Science Program — Key Stage 2

Set 2. Life Sciences: *Food Webs*

Notes to Teacher

Students have now had experience with energy flow through an ecosystem as depicted by food chains. In this section they will learn that food chains are a simplified method of explaining this process. In nature, energy flow is more accurately shown as a food web. Students review the concept of interdependence, something they have probably encountered while studying different environments previously.

In order to knowledgeably talk about how plants and animals are dependent upon one another, students are introduced to the vocabulary associated with feeding relationships. A graphic organizer is used to aid them in their understanding.

Key Words:

These words are introduced to the student in the context of this section. Students should be encouraged to add these words to their "Personal Word Glossary", their journals, and to the word wall.

Producer – green plants.

Consumer – an animal that eats plants or other animals.

Although students are not introduced to these finer distinctions in early years, there are several levels of consumers. Accepted terminology includes, "primary", "secondary", and "tertiary" consumers, depending on where in the food chain these animals lie.

Herbivores – animals that eat plants only.

Herbivores are also referred to as plant-eaters. Herbivores are primary consumers because they are the first level

Carnivores – animals that eat other animals only.

Carnivores can be secondary or tertiary consumers, depending on which other animals they eat. Carnivores that eat primary consumers, logically, are called secondary consumers. Those that eat secondary consumers are called tertiary.

Omnivores – animals that eat both plants and animals.

Decomposers – organisms that feed on the remains or waste products of plants and animals.

Food chain – a model to show how energy moves from plants to animals in the environment.

Food web – a model that shows how food chains are connected and overlap in the environment.

Interdependence – when things (meaning here plants and animals) depend on one another for survival.

Competition – when living things in an ecosystem are trying to use the same things (like food or shelter).

Competition exists in any food web as animals struggle for limited resources, often resources that other animals also need.

Ecosystem – all the living and non living parts of an environment.

Background Information

Vocabulary in this section seems logical. However, students may not have experience with the standard definitions of words like "producer" and "consumer". The scientific usage of these words is not that different. "Producers" produce and "consumers" consume. Care should be used to ensure that students understand what these words mean. The important concept of energy flow through an ecosystem will be easier to understand if students grasp the differing roles of the organisms.

Diagrams can be helpful for students as they take the food chains they learned about in the previous section and see how they overlap and integrate to form a food web. The interdependence of the organisms within a food web should be stressed. In this way, students will understand that a disruption to the system, for example, if one animal is eliminated, can cause major consequences.

They will have experience with this idea in their investigation. In nature, systems are constantly adjusting (or trying to adjust). It is natural to attempt to maintain equilibrium. In biology this is called homeostasis and translates to meaning "steady state". This is a basic principle that students will see again and again in their science studies.

Learning Strategies and Scaffolding

Throughout the section students are reminded of their earlier studies, predominantly, when they studied various environments. All environments have feeding relationships amongst the organisms. They all begin with producers and have various levels of consumers within their food webs. Energy flows through all ecosystems.

During the investigation, students will have several opportunities to analyse how changes in the ecosystem (and the flow of energy through it) affect other parts of the food web. They are asked to predict what might happen.

Prediction is a skill that is a precursor to formulating testable questions and hypotheses in future years. Students should be given opportunities to make predictions, justify them, and draw some conclusions between their predictions and the actual cause and effect relationships. Students could be asked to make their predictions individually and complete the table in the Investigation section of the text. They should be given an opportunity to discuss their ideas with their classmates in either a large group or a small group setting. Alternatively, students may discuss the predictions and form a consensus within their group. Their predictions will be verified during the activity portion of the investigation.

Activity – in this activity students will be out of their seats and simulating a food web. Depending on the class, this could be done with the entire class at one time or half the class participating and the other half observing the action.

Using the food web diagram in the investigation, have students explain how the various organisms are related to one another. They will have already done this analysis while completing their Table of Predictions.

Students will play the role of the various organisms. Their interdependence will be demonstrated by connecting the student "organisms" with long pieces of string or yarn.

For example, a student will play the role of "seeds", another "chipmunk", another "bear", a fourth "hawk". A string will go from the seeds to the chipmunk, another string from the chipmunk to the bear, a third string from the chipmunk to the hawk. Thus, the chipmunk will be holding three strings.

In the scenario, there is a drought (for example). The plants die before they can produce seeds. The chipmunk has nothing to eat. The "seeds" drops the string because there is no longer a connection between them. The "chipmunk" must then drop all its strings because if it cannot survive without the seeds, there will be no energy flow from it to the hawk or the bear. The "hawk" and the "bear" must drop their strings as well.

What happens? The "hawk" needs to hold tighter to (in nature, that would be eat more) the string of pheasants or weasels. The "bear" would be hunting more weasels as well. Suddenly, weasels become more important to the other carnivores. There is greater competition for the resources.

After a round of scenarios and dropping strings, students can re-evaluate their predictions about what might happen in the ecosystem given various situations. Students should be encouraged to discuss their findings. Repeat the activity, record the results, and compare findings to justify predictions and reach conclusions.

For this activity you will need the following materials:

Long pieces of yarn or string that will connect the students.
Index cards or some other designators for the roles that students will play.

Grasses	Seeds	Berries
Insect	Deer	Bear
Pheasant	Chipmunk	Weasel
Hawk	Decomposers (which will be connected to everyone)	

The simplest form of this activity would be to have one of each organism and give simple directions such as "what if all the pheasants left the area?"

To move this to a higher level of thinking for the students, more complex scenarios could be invented for them to analyse before the strings were dropped. For example:

1. What if the virus that is causing bird flu attacked the pheasant population? (If there were fewer pheasants there would be more insects, seeds, and berries available for the other animals.)

2. What if some mice moved into this area? Mice eat the same kinds of things as chipmunks do.
(There may be a shortage of seeds, or the weaker of the mice and chipmunks would probably go hungry while the stronger ones won out and got the food.)

