



Accredited

OCR LEVEL 2 CAMBRIDGE TECHNICALS IN SCIENCE

LEVEL 2 UNIT 7
FOOD PRODUCTION

DELIVERY GUIDE

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OCR Resources: the small print

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INTRODUCTION

This Delivery Guide and Plan has been developed to provide practitioners with a variety of creative and practical ideas to support the delivery of this qualification. The Guide is a collection of lesson ideas with associated activities, which you may find helpful as you plan your lessons. The Plan offers one way to deliver this unit, with suggestions on how many lessons to spend on a particular topic and the resources you could use.

OCR has collaborated with current practitioners to ensure that the ideas put forward in this Delivery Guide are practical, realistic and dynamic. The Guide is structured by learning outcome so you can see how each activity helps you cover the specification.

We appreciate that practitioners are knowledgeable in relation to what works for them and their learners. Therefore, the resources we have produced should not restrict or impact on practitioners' creativity to deliver excellent learning opportunities.

Whether you are an experienced practitioner or new to the sector, we hope you find something in this guide which will help you to deliver excellent learning opportunities.

If you have any feedback on this Delivery Guide or suggestions for other resources you would like OCR to develop, please email resourcesfeedback@ocr.org.uk.

PLEASE NOTE

The activities suggested in this Delivery Guide **MUST NOT** be used for assessment purposes. (This includes the Consolidation suggested activities).

The timings for the suggested activities in this Delivery Guide **DO NOT** relate to the Guided Learning Hours (GLHs) for each unit.

Assessment guidance can be found within the Unit document available from www.ocr.org.uk.

The latest version of this Delivery Guide can be downloaded from the OCR website.

OPPORTUNITIES FOR ENGLISH AND MATHS DEVELOPMENT

The Wolf Review of Vocational Education recommended that all learners studying post-16 qualifications have the opportunity to further develop their English and maths skills, with the aims of:

- achieving a GCSE in English and/or maths at grade A*-C if they have not already done so or
- making significant progress towards GCSE entry and success if this is some way off for the individual.

We believe that being able to make good progress in English and maths is essential to learners in both of these contexts and on a range of learning programmes. To help you enable your learners to progress in these subjects, we have signposted opportunities for English and maths skills practice within this resource. These suggestions are for guidance only. They are not designed to replace your own subject knowledge and expertise in deciding what is most appropriate for your learners.

OPPORTUNITIES FOR WORK EXPERIENCE

The Wolf Report also recommended that learners have the opportunity to apply their skills and extend their learning outside the classroom through work experience, part time jobs, work shadowing and work placements. There are lots of opportunities within these qualifications to take some of the teaching and learning outside of the classroom and into a work environment. We are working to provide you with resources to support you in achieving this, please visit www.ocr.org.uk shortly for more information.

KEY



English



Maths



Work experience

UNIT 7 - FOOD PRODUCTION

Guided learning hours : 60

Credit value: 10

PURPOSE OF THE UNIT

In recent years there has been a massive change in the way our food is grown and an even bigger change in food preparation and storage techniques. Shelf-life, best before dates, organic produce and GM crops are just some of the topics that are at the forefront of news. By completing this unit learners will understand the key factors that affect crop production and how crop yields can be maximised. Learners will understand how crops are treated to ensure freshness, the impact of food miles and different farming methods on the environment. Learners will show how modern scientific techniques could help with the world food problems.

Learning Outcome The learner will:	Assessment Criteria The learner can:	Merit	Distinction
1 Understand the different practices used in commercial farming.	P1 describe different farming practices	M1 identify and explain the advantages and disadvantages of different farming practices	D1 evaluate the commercial benefits of different farming practices
2 Understand the key factors that affect crop production.	P2 explain the key factors that may affect crop growth and crop yield	M2 explain how farming practices can influence crop yields	
3 Know how food gets from the field to the supermarket.	P4 describe the techniques that are used on farm produced products so that they are ready for sale	M3 explain how preservation and ripening methods have changed over time	D2 evaluate how modern technology can improve the shelf-life of fresh food
4 Understand the role of innovative science in addressing food production.	P5 explain how modern scientific practices are used in food production		D3 identify an example of a gm crop and explain the advantages and disadvantages of producing gm plants

