

NAME THAT CONNECTION (50-Min)

Addresses NGSS

Level of Difficulty: 2

Grade Range: K-2

OVERVIEW

In this activity, students will take on the role of organisms in various environments as they discover the concept of interdependence in ecosystems. They will analyze their relationship with other living things and describe their interdependence.

Topic: Interdependence of Organisms

Real-World Science Topics

- An exploration of the interdependence of organisms.
- An exploration of the roles of organisms in their environment.

Objective

Students will gain an understanding of the interdependence of organisms within their own environment.

NGSS Three-Dimensions

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Analyzing and Interpreting Data Analyzing data in K-2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <p>Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-LS1-1) <i>Connections to Nature of Science</i></p> <p>Scientific Knowledge is Based on Empirical Evidence Scientists look for patterns and order when making observations about the world. (K-LS1-1)</p> <p>Developing and Using Models Analyzing Modeling in K-2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, storyboard) that represent concrete</p>	<p>LS1.C: Organization for Matter and Energy Flow in Organisms All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. (K-LS1-1)</p> <p>ESS3.A: Natural Resources Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)</p>	<p>Cause and Effect Events have causes that generate observable patterns. (K-ESS3-2),(K-ESS3-3)</p> <p>Systems and System Models Systems in the natural and designed world have parts that work together. (K-ESS3-1)</p>

events or design solutions. Use a model to represent relationships in the natural world. (K-ESS3-1)

Obtaining, Evaluating, and Communicating Information

Obtaining, evaluating, and communicating information in K-2 builds on prior experiences and uses observations and texts to communicate new information.

Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas. (K-ESS3-3)

Background Information

What is interdependence?

Interdependence is the concept that organisms within an ecosystem depend on each other in order to survive. The lowest organisms on the food chain are the producers. These producers are organisms that produce their own food and then are eaten by the lowest animals on the food chain such as mice, rabbits and small birds which are the first level of consumers. Larger organisms then eat these mice, rabbits and birds and they form a food chain. The food chain is a single line of arrows showing one relationship between organisms. When many of these chains are placed together, they form a food web, which explains how all of the animals within one ecosystem survive by feeding on each other. When one of these organisms are eliminated from an ecosystem as a result of any number of reasons, it affects the whole ecosystem as other organisms that depend on them will have nothing or little to eat and will disappear or move on to other places in search of food.

Key Vocabulary

Food Chain - A series of organisms related by their feeding habits

Food Web - The entire number of interrelated food chains contained within one ecosystem

Interdependence - The concept of organisms being mutually reliant on one another for survival

Predator - An organism which survives by eating other organisms

Prey - The organism which is eaten by another organism in a food chain or food web

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Materials Needed for Activity

Materials Needed for Demonstration:

- 2 cards labeled producers and consumers for each table.
- 1 bag/envelope
- 4 pictures of producers
- 4 pictures of consumers

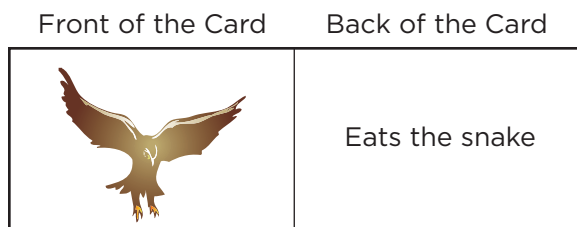
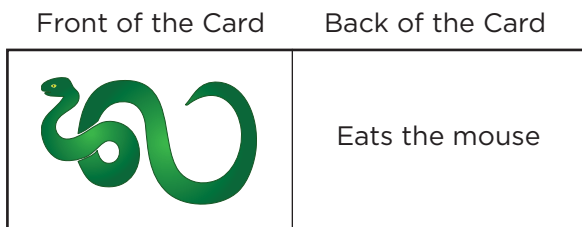
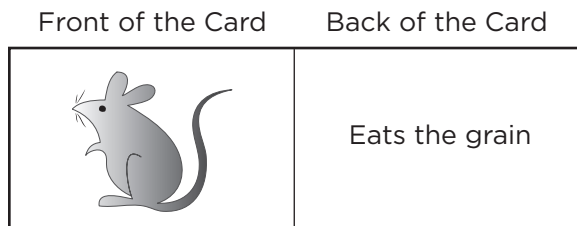
Materials Needed for Each Team of 3-4 Students:

- 6 blue note cards with hawk pictures on the front and “eat snakes” on the back
- 6 yellow note cards with snake pictures on the front and “eat mice” on the back
- 6 red note cards with mice pictures on the front and “eat grain” on the back
- 6 green notecards with grain pictures on the front and “need sun” on the back
- 6 blank green notecards
- 6 green notecards with pictures of producers not native to local ecosystems (cactus for a Pennsylvania forest)
- 8.5 x 11 ditto paper to draw simple food chains

Teacher Preparation

You will need to print off 1 producer label and 1 consumer label for each group in the classroom. You will also need to print off the 4 pictures of producers and 4 pictures of consumers for each group and place them in a bag or envelope for the warm-up.