3. Hawks and some owls eat the same kinds of things. But hawks are out hunting in the daytime and many owls hunt at night. How would that affect this food web?
(It would depend on the other animals. Chipmunks, for example, don't really come out at night. The owls would probably go to some other ecosystem where there would be something for them to eat at night.)

4. Many people hunt deer. Sometimes the deer population gets out of control and the hunting season is made longer. What would happen to this food web if there were fewer deer because of that?
(If there were fewer deer the bears would have to concentrate on eating more chipmunks and weasels.)

5. What if there were a fire at the end of the summer and the trees and grasses were all burned? What would that mean for this food web?
(Many of the smaller animals, the herbivores, would have trouble finding food.)

6. What if there were a snowstorm and the snow stayed on the ground for a month?
(There would be no berries or flowers in the winter, the chipmunks already stored their seeds for the winter, the bear would probably be hibernating so this food chain might look different in winter.)

Don't forget to remind students that the decomposers would have more or less dead plants and animals depending on these various scenarios.

Another extension could include students writing their own scenarios by introducing other organisms, natural disasters, or humans to come and upset the balance. This is a perfect opportunity for students to make inferences about what might happen based on their growing knowledge of ecosystems. The students could act these out or simply write their predictions. Were their inferences accurate? Were their predictions justified? Also, there could be several animals of the same species. Three hawks circling the area would complicate matters! Students would have to deal with the competition. That would be an interesting lesson for them.

Science Program — Key Stage 2

Set 2. Life Sciences: *Food Webs*

The Story

One of the really interesting things about science is that you can learn things at all different levels. That includes things that are really simple to really complicated. For example, you have learned about food chains so you know that animals depend on plants. Animals also depend on one another. Think about an example of a food chain: a mouse eats little seeds to get the energy it needs. A hawk swoops down and grabs (and eats!) the mouse to get the energy it needs. Now that is a simple "feeding relationship". The hawk is dependent (it depends on) the mouse that is dependent on the plant for its seeds.

Here is the interesting part, the "different levels" part. If you look more closely, and you have to, you see it gets complicated. In nature, this is more like what happens:

A deer is eating the bushes so the flowers don't even get to make the seeds for the mouse and even if it did, the birds are right there trying to eat them first. When the mouse wasn't looking a rabbit moved in and took over the place where the mouse was living so it was stuck out in the open field. A hawk could easily see it, standing out there in the field. So as the hawk was zooming down to try to grab it, an owl came out of the woods and got there first. At least with the mouse out of the way that left more seeds for the bird. That is unless the deer brought another deer to eat seeds with it.

Confused? That's great because this is really fun to sort out!

Focus Question

Food chains can get complicated. Explain why.

Because lots of different animals are in food chains so they get all mixed up.

Answer

Set 2. Life Sciences: *Food Webs*

Key Words:

Producer — green plants

Consumer — an animal that eats plants or other animals

Herbivores — animals that eat plants only

Carnivores — animals that eat other animals only

Omnivores — animals that eat both plants and animals

Decomposers — organisms that feed on the remains or waste products of plants and animals

Food chain — a model to show how energy moves from plants to animals in the environment

Food web — a model that shows how food chains are connected and overlap in the environment

Interdependence — when things (meaning here plants and animals) depend on one another for survival

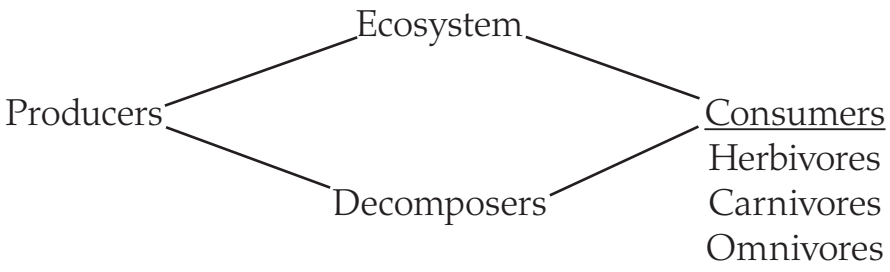
Competition — when living things in an ecosystem are trying to use the same things (like food or shelter)

Ecosystem – all the living and non living parts of an environment

Getting the Words (and the Concepts) Straight

"Oh man! That's a LOT of words to learn!"

Here's a picture of how these words go together (it's something like the sorting out of the Plant Kingdom we did before).



Set 2. Life Sciences: *Food Webs*

In every ecosystem there are:

Producers — they are the plants (never the animals!). They "produce" the matter (that's all the plant parts like leaves, stems, roots, fruits) which can be digested into materials that give energy to the consumers that eat the plants.

"You know, the stuff you find in the "fruit and vegetable" section of the supermarket."

Consumers —they are the animals (never the plants!). They "consume" (or use) the plants or other animals to digest into materials that give them energy to grow and do everyday things to live.

The consumer group can be divided into smaller groups to make it easier for us to talk about them and know what they eat.

Herbivores — Animals that eat "herbs". When scientists who study plants (called "botanists") talk about plants they say "herbs". Herbivores only eat plants or plant parts. There are lots of examples of herbivores. Some are squirrels, cows, sheep, and impalas and gazelles in Africa.

Carnivores — Animals that eat meat only. So these animals eat herbivores or, if they are ferocious (meaning here really savage) they eat other carnivores. Some examples of carnivores are sharks, lions, all snakes, and hawks.

Remember an animal doesn't have to be big to be ferocious! Spiders look pretty ferocious to small insects!

"These animals don't bother with their vegetables."

Set 2. Life Sciences: *Food Webs*

Omnivores — (that's probably you) Animals that eat both plants and meat. Some examples of omnivores are raccoons, skunks, and bears.

