

Biology > Big idea BOE: Organisms and their environments > Topic BOE1: Interdependence of organisms

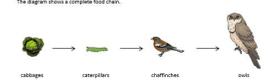
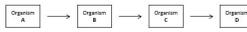
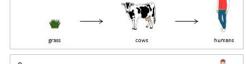
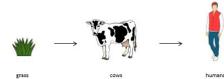
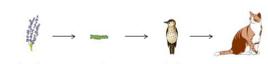
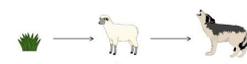
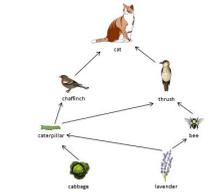
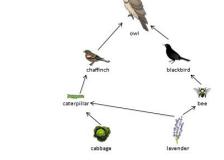
**Progression toolkit: Food chains and food webs**

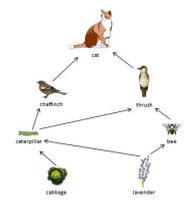
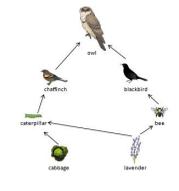
<b>Learning focus</b>	Feeding relationships within a community of organisms can be modelled using food chain and food web diagrams.				
<b>As students' conceptual understanding progresses they can:</b>					
<b>As students' conceptual understanding progresses they can:</b>	<p>Explain the order of organisms in a given food chain, using ideas about producers, consumers, predators and prey.</p> <p><b>P</b></p>	<p>Explain that the arrows in a food chain diagram represent transfers of biomass from producer to consumer, or from prey to predator.</p>	<p>Recognise that the words and pictures in a food chain diagram represent populations of organisms in a community.</p>	<p>Recognise that food web diagrams represent several interconnected food chains within a community of organisms.</p>	<p>Use a food web diagram to predict and explain effects that a change in the size of a population could have on other populations in the same community.</p>
<b>Diagnostic questions</b>	Food chain (1)	Links in the chain	How many organisms?	Food web	Through the food web
<b>Diagnostic questions</b>	Food chain (2)				
<b>Diagnostic questions</b>	Bottom of the food chain	What do the arrows mean?	Populations and communities		
<b>Response activities</b>	Build a food chain			Food web discussion	Food web role play
<b>Response activities</b>	Breakfast food chains			Food web art!	

Key:

