pet shops
- opportunities for observation during work experience
- support as mentors.

Previous learners of the BTEC Animal Management course could also be invited to share their experiences with the class and act as mentors.

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

- Learners can work in small groups to identify the different animals that require grooming and detail the health problems associated with lack of grooming.
- Show learners case studies and problems associated with lack of or incorrect grooming techniques. Working in pairs, they should describe why the problem occurred and suggest preventative measures.
- Ask learners to research the care requirements of given coat types. Show learners different coat types so they can find the correct methods. Learners should work individually or in pairs and collate the information to discuss as a group at the end.
- Show learners some videos surrounding competitions and shows, e.g. Crufts and Cat Fancy. Introduce learners to breed standard grooming. They could carry out research on these different standards for different breeds. Learners could compare show groom standards, to pet groom styles.
- You can pass around different types of grooming and restraint equipment and ask learners to identify the equipment and on which animals to use the equipment. Learners should also identify amendments that might be required for animals in different physiological states and life stages, e.g. old, young, ill and pregnant.
- Learners could devise their own records to identify the important aspects required during a grooming session. You should highlight the links to specific legislation regarding record keeping and describe the different methods available, including manual and electronic records.

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

- You should introduce the checks that must take place before starting to groom animals. You could show learners different elements of pre-grooming and learners could identify and explain the relevant order.
- Discuss the activities that take place before starting on animal grooming, as well as the steps for a safe approach. You should make clear the links to animal behaviour and include all aspects of nail care, feet care, health checking and the appropriate approach in each case. Once discussion has taken place, demonstrations and practical grooming should be completed.
- Ask learners to create a leaflet on the effects of poor handling and grooming. Learners could work in pairs to create the leaflet and research information surrounding possible injuries to both animal and handler, for example spinal injuries, burns, bites and scratches.
- Give learners images of animals showing a variety of behaviours before grooming, such as aggression, fear and being friendly. Learners should discuss how to approach animals that are showing these behaviours before grooming.
- Learners could develop their practical skills through pre-grooming activities. Health checks could be completed on a variety of species where learners describe the steps they are taking to ensure good health and a safe approach to the scenario.
- Pass around a selection of brushes and combs. Ask learners to identify which coat types and animals they might use them on; they could evaluate the equipment based on its purpose. You could also include PPE in this activity.

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

- Introduce this learning aim by reviewing the use of PPE during grooming and when and why it might be used. You could show different types of PPE and ask learners to identify whether the PPE is required during bathing or grooming procedures.
- Show learners some images of drying equipment, e.g. blaster, flat, cabinet and fluff. Learners should identify and explain when and why each piece of equipment could be used and on which specific species.
- Learners could work in small groups to identify bathing techniques for specific animals. Learners should look at specific equipment and products needed for bathing, shampooing, and drying the animals. Learners could discuss their findings with the group.
- You can demonstrate bathing techniques for small animals and allow learners to develop their practical skills. Tutors should ensure competency and progression throughout practical sessions.
- Learners could work in small groups to develop a presentation to identify grooming and styling techniques for specific animals and breeds. Learners must look at specific equipment and products needed for clipping, brushing and styling the animals to breed standards. Learners could discuss their findings with the group.
- You can demonstrate small animal grooming techniques and again allow learners to develop their practical skills. You must ensure the learners' competency and progression throughout all the practical sessions.
- Learners could visit an animal grooming centre to observe the entire grooming process. It would be useful for them to observe booking animals in, pre-grooming activities, bathing and grooming as well as record keeping.

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- Learners should undertake the maintenance of the equipment they have access to. Demonstrate first what they have to do and then learners should carry out a similar activity, explaining what they have completed and why.
- Allocate learners a specific piece of equipment or procedure and then ask them to create a risk assessment on maintaining grooming equipment.
- You need to ensure that learners are familiar with the range of equipment from the specification. If learners do not have access to all this equipment, you can use videos and images to demonstrate the maintenance of all required equipment.
- Make sure you discuss all relevant health and safety information relating to a grooming parlour, so that learners are informed and able to discuss COSHH, RIDDOR and HASAW 1974.

Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 4: Practical Animal Husbandry*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

- Dallas S, North D, Angus J – *Grooming Manual for the Dog and Cat* (Wiley-Blackwell, 2006) ISBN 9781405111836.
  An ideal book for learners studying grooming qualifications, this book looks at the different techniques used to groom different breeds of cats and dogs.
- Gould S – *The Dog Groomer's Manual: A Definitive Guide to the Science, Practice and Art of Dog Grooming* (The Crowood Press Ltd, 2014) ISBN 9781847975904.
  A book designed for learners and dog groomers covering the development of skills and knowledge in the area.
- Young P – *Grooming Your Dog* (Interpet Publishing, 2009) ISBN 9781842862209.
  This book gives an illustration and overview of dog grooming, looking at the importance of grooming, how to do it, and also the tools and equipment required.

Journals

- *Animal Welfare Journal* (UFAW)
  A scientific journal that focuses on the welfare of captive and domestic animals. Some articles published are based on animals within a collection centre, or kennelled environment. These articles can sometimes also offer an insight into animal grooming.

Videos

- www.youtube.com
  There are many useful videos on *YouTube* demonstrating the grooming of animals both domestic and captive. Operant conditioning in zoo animals can also be viewed for health checking and animal grooming purposes.

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Websites

- www.britishcavycouncil.org.uk/Novice/
  The *British Cavy Council* website has information relating to guinea pig breeds and general information about showing these animals.
- www.thebrc.org/shows-current-year.htm
  The *British Rabbit Council* has information relating to rabbit breeds and general information about showing these animals.
- www.gccfcats.org
  The *Governing Council of the Cat Fancy* contains information relating to cat breeds and general information about showing these animals.
- www.horse-journal.com
  The *Horse Journal*: this site focuses on the types of grooming equipment available and that is easily accessible for horses. Details on specific grooming related issues can also be found.
- www.thekennelclub.org.uk
  The Kennel Club gives information relating to dog breeds and general information about showing these animals.
- www.petsathome.com/shop/en/pets/dog/dog-grooming
  Pets at Home is a large network of stores including websites, products, and pet services (vet practices and grooming salons). This site focuses on the types of grooming equipment available and that is easily accessible for dogs.
- www.petcare.org.uk
  This useful website by the *Pet Industry Federation* gives information and details of businesses that all meet specific industry standards, including animal grooming, boarding, pet sitters, dog walkers and other pet services.

Unit 17: Principles of Animal Nursing

Delivery guidance

Approaching the unit

This unit assumes no prior knowledge of veterinary nursing procedures or responsibilities although learners may have an awareness of the organisation of veterinary practices from their own experience.

As many of the principles covered in this unit have practical application, you should encourage learners to arrange work placements within a veterinary practice. They should investigate and analyse the structure of the organisation and key veterinary nursing practices.

Learners will need access to a range of resources and research materials such as key items of veterinary equipment and supporting information. Delivery methods for this unit could include:

- discussions – small group and class
- presentations – individual or group
- case studies – uses and effectiveness of techniques
- guest speakers – roles, responsibilities and procedures.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order and it is intended that you should take a holistic approach to the delivery of the units. You could set tasks that enable learners to gain practice and acquire skills relevant to several related units at the same time. For example, this unit could be delivered alongside *Unit 6: Animal Health and Diseases* or *Unit 2: Animal Biology*.

Delivering the learning aims

You could introduce learning aim A with a discussion on the roles of veterinary practice staff, distinguishing the limitations of each role. Learners could then research the role of regulating bodies and legislation in directing these limitations. You might need to help learners identify key information. A further group discussion could identify and review any additional limitations, roles and responsibilities.

Learners could generate presentations or leaflets describing their findings after research. It would also be useful to have guest speakers from veterinary practices or regulating bodies who could offer their insights and talk about operational procedures. You could arrange for learners to have access to policies and procedures from veterinary centres and ask them to analyse the purpose of each document and key component.

Learning aim B could involve learners undertaking a work placement in a veterinary practice to experience the use of the techniques listed in the unit content. Learners can research symptoms for animals with different types of health issues and produce presentations distinguishing these. You can select the health issues that lead in to the veterinary techniques listed in the unit content.

You could introduce learners to veterinary procedures suitable for each type of issue, using video clips and demonstrations of nursing methods. Give learners initial input with presentations then learners can carry out independent research to further explore different nursing methods.

You can give learners case studies to contextualise each method and small groups of learners could analyse the use of nursing methods for different scenarios. Learners could work individually or in small groups to produce leaflets for each type of health issue.

You could introduce learning aim C with a video clip of a rehabilitation therapy then learners could work in groups to identify as many therapies as they can. They can carry out research to explore the uses of each therapy. You could give learners case studies to use to recommend suitable therapies, justifying their reasoning. You could direct learners to identify and suggest procedures to diagnose conditions and they could then research and produce presentations explaining these in depth along with treatment frequency, contraindications and monitoring methods.

Learners could use this research to create care plans for animals with different conditions. Learners could work in small groups, mind mapping suitable PPE for different therapy scenarios and describing why they might be useful. Learners could then create a risk assessment for a specific therapeutic scenario.

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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 diseases 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	

Assessment guidance

This unit is internally assessed through independent tasks. Each learner must have sufficient independent evidence to meet the criteria. Authentication of this evidence is required and learners must produce a complete bibliography with each task. Suitable evidence could include written, photographic, video or presentation. Video, photographic and presentation evidence should be accompanied by observation records, supporting notes or peer assessment records.

Scenarios will help the learners contextualise the information they have to give. Encourage learners to use the analytical skills developed throughout the unit when completing their assignments.

Learners can create a report for the assessment of the learning aim A. The report could discuss the relationship between the organisation of a specific practice and regulatory requirements. The veterinary practice could be one that the learners have visited. You could give learners a practice's documentation to review and suggest headings for the report relating to key regulatory requirements.

Learning aims B and C should be combined for the second assessment. You could give learners case studies for medical, surgical and infectious disease patients and learners can produce a report exploring assessment (initial and ongoing), relevant nursing and rehabilitation methods for each scenario. Learners could be encouraged to consider traditional and complimentary therapies, structuring their information as care plans for each scenario and explaining the relevance of each component.

There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments for *Unit 2: Animal Biology* or *Unit 6: Animal Health and Diseases* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

Try to be imaginative in your assessment approach so as to engage learners and to make the method of assessment relevant to the learning aim being assessed. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- interviews with employers – recorded through video, email conversations or recorded video calling
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

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Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 17: Principles of Animal Nursing

Introduction

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

You could introduce this unit through video clips of veterinary programmes, looking at the roles of both veterinary surgeons and veterinary nurses.

Unit delivery will need to reflect the current practices and policies; these are updated regularly so specific guidance should be sought from registered veterinary nurses or surgeons and RCVS.

If it is possible to arrange, this unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local veterinary practices
- contribution of ideas to unit assignments/projects
- opportunities for observation during work experience
- support as mentors.