It might be easier to keep these straight if you know where the words came from:

Herbivore	is from the Latin words "herba", which means "grass" and "vovare" which means "to swallow". So "herbivorus" (say "her- biveress") means an animal that "swallows grass"
Carnivore	is from the Latin words "carn", which means "flesh" and "vovare". So "carnivorus" (say "car –niveress") means an animal that eats meat (or flesh). This is the same place the Spanish word for "meat" comes from.
Omnivore	is from the Latin word "omni", which means "all" and "vovare". So "omnivorus" (say "om-niveress") means an animal that eats everything. Remember this "omni" prefix because you will see this a lot in your studies.

Sometimes all these different consumers are trying to eat the same things. For example, hawks and owls might be fighting over the same mouse. Or otters and ducks might want the same fish. Sometimes plants are trying to grow in the same place.

When plants or animals are trying to use the same things to stay alive we call it competition.

Finally, we have a very important group of little organisms called decomposers.

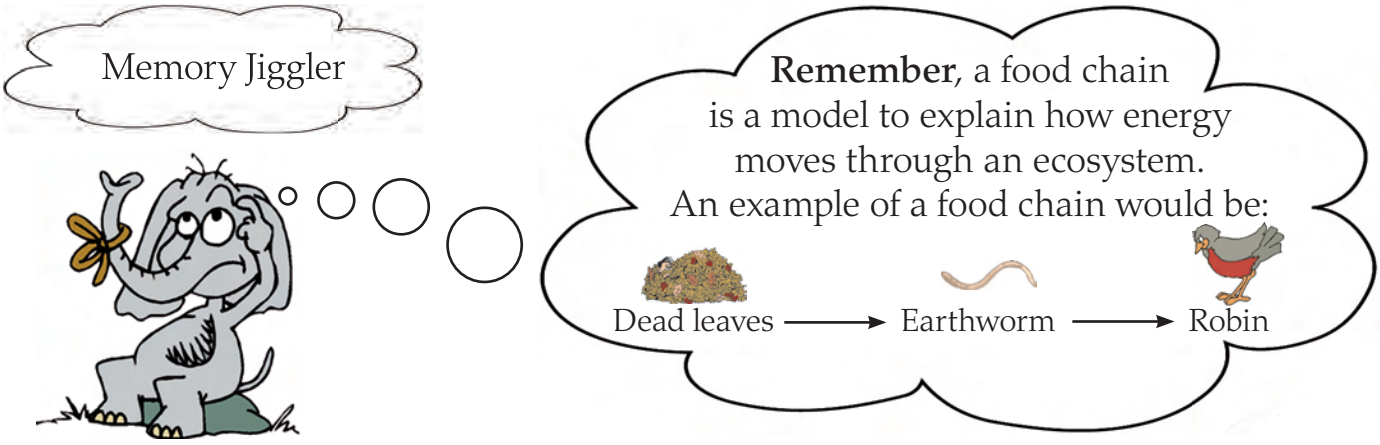
Decomposers feed on all the dead stuff that is left over. They break down dead animals and animal wastes into nutrients (those are the substances needed to live and grow). Those nutrients sink into the soil and are sucked up by plant roots to be used by the plants.

Set 2. Life Sciences: *Food Webs*

"I know you see what is happening here… if the plants are sucking up the nutrients from the soil to help them live and grow, then the herbivores are getting those nutrients when they eat the plants, and the carnivores are getting the nutrients next and on it goes… nature!"

Food Webs

Producers and consumers, that includes herbivores, carnivores, omnivores, and decomposers, are all related to one another in food chains and food webs.



A food web is a way to show how food chains interconnect and overlap in the environment. Food webs are a good way to show that plants and animals are interdependent.

Here that means that lots of different plants and animals are depending on one another for things (including energy to live!). It is more than, in our example, just the robin depending on the earthworm depending on the leaves.

Focus Question

Explain how producers are related to consumers

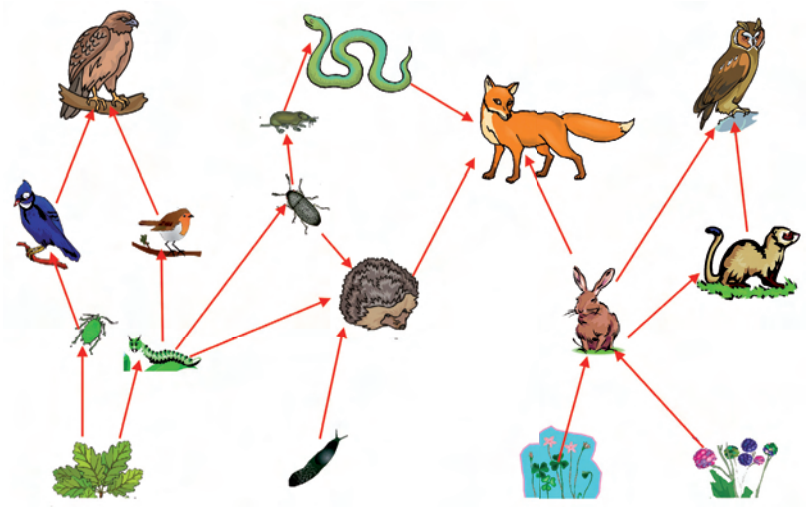
Producers are the plants. They are the food for the consumers.

Answer

Set 2. Life Sciences: *Food Webs*

"Here's a hint: keep this idea of interdependence in your head. We are going to see this coming up again soon and you are going to see this coming up all over the place in all the rest of science you study."

If we look at some examples of food webs you will definitely get the idea.



If you take a close look at this food web you will see the interdependence of the plants and animals. For example,

Caterpillar - the caterpillar is getting its energy from the oak leaves, but the robin, the beetle, and the hedgehog are all using caterpillars for their energy sources.

Hawk - the hawk is looking for robins and other small birds to give it energy.

Fox – the hedgehog gets its energy from slug, caterpillars and beetles. The fox can get its energy from the hedgehog.

Focus Question

Looking at this food web, predict what would happen to the beetle population if the snakes ate all the shrews.