**P** Prior understanding from earlier stages of learning

**B** Bridge to later stages of learning

<p><b>Food chain (1)</b></p> <p><b>BEST</b> STUDENT WORKSHEET</p> <p><b>Food chain (1)</b></p> <p>The diagram shows a complete food chain.</p>  <p>1. Read the statements about cabbages.</p> <p>How do you feel about each statement?</p> <table border="1"> <thead> <tr> <th>Statement</th> <th>I am sure this is right</th> <th>I think this is right</th> <th>I think this is wrong</th> <th>I am sure this is wrong</th> </tr> </thead> <tbody> <tr> <td>1. Cabbages are at the start of the food chain.</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2. Cabbages are producers.</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3. Cabbages are consumers.</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4. Cabbages are herbivores.</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p><small>Developed by the University of York Science Education Group and the Salters' Institute. This document may have been edited. Download the original from <a href="http://www.BestEvidenceScienceTeaching.org">www.BestEvidenceScienceTeaching.org</a>. © University of York Science Education Group. Distributed under a Creative Commons Attribution-NonCommercial (CC BY-NC) license.</small></p>	Statement	I am sure this is right	I think this is right	I think this is wrong	I am sure this is wrong	1. Cabbages are at the start of the food chain.					2. Cabbages are producers.					3. Cabbages are consumers.					4. Cabbages are herbivores.					<p><b>Food chain (2)</b></p> <p><b>BEST</b> STUDENT WORKSHEET</p> <p><b>Food chain (2)</b></p> <p>The diagram shows a complete food chain.</p>  <p>1. Read the statements about organism A.</p> <p>How do you feel about each statement?</p> <table border="1"> <thead> <tr> <th>Statement</th> <th>I am sure this is right</th> <th>I think this is right</th> <th>I think this is wrong</th> <th>I am sure this is wrong</th> </tr> </thead> <tbody> <tr> <td>1. 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Organism A is a consumer.					4. Organism A is a herbivore.					<p><b>Bottom of the food chain</b></p> <p><b>BEST</b> STUDENT WORKSHEET</p> <p><b>Bottom of the food chain</b></p> <p>The diagram shows a complete food chain.</p>  <p>Which statement best explains why the grass is at the start of the food chain?</p> <p>A It is there to feed the rabbits. B It is a producer. C It is the smallest. D It cannot defend itself from being eaten.</p> <p><small>Developed by the University of York Science Education Group and the Salters' Institute. This document may have been edited. Download the original from <a href="http://www.BestEvidenceScienceTeaching.org">www.BestEvidenceScienceTeaching.org</a>. © University of York Science Education Group. Distributed under a Creative Commons Attribution-NonCommercial (CC BY-NC) license.</small></p>	<p><b>Links in the chain</b></p> <p><b>BEST</b> STUDENT WORKSHEET</p> <p><b>Links in the chain</b></p> <p>Which food chain correctly shows the information?</p> <p>A </p> <p>B </p> <p>C </p> <p>D </p> <p><small>Developed by the University of York Science Education Group and the Salters' Institute. This document may have been edited. Download the original from <a href="http://www.BestEvidenceScienceTeaching.org">www.BestEvidenceScienceTeaching.org</a>. © University of York Science Education Group. Distributed under a Creative Commons Attribution-NonCommercial (CC BY-NC) license.</small></p>	<p><b>What do the arrows mean?</b></p> <p><b>BEST</b> STUDENT WORKSHEET</p> <p><b>What do the arrows mean?</b></p> <p>The diagram shows a complete food chain.</p>  <p>Which statement best explains what is shown by the arrows in the food chain?</p> <p>A The arrows show what eats what. B The arrows mean "eat". C The arrows mean "is eaten by". D The arrows show how biomass moves through the food chain.</p> <p><small>Developed by the University of York Science Education Group and the Salters' Institute. This document may have been edited. Download the original from <a href="http://www.BestEvidenceScienceTeaching.org">www.BestEvidenceScienceTeaching.org</a>. © University of York Science Education Group. Distributed under a Creative Commons Attribution-NonCommercial (CC BY-NC) license.</small></p>
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<p><b>How many organisms?</b></p> <p><b>BEST</b> STUDENT WORKSHEET</p> <p><b>How many organisms?</b></p> <p>Lucy made this food chain diagram.</p>  <p>1. How many caterpillars are there in Lucy's garden?</p> <p>A One B At least one C We cannot tell from the diagram.</p> <p>2. What is the best explanation for your answer to question 1?</p> <p>A Each stage in the food chain diagram is a population. B Each stage in the food chain diagram is an individual organism. C The diagram shows one caterpillar. D Lucy might not have counted all of the caterpillars.</p> <p><small>Developed by the University of York Science Education Group and the Salters' Institute. This document may have been edited. Download the original from <a href="http://www.BestEvidenceScienceTeaching.org">www.BestEvidenceScienceTeaching.org</a>. © University of York Science Education Group. Distributed under a Creative Commons Attribution-NonCommercial (CC BY-NC) license.</small></p>	<p><b>Populations and communities</b></p> <p><b>BEST</b> STUDENT WORKSHEET</p> <p><b>Populations and communities</b></p> <p>The diagram shows a complete food chain.</p>  <p>Part 1</p> <p>1. How many populations are shown in the diagram?</p> <p>A None B One C Two D Three</p> <p>Part 2</p> <p>2. How would you explain your answer to question 1?</p> <p>A Only humans can form a population. B All of the organisms in the food chain make up a population. C Only animals can form a population. D Each stage in the food chain is a population.</p> <p><small>Developed by the University of York Science Education Group and the Salters' Institute. This document may have been edited. Download the original from <a href="http://www.BestEvidenceScienceTeaching.org">www.BestEvidenceScienceTeaching.org</a>. © University of York Science Education Group. Distributed under a Creative Commons Attribution-NonCommercial (CC BY-NC) license.</small></p>	<p><b>Food web</b></p> <p><b>BEST</b> STUDENT WORKSHEET</p> <p><b>Food web</b></p> <p>Lucy made this food web diagram.</p>  <p>The food web diagram shows feeding relationships in Lucy's garden. How many food chains are shown in Lucy's food web diagram?</p> <p>A None B One C Two D Three</p> <p>E Four F Five G Six or more</p> <p><small>Developed by the University of York Science Education Group and the Salters' Institute. This document may have been edited. Download the original from <a href="http://www.BestEvidenceScienceTeaching.org">www.BestEvidenceScienceTeaching.org</a>. © University of York Science Education Group. Distributed under a Creative Commons Attribution-NonCommercial (CC BY-NC) license.