P = Pass, M = Merit, D = Distinction

LEARNING OUTCOME 1 – UNDERSTAND DIFFERENT APPROACHES TO COMMERCIAL FARMING

Learning Outcome The learner will:	Assessment Criteria The learner can:	Merit	Distinction
1 Understand the different practices used in commercial farming	P1 describe different farming practices	M1 identify and explain the advantages and disadvantages of different farming practices	D1 evaluate the commercial benefits of different farming practices

Suggested content	Suggested Activities	Suggested timings	Links to Assessment Criteria
Food production introduction	The tutor could introduce the unit to learners using the introductory PowerPoint.	5 minutes	
Farming practices	Learners could carry out research into different farming practices. They could then collate their research in groups in order to present arguments for and against the different farming practices. These arguments could be presented to the whole group as a PowerPoint presentation or the learners could produce individual web pages or blogs on the different practices.	2 hours	P1 describe different farming practices M1 identify and explain the advantages and disadvantages of different farming practices D1 evaluate the commercial benefits of different farming practices
Organic and non-organic produce from farms	Learners could use the lesson element Organic and Non-Organic Produce and do two identical grocery shops, one organic and one non-organic. The tutor should make sure the learners understand the term organic. They could then discuss this in groups or feedback as a whole class. It should be clear to learners that organic produce is more expensive than non-organic produce. Learners should be introduced to the idea that they will investigate commercial farming practices and use this to plan which practices are best for certain farms.	45 minutes	P1 describe different farming practices
How do farmers farm?	Learners could be shown short videos of the different farming practices, intensive, organic, rare breed and hydroponics of which there are many on either BBC class clips or you tube for example: http://www.youtube.com/watch?v=YH4w-xlOxc for hydroponics, http://www.youtube.com/watch?v=lzuNOaEXc_E for rare breeds, http://www.youtube.com/watch?v=tJpxaWR2J-c for intensive farming, http://www.youtube.com/watch?v=F6i4O0g_9GA for organic. Following each clip, the tutor could lead a discussion. Learners could make brief notes on each.	30 minutes	P1 describe different farming practices

Suggested content	Suggested Activities	Suggested timings	Links to Assessment Criteria
Animal welfare 	Learners could watch the video from compassion in world farming (http://ciwf.org.uk/resources/education/resources_for_tutors/default.aspx) to introduce them to the idea of animal welfare. Learners could be given specific roles for a debate such as a farmer with not much land, a consumer, an animal welfare campaigner. Each could have a guide to what that person's interest in animal welfare is to help them stay in role and then the students could have a controlled debate to understand the issues. An idea for structuring the debate can be found at http://www.rspb.org.uk/ourwork/teaching/resources/science/stimulate_debate.aspx . As an alternative the tutor could use the resource at http://www.teachable.net/biology/ks4/energy-and-the-environment/intensive-vs-organic-farming-debate/ which asks learners to write a speech to the local council giving arguments for and against a new farm opening in the town.	45 minutes	P1 Describe different farming practices M1 Identify and explain the advantages and disadvantages of different farming practices
Investigating hydroponics	Learners could carry out a practical centred around hydroponics which can be found here http://www.saps.org.uk/secondary/teaching-resources/847-hydroponics	1 hour	P1 Describe different farming practices
Can organic produce feed the world? 	Learners could be asked to estimate the population of the planet before being given the figure of 7 billion. Learners could be played the mp3 file 'Who is your farmer' from the Royal Geographic Society found here http://www.rgs.org/OurWork/Schools/Teaching+resources/Key+Stage+3+resources/You+are+what+you+eat/Organic+vs+intensive+farming+methods.htm . Learners should understand the reasons why some people like organic produce but that it will not produce enough food for the population of the planet. This could be achieved by using the lesson plan and resources available on the Royal Geographic Society website page listed above or by independent research by the learners.	1 hour	M1 Identify and explain the advantages and disadvantages of different farming practices
The four commercial farming practices 	Learners should conduct independent research using the internet into the four farming practices: organic, intensive, hydroponic and rare breed. The tutor could structure this by providing a list of pre-checked websites and a list of structured questions designed to support all learners and stretch some learners and make sure they are picking up the important points. They could draw a table in which to put advantages and disadvantages of each method alongside a detailed summary of each, giving examples of real farms. To stretch learners they could be asked to include information about the yield of product per acre for each type of farm.	1 hour	P1 Describe different farming practices M1 Identify and explain the advantages and disadvantages of different farming practices