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

- You could begin with a group discussion distinguishing the roles and structure of veterinary practice staff and extend this to look at the limitations of each role. This could then lead in to research activities exploring the roles of regulatory bodies and legislation.
- This learning aim lends itself to independent research. Learners could carry out research into legislation and governing bodies and this can be the basis for further class discussion. You could give learners specific aspects to research then share information with the group, or give out a task sheet that would encompass all perspectives.
- Guest speakers working in veterinary practices could offer detailed information about their roles and responsibilities, while representatives from veterinary organisations (RCVS) could discuss welfare legislation. Learners could prepare questions for guest speakers relating to areas of the unit specification.
- You could direct learners to produce wall displays explaining key regulations relating to veterinary practices.
- It would be useful to give learners sample forms and paperwork, such as policies, procedures, risk assessments, consent forms, aftercare instructions, etc. Learners can compare documents, then develop their own based on their own findings from additional research or work experience and the samples you have given them.
- Learners could be given scenarios to role play, for example registering new clients, aftercare instructions, making appointments.

Learning aim B – Investigate veterinary nursing methods, procedures and resources necessary to provide patient care
• You could show video clips of veterinary programmes to introduce this learning aim. You could give learners a question sheet based on techniques in the video before they watch clips that focus on nursing methods listed in the unit content. Learners could also contribute their own experiences of procedures they have seen or that their animals have undergone. • Learners could undertake work experience placements or work shadow veterinary nurses to experience how procedures are carried out. You could use video clips or demonstrations for situations that learners are not able to observe first hand. • Practical activities could include demonstration and trial/practise of handling and restraining techniques for different species and procedures. • Working individually as well as in groups, learners could explore different techniques for each procedure, and then present their findings to the class. • Learning aims B and C complement each other with plenty of opportunities to link the two when planning lessons that use case studies.
Learning aim C – Explore rehabilitation methods and procedures used to promote the recovery of animal patients
• You could introduce this learning aim with a group discussion of the different types of rehabilitation therapies and the benefits of each. Try to make sure that sample equipment is available for learners to access. • Learners could visit rehabilitation centres to observe procedures for different complementary and rehabilitation therapies. You could also use video clips as an alternative or in addition to these visits. Learners could produce video clips advising animal owners on what the therapies involve and how they work. • Guest speakers from veterinary practices or rehabilitation centres could give information on techniques, their uses and referrals. You could ask learners to create a flow diagram of the referrals procedure from injury/illness diagnosis to sign off. • You could use case studies and animal profiles to encourage learners to analyse information and carry out research into rehabilitation methods and procedures. Learners could produce a report reviewing the potential for each therapy.

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Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 6: Animal Health and Diseases*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

- Cooper B, Mullineaux E, Turner L – *BSAVA Textbook of Veterinary Nursing 5th edition* (BSAVA, 2011) ISBN 9781905319268.
  Discussions of responsibilities and regulation in veterinary situations. Handling and treatment techniques are also included.

Journals

- *Journal of Veterinary Nursing* (Hindawi)
  A journal containing current articles regarding policies, procedures and techniques.

Websites

- www.bvna.org.uk
  The *British Veterinary Nursing Association* website includes free downloadable resources.
- www.rcvs.org.uk
  The *Royal College of Veterinary Surgeons* gives information on roles, regulations and practice standards.

Unit 18: Aquatic Management

Delivery guidance

Approaching the unit

The primary principle of managing aquatic species is to undertake all husbandry tasks to keep fish in the best of health. This unit will allow learners to gain knowledge of specific aquatic health signs for a variety of species, as well as giving them an insight into the causes of disease and an understanding of some common diseases and their prevention. With your guidance, learners should have the opportunity to put their knowledge into practice through practical sessions in which they undertake processes to maintain selected aquatic systems.

Wherever possible, use practical sessions to consolidate the knowledge that learners have gained. Practical sessions will also emphasise the vocational nature of this course and will help learners to gain important transferable employability skills. You can observe these practical activities and, together with observation records, this can form part of the assessment evidence for this unit. Learners will be able to demonstrate the skills they have learned and it will give them the opportunity to apply their knowledge and receive feedback on their practical performance.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order and it is intended that you should take a holistic approach to the delivery of the units. You could set tasks that enable learners to gain practice and acquire skills relevant to several related units at the same time. For example, this unit could be delivered alongside *Unit 6: Animal Health and Diseases* or *Unit 23: Zoological Animal Health and Husbandry*.

Delivering the learning aims

When you are delivering learning aim A, ensure that learners keep the health and safety of the fish in mind at all times. You will need to guide and encourage them to do this. This learning aim also gives learners the opportunity to work with a variety of species and gain practical hands-on experience, as well as improving their observational skills as they complete the visual checks.

It is important to schedule in regular visits to aquatics facilities so that learners can monitor fish health over a period of time (for example, weekly over a period of at least three weeks or monthly over the length of a term). They should record the results of their monitoring. This will allow them to begin identifying subtle changes and understand the importance of noticing these changes when working with aquatic species.

Following on from this, learners should complete a report detailing their findings. It should include signs of health, disease prevention and the role of correct aquatic management for the welfare of aquatic species. This will develop their understanding of the health and safety considerations, such as being aware of zoonosis, required when undertaking routine maintenance. It will also develop useful management techniques that will then support practical skills.

This learning aim offers the opportunity to bring in outside speakers such as fish breeders to discuss the types of fish commonly kept as pets. Alternatively, depending on the number of learners in the group, you could arrange a visit to a specialist aquatics centre so that learners can see how to undertake specialist checks, for example identifying diseases.

Learners need to examine the anatomy of fish and breeding. In order to fully understand the anatomical structures, learners could produce a poster to demonstrate the fish anatomy. If there is appropriate access, breeding programmes for fish could be designed and implemented. Alternatively, learners could plan how they would implement a breeding strategy to support the reproduction of healthy fish.

For the delivery of learning aim B, set the scene for learners by giving definitions of the terms used in relation to common diets and feeding regimes. You might use discovery or active inquiry-based learning styles for this. You could organise a discussion about meeting feeding requirements and supplement this with an outside speaker, for example someone from an aquatic food supplier.

To give the learning a practical context you could try to use case studies about the different diets for aquatic animals, perhaps including examples of where incorrect diets have been used and the impact this has. You will need to include images and concise details of the diets. Learners could be allocated species of fish and asked to comment on the types of food required and the reasons for this.

For learning aim C, learners will look at selected aquatic systems, learn how to prevent ill health and demonstrate methods and processes to maintain a suitable environment for the aquatic species including water quality testing, assessing stocking density and routine cleaning. Learners could observe examples of common aquatic systems, either by using specified in-house tanks or through gaining access to external systems.

As with learning aim B, you could use case studies about the different aquatic systems to contextualise the learning for a range of species. Learners might also be able to organise work placements within organisations that have aquatic systems and so carry out maintenance and gain witness testimonies from real work examples.

Health and safety considerations are very important in this learning aim, learners should be particularly aware of the safe working practices where water, electricity and glass are involved. They should also be able to use the correct PPE as appropriate.

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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 the systems **C3** Health and safety	Demonstration of methods and processes to maintain selected aquatic systems with signed witness statement and/or observation records.

Assessment guidance

You should encourage learners to present evidence using visual diagrams, for example when explaining the anatomy of fish, and colour photographs when showing the range of aquatic species and how they can be identified from specific markings or colours. Learners could also use images to show examples of abnormal conditions.

When learners give evidence for breeding strategies, their report could contain video evidence if they have access to breeding species and are able to record the gestation period and include stages of the pregnancy cycle.

Learners could produce a video diary to demonstrate their practical skills maintaining aquatic systems. Alternatively, you could complete observation records or they could use witness testimonies if they demonstrate the skills during a work placement.

There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments for *Unit 6: Animal Health and Diseases* or *Unit 23: Zoological Animal Health and Husbandry* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

Try to be imaginative in your assessment approach so as to engage learners and to make the method of assessment relevant to the learning aim being assessed. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- interviews with employers – recorded through video, email conversations or recorded video calling
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

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Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 18: Aquatic Management

Introduction

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

If it is possible to arrange, this unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local pet shops, zoos or aquariums
- contribution of ideas to unit assignments/projects
- opportunities for observation during work experience
- support as mentors.

Previous learners of the BTEC Animal Management course could also be invited to share their experiences with the class and act as mentors.

Introduce the unit to learners through a group discussion exploring aquatic species they know. You can follow this by outlining the learning aims of the unit.

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

- Ask learners to collaborate in small groups to come up with examples of different aquatic species that they have experienced. Each learner could then contribute to a class discussion on the species, compatibility or not with other species, type of environment and welfare considerations.
- Ask learners to take notes individually on which species can successfully share an aquarium. In small groups, learners should then list what they consider to be the three main species that can successfully share in each type of environment. Learners should discuss their findings as a class, resulting in a list of species per environment that can be housed together.
- Using the learners' examples, lead a discussion on which species should **not** be housed together. Ask learners to consider why some species would not be suitable within the same aquarium and suggest alternative species to consider.
- You could use flash cards of different species of fish to consolidate learning; learners name each fish and state its water type and social preference.
- Discuss with the learners the internal and external anatomy of the fish. Learners could annotate diagrams and compare external anatomy, offering explanations for the differences, this can also be linked with sex determination.
- Learners could research breeding strategies then return to the flash cards and identify each species method of reproduction.
- Give learners structured presentations to show fish diseases and disease prevention. In small groups, learners should consider how and whether the presentation is suitable for a given audience, for example new fish owners. Illustrations are essential so learners can recognise signs of health and ill health.
- If learners are able to visit establishments with suitable aquatic facilities then the focus should be on fish species that are commonly kept and routines to promote fish health and prevent disease. Learners should be encouraged to make their own observations and record areas such as signs of ill health etc.

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

- Ask learners to work in small groups to research and gather information on the feeding techniques and mechanisms for a range of species. This could be through online research or visits to local businesses with aquariums. Learners could visit a number of contrasting aquariums locally with a view to gathering a variety of techniques.
- Ask learners to prepare and deliver a presentation with professionally presented slides and/or video with speaker notes of what they have observed to share their findings with the class.
- Use the learners' presentations to lead a discussion on the suitability of different types of feeding mechanisms and types of diets.
- For assessment, learners should research two feeding mechanisms, looking at the type of diet, how it meets the needs of the species and reasons why it is successful. You should also encourage learners to research the mechanisms, suitable food type and species, as they will be required to report on how the system works.

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

- You could begin by introducing the types of aquatic systems available, as well as the process for setting up the aquariums, and why each type of aquarium has to have environmental differences.
- Give learners three case studies (marine, fresh water, tropical environments) which detail poor management techniques. Lead the class in a discussion to ensure that learners understand the difference between poor aquaria management and neglect. Divide the class into three groups (marine, fresh water, tropical environments), give them the process for setting up aquaria and ask them to explain suitable systems and how they need to be maintained.
- Once learners have used the case studies to establish how to maintain the aquatic systems, they should undertake the activities practically. You will need to ensure learners have a clear understanding of their role. You should observe them carrying out the maintenance and complete a suitable observation record. Where possible, learners should also be encouraged to evaluate the success of their practical maintenance skills.
- Introduce health and safety considerations within this context, including safe working practices and the use of appropriate PPE.
- You could outline the process and ask learners to demonstrate correct techniques for aquarium management, learners would need access to suitable practical tasks. This could be video recorded as a diary or they could show photographic evidence to the group.
- Ask learners to work in small groups to evaluate the success of their management system compared to the case studies given to them, and to highlight areas for improvement reflecting on the welfare needs of the species.
- You should encourage learners to research alternative management systems so they can analyse best practice and discuss the connection between correct aquarium management, fish welfare and health.