Before students arrive you will need to prepare the needed number of notecards. You will need to create enough cards to put your students into groups of four. It is not important that it be exactly the organisms used in the materials needed section. The four organisms can be adapted to your local ecosystem. They should have a picture on the front of the organism and what they eat on the back of the notecard. The colors are also not significant, but they do need to be four different colors to help students in forming their groups. The four notecards should look as follows:

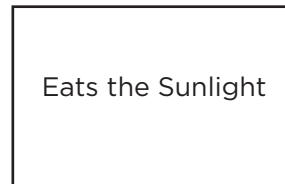


1. Warm-up Activity: Start the activity by breaking students up into groups of 3 to 4 students. Show them the words: producer and consumer. Review with them the definitions of a producer and a consumer.
Producer – organisms that produce their own food and serve as food for other organisms in a food chain.
Consumer – an organism that feeds on other animals or plants.

- Hand out the envelope with eight pictures in it (4 producers and 4 consumers). Allow the groups to sort them into the two groups and explain their choices to the class. (Four producers: acorns, berries, grains, grass. Four consumers: cows, squirrels, birds, mouse)
- **Grade K-2:** Hand out to each group the handout with the word producer and two examples on it as well as the hand out labeled consumer with two pictures on it. Explain that the producer “eats” the sun, while the consumers eat producers and other consumers. Then give the groups an envelope with two more producer pictures and two more consumer pictures. Let the groups decide where they think the pictures go and place them on the appropriate hand outs.
- Explain to the students that a relationship between a producer and consumer is one that goes through out an ecosystem. These relationships form a food chain and many of these relationships together form a food web. Every organism depends on every other one for survival. This is called interdependence. They will be doing an activity to demonstrate this interdependence.

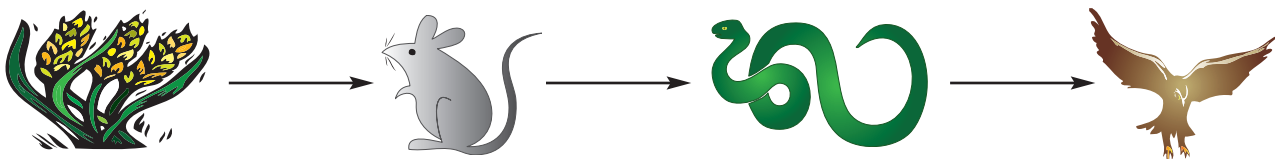
2. Mix up the colored notecards prepared beforehand and pass them out to the class.

- Explain that on one side of the notecard is a picture of an organism. This organism represents who they are. On the reverse side of the card is a statement of what the organism eats.
- The students then form groups of four with each person in the group having a different colored card. They are to move around the room until they have a group of four people that have one of each color card.



Grades K-1: Give each group of three to four students an envelope that has four pictures and three arrows. The four pictures should be grain, mouse, snake and a hawk. Explain that the students are to put the pictures in the order they are eaten to make a food chain. Tell them the producer or the plant will be first. The arrows should point to the organism that is eating the one before it.

- Once students are in their groups, have them explain how they are connected and draw a food chain on a piece of paper representing their interdependence one another. (simple arrow drawing)



3. Have students predict what might happen if some of the organisms were missing. This time take out several of the producer cards and replace them with blank ones to signify they have disappeared.
 - Have students group up again. Have the students discuss what they think is going to happen in the groups with blank cards and how that will affect the other organisms in the groups as well.

