

## Unit 5: Operational and Environmental Activities in Land-based Enterprises

---

### Delivery guidance

Operational and Environmental Activities in Land-based Enterprises is an important unit for learners as it is intrinsically linked with nearly all aspects of outdoor work in a huge range of industries. Developing a sound understanding of the different aspects is essential for learners going into the land-based sector. Learners need to be able to understand the impacts of activities on our environment, know how to manage activities for land-based enterprises as well as plan these activities.

You should include variety within your lectures for good quality knowledge transfer as well as delivering an understanding of this knowledge through in depth explanation. Practical skills should also be delivered and in order that your learners are engaged and motivated different lecture techniques should be used: theory lectures, formal presentations by yourself and guest speakers, as well as demonstrations and practical activities. Learners should be encouraged to revise throughout the delivery of the unit and time should be given during lecture time to revisit sections that the learners feel they would like to review.

### Approaching the unit

This unit is integral to all aspects of work in land-based enterprises. The focus of the unit is to ensure your learners have the knowledge and skills to complete a variety of skills, operations and activities in land-based enterprises. In turn, this ensures that learners know how to limit the negative impact on our environment and that positive effects are factored into activities carried out for other purposes.

Practical activities will be essential to ensure your learners have a sound understanding, and also to meet some of the assessment criteria requirements.

A range of environments, with varying habitats, purposes, wildlife, geographical features and altitudes should be visited and worked in. In addition to this, personal protective equipment and tools will need to be available for practical activities to ensure learners' safety and quality of practical tasks.

Learning aim A focuses mainly on changes in land-based practices and the impact on our environment of these practices. You will review the history of land use and where current affairs would suggest it will go in the future. You will discuss with learners the positive and negative impacts on our environment and how these can be increased and managed respectively.

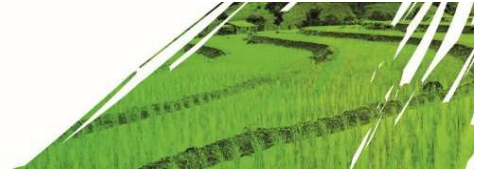
Learning aim B develops the points made in learning aim A by looking at the way land-based enterprises work, how they are best managed and by what methods they can be carried out in a way which has the lowest negative impacts on other land-based enterprises and our environment. Learners will see how to measure these effects on our environment and understand points at which small issues can turn into big ones,



and where and how past big issues have been managed for a better or improved situation.

Learning aim C sees learners learning about efficiencies while working in land-based enterprises in order to be financially viable and safer, and to work in a way which boosts our natural environment. This will be carried out by:

- reviewing staff
- resource and waste management
- considering tasks long before they are carried out
- managing risk and reviewing possible negative effects by reviewing historical incidents incurred while carrying out similar tasks.



### Assessment model

Learning aim	Key content areas	Recommended assessment approach
<b>A</b> Explore the impact of land-based practices on local environments	<b>A1</b> Changes in land-based practices <b>A2</b> Environmental impact of land-based practices	This unit is assessed through a Pearson Set Assignment.
<b>B</b> Explore operational and environmental management activities for land-based enterprises	<b>B1</b> Working environment of a land-based enterprise <b>B2</b> Environmental management activities <b>B3</b> Managing operational and environmental activities	
<b>C</b> Plan operational and environmental management activities for land-based enterprises	<b>C1</b> Planning processes for operational management activities <b>C2</b> Planning processes for environmental management activities <b>C3</b> Evaluating management performance	

### Assessment guidance

This unit is assessed through a Pearson Set Assignment. Learners will submit their assessment in the form of a written report, research and a plan. This should contain evidence of planning which may be backed up with pictures, graphs and charts. Learners should do background reading of journals, books and websites to back up what they learned during lectures and a list of vetted resources should be given for learners to use as preparation for their assessment.



## Getting started

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

### Unit 5: Operational and Environmental Activities in Land-based Enterprises

#### Introduction

Operational and Environmental Activities in Land-based Enterprises aims to teach learners who will go on to work within these enterprises to plan, work and manage others in a way that interacts with its own components, other enterprises and our environment in an efficient, safe and beneficial way. There are opportunities to build in assignment writing, preparation for assessment and work experience within this unit.

#### Learning aim A: Explore the impact of land-based practices on local environments

First of all, learners should be introduced to their learning environment. Discuss with them health and safety aspects and expectations; consider fire safety and any other housekeeping rules that the centre deems important to the learners' safety during lectures.