The beetle population would increase because there would be no shrews to eat them. That is, unless the hedgehogs noticed that there were lots more yummy beetles around. They might stop eating so many slugs and eat more beetles. That's what we mean by interdependence.

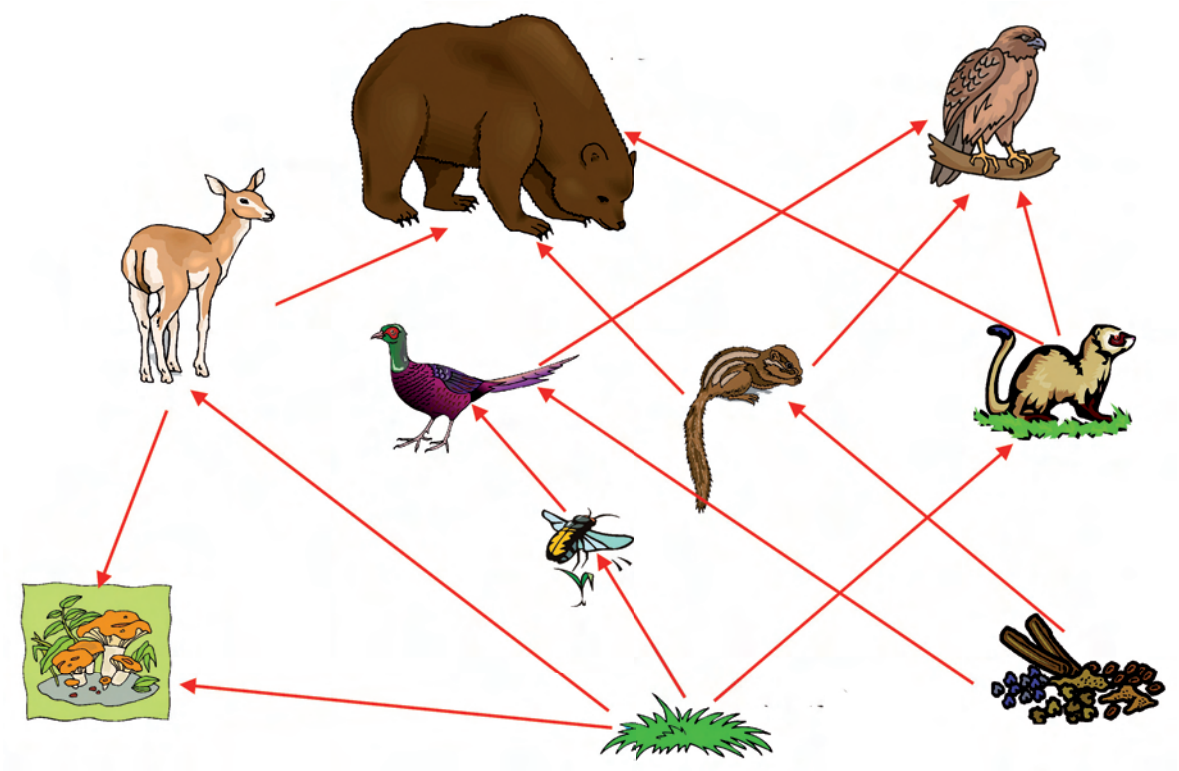
Answer

Set 2. Life Sciences: *Food Webs*

Investigation — Competition

You have already studied many different environments in other years. There are food chains and food webs in all environments. Let's think about an environment that is in the more northern climates where tall trees don't usually grow. It will include the following organisms:

Grasses	Seeds	Berries
Insects	Deer	Bears
Pheasants	Chipmunks	Weasels
Hawks		Decomposers



You know that if something happens in one part of the food web, it will affect other parts (that is, other plants and animals). The table on the next page gives some examples of changes that might happen in the ecosystem. Predict what effects these changes would have on the existing populations.

Set 2. Life Sciences: *Food Webs*

"Remember 'increase' means to make bigger and 'decrease' means to make smaller."

Changes in the Ecosystem
Table of Predictions

Change made:	Number of insects	Number of seeds	Number of hawks
Decrease the number of chipmunks			
Increase the number of bears			
Decrease the number of pheasants			

Activity

In this activity you will be playing the role of different plants or animals in the ecosystem.

Your teacher will assign your role and will explain changes in the numbers of various populations.

You should observe what happens based on these changes. Were your predictions correct?

Complete the table on the next page based on your observations. It is the same table as the one you used for your predictions. Compare your observations with your predictions.

Set 2. Life Sciences: *Food Webs*

"Remember 'increase' means to make bigger and 'decrease' means to make smaller."

Changes in the Ecosystem
Table of Observations

Change made:	Number of insects	Number of seeds	Number of hawks
Decrease the number of chipmunks			
Increase the number of bears			
Decrease the number of pheasants			

Answer the following questions based on the two tables.

1. How did your predictions compare to your observations? Explain your answer.

_____

_____

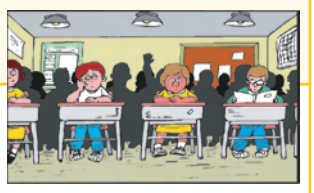
2. Based on what you know about food webs and on your observations, choose another change in the ecosystem and predict what would happen. Give a reason for your answer.

_____

_____

Set 2. Life Sciences: *Food Webs*

Test Practice Questions



1. Compare a food chain and a food web?
   A. a food chain only has two organisms interacting
   B. a food web only explains how spiders fit into the ecosystem
   C. a food web is made up of many food chains
   D. a food chain is made up of many food webs

   Answer: _____

2. A group of "consumers" would include
   A. squirrels, chipmunks, and nuts
   B. herbivores, carnivores, and flowering plants
   C. herbivores, carnivores, and bears
   D. anything that makes its own food from the Sun's energy

   Answer: _____

3. Ecologists (scientists who study ecosystems) are worried that too many cod are being fished from the ocean. Using the food web below, predict what would happen to the other organisms if the numbers of cod were decreased.