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Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 6: Animal Health and Disease*
- *Unit 23: Zoological Animal Health and Husbandry*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

The special resources required for this unit are:

- suitably well-stocked aquaria
- water-quality test kits
- equipment for the establishment and maintenance of aquaria
- case studies for a range of aquaria.

Textbooks

- Hargreaves V – *The Complete Book of the Marine Aquarium* (Thunder Bay Press, 2002) ISBN 9781571457622.
  This book shows how to set up a marine aquarium and describes in detail over 700 plant and animal species that make up a coral reef. It also offers information on equipment and practices.
- Roberts R – *Fish Pathology 4th edition* (Wiley-Blackwell, 2012) ISBN 9781444332827.
  The definitive, classic and essential book on the subject, containing in-depth coverage across all major aspects of fish pathology.
- Wilson K – *Aquarium Guide: Looking After Tropical Fish* (CreateSpace Independent Publishing Platform, 2013) ISBN 9781484904053.
  A useful guide to setting up, maintaining and getting the most out of a tropical aquarium.

Journals

- *Aquatic Living Resources* (Cambridge Journals)
  A journal designed for scientific studies, including relevant theoretical articles as well as information on research papers.

Websites

- www.brighton.ac.uk/aquatic/index.aspx
  The *Aquatic Research Centre, University of Brighton* contains much useful information on aquatic research.
- www.bristolzoo.org.uk/
  Bristol Zoo has a range of aquatic systems and, as a research facility, offers the opportunity to observe environmental factors as well as welfare management, breeding programmes and the opportunity to visit.

- www.thedeep.co.uk/
  The Deep is a large aquarium facility in Hull which demonstrates a range of aquatic management systems. There are opportunities to visit the facility as it is open to the public.

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Unit 19: Farm Livestock Husbandry

Delivery guidance

Approaching the unit

Raising, caring for and handling farm livestock requires knowledge of a range of species. In this unit, learners explore a range of farming systems and develop both theoretical and practical knowledge and skills in farm livestock handling and husbandry. They will also explore meeting nutritional needs to balance productivity with welfare needs.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order and it is intended that you should take a holistic approach to the delivery of the units. You could set tasks that enable learners to gain practice and acquire skills relevant to several related units at the same time. For example, this unit could be delivered alongside *Unit 3: Animal Welfare and Ethics*, *Unit 9: Practical skills in Animal Science* or *Unit 11: Advanced Animal Nutrition*.

Delivering the learning aims

You could introduce learning aim A by visits to farms housing a range of livestock species and breeds. You could give learners a set of breed profiles to assess the suitability of each breed for a set purpose, e.g. meat or wool. You can encourage learners to develop their research skills by finding out about the different production systems and they could present information as display material. Guest speakers could include farmers who use a range of production methods or a local animal welfare officer could talk about different farming systems.

You could introduce learning aim B by giving learners a range of feed samples to analyse. Learners can research the nutritional needs of different livestock animals and use their findings to assess the suitability of each feed for different livestock, developing their own feeding plans based on this. You could arrange for learners to have practical experience of giving food and water to livestock using a range of feeding and watering equipment. Practical visits can link to learning aim C.

Learning aim C emphasises the importance of practical skills. You could arrange for a series of visits to livestock centres for learners to gain practical experience. Learners could research handling and assessment techniques and equipment prior to visits and be given demonstrations before trying these out themselves. You need to prioritise the health and safety of animals and learners at all times and you could encourage learners to carry out their own risk assessment for an activity.

Practical visits are essential to allow learners to consider the effectiveness of different accommodation types in use. Learners could research further accommodation types and review their use. Based on this, learners could design accommodation for livestock which they think will meet welfare and productivity needs.

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 the 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	

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Assessment guidance

For learning aim A it is recommended that learners produce an illustrated report or essay examining the common and unconventional farm livestock species, and how these are produced. Learners could give an overview of UK livestock species along with examples of their uses (e.g. meat, cloth). Learners could then describe the different production systems and evaluate their suitability for different livestock species, considering the impact on animal welfare.

Learning aims B and C should be assessed together. Learners should produce a range of evidence of practical activities showing competence in handling, feeding watering and husbandry. Evidence could include photographic evidence, observation records or videos. Written supporting evidence could include analyses of livestock animals' nutritional needs, descriptions of feeding and watering equipment and evaluation of the feeding, watering and husbandry the learners have carried out.

There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments for *Unit 3: Animal Welfare and Ethics*, *Unit 9: Practical skills in Animal Science* or *Unit 11: Advanced Animal Nutrition* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

Try to be imaginative in your assessment approach so as to engage learners and to make the method of assessment relevant to the learning aim being assessed. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- interviews with employers – recorded through video, email conversations or recorded video calling
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 19: Farm Livestock Husbandry

Introduction

This unit will allow learners to progress to employment with common farm livestock or to further study in an apprenticeship or higher education establishment.

You could introduce this unit through a visit to a working farm or a talk from a guest speaker with experience of industrial farming.

If it is possible to arrange, this unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local farms
- contribution of ideas to unit assignments/projects
- opportunities for observation during work experience
- support as mentors.

Learning aim A – Understand the production systems used for farm livestock in the UK

- You could introduce this learning aim by asking learners to work in small groups to identify the types of farm livestock in the UK. You could then give learners breed profiles for a selection of UK livestock breeds and ask them to sort them according to purpose.
- You could set learners an independent research task to investigate an area of unconventional livestock diversification, e.g. ostrich or alpaca meat.
- You could arrange for learners to carry out research into different production systems and present their findings to the class. Direct learners to consider all the components listed in the unit content. Learners could research an individual component or be given several to investigate and compare.
- Arrange for learners to visit a range of production systems where they can observe the application of the production systems and discuss their efficacy.
- You could deliver a presentation on the classes of stock, ages of stock and length of time animals are in production. This could incorporate unconventional production systems.
- Ask learners to research then discuss the impact of supply, demand, time and cost on welfare and production.
- You could invite in guest speakers such as farmers involved in different production systems or animal welfare officers.

Learning aim B – Explore the nutritional needs of farm livestock in order to maintain good standards of health

- Ask small groups of learners to discuss why understanding nutritional needs and feed composition is important for livestock. Consider animal health, productivity and finances.

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- Guest speakers could give learners information on hay, haylage, silage and straw production. They could also discuss the production of effective feeding protocols, based on their experience and practical application.
- You could give learners a range of feed samples to analyse for nutritional value, digestibility etc. Allocate learners a species and ask them to research the nutritional requirements and consider which of the feeds will best meet these nutritional needs.
- You could give learners case studies of the impact of palatability on behaviour and ask them to present the information.
- Arrange for learners to have access to a range of feeding and watering equipment and ask them to evaluate each item. They should consider the advantages and disadvantages of each. For example, a water bucket: time consuming to fill and often tipped over by pigs, but easy to clean and cheap to replace. Water spigot systems: sturdy and no issues refilling, but can expensive to install, not all animals can use them and they are prone to freezing up in cold weather.
  If the equipment is not available, you could use a presentation with images.
- Ask learners to work in small groups to research the considerations for effective feeding protocols. You could then allocate a species to each group so they can develop a feeding protocol, justifying their proposal.
- You could show examples of feed ration formulation and give learners scenarios to calculate feed rations for these.
- Learners could use their calculations to develop and implement feed plans for livestock.
- It could be helpful to arrange for talks from guest speakers working in commercial feed production.

Learning aim C – Carry out handling and routine husbandry of farm livestock to meet current standards

- You could give learners an item of health and safety legislation to research and deliver a presentation.
- Ask learners to identify the components of a risk assessment. You could then give learners a scenario and ask them to produce a risk assessment for it.
- Learners could undertake independent research to identify behaviour patterns and health indicators, including body scoring, in different species and produce informative materials for the class to use. Arrange for practical experience in assessing livestock health and behaviour.
- You could show learners video clips or give demonstrations of appropriate handling techniques for livestock. You could also arrange for learners to have access to restraining and handling equipment to evaluate their range of use.
- You could arrange for learners to undertake practical handling of livestock for the range of situations listed in the unit content over a few weeks to allow them to develop their practical skills.
- Give learners images of a range of farm animal accommodations. Then ask them to work in groups to assess the accommodations for their ability to meet the animal's needs, sustainability, maintenance, required husbandry techniques and codes of practice.
- Ask learners to design accommodation for a given livestock species, considering productivity, animal needs, codes of practice and cost.

Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 3: Animal Welfare and Ethics*
- *Unit 4: Practical Animal Husbandry*
- *Unit 11: Advanced Animal Nutrition*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

- Gillespie J, Flanders F – *Modern Livestock and Poultry Production 9th edition* (Wadsworth Publishing Co Inc, 2015) ISBN 9781133283508.
  Describes production systems for a range of livestock animal species.
- Grandin T – *Livestock Handling and Transport 4th edition* (CABI Publishing, 2014) ISBN 9781780643212.
  A practical guide to humane animal handling. It also reviews transport systems and restraining methods.
- McDonald P, Greenhalgh J, et al – *Animal Nutrition 7th edition* (Cummings, 2011) ISBN 9781408204238.
  Covers key nutrient groups and dietary considerations. Feeding standards for key livestock species are also included.

Journals

- *Animal* (Cambridge Journals)
  This journal contains articles on a range of livestock subjects including nutrition, behaviour, health and welfare, livestock farming systems and product quality.

Videos

- www.youtube.com/playlist?list=PL3FEEBA5664A1B338
  Demonstrations of safe handling of farm animals from the HSA.

Websites

- www.farminguk.com
  Farming UK is a Farming and agricultural industry news site with discussions of current issues in livestock farming, along with access to online journals.

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Unit 20: Human and Animal Interaction

Delivery guidance

Approaching the unit

Humans have interacted with animals for thousands of years. Today we use animals in a wide variety of ways, ranging from food production, to working animals and pets. The relationship between animals and humans is varied and complex. This unit assumes no prior knowledge and learners will find out about the complex relationship that exists between humans and animals and the impact this can have on both. Through the study of basic animal psychology and motivation, learners can also discover how to manipulate this relationship to bring about certain desired behaviours. You should focus on allowing learners to develop a deep understanding of the underlying principles of human uses of animals, ethical considerations and the psychological responses of animals. They need to consider how this knowledge is used to plan, implement, assess and measure effectiveness of animal training programmes.