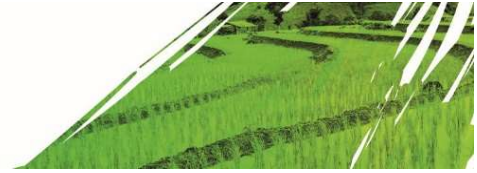
Ask learners to produce a list of the things they expect to learn during the delivery of this unit. This can be used to assess learners' attitudes and opinions on different areas of land-based enterprise. Discuss every aspect of these lists during a group discussion and highlight and review different areas that build on these points. This will help you begin to create an idea of your learners' background knowledge, practical abilities and learner styles.

Have learners consider all of the areas of land-based enterprises and how these interact with our environment in some way. Have them consider positive and negative impacts, the opportunities and threats of future systems too. Write these up on the board in a brainstorm type manner and ask learners to copy these down to produce a full group idea. Add to this brainstorm throughout the delivery of the module as further interactions are discovered, developed or invented. Give a presentation on different aspects of these interactions to learners to build their understanding of this field.

Ask learners work in groups and produce their definition of what biodiversity is. Through a group discussion, build a class definition of biodiversity on the board before comparing this to a dictionary definition. Go on from this to give a presentation on biodiversity to learners and its involvements and relationships with land-based enterprises. Include how economic and environmental value of habitat sites on farms have associations with yield and cost savings. Where possible, a visit to a farm to see these in practice is very beneficial to different learners' styles. For example, viewing how beetle banks have an increase to crop yield demonstrates directly how increased wildlife habitat increases yield, and thus profits. Review waste control in different farming methods and the positive and negative impacts upon our environment.

At points throughout the delivery of this learning aim, quiz learners on terminology used during the lecture. This will ensure learning has taken place as well as produce a glossary of terms that learners can use and add to throughout the delivery of the unit.

Discuss with learners the meaning of mechanisation. Have them come up with their own definitions of this word and research where it started. Consider with them the agricultural and industrial revolutions and the first massive developments that began mechanisation of land-based enterprises. After a presentation on mechanisation detailing its increase in efficiency, yield and production, split learners into two teams in order to form an argument for and



## **Unit 5: Operational and Environmental Activities in Land-based Enterprises**

against the increasing of yields in agriculture through technological advancement. You or another lecturer can take the position of chief adjudicator and highlight points of interest in learners' arguments after the debate. Give a presentation to learners that builds on their argument, taking particular note of:

- consumer pressures
- farming for the production of energy and fuels
- how to farm sustainably
- the legislation governing farming in these areas.

During a lecture with access to PCs, learners can research (using books, journals and websites) the history of developments in agriculture from the industrial revolution to the present day. A timeline of inventions could be produced including figures like Jethro Tull, and include machinery such as the satellite steering systems on board tractors. This could be completed as homework and handed in as a finished piece for your assessment. This will help give an idea of learners' abilities and overall understanding of the unit so far.

Give a presentation to learners on the impact on our environment of land-based practices such as those which may be causing climate change through deforestation and eutrophication. Consider with your learners how the environment is affected by pollutants to water and soil, as well as waste products which set off chain reactions or adversely affect areas indirectly. You could tour a site that has been adversely affected by indirect human activities in land-based industries.

Once learners understand the negative effects of land-based enterprises, they can consider the positive effects on our environment due to land-based enterprises. They could research a different environmental benefit to our environment from each continent. This will encourage learners to think about systems in other countries and the possible employment opportunities which may not be available to them at home. Learners should read out these ideas to the rest of the class, followed by a presentation from you on their ideas to underline and correct the different points researched. Learners could then rank these different systems in order of importance to our environment.

Tour with learners areas where land-based enterprises are actively trying to increase the quality of our environment, either by installation of habitat, changes in techniques or better storage, management and use of waste products.

To display a negative effect on an environment, set up a fish tank in the learners' environment with some pond water in it. This should contain both microfauna and flora. Add some fertiliser to it and discuss with learners through the next few lectures how the eutrophication effect takes over the water as the vegetation grows to the point of shadowing out lower vegetation and killing it. This will then begin to break down and reduce the oxygen in the water to the point that the microfauna can no longer respire.

Introduce learners to the different government organisations that are involved with ensuring land-based enterprises meet certain legislation regarding our environment. In order to deliver information on these different organisations, invite visiting speakers who represent each of these bodies to give a presentation to learners. This could be done as part of an employers' fair held at the centre in conjunction with other lecturers of different units as well as other courses. Afterwards, ask learners to review which government bodies they feel are easiest to work with, have the best interest in producers and have the best interests in our environment.