   A. the herring population would increase
   B. the sea gull population would decrease
   C. the plankton would begin to eat the herring
   D. the sea eels would eat more sea gulls

   Answer: _____

4. Animals eat plants or other animals. How much and what they eat affects other parts of the ecosystem. These interrelationships between the living things in an ecosystem is called
   A. interdependence
   B. environment
   C. food webbing
   D. decomposing

   Answer: _____

Answer Key

Investigation answers.

Change made:	Number of insects	Number of seeds	Number of hawks
Decrease the number of chipmunks	Increase because more seeds are left for insects to eat	Increase because not as many chipmunks will be eating them	Decrease because there are fewer chipmunks to eat
Increase the number of bears	No change because bears don't eat insects and neither do the animals that bears eat	Increase because the bears will eat more chipmunks so there will be fewer chipmunks to eat seeds	Probably decrease because more bears will eat more chipmunks and weasels so the hawks will have less to eat. Or hawks will stay the same, they will just eat more pheasants
Decrease the number of pheasants	Increase because pheasants are the only organisms that eat the insects	No change because the pheasants don't eat seeds	Decrease because hawks eat pheasants. Or hawks will have to eat more chipmunks and weasels

1. Answers will vary depending on predictions.

2. Answers will vary depending on the student choice.

Test practice questions answers.

1. Answer: C

2. Answer: C

3. Answer: A

4. Answer: A

Science Program — Key Stage 2

Set 2. Life Sciences: *Food Webs*

The Story

One of the really interesting things about science is that you can learn things at all different levels. That includes things that are really simple to really complicated. For example, you have learned about food chains so you know that animals depend on plants. Animals also depend on one another.

Think about an example of a food chain: a mouse eats little seeds to get the energy it needs. A hawk swoops down and grabs (and eats!) the mouse to get the energy it needs. Now that is a simple "feeding relationship". The hawk is dependent (it depends on) the mouse that is dependent on the plant for its seeds.

Here is the interesting part, the "different levels" part. If you look more closely, and you have to, you see it gets complicated. In nature, this is more like what happens:

A deer is eating the bushes so the flowers don't even get to make the seeds for the mouse and even if it did, the birds are right there trying to eat them first. When the mouse wasn't looking a rabbit moved in and took over the place where the mouse was living so it was stuck out in the open field. A hawk could easily see it, standing out there in the field. So as the hawk was zooming down to try to grab it, an owl came out of the woods and got there first. At least with the mouse out of the way that left more seeds for the bird. That is unless the deer brought another deer to eat seeds with it.

Confused? That's great because this is really fun to sort out!

Focus Question

Food chains can get complicated. Explain why.

Because lots of different animals are in food chains so they get all mixed up.

Answer

Set 2. Life Sciences: *Food Webs*

Key Words:

Producer — green plants

Consumer — an animal that eats plants or other animals

Herbivores — animals that eat plants only

Carnivores — animals that eat other animals only

Omnivores — animals that eat both plants and animals

Decomposers — organisms that feed on the remains or waste products of plants and animals

Food chain — a model to show how energy moves from plants to animals in the environment

Food web — a model that shows how food chains are connected and overlap in the environment

Interdependence — when things (meaning here plants and animals) depend on one another for survival

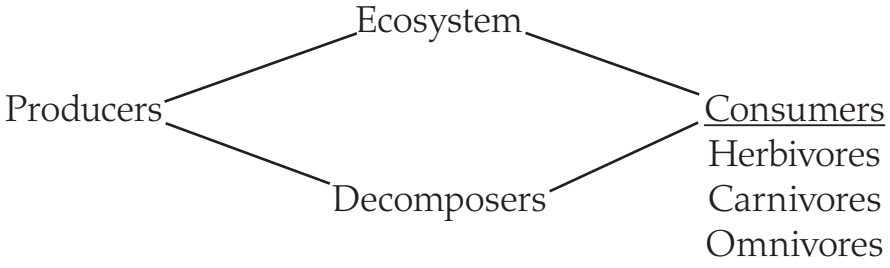
Competition — when living things in an ecosystem are trying to use the same things (like food or shelter)

Ecosystem – all the living and non living parts of an environment

Getting the Words (and the Concepts) Straight

"Oh man! That's a LOT of words to learn!"

Here's a picture of how these words go together (it's something like the sorting out of the Plant Kingdom we did before).



Set 2. Life Sciences: *Food Webs*

In every ecosystem there are:

Producers — they are the plants (never the animals!). They "produce" the matter (that's all the plant parts like leaves, stems, roots, fruits) which can be digested into materials that give energy to the consumers that eat the plants.

"You know, the stuff you find in the "fruit and vegatable" section of the supermarket."

Consumers —they are the animals (never the plants!). They "consume" (or use) the plants or other animals to digest into materials that give them energy to grow and do everyday things to live.

The consumer group can be divided into smaller groups to make it easier for us to talk about them and know what they eat.

Herbivores — Animals that eat "herbs". When scientists who study plants (called "botanists") talk about plants they say "herbs". Herbivores only eat plants or plant parts. There are lots of examples of herbivores. Some are squirrels, cows, sheep, and impalas and gazelles in Africa.

Carnivores — Animals that eat meat only. So these animals eat herbivores or, if they are ferocious (meaning here really savage) they eat other carnivores. Some examples of carnivores are sharks, lions, all snakes, and hawks.

Remember an animal doesn't have to be big to be ferocious! Spiders look pretty ferocious to small insects!

"These animals don't bother with their vegetables."

Omnivores — (that's probably you) Animals that eat both plants and meat. Some examples of omnivores are raccoons, skunks, and bears.

It might be easier to keep these straight if you knew where the words came from:

Herbivore	is from the Latin words "herba", which means "grass" and "vovare" which means "to swallow". So "herbivorus" (say "her- biveress") means an animal that "swallows grass"
Carnivore	is from the Latin words "carn", which means "flesh" and "vovare". So "carnivorus" (say "car –niveress") means an animal that eats meat (or flesh). This is the same place the Spanish word for "meat" comes from.
Omnivore	is from the Latin word "omni", which means "all" and "vovare". So "omnivorus" (say "om-niveress") means an animal that eats everything. Remember this "omni" prefix because you will see this a lot in your studies.