This unit is an internal optional unit with internal assessment. Learners will need access to a range of research materials, which could include the internet, journals or magazines, science equipment, books, animal training aids and devices.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order and it is intended that you should take a holistic approach to the delivery of the units. You could set tasks that enable learners to gain practice and acquire skills relevant to several related units at the same time. For example, this unit could be delivered alongside *Unit 2: Animal Biology*, *Unit 2: Animal Biology* or *Unit 9: Practical skills in Animal Science*.

Delivering the learning aims

You could introduce learning aim A with learners examining how human attitudes have developed towards animals in a variety of contexts. You should direct learners to look at different aspects including cultural, traditional, mythological, religious, economic, educational and legislative perspectives, as well as animals in the media and public perception. This will give excellent opportunities to incorporate equality and diversity issues through class or small group discussion.

Learners could produce informative posters or create media recordings of discussions, comparing and contrasting the significant differences in the attitudes of people to animals. Learners could carry out online questionnaires or survey techniques to collect primary data on the uses of animals and link this to the welfare of the animal, investigating any correlations.

Learners should go on to explore the human-animal bond and the benefits and problems such bonds can present. For example, learners might look at extremes

such as bird training and bonding, and how pair bonding poses challenges in training and managing stress, then go on to look at dog and owner relationships.

Learners could carry out independent investigative research into key themes such as animal hoarding, animal neglect and abuse, highlighting the causes through working with animal and human support charities. You can support learners in their exploration through the use of wide-ranging teaching, learning and assessment strategies such as written reports, poster presentations, creating a website, blogging, podcasts and use of social media.

For learning aim B, you should build on the themes in learning aim A by using the human–animal relationship to inform and develop training programmes and practices. Introduce the learning aim by questioning learners and suggesting research to develop an understanding of animal temperament and basic animal psychology, including psychological theorists. You could bridge the two learning aims by asking learners to assess pet owners and their pets, considering how the animal's temperament might have been affected by the way the owner has raised and treated the animal.

Learners can carry out observational assessments and surveys, and apply learning theories in determining modes of training animals in the first instance. You should ask learners to make links between the theories and training in practice. Learners could develop simple training goals for each of the theories and compare how effective each one is in relation to the goal; they could also explore a system of measuring effectiveness.

Encourage learners to complete practical assessments using training aids. Learners can demonstrate use of a variety of training aids by measuring responses of suitable species followed by tutors questioning learners to assess knowledge and understanding. Learners can make lists of training aids and evaluate the associated benefits and drawbacks to their use.

For learning aim C you should allow learners to undertake an animal training programme. This will build on both learning aims A and B, encouraging and allowing learners to put theory into practice. Training programmes need to consider the animal's welfare as a priority and you must approve the programmes before learners can start.

You could suggest learners work in small groups to first choose a suitable species in the collection and identify a set of training goals. Learners can then develop these further and start planning and writing a training plan. When learners have identified goals and conducted research into the species, they can progress into implementing the training plan. It is important that the emphasis should be on a very simple training goal to bring about a desired behavioural change. Learners could work in small groups and carry out some independent or e-learning sessions, complemented by comparisons with industry training plans.

You should question, observe and assess learners implementing the training plans with suitable species, such as mice, rats, rabbits, goats, alpaca or exotic species. It is important to encourage learners to implement training plans to see the whole process of training and the impact it can have on animal welfare. Learners should reflect on and evaluate the plan at regular intervals to develop it and make alterations as needed. Learners could monitor the progress of the plan by creating blogs, media streams or written logs, or by using project-monitoring software.

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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	

Assessment guidance

This unit is an internal, optional unit, which is assessed through two independent tasks. The first, covering learning aim A, is a report which examines the relationship between humans and animals, and the role of animals in human society. The second is a report with evidence of planning, implementing and monitoring a training programme, which covers both learning aims B and C.

Learners could produce evidence of planning, implementing and monitoring training programmes through observational assessments where learners have used sampling and associated techniques, followed by a professionally written report. Observation records alone are not sufficient sources of learner evidence. The original learner-generated evidence must also support them. Suitable supporting evidence includes video, blogs, clear audio logs and written evidence such as diary sheets, training logs and project timelines.

All learners must independently generate individual evidence that can be authenticated. The main sources of evidence are likely to be written reports and scientific reports in standard scientific format, or articles for a journal. Learners should offer in-depth research with a fully referenced bibliography.

There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments for *Unit 2: Animal Biology*, *Unit 2: Animal Biology* or *Unit 9: Practical skills in Animal Science* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

Try to be imaginative in your assessment approach so as to engage learners and to make the method of assessment relevant to the learning aim being assessed. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- interviews with employers – recorded through video, email conversations or recorded video calling
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

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Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 20: Human and Animal Interaction

Introduction

This unit will help learners to progress to higher education courses such as animal behaviour science or, following further training, to gain employment as an animal trainer in a zoo, work in a kennel or cattery or work with assistance animals.

If it is possible to arrange, this unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local zoos, animal boarding establishments or representatives from organisations providing assistance animals
- contribution of ideas to unit assignments/projects
- opportunities for observation during work experience
- support as mentors.

Introduce the unit by asking learners to discuss the different relationships between human and animals, the question of partnership, attitudes and the uses humans have made of animals. This can cover a wide range of issues, which may affect attitudes.

Learning aim A – Examine the relationship between humans and animals, and the role of animals in human society

- Learners can work in small groups to discuss human attitudes towards animals. They can review video and online footage of scenarios and discuss their impact.
- Ask learners to mind map factors affecting attitudes towards animals and the consequent effects on welfare, follow this with group discussion.
- Arrange visits to commercial farms, working animal demonstrations and/or animal sporting facilities to assess use of animals in different environments and commenting on how their use affects their welfare.
- Ask learners to complete surveys or questionnaires on what the public thinks animals are used for. Learners can then review the data and present their findings to the class.
- Ask learners to evaluate problems and successes with the animal–human bond.
- Ask learners to relate the benefits of animals to real-life scenarios, such as animals used to calm and reduce stress and give people companionship.
- Once learners have developed a good level of knowledge and understanding, carry out some review and recap exercises and activities to consolidate their learning.

Learning aim B – Understand the use of training aids in an animal training programme

- Ask learners to assess a variety of animals in collections for their temperament through use of ethograms. They should carry out temperament testing on domesticated species and follow this by evaluation of what they have found. Learners could present their findings to the class.

- Learners could produce a poster on how to assess animal behaviour and temperament prior to training.
- Learners should explore learning theories through studying video examples, applying these to modes of training and creating a factual website or leaflet.
- Learners can carry out research then complete compare and contrast activities on different learning theories.
- Ask learners to give a presentation in a suitable format on specialist equipment or to design alternatives with recommendations for improvement.
- Learners could evaluate specialist equipment and training aids through practical demonstration, developing a way of measuring the impact on animal welfare and their effectiveness on training.
- Ask learners to develop a checklist for selecting the correct equipment.

Learning aim C – Undertake an animal training programme, using the principles of learning theory to achieve simple training goals

- Ask learners to evaluate case studies on different species and their formal and informal training, and then apply the learning theories they think are suitable.
- You could use video clips of animals in training programmes and again learners can apply the learning theories they deem suitable.
- Learners can create a poster of learning theories or deliver presentations to the class for wider discussion.
- Ask learners to spend time researching a species and identify training goals by discussing what training can do to improve welfare in a given species.
- Learners could create a written training plan in storyboard format with descriptions of stages and images.
- Ask learners to carry out a practical training programme for animals in the collection. Learners should set one or more simple goals and work on achieving this. The goal(s) should be achievable in the time allocated.
- Learners could visit zoological collections, guide dogs, police dogs etc. They should carry out observational assessment of training sessions then interview the trainers or ask questions afterwards.
- Ask learners to design numerical scoring/measuring systems for assessing the effectiveness or ineffectiveness of training plans. They can then present their findings to the class.

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Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 2: Animal Biology*
- *Unit 5: Animal Behaviour*
- *Unit 9: Practical Skills in Animal Science*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

- Gross A, Vallely A – *Animals and the Human Imagination: A Companion to Animal Studies* (Columbia University Press, 2012) ISBN 9780231152976.
  Makes accessible a range of complex issues in contemporary animal studies.
- Manning A – *Introduction to Animal Behaviour 6th edition* (Cambridge University Press, 2012) ISBN 9780521165143.
  A good book for starting out and for those who find large books intimidating.
- Martin P – *Measuring Behaviour 3rd edition* (Cambridge University Press, 2007) ISBN 9780521535632.
  Gives information on techniques and methods that are used in measuring animal behaviour.
- Pearce J – *Animal Learning and Cognition: An Introduction 3rd edition* (Psychology Press, 2008) ISBN 9781841696560.
  A fundamental core text explaining science of behaviour.
- Pryor K – *Reaching the Animal Mind: Clicker Training and What It Teaches Us about All Animals* (Scribner Book Company, 2009) ISBN 9780743297776.
  Discusses basic training techniques in dogs.
- Zeligs J – *Animal Training 101: The Complete and Practical Guide to the Art and Science of Behavior Modification* (Mill City Press Inc, 2014) ISBN 9781634130660.
  A good comprehensive approach across species.

Journals

- *Applied Animal Behaviour Science* (Elsevier)
  International journal reporting on the behaviour of animals managed by humans in relation to animal management and welfare.
- *Animal Behaviour* (Elsevier)
  This journal has wide appeal and contains critical reviews, original papers, and research articles on all aspects of animal behaviour. It contains valuable research.

Videos

- Video sharing websites such as *YouTube* have a wide range of individual video clips of animal training.

Websites

- www.abtcouncil.org.uk
  The *Animal Behaviour and Training Council* has some educational resources for learners.
- www.animaltraining.org
  This website, *Animal training – Disney Animal Training Program*, has some very useful educational resources for learners.

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Unit 21: Exotic Animal Husbandry

Delivery guidance

Approaching the unit

The keeping of exotic animals is becoming more popular. This unit focuses on the husbandry and animal needs of a range of exotic species, allowing learners to develop sound skills and knowledge. Learners will develop the practical ability to work with a range of exotic animals and become familiar with current legislation and the theory behind the keeping of exotics. Learners will benefit from visits to different external animal collections with a wide variety of exotic species. It is essential that learners have access to a range of exotic animals for handling and husbandry purposes.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order and it is intended that you should take a holistic approach to the delivery of the units. You could set tasks that enable learners to gain practice and acquire skills relevant to several related units at the same time. For example, this unit could be delivered alongside *Unit 4: Practical Animal Husbandry*, *Unit 6: Animal Health and Diseases* or *Unit 23: Zoological Animal Health and Husbandry*.

Delivering the learning aims

You could introduce learning aim A by focusing on the definition of exotic species. Allow time for learners to investigate the species that fall within the 'exotic' category, as well as consider how and from where people can acquire exotic animals. Learners could work in pairs or small groups and collaborate at the end of the session to share their findings.

Learners could use different research techniques to look at case studies that you allocate. They could consider the positive and negative impacts that exotic species can have on indigenous species and the environment as well as other areas. It is also essential to consider legislation as part of this learning aim. You could allocate specific legislation to pairs or small groups for further research and presentation; alternatively, you could lead a class presentation and discussion.