## Unit 5: Operational and Environmental Activities in Land-based Enterprises

Have learners work in small groups to write their own piece of legislation that they feel should be met by people working in land-based enterprises. Feeding this back to the rest of the class will give all learners an outlook on each other's attitudes, instil other's ideas in their own minds, as well as giving you a firmer picture of the learners' styles, attitudes and work ethics. Give a presentation afterwards which delivers key pieces of legislation to your learners that they are likely to use and respect on a daily basis when working in land-based enterprises.

### Learning aim B: Explore operational and environmental management activities for land-based enterprises

Introduce learning aim B by asking learners to think of as many reasons as possible why we have land-based enterprises. They should consider what they produce and what services they provide. This should be fed back during a class discussion and brainstormed on the board to draw in all of the learners' ideas to create one large picture of land-based enterprises. This should be recorded and added to throughout the delivery of the unit for learners' future reference and preparation for assessment. Learners could use a colour key to group these different aspects of land-based enterprises into groups such as meat producers, energy producers or forestry services.

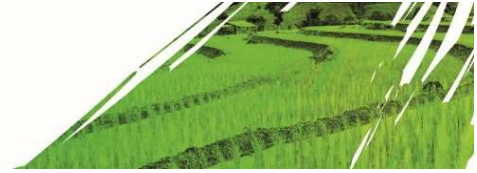
Take learners to different working land-based businesses where they should be encouraged to take part in routine procedures where possible. Ask site representatives to detail the work they will be doing and why, as well as how regularly the tasks are carried out. Learners should have proper personal protective equipment (PPE), with a discussion about its maintenance and application before the visit, possibly while traveling to the site.

Learners should take part in tasks which are carried out daily, as well as less regularly such as weekly or monthly. Learners talk with site representatives about their own future employment and what avenues they feel are open to them. Take photographs and videos of the learners carrying out different tasks and ask them to record important information about what they have done when they are back at the centre for future reference. This may also form part of their assessed work as evidence.

Building on their visit, learners could be tasked with writing down what aspects of the work they carried out which needed recording and for what reasons. After learners have fed back their ideas, give a presentation on the importance and methods of measuring success, yields, expenditure, medicine, deaths, drilling dates and any other important information. Learners could be given different record headings and given time to produce their own record sheets. These could be reviewed and amalgamated in order to produce increasingly accurate and useful methods of recording land-based enterprise information.

Introduce learners to specialists who work in conjunction with land-based enterprises. In small groups, ask learners to write down as many land-based specialists as they can think of such as vets, nutritionists and agronomists. Write the learners' suggestions on the board, and then present learners with the applications, timings and utilisation of these specialists. Ask learners to think about a land-based enterprise that they would particularly like to work in and for which they feel they would require specialist help. This should be written up as a formal piece of work and handed in to you. This will show you the areas in which learners feel they have limitations and the areas you may want to go into in more depth. It will also highlight for the learners themselves the areas they may want to study further.

Ask learners to work in small groups to discuss what they think are the most important aspects of land-based operations which require security. The learners can feed back their ideas to the



## Unit 5: Operational and Environmental Activities in Land-based Enterprises

rest of the class, noting the different aspects on the board. Build on this by giving a presentation on the security procedures and processes of land-based enterprises. Discuss the requirements of security for machinery (to protect from theft), security of grain stores (to avoid damage to health of staff and the public), and the biosecurity of livestock, plants and soil from pathogens.

Expand the lecture on security to consider the issues and challenges faced by land-based enterprises by people:

- such as activists
- generally being at risk themselves
- causing risk to livestock or farm staff directly and indirectly.

Review the numerous challenges to technology, such as reduced developments due to shortfall of land-based technology developers.

Discuss with your learners the issues around land use being important for food production but also being usable for the production of fuel. The sustainability of these different reasons for production is also brought into question and some methods have a negative effect on our environment which is arguably a challenge to future production. Look at different organisations which are for and against the various methods of land-based enterprises and consider their arguments with learners.

You could take learners to a farmed environment and demonstrate surveying techniques. Have learners carry out these surveying methods to build a picture of the biodiversity, key species, water and soil health, and the fertility of the arable land. Back in the classroom, ask learners to remember what they felt were the most productive and damaging aspects on our environment, or any other sections that were surveyed. Give a presentation on how to limit negative effects of land-based enterprises and how to boost the positives. Use the application of fertiliser as an example and explain to learners the different areas where fertiliser causes issues and solutions. Review Nitrate Vulnerable Zones (NVZs), eutrophication and nitrogen leaching, and the associated positives and negatives of fertiliser application.