Sometimes all these different consumers are trying to eat the same things. For example, hawks and owls might be fighting over the same mouse. Or otters and ducks might want the same fish. Sometimes plants are trying to grow in the same place.

When plants or animals are trying to use the same things to stay alive we call it competition.

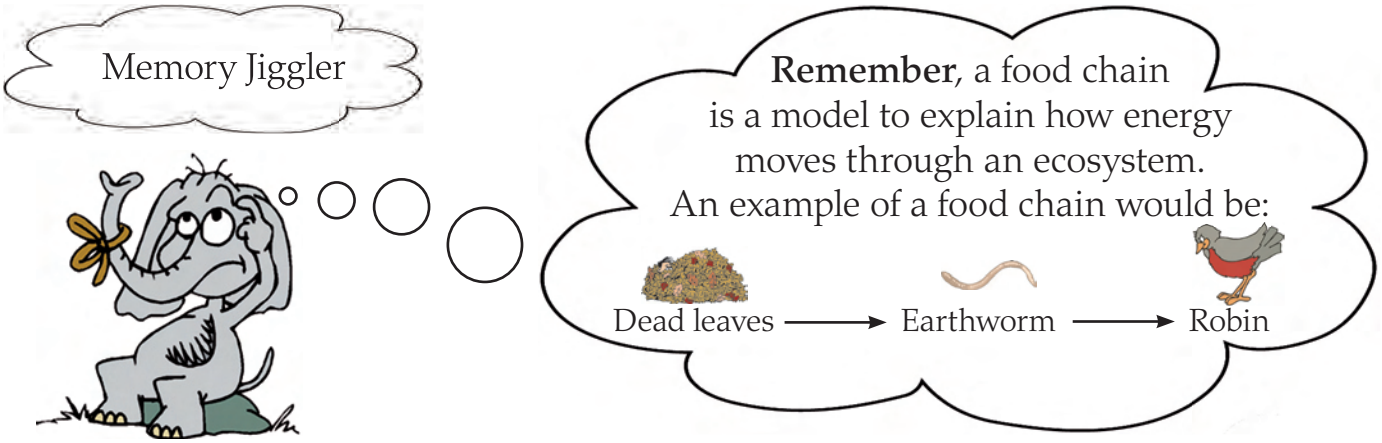
Finally, we have a very important group of little organisms called decomposers.

Decomposers feed on all the dead stuff that is left over. They break down dead animals and animal wastes into nutrients (those are the substances needed to live and grow). Those nutrients sink into the soil and are sucked up by plant roots to be used by the plants.

"I know you see what is happening here… if the plants are sucking up the nutrients from the soil to help them live and grow, then the herbivores are getting those nutrients when they eat the plants, and the carnivores are getting the nutrients next and on it goes… nature!"

Food Webs

Producers and consumers, that includes herbivores, carnivores, omnivores, and decomposers, are all related to one another in food chains and food webs.



A food web is a way to show how food chains interconnect and overlap in the environment. Food webs are a good way to show that plants and animals are interdependent.

Here that means that lots of different plants and animals are depending on one another for things (including energy to live!). It is more than, in our example, just the robin depending on the earthworm depending on the leaves.

Focus Question

Explain how producers are related to consumers

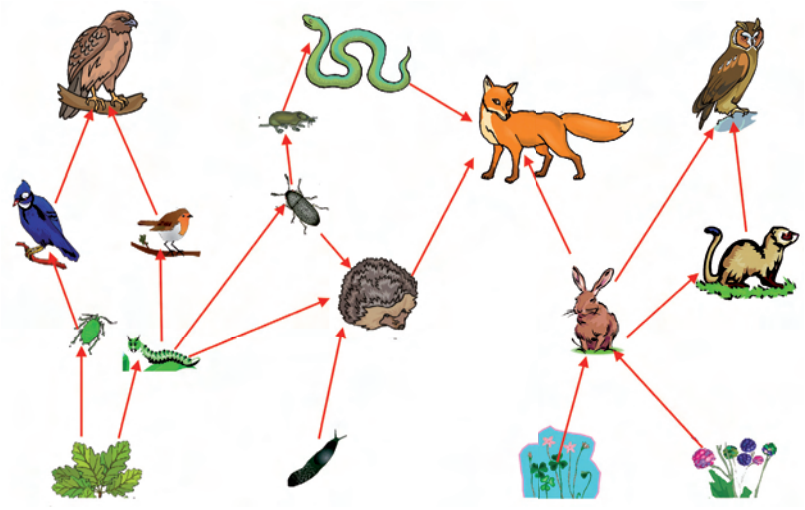
Producers are the plants. They are the food for the consumers.

Answer

Set 2. Life Sciences: *Food Webs*

"Here's a hint: keep this idea of interdependence in your head. We are going to see this coming up again soon and you are going to see this coming up all over the place in all the rest of science you study."

If we look at some examples of food webs you will definitely get the idea.



If you take a close look at this food web you will see the interdependence of the plants and animals. For example,

Caterpillar - the caterpillar is getting its energy from the oak leaves, but the robin, the beetle, and the hedgehog are all using caterpillars for their energy sources.

Hawk - the hawk is looking for robins and other small birds to give it energy.

Fox – the hedgehog gets its energy from slug, caterpillars and beetles. The fox can get its energy from the hedgehog.

Focus Question

Looking at this food web, predict what would happen to the beetle population if the snakes ate all the shrews.

