

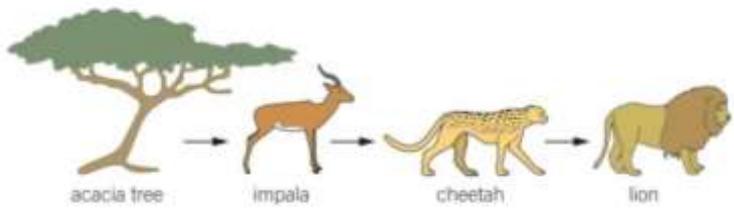
TOPIC 1 – INTERDEPENDENCE AND PLANT REPRODUCTION

Week 1: Food chains and webs

Objectives & Resources	Lesson Notes
<p>Lesson 1 Combining food chains to form a food web</p> <p>Objectives To state what food chains and food webs are.</p> <p>To describe what food chains and food webs show.</p> <p>To combine food chains to form a food web.</p> <p>Resources <i>AQA Activate 1 - 9.1.1 Food chains and webs</i> <i>Worksheet 9.1.1 Activity sheet</i></p>	<p>Starter Try to solve the puzzles on page 181 of your book.</p> <p>Main Lesson</p> <ul style="list-style-type: none"> Think of an order to put the following organisms in. Why have you chosen this order? <div style="text-align: center;">  </div> <ul style="list-style-type: none"> Read page 182 of your book and then explain to your teacher what the words in bold type mean. Use the following words to complete the food chains below: <i>grass seagull acorn lion caterpillar fox periwinkle blackbird</i> <p style="text-align: center;"> <input type="text"/> → zebra → <input type="text"/> cabbage → <input type="text"/> → <input type="text"/> <input type="text"/> → squirrel → <input type="text"/> seaweed → <input type="text"/> → <input type="text"/> </p> <ul style="list-style-type: none"> Read page 183 of your book and complete the tasks on <i>Worksheet 9.1.1 Activity sheet</i>. <p>Plenary Write down as many food chains as you can, using the food web on page 183 of your book.</p> <p>Homework Answer <i>Summary Question 3</i> on page 183 of your book. Construct a food web for an environment near where you live. You could make it a poster, a mobile or a PowerPoint presentation.</p>

Week 1: Disruption to food chains and webs

Objectives & Resources	Lesson Notes
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<p>Lesson 2 How populations can change</p> <p>Objectives To state factors that affect the population of a species.</p> <p>To explain how toxic materials can accumulate in a food web and the effect on different populations.</p> <p>To explain the importance of insect pollinators to food supplies.</p> <p>Resources AQA Activate 1 - 9.1.2 Disruption to food chains and webs Worksheet 9.1.2 Activity sheet Worksheet 9.1.2 Information sheet</p> <p>Extension Write a prediction for the population of gannets for each of the following scenarios:</p> <ol style="list-style-type: none"> 1. A new competitor for the gannet arrives. 2. An oil spill has resulted in a temporary fall in fish stocks in the area. 3. A new colony of fish move into the area. 4. The local farmer starts to use pesticides extensively. <p>Give explanations for your predictions</p>	<p>Starter Look at the food web on page 184 of your book. What would be the effect if the snails were all removed?</p> <p>Main Lesson</p> <ul style="list-style-type: none"> • Read pages 184 and 185 of your book and answer <i>Summary Questions</i> 1 and 2. • Read and work through <i>Worksheet 9.1.2 Activity sheet</i>. • Cut out the cards on <i>Worksheet 9.1.2 Information sheet</i>. The first card in this story is 'Farmer Harold James sprayed his fields with a pesticide in May.' Order the remaining cards to answer the question 'what killed the herons?' <p>Plenary Farmers use pesticides. What features should pesticides have? What features shouldn't they have?</p> <p>Homework Only about 10% of energy is passed along the food chain. The food chain below has four links. 8000 kJ is available from the acacia tree. Calculate the amount of energy the lion received.</p>  <p>The diagram illustrates a linear food chain with four components: an acacia tree, an impala, a cheetah, and a lion. Arrows point from the acacia tree to the impala, from the impala to the cheetah, and from the cheetah to the lion, showing the flow of energy through the chain.</p>
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Week 1: Ecosystems

Objectives & Resources	Lesson Notes
<p>Lesson 3 The place of ecosystems</p> <p>Objectives To state what is meant by ecosystem, community, habitat, environment, and niche.</p> <p>To describe how different organisms co-exist within an ecosystem.</p> <p>Resources <i>AQA Activate 1 - 9.1.3 Ecosystems</i> <i>Worksheet 9.1.3 Practical sheet</i> <i>Equipment - see notes to the teacher</i></p>	<p>Starter Pick a place you are familiar with and tell your teacher a food chain that may occur there.</p> <p>Main Lesson</p> <ul style="list-style-type: none"> • Read pages 186 and 187 in your book and answer <i>Summary Questions 1 and 2.</i> • You are going to measure the abundance of a plant within a field or other local area. Work through <i>Worksheet 9.1.3 Practical sheet</i> with your teacher who will show you how to use quadrats and transect lines. <p>Plenary Give your teacher a definition for each of the following words: ecosystem habitat niche community population environment co-existence.</p> <p>Homework Research an ecosystem of your choice. Produce an image (drawing or print-out) of your ecosystem. Select at least three organisms from the ecosystem and explain how these live together.</p>

NOTES TO THE TEACHER

A number of websites are suggested within the teaching notes and some work would be best completed on computer. If at all possible, try to allow access to the internet and/or a computer for at least some of the lessons.