During another visit to a farmed environment, invite the farm manager to discuss with learners how the routines and activities are managed and relayed to the farm staff. Look at measures that are in place to increase safety and avoid health and safety issues. Ask them explain to learners how they react in emergencies, what emergency protocols are, and how these are reported to necessary bodies.

After asking learners to consider the reasons for recording work output, give a lecture on the advancement of work. Discuss measuring task completion against general and planned expectations including costs, timings, staffing requirements, resources, and profits and losses. Introduce learners to activities' plans and how to ensure work is carried out in relation to regulations and codes of practice, while ensuring risks are managed and avoided where possible. You could do this by giving learners a small, random task to complete in a manner which has specific instructions **not** to do certain things (the legislation) even though this may well seem the most obvious way of doing it. This will teach learners that the direct route is not always the most appropriate due to certain side effects, and that this is governed by following legislation.

Teach learners about the aspects of thinking outside the box by giving them a range of problem-solving activities in order to develop their strategic thinking. This can be scaled up



## Unit 5: Operational and Environmental Activities in Land-based Enterprises

from basic thought experiments to real world scenarios, or those which require learners to move around on a grid in the style of a specific chess piece, or by only being able to turn right. Afterwards, ask learners to consider how they approach different problem-solving activities, encouraging them to produce a flow chart of what to do in the event of an arising issue which still completes the task safely and effectively.

Give learners examples of risk assessments from different areas of land-based enterprises. Ask them to look for common features. Risk assessments can also be taken from other industries because it is less the subject matter as the methods used to produce them that is important. Ask learners how they think a risk assessment targets specific risks and how it ensures the safety of workers. Give a presentation which explains to learners what they should look out for as markers for safety in land-based environments. Review this in a specific ecosystem with learners and ask them to complete a risk assessment for this environment using the aspects they have learned about in the presentation.

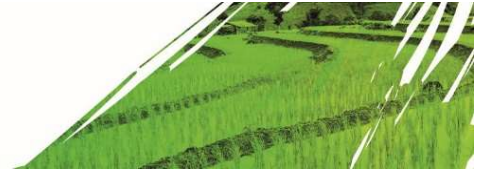
Review historic accidents that have had an effect on land-based enterprises and our environment, and how they could have been avoided through better risk assessment. Case studies of real incidents and maybe a task linked to one could enhance teaching. News story video clips could be useful. Learners could be put into small groups and each given an issue, accident or disaster to review. Each group could then give a small presentation to the rest of the class.

### Learning aim C: Plan operational and environmental management activities for land-based enterprises

Introduce learning aim C to learners by looking at planning cycles for a land-based enterprise. Consider the aspects of these, such as the aims, preparation and monitoring systems and evaluations and conclusions. These parts will themselves break down into further headings such as budgets, schedules and flow charts. Present on the aspects and implementations of each. After teaching learners about the aspects of land-based planning cycles, ask them produce a plan of their own for an operation that they are aware of. This should be an individual task and learners should consider seasonal variation, side effects, the activities, equipment, materials, and health and safety. Books, journals, websites and lecture notes should all be utilised by learners in the completion of this task which should be formally written up and handed to you for review. This will assess their learning and if there are any shared issues which you can review with learners.

Give learners an example of an operation that you would like them to carry out. Ask them to produce a resource list for this operation and feed back to the rest of the class. Ask learners where they think they are going to source this equipment and how they will get the best equipment for the lowest cost. Give a presentation on sourcing equipment, thinking about different planned operations. Look at machinery, materials and skill acquisition within different areas of land-based enterprises.

Teach learners about the importance of clear communication and following instructions. A quick round of Chinese whispers will quickly show learners how information is distorted and changed. Give a presentation on the importance of clear communication to different operating systems in order to plan for an efficient system change. Discuss links with central staff, contractors, agronomists, vets, nutritionists and any other person or business system that is crucial to completing or implementing different stages of a plan effectively. Invite learners to



## **Unit 5: Operational and Environmental Activities in Land-based Enterprises**

suggest barriers to clear communication in different land-based enterprises, such as noise, improper records and tiredness.

Building on previous health and safety and risk assessment lectures, tour the learning centre or another land-based setting and encourage learners to point out the areas which may currently be, or may develop into, a risk. Talk to learners about the PPE that could be worn by employees or visitors to this environment to increase their safety. Give learners an example of the centre's risk assessment framework and, back in the classroom, ask them to complete it for the areas toured. Learners may very well forget one aspect that they have seen; explain to them the importance of carrying out a risk assessment while in the environment so that they don't forget anything.