Suggested content	Suggested Activities	Suggested timings	Links to Assessment Criteria
Farming from the farmer's view 	Learners could either visit a working farm or rare breeds park or visit farms virtually on the internet to see a farm in practice. Another way to give learners a first hand experience would be to arrange a video link/web cam interview with a farmer/farmers to whom learners can pose questions. It may also be possible to arrange for a farmer to visit the learners for an interview. In preparation for this learners could write two questions each that they would like to know about farming practices. To stretch learners the tutor could stipulate that some questions must be open questions. These could be collated by the tutor to give the visit/interview some structure. They could compare their research with what the farm is actually like and add any information to the table they produced from their research. To look at organic farms learners could visit http://www.farmtrails.org.uk/ where they can compare different farms by carrying out a virtual farm walk.	1 hour	P1 Describe different farming practices M1 Identify and explain the advantages and disadvantages of different farming practices D1 Evaluate the commercial benefits of different farming practices
Farming for profit 	Learners could be given the task of setting up their own farm. They could be given a starting amount of money and an area of land. They would need a list of costs involved in starting up their own farm such as hydroponic equipment, cattle including rare breeds, polytunnels, tractors and seeds. They could use the information they have been building up throughout the unit to plan which farming method would be best for their financial and space conditions and how they would best use the land to maximise profit for their chosen farming method. As part of the lesson they also justify their reasons for choosing the method. Learners can be stretched by calculating predicted profit for their farm over the course of a year.	1 hour	P1 Describe different farming practices M1 Identify and explain the advantages and disadvantages of different farming practices D1 Evaluate the commercial benefits of different farming practices

LEARNING OUTCOME 2 – UNDERSTAND THE KEY FACTORS THAT AFFECT CROP PRODUCTION.

Learning Outcome The learner will:	Assessment Criteria The learner can:	Merit	Distinction
2 Understand the key factors that affect crop production	P2 explain the key factors that may affect crop growth and crop yield	M2 explain how farming practices can influence crop yields	

Suggested content	Suggested Activities	Suggested timings	Links to Assessment Criteria
Photosynthesis	Although the process of photosynthesis is not covered in the learning outcomes and assessment criteria it would be advisable to spend some time revising the topic to ensure that the learners have a good understanding of the importance of the process in food production. The tutor could use the SAPS website http://www.saps.org.uk/secondary/teaching-resources/134-photosynthesis-a-survival-guide-teaching-resources where there are lots of PowerPoint documents relating to photosynthesis. There is a vast choice and the tutor could use all or some of them. Some of the PowerPoints contain practical instructions for investigating photosynthesis.	1 hour	P2 Explain the key factors that may affect crop growth and crop yield
Limiting factors on plant growth	Learners could plan and conduct a series of investigations into limiting factors on plant growth. Cress seedlings could be used as they grow quickly. To investigate light learners could place one set of seedlings in a dark place and one in a light place and compare the growth. To investigate temperature they would place one in a warm place and one in a dark place. To more accurately see the effect of the limiting factors and to stretch learners they could measure the rate of photosynthesis using either algal balls (http://www.saps.org.uk/secondary/teaching-resources/235-student-sheet-23-photosynthesis-using-algae-wrapped-in-jelly-balls) or elodea (http://www.nuffieldfoundation.org/practical-biology/investigating-factors-affecting-rate-photosynthesis).	1 hour	P2 Explain the key factors that may affect crop growth and crop yield
Investigating fertilisers	Following the investigation into factors that affect plant growth learners could set up radish seedlings in soils with different concentrations of fertilisers in to see how this affects their growth. There are details on how to do this at http://www.saps.org.uk/secondary/teaching-resources/105-investigating-fertilisers-the-effects-of-different-levels-of-minerals-on-plant-growth	30 minutes	P2 Explain the key factors that may affect crop growth and crop yield