It would be useful to introduce learning aim B with visits to exotic animal collections. Encourage learners to document accommodation types and capture photographic evidence. You could also show learners television documentaries showing animals in their natural habitats and also those kept in collections at other locations. Learners can evaluate accommodation types and justify improvements based on natural environments. Using the knowledge gained from their visits, learners could design accommodation for a given species to ensure high levels of animal care and welfare. They could share these with the group and their peers could evaluate the designs and justify improvements.

Learners could carry out research into the problems associated with keeping exotic pets. You could give learners case studies so that they can investigate specific issues with different species. Guest speakers could enhance the learning by discussing the impact that exotic pets have had on their line of work, how they designed animal accommodation or common problems found in exotic pets. Suitable guest speakers could include staff from both veterinary surgeries and animal welfare organisations.

Start learning aim C by asking learners to work in small groups to identify the main reasons for handling exotic animals. Draw this together in a group discussion with additional input from you as required. You could show a presentation encompassing images or videos, or pass around the equipment that is required to handle and restrain exotic species. Learners should identify which species the equipment would be used for, as well as the positive attributes and limitations of the equipment that they may come across.

This should be a practical topic, with you demonstrating correct handling and restraint procedures for learners to imitate. Learners should be competent before undertaking practical assessment. Similarly, learners should undertake and show competency in both accommodation management and feeding activities. Learners could analyse existing feeding charts to gain an understanding of dietary needs. They could also research dietary needs based on life stage and the best method to enhance a natural environment (using enrichment feeding within their accommodation), strengthening links to learning aim B.

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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	

Assessment guidance

Learners need to present a case study of two exotic animals kept in the UK with an evaluation of keeping exotic animals from the perspectives of both animal and keeper. It is also important to highlight relevant legislation and the impacts on both the exotic species and the UK (regarding education, commercial and ecological aspects and disease). Learners could put together a presentation with images, or write a report to best present the case study of the animals. They could use witness statements or video recording equipment to document evidence.

For learning aims B and C, learners should undertake practical activities and put together a portfolio of practical husbandry. Learners must be able to demonstrate correct handling techniques and accommodation set up or maintenance. They should also correctly implement methods for feeding animals. Learners must show evidence in the form of photographic evidence, observation records or videos. A written report should accompany the portfolio to detail the needs of exotic animals, with reference to accommodation design and their husbandry management. Encourage learners to use real examples, which will develop their analytical skills, e.g. using information and evidence from visits to animal collections.

There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments for *Unit 4: Practical Animal Husbandry*, *Unit 6: Animal Health and Diseases* or *Unit 23: Zoological Animal Health and Husbandry* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

Try to be imaginative in your assessment approach so as to engage learners and to make the method of assessment relevant to the learning aim being assessed. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- interviews with employers – recorded through video, email conversations or recorded video calling
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

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Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 21: Exotic Animal Husbandry

Introduction

Introduce the unit with a discussion of different types and examples of exotic animals. Studying this unit will assist learners to gain employment in establishments that keep exotic species, such as zoos or pet shops.

If it is possible to arrange, this unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local zoos or pet shops
- contribution of ideas to unit assignments/projects
- opportunities for observation during work experience
- support as mentors.

Learning aim A – Understand the implications of keeping exotic animals in the UK

- Ask learners to work in pairs to create a definition of an exotic animal. Give learners a selection of definitions from different sectors (legal, welfare and the pet industry) and ask them to discuss how these differences can lead to difficulty in defining exotic animals.
- Learners can work in small groups to research a particular type of sourcing for exotic animals. They can present their information to other groups, followed by a class discussion to summarise the findings and discuss ethical implications.
- You can give learners case studies of the exotic species introduced to the UK. They can work in groups to research the benefits and drawbacks to the introduction of the species given in the case study. They should include educational, commercial and ecological issues and diseases.
- Ask learners to work individually to research the impact of keeping exotic animal species in the UK. Learners could take part in a debate, or present information to the group on species conservation, habitat change and the impact on wild populations.
- Groups of learners could work together to research and discuss the purpose of regulatory bodies involved with exotic animals. You might need to direct them to all the relevant regulatory bodies.
- Introduce learners to the codes of practice and legislation governing exotic animal species. Ask learners to review the effectiveness of these with regard to sourcing, trading, licensing and transport.
- Following on from this, learners could research the consequences of contravening these laws and regulations. They could present their information in the form of a leaflet to share with the class.
- You could arrange for a guest speaker to inform learners about the illegal trade of animals and their by-products. Suitable speakers from WSPA, TRAFFIC or WWF would all be relevant.

Learning aim B – Understand the environmental needs of exotic animals to maintain their health and welfare

- Learners could work in groups to research the characteristics of a given natural environment for exotic animals. You could show learners videos from the *Natural World* documentary series so they can identify key features of an animal's natural environment. You should cover a range of exotic species to ensure learners are aware of the variety of environments. Learners could present their findings to the group.
- Ask small groups of learners to work together to analyse a range of artificial accommodation types. They could evaluate each for its ability to be a suitable environment for a range of species. For example, is a vivarium suitable for water dragons, African pygmy hedgehogs, hermit crabs and so on? They should also consider size, construction and the required materials.
- Once learners have analysed artificial environments, you should ask them to create an artificial environment for a given exotic animal. This should be a practical task setting up accommodation.
- Learners could visit exotic animal collections to compare the animal's natural environment with the artificial provision and evaluate the provision in meeting the animals' needs. Following on from this, learners could present their findings along with suggested improvements.
- Ask small groups of learners to discuss the problems of keeping exotic animals in artificial locations and then produce posters on this. To show the different problems, you could show videos of captive exotic species, or learners could observe exotic species in a collection, or at the college, and discuss how the problems can be prevented.
- You could give learners case studies to emphasise the problems of keeping exotic pets. Learners could add this information to posters they had previously developed around potential problems, or they could develop leaflets or PowerPoint® presentations surrounding the case studies they have looked at.
- Guest speakers from veterinary centres or animal welfare organisations could discuss their experiences of dealing with diseased or ill exotic animals along with common causes and solutions.

Learning aim C – Undertake the husbandry needs of different exotic animals in order to maintain their health and welfare

- Ask learners to work in small groups to identify reasons for handling or restraining exotic animals and reasons to avoid handling or restraining. The class could then discuss their information including some key considerations, e.g. circadian rhythm.
- You could then lead learners through a presentation discussing special handling and restraining issues relating to exotic animals. You could also discuss methods of capture, approach, behaviour assessment and stress.
- Give learners a range of handling or restraining equipment (as listed in the unit content) and ask them to evaluate the use of each type.
- You could give a demonstration first and then learners could select and use appropriate equipment to handle and restrain exotic animals.
- Learners could work in small groups to refresh and review their understanding of key terms relating to accommodation management, such as types of cleaning and sterilisation.
- Learners could also discuss the types and uses of PPE items.
- You could give learners a list of chemicals and they could work in pairs to assess how suitable each would be to use with different types of animal accommodation.

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This could include the same chemical at different concentrations. As an extension activity, learners could do a quiz to identify suitable disposal methods for different types of waste.

- Small groups of learners could identify the maintenance checks and routines (e.g. cleaning and security) needed for animal accommodation. They could then develop their own accommodation maintenance checklists to carry out checks on animal accommodation.
- Learners could complete practicals within their sites animal facilities, or visit an animal centre to carry out accommodation maintenance checks on a range of accommodations. If needed, they could watch demonstrations for procedures to follow and the correct methods of temporarily securing animals.
- You could allocate learners an animal species to investigate and they could present information on the dietary needs of the animal species and how these needs change according to life stage. The class could compile the results and produce a poster giving general information on dietary changes between life stages.
- Ask learners to work in groups to discuss the range of food types and storage available for exotic animals. They can discuss the preparation of each food type and present the information as a leaflet (this could be specific to a named species).
- Give learners a range of feeding and watering equipment to explore the different methods of providing food and water. They could produce wall charts explaining the suitability of each method for different species.
- Following on from this, learners could explore the concept of enrichment feeding and ways to do this, using this information to give food to a range of animal species. They could record and present this as a video instruction guide, which could be used as part of their portfolio of evidence.
- Ask learners to research a given set of feeding problems associated with animals and identify the possible solutions. You might need to make case studies available for learners to review. They could then produce information as a journal article.

Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 4: Practical Animal Husbandry*
- *Unit 6: Animal Health and Diseases*
- *Unit 23: Zoological Animal Health and Husbandry*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

- Banks R, Sharp J, Doss S, Vanderford D – *Exotic Small Mammal Care and Husbandry* (Wiley-Blackwell, 2010) ISBN 9780813810225.
  This book focuses on small exotic mammal species including mice, hedgehogs and ferrets. The book helps learners gain an understanding of the basic husbandry requirements and common diseases that can affect their health and wellbeing.
- Judah V, Nuttall K – *Exotic Animal Care and Management 2nd edition* (Cengage Learning, 2015) ISBN 9781285425085.
  This book takes an in-depth look at the care and management of exotic species. It focuses on the handling and housing considerations of different animal groups, including reptiles, mammals and birds.
- Rosenthal K, Forbes N, Frye F, Lewbart G – *Rapid Review of Exotic Animal Medicine and Husbandry: Pet Mammals, Birds, Reptiles, Amphibians and Fish* (CRC Press, 2008) ISBN 9781840760552.
  This book is usefully divided into sections so learners can review the husbandry of different animal groups. The book also touches upon the medicinal requirements of common exotic animals.

Journals

- *Animal Welfare Journal* (UFAW)
  A scientific journal that focuses on the welfare of captive animals. Some articles published are based on animals within a collection centre, whereas others detail captive companion animals and those on farms and in laboratories.

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Videos

- *Natural World* documentaries (BBC)
  A series of documentaries on wildlife and the environment which show a wide range of species' natural environments.
- www.youtube.com
  There are many useful videos on *YouTube* demonstrating the accommodation types of both domestic and captive animals.

Websites

- www.cites.org
  The *Convention on International Trade in Endangered Species of Wild Fauna and Flora* has useful information surrounding the trade in exotic animals, focusing on those that are at risk of extinction.
- www.rspca.org.uk
  The *Royal Society for the Prevention of Cruelty to Animals* is a registered charity that offers information relating to the keeping of pets, including exotic species.

Unit 22: Practical Estate Planning, Construction and Maintenance

Delivery guidance

Approaching the unit

For anyone working in the animal sector, this is an essential unit, but one that can often be overlooked. For those managing or working with animals, this unit will give them the skills and knowledge to ensure that the fabric of their animal care – the environment, surfaces, boundaries, structures and supply of essential services – are delivered to the best professional standards and with animal welfare paramount.

This unit will develop practical skills so that learners can undertake planning, construction and maintenance tasks themselves. It will also enable them to assess the work of professionals engaged to perform those tasks.