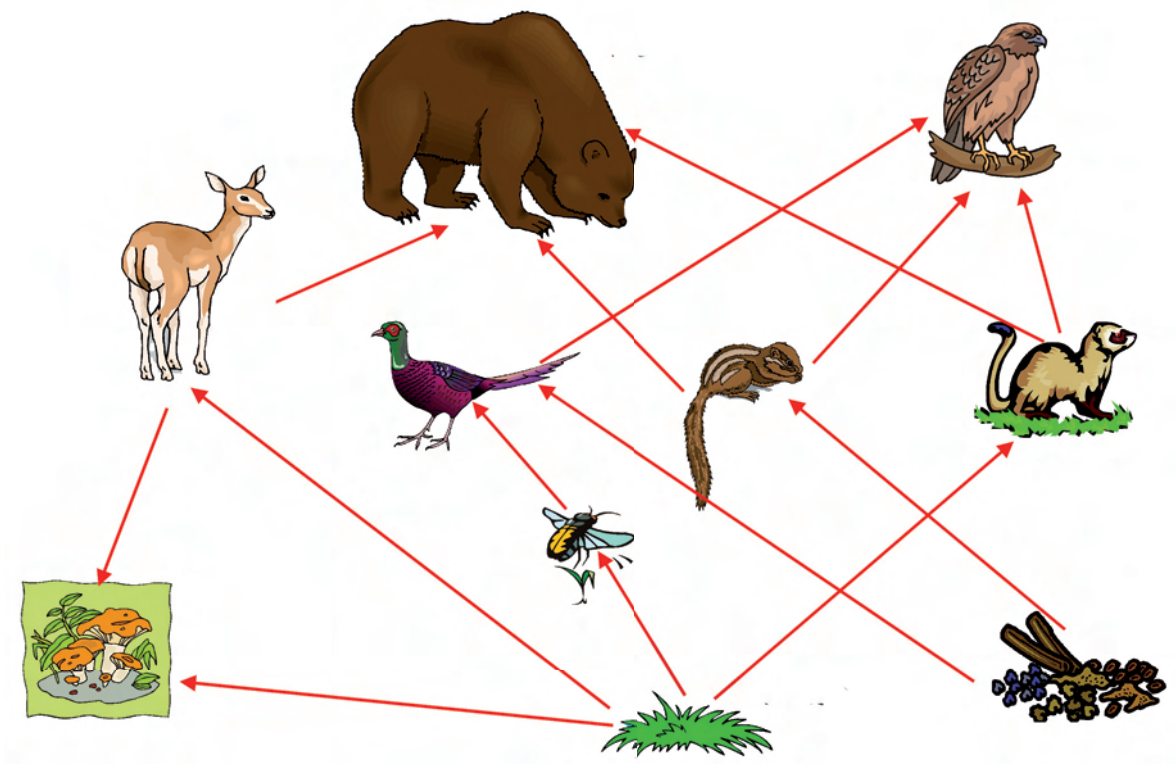
Answer

The beetle population would increase because there would be no shrews to eat them. That is, unless the hedgehogs noticed that there were lots more yummy beetles around. They might stop eating so many slugs and eat more beetles. That's what we mean by interdependence.

Investigation — Competition

You have already studied many different environments in other years. There are food chains and food webs in all environments. Let's think about an environment that is in the more northern climates where tall trees don't usually grow. It will include the following organisms:

Grasses	Seeds	Berries
Insects	Deer	Bears
Pheasants	Chipmunks	Weasels
Hawks		Decomposers



You know that if something happens in one part of the food web, it will affect other parts (that is, other plants and animals). The table on the next page gives some examples of changes that might happen in the ecosystem. Predict what effects these changes would have on the existing populations.

"Remember 'increase' means to make bigger and 'decrease' means to make smaller."

Changes in the Ecosystem
Table of Predictions

Change made:	Number of insects	Number of seeds	Number of hawks
Decrease the number of chipmunks			
Increase the number of bears			
Decrease the number of pheasants			

Activity

In this activity you will be playing the role of different plants or animals in the ecosystem.

Your teacher will assign your role and will explain changes in the numbers of various populations.

You should observe what happens based on these changes. Were your predictions correct?

Complete the table on the next page based on your observations. It is the same table as the one you used for your predictions. Compare your observations with your predictions.

"Remember 'increase' means to make bigger and 'decrease' means to make smaller."

Changes in the Ecosystem
Table of Observations

Change made:	Number of insects	Number of seeds	Number of hawks
Decrease the number of chipmunks			
Increase the number of bears			
Decrease the number of pheasants			

Answer the following questions based on the two tables.

1. How did your predictions compare to your observations? Explain your answer.

_____

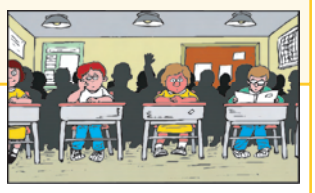
_____

2. Based on what you know about food webs and on your observations, choose another change in the ecosystem and predict what would happen. Give a reason for your answer.

_____

_____

Test Practice Questions



1. Compare a food chain and a food web?
   - A. a food chain only has two organisms interacting
   - B. a food web only explains how spiders fit into the ecosystem
   - C. a food web is made up of many food chains
   - D. a food chain is made up of many food webs

   Answer: _____

2. A group of "consumers" would include
   - A. squirrels, chipmunks, and nuts
   - B. herbivores, carnivores, and flowering plants
   - C. herbivores, carnivores, and bears
   - D. anything that makes its own food from the Sun's energy

   Answer: _____

3. Ecologists (scientists who study ecosystems) are worried that too many cod are being fished from the ocean. Using the food web below, predict what would happen to the other organisms if the numbers of cod were decreased.

   - A. the herring population would increase
   - B. the sea gull population would decrease
   - C. the plankton would begin to eat the herring
   - D. the sea eels would eat more sea gulls

   Answer: _____

4. Animals eat plants or other animals. How much and what they eat affects other parts of the ecosystem. These interrelationships between the living things in an ecosystem is called
   - A. interdependence
   - B. environment
   - C. food webbing
   - D. decomposing

   Answer: _____

Science Program — Key Stage 2

Set 2. Life Sciences: *Food Webs*

Science and Literacy Strategies

Literacy Strategy: Comprehension Check: Chart to Guide Reading, Stop and Draw.