Suggested content	Suggested Activities	Suggested timings	Links to Assessment Criteria
Controlling factors to increase yield 	The tutor could show some packaging / images of a mediterranean vegetable such as a pepper or tropical fruit such as a kiwi fruit, and data such as the yield, average daily temperatures, daylight hours and average proportion of sunny days per growing period for the country of origin and the UK. The cost of the item could be discussed and linked to not being able to be grown locally. Learners should discuss why they think it is difficult to grow the item here which could lead onto a re-cap of photosynthesis. The tutor could present learners with a problem solving exercise on how to make the item a viable crop in the UK. They could work in groups and write/draw their ideas onto a large sheet of paper (A3 or flipchart). Learners could then present their ideas to the rest of the group. Their ideas can then be compared to what is already in place for crops such as tomatoes such as polytunnels, artificial lighting and temperature control.	1 hour	P2 Explain the key factors that may affect crop growth and crop yield M2 Explain how farming practices can influence crop yields
Utilising technology to increase crop growth	Learners could be shown the video http://www.bbc.co.uk/learningzone/clips/how-commercial-growers-improve-crop-yield/12902.html which shows how carbon dioxide is utilised to help crop growth. Learners could be given a picture of a crop and they could use their ideas and feedback from the previous task to label it to show they would achieve the maximum yield using technology. They should explain why their chosen techniques will work for example, polytunnels keep the crop warm and cheap, glasshouses, effective at maximising sunlight and heat but more expensive, irrigation systems to provide the correct amount of water without the crop needing to be outdoors or watered by hand.	1 hour	P2 Explain the key factors that may affect crop growth and crop yield M2 Explain how farming practices can influence crop yields
Fertilisers 	Learners could visit the growhow website (http://www.growhow.co.uk/content.output/275/275/Publications/Publications/Educational.Resources.msp) to view the publications on farming and fertilisers or the tutor could provide a print out. Learners could read the information and use it to produce a mind map on farming, fertilisers and food production.	45 minutes	P2 Explain the key factors that may affect crop growth and crop yield M2 Explain how farming practices can influence crop yields

Suggested content	Suggested Activities	Suggested timings	Links to Assessment Criteria
Eutrophication	Learners could be presented with the lesson element, 'Eutrophication' and a series of statements describing how eutrophication occurs. Learners could work in groups or individually to organise the statements into the order they think eutrophication happens. Learners could then represent the stages of eutrophication as a storyboard with captions explaining how this phenomena occurs. Learners could be stretched by finding examples of dead lakes and explaining how they occur.	1 hour	P2 Explain the key factors that may affect crop growth and crop yield M2 Explain how farming practices can influence crop yields
Pesticides	The tutor could show learners some images of the effects of pests on crops and then provide a structured research task on pesticides, herbicides, fungicides and insecticides so that learners can find out what they are, why they are used and how they can be harmful. Once learners know this the tutor could present them with the research article 'Green Pesticide' from the Natural Environment Research Council (http://www.nerc.ac.uk/business/casestudies/pesticide.asp). Learners could create an advertisement for the new pesticide. They could be given a success criteria to ensure they include the correct information. This could include what a pesticide is, how one works, why in terms of world population are the necessary and what environmental and/or financial problems they cause. Learners could be stretched by including the advantages and disadvantages of each.	1 hour	P2 Explain the key factors that may affect crop growth and crop yield M2 Explain how farming practices can influence crop yields
Irrigation	The tutor could use the resource 'Irrigation ideas' (http://www.tryengineering.org/lessons/irrigationideas.pdf) where learners design their own irrigation system to move water from one place to another. Following the activity the learners could discuss why irrigation is needed and link it to crops.	1 hour	M2 Explain how farming practices can influence crop yields
	Learners could be shown the video about 'Drip irrigation' (http://www.sharemylesson.com/ResourceDetail.aspx?storyCode=6059311) which explains why irrigation is needed and gives an introduction to drip irrigation. Learners could then research the different irrigation methods used by farmers and decide which would be best to use in a farmland setting, for example in Senegal. As an alternative the tutor could use the resource 'How to build your own drip irrigation kit' (http://practicalaction.org/media/preview/16123) which shows learners how to build a drip irrigation system which they can then carry out as an activity, explains how it works and which countries it is helping.	1 hour	M2 Explain how farming practices can influence crop yields