To complete this unit, learners will need to experience and understand the range of these 'estate skills' and become competent in carrying them out and managing the work of others.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order and it is intended that you should take a holistic approach to the delivery of the units. You could set tasks that enable learners to gain practice and acquire skills relevant to several related units at the same time. For example, this unit could be delivered alongside *Unit 7: Work Experience in the Animal Sector* or *Unit 24: Wildlife Ecology and Conservation Management*.

Delivering the learning aims

For learning aim A, learners will need to understand the range of tasks that comes under the general heading of Estate Skills. There are six main headings within this learning aim. These cover the specific components of the fabric: boundaries, surfaces, structures, environments, the supply and storage of mains services and utilities (gas, electricity, fuel oil, sewerage and water) and the tools, equipment, materials and methods commonly needed to carry out the tasks.

If your centre does not have a comprehensive range of these tasks available then you will need to arrange visits to other locations. Where the centre has a good range of opportunities then an initial survey is a good starting point.

The second part of this learning aim is concerned with the key regulations, guidance and risk assessments that will have an impact on the tasks carried out. It is essential that learners become familiar with the requirements of health and safety regulations. It is equally essential that they understand the need to comply with animal welfare legislation and guidelines.

Learning aim B is primarily concerned with assessing, planning and supervising estate skills tasks. Learners will need to inspect a variety of locations where construction, maintenance or installation jobs are required. They should then be able to plan the work that is needed, supervise others to carry out the work and then evaluate the progress and standard achieved. This will require effective written and oral communication skills. The tasks learners carry out should be directly concerned with animal management and they must take account in their planning of any relevant animal welfare legislation and guidance.

In learning aim C, learners will undertake a range of practical tasks and in addition review their own skills. Learners should become competent in a wide range of skills using different materials and for different purposes. The aim is to equip learners with the skills and knowledge needed to undertake tasks and also to ensure they can evaluate work done by others, including professionals.

It is important that in their self-evaluation, learners recognise their own limits. This is particularly important when dealing with electrical or gas installations where working beyond their competency level would create an unacceptable risk. However, it would be appropriate for learners to use electrical fault-finding equipment or bottled gas cylinders.

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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** Key regulations, guidance and risk assessment	A portfolio of evidence that plans for estate management projects in relation to animal management. The portfolio must include: • 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.
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	
C Carry out practical estate construction and maintenance for animal management	**C1** Practical repair, maintenance, construction and installation tasks	Demonstration of carrying out specific estate skills tasks with logbooks, signed witness statements and/or observation records.

Assessment guidance

This unit is internally assessed through two independent tasks. All learners must generate individual evidence that can be authenticated. The main sources of evidence are likely to be photographic or video logs to support observation records or witness statements.

Learning aims A and B are assessed together. Evidence for learning aim A will most likely be in the form of an annotated estate survey, recording the variety of maintenance, repair and installation requirements. This survey should include a wide range of opportunities. These must include: boundaries, surfaces, structures, habitats and the provision of mains or portable services, for example water, gas, electric.

Learning aim B will be evidenced through job sheets, maps, plans, drawings, specifications and schedules drawn up by the learner to reflect the planning process needed to maintain, repair and install the fabric for a range of animal-management needs. Evidence must include reference to relevant legislation, guidance notes and codes of practice. An important part of meeting this learning aim is for learners to be able to evaluate, as managers, work undertaken. This could be assessed using job specifications and matching the work planned to the work done.

Learning aim C will most likely be evidenced through learner-completed logs and tutor-completed observation records. Learners must ensure they assess the process to ensure they understand the skills required for practical estate maintenance, installation and repair tasks to meet animal needs.

BTEC assessors could complete observation records and learner's colleagues in placements or part-time work could complete witness statements. Observation records alone are not sufficient sources of learner evidence; the original learner-generated evidence must also support them.

Try to be imaginative in your assessment approach so as to engage learners and to make the method of assessment relevant to the learning aim being assessed. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- interviews with employers – recorded through video, email conversations or recorded video calling
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

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Other relevant evidence could be through written reports, surveys, maps and plans. Learners should be able to work to an agreed specification that should include the standard of work expected and both budget and time constraints.

It is essential that evidence is produced to show safe working practice and compliance with current legislation and codes of practice. This must include relevant aspects of animal welfare.

Assessment must be based on work undertaken that is directly related to animal management.

There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments for *Unit 7: Work Experience in the Animal Sector* or *Unit 24: Wildlife Ecology and Conservation Management* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 22: Practical Estate Planning, Construction and Maintenance

Introduction

This unit will provide learners with the skills to progress to employment in areas of the animal sector in which large collections of animals are managed, such as farms or zoological collections.

If it is possible to arrange, this unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local estates or wildlife parks
- contribution of ideas to unit assignments/projects
- opportunities for observation during work experience
- support as mentors.

Previous learners of the BTEC Animal Management course could also be invited to share their experiences with the class and act as mentors.

You could introduce the unit by linking it to the ways that meeting animal needs require a high standard of repair, maintenance and installation skills. In addition, there must be good management through planning and supervision to ensure the skills are used effectively. A presentation that identifies good and bad practice would be one way of doing this.

Learning aim A – Understand the nature and scope of estate planning, construction and maintenance for animal management

- In learning aim A, learners should be introduced to as wide a variety of estate management tasks as possible. Learners need to understand that much of the work undertaken is carried out within a legislative framework that they, as managers, will need to implement.
- Learners will need to see the type of installations requiring maintenance and understand the construction methods, tools, equipment and materials that could be used. They could do this through an initial survey to include boundaries, surfaces, structures, habitats or environments, and water, gas and electrical installations.
- Encourage learners to examine the specific needs of animals when undertaking estate tasks. For example, they might look at the way in which electric fencing is adapted for different animals and purposes.
- Texts used in the classroom and even small-scale models could improve the learners' understanding of construction methods. From this understanding, they could then sequence the repair, installation or maintenance of an estate task.
- Learners could practise selecting the right tools for tasks, also considering their maintenance and storage. These practical tasks will allow learners to become familiar with the proper use of particular tools.
- Learners need to appreciate that there is a significant amount of legislation covering their work activities and to protect animal welfare. They could carry out independent research to support classroom presentations in this area. Completing

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risk assessments must become second nature to them. In a practical setting, while working, they must foster a culture of dynamic risk assessment.
Learners must become proficient at locating current relevant legislation and guidance using internet-based resources. You could give learners role-based activities to encourage this.

Learning aim B – Manage effective planning of estate construction and maintenance projects to aid animal management

- Learners should have access to a wide range of opportunities where they can assess maintenance, construction and installation needs. They may need to visit other locations to gain sufficient experience.
- Learners must be able to demonstrate the correct use of standard test equipment for fault finding. This could include the use of basic smoke and carbon monoxide detectors. Learners should also use more sophisticated test equipment to trace electric cables and gas or water pipes. Where more advanced electrical test equipment is used, it should be of the "non-contact" type.
- Learners will need to develop both written and oral communication skills for planning work. They should follow standard procedures to include pricing, ordering and creating job specifications or works tickets. They should also gain experience in giving instructions and directing the work of others. This might include the use of maps, plans and schematic diagrams. Where possible, learners should be able to use ICT-based planning systems.
- Learners should also develop their analytical skills when assessing work to ensure it has been completed to the required standard. They should take the opportunity, when carrying out tasks for learning aim C, to develop these skills. It may be useful for learners to consider how the outcome of unskilled, skilled and professional practitioners might differ in the standard of work completed.

Learning aim C – Carry out practical estate construction and maintenance for animal management

- Learning aim C is concerned with the practical aspect of carrying out estate construction, installation and maintenance. Learners need to demonstrate they are competent to undertake these tasks and can complete them safely and to a satisfactory standard.
- Learners must have the opportunity to demonstrate their skills in all aspects. This will include working with boundaries, surfaces, structures, habitats or environments and mains or temporary services (gas, electric, water).
- It is possible that learners will have a variety of opportunities. For example, maintaining a fish aquarium could give learners just as valuable an experience as installing a trough for horses.
- Learners must demonstrate they can: interpret a specification (including any plans, maps or other additional information), carry out risk assessments, select the correct tools, materials and equipment, transport and use tools, materials and equipment safely and with due regard for legislation that applies to themselves, other people and the environment, meet the requirements of a specification, and clear the site and maintain and store tools, equipment and materials.

Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 7: Work Experience in the Animal Sector*
- *Unit 13: Animal Management in a Retail Environment*
- *Unit 14: Animals in Boarding Establishments*
- *Unit 24: Wildlife Ecology and Conservation Management*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

The British Trust for Conservation Volunteers produces an excellent range of handbooks under the editorship of Elizabeth Agate. The books cover a range of traditional and contemporary estate skills. They include:

- Agate E – *Fencing: A Practical Handbook* (British Trust for Conservation Volunteers, 2001) ISBN 9780946752294.
- Agate E – *Footpaths: A Practical Handbook* (British Trust for Conservation Volunteers, 1996) ISBN 9780946752317.
- Agate E – *Toolcare: A Maintenance and Workshop Manual (revised edition)* (British Trust for Conservation Volunteers, 2000) ISBN 9780946752249.
- Kitcher C – *Practical Guide to Inspection, Testing and Certification of Electrical Systems 3rd edition* (Routledge, 2013) ISBN 9780080969077. This is a very comprehensive manual covering all aspects of electrical inspection and testing. It is a useful reference for tutors.

Journals

The two journals listed below offer learners an insight into rural life and the issues involved. There are often very specific articles as well as general topics. Both have extensive online links

- *Countryfile* magazine (BBC publications)
- *Countryside* magazine (NFU publications)

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Videos

- *Dry Stone Walling* DVD (NTSC) Andy Radford [2007]
  There are videos available that cover a range of estate skills and this one is an example.
- www.youtube.com/watch?v=I_wuyOv3-lI
  YouTube has very specific and useful resources that will be in a format familiar to learners. This example shows the installation of a Hotline electric fence.

Websites

- www.gov.uk/guidance/animal-welfare#page-navigation
  This website contains links to *DEFRA*'s Regulations, Codes of Practice and Codes of Recommendations governing the welfare of farmed animals. It is useful since learners must ensure estate tasks, such as maintaining animal accommodation, comply with current legislation and guidance.
- www.gov.uk/guidance/animal-welfare-legislation-protecting-pets
  This website has links to *DEFRA* Codes of Practice for dogs, cats, horses and non-human primates.
- www.hse.gov.uk
  This is the entry portal for the *HSE (Health and Safety Executive)*. It has links which learners will find useful for ensuring they work within the regulations and guidance for health and safety in the workplace.

Unit 23: Zoological Animal Health and Husbandry

Delivery guidance

Approaching the unit

This unit focuses on approaches to health and husbandry of animals within different animal collections. The most useful and exciting resource to engage learners, and which will offer a true insight into keeping exotic animals, is to arrange visits for learners to a range of animal collection centres. Visits could incorporate talks from animal keepers, or a behind-the-scenes tour.