Producers, Consumers and Food Webs

All organisms need energy to live. Scientists categorize organisms into three main groups according to the part they play in giving energy to one another. The three main groups are called producers, consumers, and decomposers.

Plants, bacteria, and algae are great examples of producers. Producers are important because they take energy from the Sun to make their own food, and they draw raw material from the Earth as well. All plants are producers, as producers use the energy from the Sun to make their own food. Therefore, plants rely on the Sun for food.

Organisms that eat plants and animals are called consumers. The word "consume" means "to take in". There are three types of consumers: herbivores, carnivores, and omnivores.

Some organisms eat plants to survive. Organisms that eat only plants and feed directly on producers are called herbivores. Herbivores eat plants and plant products like berries. Examples of herbivores are rabbits, squirrels, and deer. Some humans eat only vegetables that come from plants and their products. We call these people "vegetarians". They can be considered herbivores, too.

Other organisms are meat-eaters. They get their food by eating herbivores or other animals. These organisms are called carnivores. The word "carne" comes from the Spanish word which means "meat". Sharks, wolves, and eagles are examples of carnivores.

The word "omni" means "all". Omnivores are consumers that eat both plants and animals. They eat consumers and producers. Raccoons, bears, and skunks are omnivores. People who eat meat, chicken, fish and vegetables are considered omnivores.

Set 2. Life Sciences: *Food Webs*

Decomposers are organisms that feed on waste and remains of other organisms. Bacteria and fungi are examples of decomposers. They get their energy from other dead animals and plants, and use their remains for food.

Plants and animals are interdependent, meaning that they depend on one another for survival. Sometimes living things compete with each other by trying to eat the same things or relying on the same things for shelter.

Comprehension Check: Chart to Guide Reading. Fill in the missing parts of the chart to understand the relationship between plants and animals. Look back at the passage for help.

Type of organism	Examples	Where they get food	Notes
Producers			
Consumers			
Herbivores			
Carnivores			
Omnivores			
Decomposers			

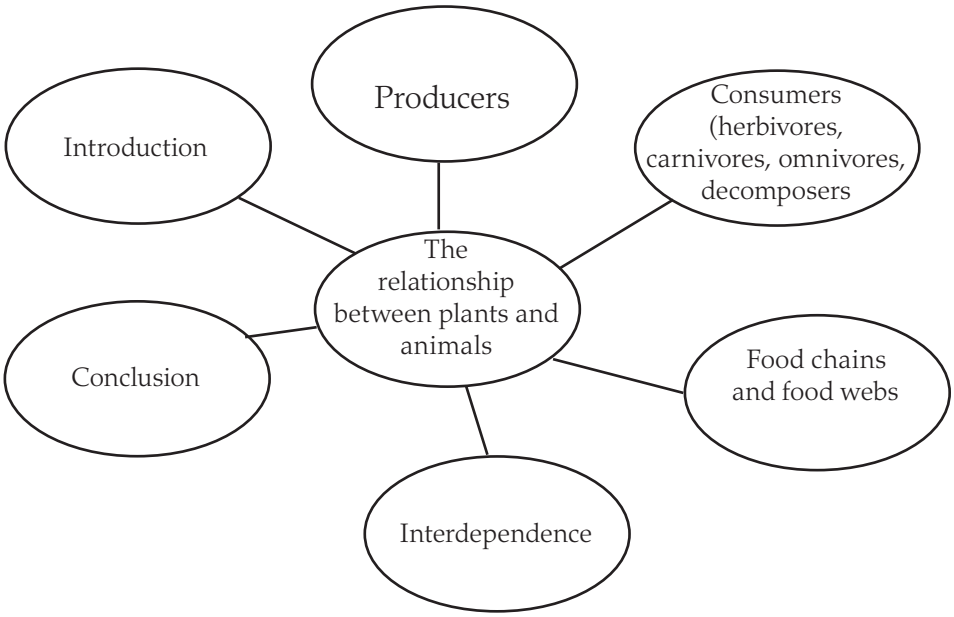
Food chains consist of organisms known as producers and consumers. Producers are green plants which make their own food, and depend on the Sun to do so. When food chains are put together, they sometimes overlap one another. That means that there are some organisms from one food chain that also feed off of organisms on a different food chain. When food chains overlap like this, we call it a food web. A food web is a model that shows how food chains are connected and overlap in the environment.

Set 2. Life Sciences: *Food Webs*

Comprehension Check: Stop and Draw. Draw a picture of a food web by drawing two food chains that overlap by feeding on the same animal. Challenge yourself by adding another food chain that overlaps!

Demonstrate What You Have Learned: Using the writing map below, write an essay about the relationship between plants and animals. Remember that the topics are in the ovals, and include an introduction and conclusion.

Writing Map



Science and Literacy Strategies

Literacy Strategy: Mnemonic Device

Topic Pack 2.b. — Producers, Consumers and Food Webs

We learned that plants and animals help each other by providing energy to one another. They provide energy by feeding on one another, and the order in which they consume each other is called a food chains. Food chains that overlap are called food webs.

One way that we can remember the order of steps in this process is to come up with something called a mnemonic device. A mnemonic device is a way of remembering the order of something by making it fun!

In the Student Pages, reread about producers and consumers. Here is a mnemonic device for remembering the order of energy and how it is used by living things!

1.	Sun =	**Some**
2.	Producers =	**People**
3.	Consumers =	**Can**
4.	Herbivores =	**Have**
5.	Carnivores =	**Crazy**
6.	Omnivores =	**Outrageous**
7.	Decomposers =	**Dreams**

Try this learning strategy yourself! Come up with a mnemonic device on your own! Remember, it must be meaningful and easy to remember.

1. S _____
2. P _____
3. C _____
4. H _____
5. C _____
6. O _____
7. D _____