Suggested content	Suggested Activities	Suggested timings	Links to Assessment Criteria
The importance of drainage 	Learners could set up an investigation into the effect of water on plants growth using the resource 'Growing Plants in Different Soils' (http://www.scienceprojectideas.co.uk/growing-plants-different-soils.html). They could use bean seedlings and compare the growth. This is an opportunity for learners to revisit what a plant needs to grow and for them to explain why waterlogged plants do not grow well. Learners could work in groups to design ways of improving drainage in soils.	45 minutes	M2 Explain how farming practices can influence crop yields
	The tutor could use the resource 'Floating GardenChallenge' (http://practicalaction.org/floatinggardenchallenge-4) where learners look at the effect of climate change and focusses on flooding and how this affects crop production in Bangladesh. They then complete the challenge to make a floating garden. This resource includes a starter activity, PowerPoint, tutor and student notes and a poster.	1 hour	M2 Explain how farming practices can influence crop yields

LEARNING OUTCOME 3 – KNOW HOW FOOD GETS FROM THE FIELD TO THE SUPERMARKET

Learning Outcome The learner will:	Assessment Criteria The learner can:	Merit	Distinction
3 Know how food gets from the field to the supermarket	P3 describe the techniques that are used on farm produced products so that they are ready for sale	M3 explain how preservation and ripening methods have changed over time	D2 evaluate how modern technology can improve the shelf-life of fresh food

Suggested content	Suggested Activities	Suggested timings	Links to Assessment Criteria
Food from the field to the supermarket	Learners could study specific crops (eg garden peas, tomatoes, strawberries etc.) and find out all of the processes that occur from harvest to the retail outlet to ensure that the crop arrives in optimum condition. This could involve a visit to the supermarket. Learners could produce a photo storyboard showing the different stages involved from when crops are harvested to when they are eventually eaten. This could then be extended to show how preservation methods have changed over time for M3. For D2 learners could include an evaluation of how modern technology can improve the shelf-life of food.	2-3 hours	P3 Describe the techniques that are used on farm produced products so that they are ready for sale M3 Explain how preservation and ripening methods have changed over time D2 Evaluate how modern technology can improve the shelf-life of fresh food
Providing the conditions needed for mold to grow 	Learners could investigate how mold grows on an item. They could use bread or yogurt. They would need eight of the same items. To investigate if air is necessary they should leave one sample unsealed and seal one either using clingfilm or a sealable bag. To investigate if moist conditions are needed they could create moist conditions by laying the item on damp cotton wool and sealing in a polythene bag and leave one sample in dry conditions. To investigate if light or dark is best for mold growth they could put one in a dark place and one in a light place. To investigate if warmth is needed they should place one in the fridge and one in a warm place. This will prove the conditions needed for mold growth. Learners should record their findings in a table and discuss the best way to prevent mold growing on food.	30 minutes	M3 Explain how preservation and ripening methods have changed over time