Learners should also have access to videos and images of different accommodation and, more specifically, equipment that may be used in animal collections, as it may not be possible to have access to these on a frequent basis (or at all). It is possible to make links to other units where handling and restraint equipment is covered, while referring to larger species that are found in zoos.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order. It is intended that you should take a holistic approach to the delivery of the units, so, for example, *Unit 3: Animal Welfare and Ethics, Unit 4: Practical Animal Husbandry, Unit 6: Animal Health* and *Diseases and Unit 21: Exotic Animal Health and Husbandry* could be delivered alongside this unit and tasks for assessment could link learning aims from these units.

Delivering the learning aims

You could introduce learning aim A by allocating learners different types of legislation that affect zoos within the UK. Learners could produce presentations to inform other learners about what they need to know for each legislative requirement. It is essential to emphasise health and safety when visiting and working in an animal collection. It could be useful to lead a presentation and discussion on this.

A trip to an animal collection should help to demonstrate good practice in health and safety. You could ask learners to evaluate animal collections to see whether they are meeting the required standards or how they could further improve their adherence. You could give learners examples of records that animal collections are legally required to keep. Learners could then decide why this is necessary.

For learning aim B, it would be useful for learners to visit a variety of zoos and animal collection centres. You could also give learners access to images and videos to demonstrate different types of accommodation, enrichment and structures used in different zoos. You can offer information on the specific animals from different groups including mammals, birds, herptiles, fish and invertebrates. You could arrange visits, as required, to help learners focus on the variety of techniques used within animal collections. You should focus on key

areas including maintaining animal health, behaviour, accommodation types, enrichment and feeding.

It is important to teach learners how to critically evaluate and explain their findings. It would be useful for learners to design their own accommodation for given species to enable a deeper understanding of how to embed high standards of health and welfare, and eliminate the risk of disease, including zoonosis. Learners may also gain more confidence and interpersonal skills from discussing the different aspects of the health and welfare of animals in zoos within small groups or with the class.

You could introduce learning aim C by asking learners to consider and record the reasons why zoo animals may be handled and restrained. Giving specific examples can allow learners to plan and research the different handling and restraint methods used on zoo animals.

Learners must also be able to detail the equipment available for a variety of zoo animals. You should give learners access to ICT as this will give them the opportunity to look at both chemical and physical restraint techniques for different species. You should also introduce the concept of animal training and it would be a good idea to use examples of animal training in zoos, e.g. operant conditioning.

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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 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.

Assessment guidance

This unit is internally assessed through two set tasks. Learners should have evidence of independent authentic reports or articles based on information gathered during visits to animal collections. They should include images in their reports to show accommodation types and their evaluations. Learners can present their information in report form, but you should try to be imaginative in your assessment approach so as to engage learners and to make the method of assessment relevant to the learning aim being assessed. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- interviews with zoo staff – recorded through video, email conversations or recorded video calling
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

Learning aims A and B are assessed together emphasising legislative requirements. Learners must also visit a minimum of two animal collections while looking at different species throughout. Learning aim C should be assessed independently and focus on the equipment listed in the unit content. Learners should cover equipment for both chemical and physical restraint, however, it is not essential to detail each item. Encourage learners to detail various scenarios – for example three scenarios that would use a variety of the equipment listed within the unit content.

There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments for *Unit 3: Animal Welfare and Ethics* or *Unit 21: Exotic Animal Health and Husbandry* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

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Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 23: Zoological Animal Health and Husbandry

Introduction

Introduce the unit by outlining the learning aims. You could discuss the variety of species that are commonly found in animal collections, and how their health and welfare can be maintained, ensuring disease elimination. It would be useful to detail different animal groups to ensure a variety have been discussed, including mammals, birds, herptiles, fish and invertebrates.

This unit will help to prepare learners for job roles such as animal officer/inspector, assistant zoo keeper or zoologist.

If it is possible to arrange, this unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local zoos
- contribution of ideas to unit assignment
- opportunities for observation during work experience
- support as mentors.

Learning aim A – Understand legislative requirements to meet animal welfare and human safety needs in zoological collections

- You could give learners specific laws to research and present to the class. Learners could work in small groups to produce leaflets regarding specific items of legislation, for example, the Zoo Licensing Act 1981, Health and Safety at Work Act 1974, Animal Welfare Act 2006. At the end, the groups could give feedback and discuss what they have found out for each legislative requirement, or you could give out copies of all the leaflets produced.
- You should give a presentation to learners on record keeping. You can encourage communication and thought through question and answer sessions. You should ask learners questions relating to the importance of record keeping, but also detail specific elements that they must record.
- Learners could use ICT to design their own records for use in a collection for a specific animal.
- You could give learners examples of records for specific species to analyse. It is important to show learners both high and low quality records to enhance their evaluation techniques.

Learning aim B – Examine the approaches used to maintain the health and welfare of animals in zoological collections

- Throughout learning aim B you should encourage visits to animal collections so learners can see a range of accommodation types and species.
- Introduce this section by introducing learners to animal accommodation requirements and how zoos must meet welfare legislation. You can make links to learning aim A as a revision session

- You could supply images of a range of accommodation structures and materials so that learners can assess how suitable they are for the animals. Learners can analyse and feed back to the class.
- Learners will benefit from a visit to an animal collection, which will allow them to analyse the location of species, the accommodation type, as well as materials used in the construction of a variety of enclosures and species.
- Ask learners to comment on the suitability of accommodation based on several visits. Encourage learners to document their evidence in the form of video or explanations with accompanying images.
- You could encourage learners to design accommodation types in order to instil and demonstrate knowledge based on accommodation layout and access.
- You could give learners a presentation on enrichment types and allow them to decide what species the types should be allocated to and why this may be the case. You could ask learners to design an 'enrichment plan' for a particular species and detail the importance of zoo animals having a variety of enrichment.
- Learners must be able to identify signs of good health in animals, as well as 'normal' behaviour. Learners could observe these while on visits to animal collections, and make links between their care and why they exhibit signs of good health.
- You could outline the major signs of ill health and behaviour in zoo animals. It is important to identify the main causes of these and allow learners to give thorough explanations.
- Learners should investigate the diseases that can occur in animal collections. They should know the difference between isolation and quarantine procedures. A range of diseases caused by different pathogens should be covered.

Learning aim C – Investigate the techniques required for the safe and competent handling and restraint of animals in zoological collections

You should lead this learning aim by asking learners to investigate the different types of equipment used in given scenarios.

- You could introduce the learning aim by asking learners to record the different reasons for handling and restraining animals within a collection. It is also important to understand when animals should **not** be handled. You could ask learners to discuss this in small groups and give examples.
- Learners should detail the types of equipment that may be used to handle and restrain zoo animals, including physical and chemical restraint.
- Initially you should ask learners to establish which equipment is suitable for specific animals. They can then research how to use equipment safely and whether there are alternative methods available.
- You could suggest other scenarios in which learners must plan the restraint and handling of a given animal. It is important for learners to think about length of time, size of transport enclosure, the environment and other essential aspects. They could demonstrate this by producing flow charts or plans of action in relation to handling an animal.
- You should revisit health and safety legislation as covered in learning aim A. Make clear links to using equipment. Each learner must understand the importance of maintaining handler safety when they are close to zoo animals.
- You should also revisit record keeping from learning aim A and make clear links to using restraint (physical and chemical methods) and handling equipment.

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- You will also need to cover operant conditioning in order to highlight animal training that takes place in zoos. You could show learners video clips of animals that are undergoing training using positive reinforcement. Learners could create training plans for a specified zoo animal with a training goal in mind. For example, a zebra raising a hoof for inspection, a lion opening its mouth for inspection, a giraffe standing in a specific area for a blood sample to be taken.

Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 3: Animal Welfare and Ethics*
- *Unit 4: Practical Animal Husbandry*
- *Unit 6: Animal Health and Diseases*
- *Unit 21: Exotic Animal Health and Husbandry*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

- Hosey G, Melfi V, Pankhurst S – *Zoo Animals: Behaviour, Management and Welfare 2nd edition* (Oxford University Press, 2013) ISBN 9780199693528.
  Key information on zoo management with reference to examples throughout.
- Kleinman D, Thompson K, Baer C – *Wild Mammals in Captivity: Principles and Techniques for Zoo Management 2nd edition* (University of Chicago Press, 2012) ISBN 9780226440101.
  Useful information that can be used by zoo managers, animal caretakers, researchers and anyone with an interest in how to manage animals in captivity.
- Rees P – *An Introduction to Zoo Biology and Management (*Wiley-Blackwell, 2011) ISBN 9781405193504.
  This book is specifically designed for those studying a range of courses within the animal management sector. The book focuses on a range of aspects from a zoo point of view.

Journals

- *Animal Welfare Journal* (UFAW)
  A scientific journal that focuses on the welfare of captive animals. Some articles published are based on animals within a collection centre and others detail captive companion animals and those on farms and in laboratories.

Videos

- www.youtube.com
  There are many useful videos on *YouTube* demonstrating operant conditioning in zoo animals for health checking and entertainment purposes.

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Websites

- www.abwak.org
  The *Association of British and Irish Wild Animal Keepers* is a membership organisation for those interested in looking at conservation and animal welfare.
- www.bornfree.org.uk
  The *Born Free Foundation* is a wildlife charity that helps rescue and care for vulnerable wild animals. The charity helps with conservation and education.
- www.chesterzoo.org
  Chester Zoo website offers information on the animals that they currently have and information regarding upcoming events relating to conservation.
- www.eaza.net
  European Association of Zoos and Aquaria is an organisation that completes research into animals and their environment in order to educate and conserve species.
- www.gov.uk/government/organisations/department-for-environment-food-rural-affairs
  This *Department for Environment, Food and Rural Affairs* site contains policies and documentation based on the transport of animals within the UK.
- www.zsl.org/zsl-london-zoo
  The *London Zoo* website offers information on the animals they currently have and information regarding upcoming events relating to conservation.

Unit 24: Wildlife Ecology and Conservation Management

Delivery guidance

This unit offers learners the opportunity to undertake wildlife ecology and conservation management through practical experience based on sound scientific understanding.

Approaching the unit

The emphasis in the unit should be to explore ecology and conservation management through the study of specific wildlife animals and habitats. Wherever possible, learners should achieve this through practical tasks and activities.

Encourage learners to develop an expertise in the species chosen and ensure that good scientific research underpins the management. Learners should be able to predict the outcome of their management strategies and develop a monitoring framework to evaluate those outcomes.

By looking in depth at target habitats and species, learners will soon recognise that the complex interrelationships they find will need a broader understanding for successful management.

There is flexibility in the method of delivery and the timing of this unit and you may wish to combine teaching and learning with some of the other units depending on your resources and the expertise of your tutors.

Each centre can create assessment plans and schemes of work to meet the needs of their own organisation. None of the units in this suite of qualifications have prerequisite units and this allows them to be taught in any order and it is intended that you should take a holistic approach to the delivery of the units. You could set tasks that enable learners to gain practice and acquire skills relevant to several related units at the same time. For example, this unit could be delivered alongside *Unit 7: Work Experience in the Animal Sector* or *Unit 22: Practical Estate Planning, Construction and Maintenance*.