Answers for the worksheets/activities in the *Term 3 Appendix* are in the *Answers section* of the Appendix.

Week 1

Lesson 1 - Food chains and webs

Starter

The answer to the picture quiz is pollen, and the photo shows magnified pollen grains.

Main lesson

The ideas and terms associated with food chains and webs need to be introduced, either by using the starter, or by an opening introduction. Many of the terms will be familiar from Key Stage 2.

When completing the food web task ask the student to cut out the squares containing both the image and the feeding relationship information. She can then arrange these organisms into a food web on a sheet of A3 paper. The questions in the activity focus on the transfer of energy in food webs. Remind her that energy is not lost or created but transferred.

Lesson 2 - Disruption to food chains and webs

Starter

Encourage the student to first look at the organisms in the same food chain as the snail, and to say what the effect on these would be. Then she should look at the effects on nearby food chains eg if there is more grass available then there may be more caterpillars but as the thrush does not have snails to eat, then it will eat more caterpillars etc.

Main lesson

The student should be confident in her understanding of the words in bold type on pages 184 and 185 of her book before attempting the activity. When completing the information task on herons the student may struggle to order all of the cards at once. Encourage her to place the cards into piles which occur at similar times: start, middle and end. These can then be sorted. It is possible for some cards to be in several positions - allow the student freedom to justify her choice as long as the overall story is correct.

Lesson 3 - Ecosystems

Before the lesson, examine the area near you to identify a good place to study. You need a 30 m stretch of land moving from shade into open light, ideally with dandelions or daisies - or other suitable flowering plants or grasses - clearly visible. A set of data has been supplied if sampling is not possible.

Equipment Required

From the home

4 garden canes, PVC tubing etc.
Sticky tape
String
Scissors

Supplied by WES

Eye protection

Safety: ensure there are no dangerous organisms in the area to be surveyed.

A quadrat is a square frame - usually 1 m² - used to count the density of an organism in an area. You can make one by fixing 4 equal length canes/tubes/sticks etc together to make a square. Ideally the length of each side should be 1 m but you could make a smaller square if that is not possible. See <http://blog.soton.ac.uk/bioblitz/2015/03/25/how-to-make-a-quadrat/> or <http://www.discoverwildlife.com/british-wildlife/your-garden/how-make-measuring-quadrant> for further instructions and ideas.

There are a number of videos on YouTube showing quadrat sampling so if you are unable to carry out the experiments choose a suitable video and then use the sample data provided.

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9.1.1 Activity sheet

Activate
for AQA

Food chains and webs

Setting the scene

Food chains are diagrams that show what an organism eats. They show the flow of energy between organisms. A food web is a set of linked food chains. Food webs show the feeding relationships of organisms more realistically than food chains.

Aims

In this activity you will:

- make your own food web
- answer some questions using your food web.

You will be using **enquiry processes** to:

- **Analyse:** discuss the limitations of food chains compared with food webs.

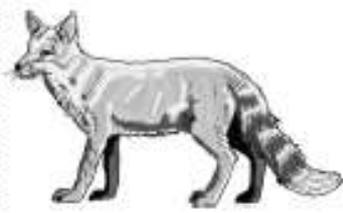
Task

Cut out the cards. Each card contains information about the feeding links. Use the cards to construct a food web. Then answer the questions.

9

9.1.1 Activity sheet

Activate
for AQA

<p>Kestrel</p>  <p>Eats: rabbit, mouse, thrush Eaten by: no natural predators</p>	<p>Grass</p>  <p>Eats: nothing Eaten by: mouse, earthworm, rabbit</p>	<p>Fox</p>  <p>Eats: earthworm, mouse, rabbit Eaten by: no natural predators</p>
<p>Rabbit</p>  <p>Eats: grass Eaten by: kestrel, fox</p>	<p>Earthworm</p>  <p>Eats: mountain ash, grass Eaten by: mouse, fox</p>	<p>Mouse</p>  <p>Eats: earthworm, grass, mountain ash Eaten by: kestrel, fox</p>
<p>Thrush</p>  <p>caterpillar Eaten by: kestrel</p>	<p>Caterpillar</p>  <p>Eats: mountain ash Eaten by: thrush</p>	<p>Mountain ash</p>  <p>Eats: nothing Eaten by: caterpillar, earthworm, thrush, mouse</p>

9

9.1.1 Activity sheet

Activate
for AQA

Questions

1 State what is meant by a producer.

2 From the food web you have made, name a producer.

3 Name the type of organism that feeds on producers.

4 From the food web you have made, write out a food chain with four organisms.

5 From this chain, name the carnivore that is also the top predator.

6 Describe the similarities and differences between food chains and food webs. Use the definitions of food chains and food webs, as well as examples from the food web you have constructed, to support your answer.

Extension

1 Suggest why food webs are more useful to biologists than food chains.

9

9.1.1 Activity sheet

Activate
for AQA

- 2 Explain how energy is transferred between organisms and to the surroundings as you move along the food chain.

- 3 Approximately 10 % of the energy contained in an organism is transferred from one level of the food chain to the next. If 7 kJ of energy are transferred to the lion, estimate the energy available in grass for the following food chain:

grass → impala → leopard → lion

Show your working.