Suggested content	Suggested Activities	Suggested timings	Links to Assessment Criteria
Seasonal produce	Learners could visit a supermarket and make a note of which fresh produce is grown in the UK. This will vary with the time of year but it should still be able to stimulate a discussion on why everything is not grown in the UK all of the time and needs to be imported.	30 minutes	P3 Describe the techniques that are used on farm produced products so that they are ready for sale
	The tutor could use the resource 'Seasonal foods' (http://education.practicalaction.org/urls/view/499) and have learners work through the suggested activities around food miles. Learners could then watch the short video found at Eat Seasonably (http://eatseasonably.co.uk/what-to-eat-now/fun-with-fruit-and-veg/) which highlights, in a fun way, the issues of eating unseasonable vegetables.	30 minutes	P3 Describe the techniques that are used on farm produced products so that they are ready for sale
Food miles 	The tutor could use the resources found at 'food for a healthy planet' (http://www.climatechoices.org.uk/pages/food3.htm) which allows learners to use a spreadsheet to calculate the food miles of different meals, and another that allows them to choose a meal and calculate the miles it had travelled. To stretch learners they could take their meal choice and research whether a similar or alternative food item is available with less food miles.	45 minutes	P3 Describe the techniques that are used on farm produced products so that they are ready for sale
Energy in farming practices 	The tutor could re-cap food chains to remind the learners that energy is passed on from the plant through the animal to the human. The learners could be given a picture of a farm animal and label everywhere that energy is lost. They could recall and discuss from key stage 3/4 how energy loss can be reduced, so keeping animals inside and restricting movement etc. Learners could be stretched by calculating energy loss.	30 minutes	P3 Describe the techniques that are used on farm produced products so that they are ready for sale
	The tutor could use the 'Intensive farming - Minimising energy loss' PowerPoint (www.worldofteaching.com/powerpoints/biology/Intensive%20farming.ppt) (the PowerPoint opens directly from the search page). Although related to intensive farming it details restrictive movement, reduced waste etc which is useful for helping learners understand the energy in farming practices. 	30 minutes	P3 Describe the techniques that are used on farm produced products so that they are ready for sale

Artificial ripening techniques	Learners could conduct an extended project investigating how ethene affects the ripening of fruit or vegetables using the SAPS resource 'Ethene - a plant growth substance with the key to ripening ... in fruits and vegetables' (http://www.saps.org.uk/students/projects/177-student-biology-extended-project-idea-ethene-a-plant-growth-substance-with-the-key-to-ripening-). While learners are carrying out this experiment they can independently research the effect of ethene on ripening fruit and research why it is used.	1 hour	P3 Describe the techniques that are used on farm produced products so that they are ready for sale M3 Explain how preservation and ripening methods have changed over time
	Learners could be given the problem of transporting bananas or other fruits over long distances. They could work in small groups to suggest how food producers and sellers make sure that the fruit is not overripe and rotten by the time it reaches the supermarket shelf. They could then carry out the research into fruit ripening and then revisit their ideas to see if was correct or needs amendment.	1 hour	D2 Evaluate how modern technology can improve the shelf-life of fresh food
How food gets from the field to the supermarket	Learners could use all of the knowledge they have built up in the unit to describe how food gets from the field to the supermarket. The tutor could give the learners a specific crop, eg, strawberries, and the learners could research using the internet or visit a farm that grows that crop. They could present their information as a flow chart showing the stages between the harvest and going on sale. To ensure learners include all of the required information the tutor could give success criteria linked to the assessment criteria. To stretch learners they could include some research on artificial ripening methods and modern technology on improving shelf life.	1 hour 30 minutes	P3 Describe the techniques that are used on farm produced products so that they are ready for sale M3 Explain how preservation and ripening methods have changed over time
	Learners could use the production of chocolate as an example of how food gets from the field to the supermarket. Learners could use the resource 'Chocolate from Bean to Box' (http://www.chocolateexpert.co.uk/chocolate-from-bean-box.html) to produce a timeline showing how chocolate goes from bean to box.	1 hour	D2 Evaluate how modern technology can improve the shelf-life of fresh food