Delivering the learning aims

Learning aim A is concerned with developing an understanding of the processes that lead to diversity in ecosystems and their associated wildlife, and the different relationships within them. One approach would be to conduct basic fieldwork into locally available habitats and to supplement this with presentations. Learners should quickly move away from general descriptions to targeted species and the interactions between these, their environment and other animals.

At the outset, learners should appreciate the impact of human activity – positive, negative, intentional and unintentional, and the scale at which these interactions occur. Local fieldwork and well-chosen global case studies would help to exemplify these.

Learning aim B allows learners to develop their understanding and knowledge in more detail by undertaking targeted habitat surveys and wildlife monitoring. This then gives the framework for planning habitat management and rehabilitation.

Again, one method of conducting the surveys is to target particular species rather than conduct general surveys. So, for example, surveying a hazel woodland habitat to investigate the extent to which it would give a suitable resources base for dormice would allow a focus that a general survey would miss.

You will probably conduct wildlife monitoring through direct sightings of target species or indirect monitoring through tracks and signs. Catch and release can be undertaken but would be better carried out in conjunction with an organisation that routinely carries out such activities. Learners must understand that there are strict regulations within which catch and release takes place.

After conducting surveys and monitoring data, learners will develop a plan for either habitat management or rehabilitation. In either case, they will clearly link the elements of their plan to both their data and the science that underpins their planned intentions and outcomes.

For learning aim C, learners will implement a plan for both habitat management and wildlife rehabilitation. They should translate the plans into practical tasks using appropriate documentation, for example, specifications and job sheets. They must ensure the work will conform to current legislation regarding safe working and animal welfare. The plans would be of their own devising or a suitable alternative.

Learners should show that they can carry out a plan and adapt it to changing circumstances. A logbook would be one way of recording this. It is probable that you will have to supervise learners during rehabilitation of wildlife to ensure correct animal welfare. It may be more appropriate to invite a guest speaker to work with learners to carry out a rehabilitation plan. This would help ensure animal welfare is the prime consideration.

Learning aim C concludes with learners appreciating the need to monitor the outcome of practical work so they can evaluate the extent to which the practical tasks undertaken have met the aims. For example, has the removal of invasive, non-native rhododendron significantly altered the spread of "dormouse-friendly" bramble?

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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	

Assessment guidance

This unit is internally assessed. Learners will need access to a range of habitats and specifically to an area where they can practise practical habitat surveys and management. Observation records and witness statements can give suitable supporting evidence in addition to field notebooks and logbooks. This practical approach to gaining an understanding of ecosystems should be supported through classroom notes and independent research.

Learners will need access to organisations that specialise in the assessment of wildlife rehabilitation. This could take place during visits to assist with their activities.

Learners must show that practical management is based on good scientific evidence. This could be demonstrated through presentations and reports. Learners could deliver presentations in the classroom or during practical tasks where they explain the reasons for the activities they have undertaken.

When assessing the outcome of management tasks, it is not practical for learners to carry out what could be long-term monitoring. It is essential, however, that they can clearly articulate what they would expect such monitoring to show. They could do this through a table that details how they could monitor each aspect of the management plan and what impact on biodiversity they could reasonably expect to see.

There is flexibility to combine assignments for other related units into a single project that provides evidence for more than one unit. For example, it may be possible to combine assignments for *Unit 7: Work Experience in the Animal Sector* or *Unit 22: Practical Estate Planning, Construction and Maintenance* with those for this unit. However, with this type of assessment, careful planning would be needed to ensure that the BTEC rules are not breached. It is important to remember that all learning aims and assessment criteria from each unit must be clearly set out and met in the integrated project and that the assessment follows the delivery required so that learners are working independently.

Try to be imaginative in your assessment approach so as to engage learners and to make the method of assessment relevant to the learning aim being assessed. It is not necessary to expect learners to produce long written evaluations or reports. Other suitable methods of assessment might be:

- blogs
- vlogs
- wikis
- interviews with employers – recorded through video, email conversations or recorded video calling
- recorded interviews
- presentations with speaker notes
- posters
- fact files or leaflets
- reflective diaries, which can be written, audio or audio-visual
- filmed documentary-style presentations.

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Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 24: Wildlife Ecology and Conservation Management

Introduction

This unit will help to prepare learners for a career in conservation and environmental monitoring and planning.

If it is possible to arrange, this unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local wildlife organisations or estates
- contribution of ideas to unit assignments/projects
- opportunities for observation during work experience
- support as mentors.

Previous learners of the BTEC Animal Management course could also be invited to share their experiences with the class and act as mentors.

You could introduce the unit in the classroom but move to an outdoor setting for a practical introduction where basic concepts such as ecosystem relationships, factors controlling ecosystem distribution and different ecosystem scales can be examined.

Learning aim A - Understand the characteristics of ecosystems for wildlife habitat planning and rehabilitation

- You could introduce the unit with a presentation to cover the basic concepts of ecosystems, including a brief introduction to the Phase 1 survey.
- Learners should then conduct a Phase 1 survey of a local area using conventional symbols. They follow this with a basic field survey comparing contrasting habitats, preferably adjacent, for example woodland and grassland. Learners could record differences and similarities, including biotic and abiotic factors. They could also start to recognise animal sightings, tracks and signs for monitoring purposes.
- In the classroom, learners can expand the scale to gain an overview of UK and global habitats and ecosystems through presentations and individual research activities.
- Introduce learners to a named animal wildlife species and habitat. They should explore the factors affecting the distribution of the animal and the interrelationships with other animal species and with its habitat. You can support learners with guided research to underpin their knowledge with good scientific background information. Further fieldwork allows learners to gain a greater understanding of the chosen species in its habitat. The chosen species will form the basis for further development during the unit, so it should be accessible for a variety of tasks.
- Learners should examine human impacts on animal wildlife in the field. Ideally, this should be for the target species, but where this has insufficient examples, learners should visit other locations or use other species. You could also give learners case studies to examine the process of wildlife rehabilitation and to widen the learner's knowledge. This could include global effects of climate change resulting from human activity.

Learning aim B – Carry out field studies into wildlife populations and their habitats for the purpose of planning for wildlife management

- Learners should conduct a range of different surveys and monitoring activities appropriate for the chosen species and related species (for example to examine predator/prey/competitor relationships). The habitat surveys should focus on recording the resources within the environment that support or affect the chosen species. It is essential that the survey techniques chosen are placed within a range of available strategies. Learners should be encouraged to discuss the relevance of different techniques and the theory that underpins them. Learners should consider health and safety and produce relevant risk assessments that include, for example, working near water, habitat disturbance and "lone working".
- If the chosen species is the dormouse then the habitat survey would include the amount of honeysuckle (bedding and nectar), bramble (cover and fruit) and hazel (for food). Abiotic elements of the survey could include soil moisture (influences hibernation) and temperature (controls dormancy). Monitoring for dormice would include hazelnut bite patterns to establish the presence of dormice and their main competitor, the grey squirrel. Sightings or signs of raptors and fox would establish the presence of predators. Learners must also record human impacts, for example drainage and habitat removal.
  However, the use of the dormouse is for illustration purposes only. You should identify a target species (and resources) whose habitats learners can readily access. This must be an animal species but could be freshwater, marine or land-based (including avian). Ideally, learners should be involved in the choice of species.
- Learners must include establishing the viability of the habitat to support successful rehabilitation. This could be for the same chosen species or for another species; learners could work with the guidance of a local organisation specialising in this.
- Based on survey, monitoring and research data, learners should develop a plan for either wildlife habitat management or wildlife rehabilitation. This plan will form the basis of the practical work undertaken and should include monitoring of outcomes for evaluation purposes.

Learning aim C – Undertake practical wildlife and conservation management to affect biodiversity

- Learners need to translate management plans into practical tasks for wildlife habitats and rehabilitation. It is possible that both habitat management and rehabilitation could take place at the same location using a plan they have devised or one devised by their peers.
- Learners should interpret the plans to produce specific tasks that then have to be carried out. They will source and select materials, tools and equipment and demonstrate safe working practice. They should also ensure that they are working within animal-welfare regulations.
- Learners should have the opportunity to demonstrate they can adapt to changing circumstance while the work is in progress and that they are confident that changes made will not jeopardise the planned outcomes or aims. Where this is not possible then learners could explore this through "what if" exercises during task completion.
- In the field, learners should evaluate the task completion and the extent to which their activities may have affected biodiversity within the chosen study area. Realistically, it is unlikely that they can follow the monitoring plan they have devised; but this could form the basis for future learners as part of their own surveys. Instead, learners could detail, through report, presentation or discussion, what they would expect the monitoring programme to reveal.

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Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

Pearson BTEC Level 3 Nationals in Animal Management (NQF):

- *Unit 7: Work Experience in the Animal Sector*
- *Unit 8: Investigative Research Project*
- *Unit 22: Practical Estate Planning, Construction and Maintenance*

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Animal Management. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

- Parkins H – *Handbook for Phase 1 Habitat Survey: Technique for Environmental Audit v.1 (Reprint edition)* (Joint Nature Conservation Committee (JNCC), 1990) ISBN 9780861396368.
  This is an invaluable handbook for conducting a Type 1 survey. It can be downloaded from the JNNC website (see Websites section below).
- Sutherland W, Hill D – *Managing Habitats for Conservation* (Cambridge University Press, 1995) ISBN 9780521447768.
  This is a good and detailed introduction to habitats and their management.

Journals

The journals listed below contain articles that may be interesting for learners. They contain general habitat and ecosystem articles often linked to particular species. The *BBC Wildlife* magazine concentrates on UK habitats and species.

- *BBC Wildlife* magazine (BBC Publications)
- *Natural World* magazine (Think Publishing)

Videos

There are few videos available that contain the depth needed. Those mentioned below offer an interesting range of world habitats and species. It would be more appropriate, possibly, to search online video sources for particular species.

- http://environment.nationalgeographic.com/environment/habitats/
- www.nationalgeographic.com
- *Planet Earth – Complete Series*, 2006 [BBC DVD]

Websites

There are many specialist organisations and government departments that publish useful internet resources for a wide variety of habitats and wildlife species. The example of a specific wildlife animal in this guidance is the dormouse. Centres will choose their own species but the resources below indicate the depth of knowledge that will be needed.

- www.gov.uk/government/publications/hazel-dormice-apply-for-a-mitigation-licence
  Using the dormouse as an example, this website links to protection and licencing and illustrates the legislative framework that learners will need to understand.
- http://jncc.defra.gov.uk/
  Joint Nature Conservation Committee (JNCC) is the public body that advises the UK Government and devolved administrations on UK-wide and international nature conservation. Originally established under the Environmental Protection Act 1990, JNCC was reconstituted by the Natural Environment and Rural Communities (NERC) Act 2006. The website contains links to useful habitat resources.
- http://ptes.org/get-informed/publications/guidance-leaflets/
  This website is the gateway for leaflets from the *People's Trust for Endangered Species* (PTES). These will allow learners to access the science to underpin their understanding. The publications also contain good examples of practical tasks and some include rehabilitation.
- http://ptes.org/dormouse-papers/
  The *PTES* also have links to over 100 scientific papers on the dormouse and this is the gateway for these.

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