Give learners some examples of contingency plans from different land-based enterprises, as well as those from completely different industries, to recognise common features. Give a presentation on contingency plans, focusing on their importance and knowing when to put one into place given certain parameters. Ask learners to produce a contingency plan for an operation that interests them, to be implemented for a suggested issue that may or may not occur regularly.

Schedules could be introduced to learners by giving them examples of Gantt charts, calendars and flowcharts. Review with learners how tasks are allocated within a schedule by reviewing the local environment in which the plan will be implemented. Consider the facilities on hand, and sources, as well as levels, of available expertise and staff. The time of year, objectives, outcomes and intentions of the plan all affect the scheduling. Give learners some case studies and aspects the managers of these case study sites would like to complete. Ask them to plan a schedule in order to carry out these operations with regard to what they have learned during the lecture.

Give a presentation on the history of mapping in land-based enterprise. Discuss its application in farming for recognising soil type, boundaries, green matter indexing, pest damage and flooding. Demonstrate mapping to learners by using mobile phone apps, websites, drones and land surveying. You could ask learners to map the learning environment, the delivery centre or the landscape around it. Afterwards, learners can feed back to the class what their map could be useful for.

Building on the maps from the previous exercise, learners could begin considering environmental risks. In conjunction with a visit, ask learners to look for issues which may be a risk or could develop into one. Consider with your learners the PPE that should be employed within this environment.

Introduce the concept of feedback by giving a presentation on the collection of it from different areas in a land-based organisation. These should be both internal and external, such as staff and managers, as well as vets, bank managers or agronomists. Consider the different types of feedback and when, where and who it benefits. Ask learners to produce a SWOT analysis of an organisation from some given feedback. Review this during a group discussion and build on learners' ideas.

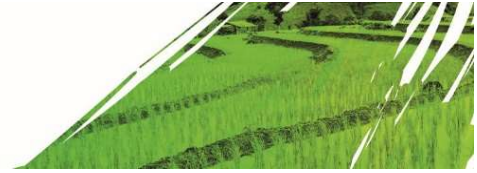
After reviewing feedback, organisations and enterprises should evaluate their work. Ask learners to review evaluation frameworks. Then give a presentation on how to create a framework which evaluates effectiveness of a process, measured against the aims and objectives of a plan. Go on to discuss the evaluation of processes and performance against the



### **Unit 5: Operational and Environmental Activities in Land-based Enterprises**

task completion requirements and evaluation frameworks, and where to next consider developments as a result of these.

Building on these assessment frameworks, ask learners to consider an evaluation framework which assesses themselves. Give a presentation on management processes of different areas including systems, efficiency or work carried out, staff skills and training requirements. Learners could then produce an action plan for the skills they feel they still need to develop. Learners could go on to consider action planning to highlight weaknesses in their own skills and how these could be carried out with an organisation's staff in order to increase staff skill sets.



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

This unit links to:

*Unit 1: Plant and Soil Science*

*Unit 2: Estate Skills*

*Unit 3: Understanding Environmental Management*

*Unit 18: Crop Handling, Storage and Quality Assurance*

*Unit 22: Organic Agricultural Production*

*Unit 26: Applied Agricultural Farming Practice*

*Unit 44: Linear and Level Surveying*

*Unit 46: Managing Soil Water*

*Unit 47: Sustainable and Renewable Land-based Practices.*

## 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 Agriculture/Horticulture/Land-based Subjects. Check the Pearson website (<http://qualifications.pearson.com/endorsed-resources>) for more information as titles achieve endorsement.

### Textbooks

CMI Checklist Series, *Managing Operations: Your guide to getting it right*, Profile Books, B00UJD8AFU

This book helps in operation management and ensures that a business's infrastructure and processes balance efficiency with effectiveness, using the right resources to maximum effect.

Carson, R., *Silent Spring*, Penguin Classics, 0141184949

One of the first books which reviewed the negative effects of agriculture on the farmed landscape with particular reference to chemical application.

Jameson, C.M., *Silent Spring Revisited*, Bloomsbury Wildlife, 1472970586

The follow up to *Silent Spring* which reviews how farming has changed since *Silent Spring* was written in order to benefit our environment.

### Journals

*National Geographic*

Often containing information on areas where our environment is being boosted and damaged by a range of human actions.

*Organic Farming Journal* by Soil Association

Reviews of soil and different farming effects upon it.

*Pearson is not responsible for the content of any external internet sites. It is essential for tutors to preview each website before using it in class so as to ensure that the URL is still accurate, relevant and appropriate. We suggest that tutors bookmark useful websites and consider enabling students to access them through the school/college intranet.*