LEARNING OUTCOME 4 – UNDERSTAND THE IMPORTANCE OF MANAGING EMPLOYEE PERFORMANCE AT WORK

Learning Outcome The learner will:	Assessment Criteria The learner can:	Merit	Distinction
4 Understand the role of innovative science in addressing food production	P4 explain how modern scientific practices are used in food production		D3 identify an example of a GM crop and explain the advantages and disadvantages of producing GM plants

Suggested content	Suggested Activities	Suggested timings	Links to Assessment Criteria
Innovative science in food production	Learners could investigate the impact of modern technology on food production. This should include GM foods and microbiology in food production (e.g. cheese, yoghurt, beer, wine, bread, fermented & non-fermented soya products). Learners carry out some research into an example of a genetically modified food such as tomatoes and assess the advantages and disadvantages of such a product. This could then be used to produce an information leaflet for the general public about the benefit of GM crops.	1-2 hours	P4 Explain how modern scientific practices are used in food production D3 Identify an example of a GM crop and explain the advantages and disadvantages of producing GM plants
Food shortages 	The tutor could use The Economist special report titled 'The 9 billion-people question' which highlights the issues in feeding the world in 2050 (http://www.economist.com/node/18200618). Learners could discuss in small groups what effect the rising population will have and make a prediction as to how agriculture will have to change to keep up with the population growth.	30 minutes	P4 Explain how modern scientific practices are used in food production
The green revolution	Learners could research the 'Green Revolution' and come up with five facts about how it changed world food production. One at a time the learners could contribute their five facts by writing them on the board. Learners would only contribute facts that other learners already have not. The tutor could discuss with the class which facts are the most useful in explaining what the green revolution was and how it changed agriculture in respect of feeding world population, if no learners have identified selective breeding then the tutor could add this. Once the series of facts has been collated on the board learners could use the facts to write a report on the green revolution. As an alternative task the learners could produce a timeline of the green revolution showing the dates and chronological order of when the processes were first used.	45 minutes	P4 Explain how modern scientific practices are used in food production
	The learners could carry out research into the 'Green Revolution', leading to the production of a timeline of the green revolution showing the dates and chronological order of when the processes were first used.	1 hour	P4 Explain how modern scientific practices are used in food production

Suggested content	Suggested Activities	Suggested timings	Links to Assessment Criteria
Selective Breeding	Learners could be given the lesson element 'Selective Breeding' which has picture cards with different pea plants all displaying different qualities such as, resistant to greenfly, resistant to fungus, large peas, fast growth. They could select which two peas they would breed together and justify their choices. The tutor could explain that this is selective breeding and clarify the definition. The tutor could show learners different examples of selectively bred animals and plants such as drought resistant wheat, beef cattle that have lots of meat, dairy cows that produce the most milk, hens that produce large eggs which students then research. Learners could answer the questions within the lesson element on how selective breeding can help feed the world.	1 hour	P4 Describe the techniques that are used on farm produced products so that they are ready for sale
	The tutor could use the RSPCA's lesson plan 'For what it's worth' (http://www.rspca.org.uk/education/teachers/lessonplandetails/-/education/SelectiveBreedingAndGeneticEngineeringForWhatItsWorth/section/aimsObjectives). This contains a very detailed lesson plan and worksheet comparing selective breeding and management farming. This resource involves sorting statements, discussions and links into animal welfare. There are also quizzes that learners could complete.	1 hour	P4 Describe the techniques that are used on farm produced products so that they are ready for sale