</small></p>	<p><b>Through the food web</b></p> <p><b>BEST</b> STUDENT WORKSHEET</p> <p><b>Through the food web</b></p> <p>Look at the food web diagram.</p>  <p>1. Imagine all the lavender died.</p> <p>Some children have suggested possible effects of the lavender dying out.</p> <p>How do you feel about each suggestion?</p> <table border="1"> <thead> <tr> <th>Suggestion</th> <th>I am sure this is right</th> <th>I think this is right</th> <th>I think this is wrong</th> <th>I am sure this is wrong</th> </tr> </thead> <tbody> <tr> <td>1. The number of bees could decrease.</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2. The number of blackbirds could decrease.</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3. The number of cabbages could decrease.</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4. The number of caterpillars could increase.</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p><small>Developed by the University of York Science Education Group and the Salters' Institute. This document may have been edited. Download the original from <a href="http://www.BestEvidenceScienceTeaching.org">www.BestEvidenceScienceTeaching.org</a>. © University of York Science Education Group. Distributed under a Creative Commons Attribution-NonCommercial (CC BY-NC) license.</small></p>	Suggestion	I am sure this is right	I think this is right	I think this is wrong	I am sure this is wrong	1. The number of bees could decrease.					2. The number of blackbirds could decrease.					3. The number of cabbages could decrease.					4. The number of caterpillars could increase.																														
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<p><b>BEST</b> STUDENT WORKSHEET</p> <p><b>Build a food chain</b></p>  <p><b>To talk about in your group:</b></p> <ol style="list-style-type: none"> <li>How would you arrange the organism cards and the arrow cards to make a food chain?</li> <li>Can you explain why you arranged them in that order?</li> <li>Which organisms would you label as producers and which as consumers?</li> <li>Which organisms would you label as prey and which as predators?</li> <li>Can you explain why you labelled them that way?</li> </ol> <p><small>Developed by the University of York Science Education Group and the Salters' Institute. This document may have been edited. Download the original from <a href="http://www.BestEvidenceScienceTeaching.org">www.BestEvidenceScienceTeaching.org</a>. © University of York Science Education Group. Distributed under a Creative Commons Attribution-NonCommercial (CC BY-NC) license.</small></p>	<p><b>BEST</b> STUDENT WORKSHEET</p> <p><b>Breakfast food chains</b></p>  <p>Think about your breakfast this morning.</p> <p><b>To answer:</b></p> <ol style="list-style-type: none"> <li>What did you eat for breakfast? (Cereal, milk, yogurt, fruit, bread, egg, bacon, sausage... something else?)</li> <li>What are the things you ate made from?</li> <li>Do the things you ate come from plants or animals?</li> <li>If you ate food made from animals, what did those animals eat?</li> </ol> <p><b>To do:</b></p> <ol style="list-style-type: none"> <li>Write, draw or build models of all the food chains involved in your breakfast.</li> </ol> <p><small>Developed by the University of York Science Education Group and the Salters' Institute. This document may have been edited. Download the original from <a href="http://www.BestEvidenceScienceTeaching.org">www.BestEvidenceScienceTeaching.org</a>. © University of York Science Education Group. Distributed under a Creative Commons Attribution-NonCommercial (CC BY-NC) license.</small></p>	<p><b>BEST</b> STUDENT WORKSHEET</p> <p><b>Food web discussion</b></p> <p>Lucy made this food web diagram.</p>  <p>The food web diagram shows feeding relationships in Lucy's garden.</p> <p><b>To talk about in your group:</b></p> <ol style="list-style-type: none"> <li>How many food chains are shown in the food web diagram?</li> <li>How many producers are there in the food web?</li> <li>How many consumers are there in the food web?</li> <li>Which organisms are eaten by more than one thing?</li> <li>Which organisms are in competition for the same food?</li> <li>Lucy eats cabbage from her garden. How would you add this information to the food web?</li> </ol> <p><small>Developed by the University of York Science Education Group and the Salters' Institute. This document may have been edited. Download the original from <a href="http://www.BestEvidenceScienceTeaching.org">www.BestEvidenceScienceTeaching.org</a>. © University of York Science Education Group. Distributed under a Creative Commons Attribution-NonCommercial (CC BY-NC) license.</small></p>	<p><b>BEST</b> STUDENT WORKSHEET</p> <p><b>Food web art!</b></p>  <p><b>To do:</b></p> <ol style="list-style-type: none"> <li>Visit a local ecosystem. This might be the school grounds, a garden at home, or somewhere else nearby.</li> <li>Draw or paint several of the organisms that live in the ecosystem.</li> <li>In your picture, show the feeding relationships between the organisms you have drawn.</li> </ol> <p><small>Developed by the University of York Science Education Group and the Salters' Institute. This document may have been edited. Download the original from <a href="http://www.BestEvidenceScienceTeaching.org">www.BestEvidenceScienceTeaching.org</a>. © University of York Science Education Group. Distributed under a Creative Commons Attribution-NonCommercial (CC BY-NC) license.</small></p>	<p><b>BEST</b> STUDENT WORKSHEET</p> <p><b>Food web role play</b></p>  <p>The diagram shows a food web. You are going to role play as an organism in the food web.</p> <p><b>To do:</b></p> <ol style="list-style-type: none"> <li>Take an organism label and attached it to yourself. This identifies you to the other organisms in the food web. Some may need to sit out! Others may be eaten by you.</li> <li>If you're a consumer, it's time to feed! Pick up a string 'arrow', and hold the arrowhead in your left hand. Go up and find your food. When you have found an organism you can eat, grab them the other end of the string arrow to hold in their right hand.</li> <li>When the feeding frenzy is over, walk away from your food to put the arrow right. The food web is formed!</li> <li>Your teacher will now describe a change to one of the populations in the food web. What effects will the change have on you, and the rest of the community?</li> </ol> <p><small>Developed by the University of York Science Education Group and the Salters' Institute. This document may have been edited. Download the original from <a href="http://www.BestEvidenceScienceTeaching.org">www.BestEvidenceScienceTeaching.org</a>. © University of York Science Education Group. Distributed under a Creative Commons Attribution-NonCommercial (CC BY-NC) license.</small></p>
Modelling, discussion	Independent research	Discussion	Drawing	Role play