Suggested content	Suggested Activities	Suggested timings	Links to Assessment Criteria
 Use of microorganisms in food production	The tutor could split the learners into small groups. Each group could be given a microorganism to research and see how it is used in food production. The microorganisms could be yeast, bacteria and mold. To stretch a particular group of students they could be given single cell proteins to research. They could be given a structured research task which provides questions for them to answer as part of their research. Examples of questions the tutor could use are: What foods is the microorganism used to produce? Is the use of the microorganism a traditional method or a modern method? Does using this microorganism increase food supplies? Does using this microorganism present any health risks? They could present their findings as a PowerPoint or using flip chart paper if ICT is not available and present to the whole group. As each group only researched one microorganism they must make notes as the other groups do their presentations. This could be in the form of a table or a mind map.	1 hour 30 minutes	P4 Describe the techniques that are used on farm produced products so that they are ready for sale
	The tutor could use the PowerPoint 'Uses of yeast and bacteria in food production' (http://www.tes.co.uk/teaching-resource/Uses-of-yeast-and-bacteria-in-food-production-and-6181003/) as an introduction to using microorganisms in food production. Learners could then consolidate their learning by carrying out an investigation into the microorganisms used in food production by making yoghurt or bread using the recipes from 'Microbial recipes' (http://www.microbiologyonline.org.uk/tutors/microbial-recipes).	1 hour	P4 Describe the techniques that are used on farm produced products so that they are ready for sale
	Learners could research how microorganisms have been used since ancient times. The resource 'An ancient hidden partnership' (http://www.tes.co.uk/teaching-resource/An-ancient-hidden-partnership-6265247/) could be used as an introduction. Learners could then develop a blog for other students detailing the uses of microorganisms.	1 hour	P4 Describe the techniques that are used on farm produced products so that they are ready for sale

Suggested content	Suggested Activities	Suggested timings	Links to Assessment Criteria
Genetic engineering 	The tutor could direct learners to the GM section of the Food Standards Agency website (http://www.food.gov.uk/policy-advice/gm/basics/) for research on GM food where they can either read or watch an animated version of how genetic modification occurs, watch a timeline on gene manipulation in potatoes and find out a lot of other useful and balanced views on GM crops. Learners could create a storyboard for a TV advert on how genetic engineering is carried out with pictures and captions. The learners could just keep this purely to the facts without including any advantages or disadvantages.	1 hour – 1 hour 30 minutes	P4 Describe the techniques that are used on farm produced products so that they are ready for sale D3 Identify an example of a GM crop and explain the advantages and disadvantages of producing GM plants
	Learners could be to use the information sheet from 'Food for life partnership' titled 'Information sheet: Genetically modified organisms' (http://www.foodforlife.org.uk/Resources/Teachingresources/Resourceview/tabid/79/ArticleId/273/Information-sheet-Genetically-modified-organisms.aspx). Learners could be split into groups where one group reads the information and highlights the advantages, another group highlights the facts about what genetic engineering is, and a further group highlights the disadvantages. Once they have done this the tutor could put them into further groups made up of one from each research group. The learners could then play the role of the expert in their area and teach the other members of their group what they have found out so all have the knowledge.	1 hour	
	The tutor could use the lesson plan 'Genetically modified foods: from the lab to the dinner table' (http://www.pbs.org/newshour/extra/tutors/lessonplans/science/gmofoods.html) which provides a full programme of activities, including a structured task where learners take on the roles of people involved in the production of GM foods.	1 hour 30 minutes	
Advantages and disadvantages of GM crops	Learners could watch the greenpeace video 'Risks of GE Food' (http://www.greenpeace.org/international/en/campaigns/agriculture/problem/genetic-engineering/food/). Following this learners could work in small groups to discuss the video and they could use their previous knowledge about predicted world food shortages. In their groups the learners could list the advantages and disadvantages of using GM foods.	45 minutes	P4 Describe the techniques that are used on farm produced products so that they are ready for sale D3 Identify an example of a GM crop and explain the advantages and disadvantages of producing GM plants
	The tutor could use the resource 'GM crops' (http://www.citizenshipfoundation.org.uk/main/page.php?200) where learners move around the room to an area that reflects their view on GM food, e.g., one corner could be 'agree with GM crops', another would be 'disagree with GM crops' and a third would be 'undecided'. Learners explain why they have moved to where they are and a discussion is started. Following this learners could use the compass rose detailed in the resource where the different factors affecting GM crops and how they interrelate are researched and discussed. Following this learners could again move to the different areas of the classroom and see if the research has made anyone change their mind.	1 hour	



CONTACT US

Staff at the OCR Customer Contact Centre are available to take your call between 8am and 5.30pm, Monday to Friday.

We're always happy to answer questions and give advice.

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