Grades K-1: Have students remove the producer card and discuss what they think will happen to the rest of the animals if the producer is no longer there.
4. When one organism disappears, that can affect an ecosystem and cause other organisms to disappear.
 - Another way to have the students think about how interdependent organisms are with each other in an ecosystem is to introduce an organism that is from a different ecosystem that does not provide for their needs.
 - In order to model this, replace the producer cards with cards of a producer not native to the ecosystem. In the case from above, replace the wheat picture with one of a cactus.
5. Have the students get into their groups again and discuss what the second organism in the chain is going to do since the producer it eats is no longer available and has been replaced by something it doesn't eat.
6. The second organism in the chain will have two options for survival. If there are other producers in its diet in its ecosystem then it will have to rely on the other producers to survive. This will put more pressure on all the organisms in the ecosystem as there will now be less food for more organisms. The second option would be for the organism to move to another ecosystem where the producer is still available. If neither of these options work, the organism will die and then will affect all the other organisms after them in the chain.
7. After the group activities, the students will answer the following questions:
 - What is the difference between a producer and a consumer?
 - What does it mean for animals and plants to be interdependent?
 - What are the results if an organism disappears from an ecosystem?
 - What are the results if an organism is placed in an ecosystem in which it is unfamiliar?
8. **Wrap-up Activity:** Collect all of the cards from the students. Have the students create a simple three step food chain that would involve them as part of it so they make the connection that they are also interdependent on the organisms in their environment.

Extension Activity

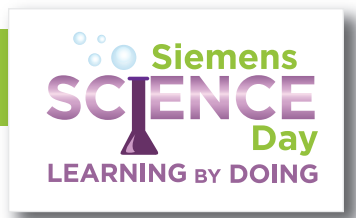
Based on what they have learned, students can research ecosystems other than local ones and create a food chain or a food web based on the information they discover. Students might also explore a food web to see that when one food source is depleted like acorns for a squirrel, there are other food sources it can turn to, but it will be more difficult to get food.

Sources

<http://www.ecokids.ca>
<http://www.geography4kids.com>
<http://www.ehow.com>
<http://www.learnnc.org>

NAME THAT CONNECTION

STUDENT HANDOUT



Name:

Date:

What is the difference between a producer and a consumer?

What does it mean to be interdependent?

Give an example of one organism depending on another one.

What happens if an organism disappears from an ecosystem?

What happens if an organism is placed in an ecosystem with which it is unfamiliar?

Grades K-1: Students draw an example of how organisms are interdependent and write one or two sentences to explain their picture.

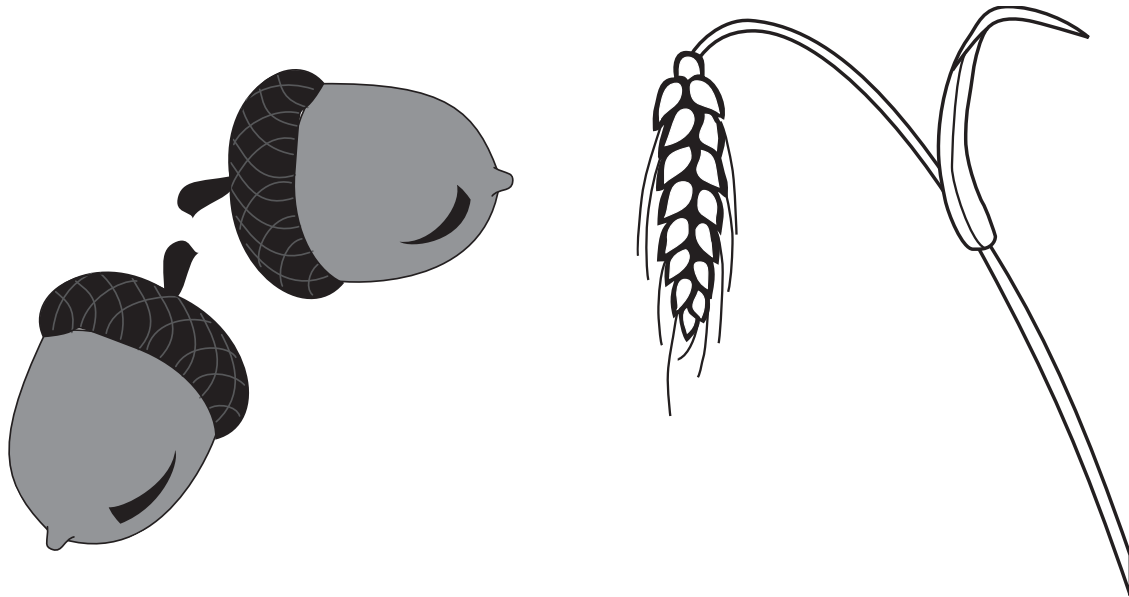
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TEACHER HANDOUT

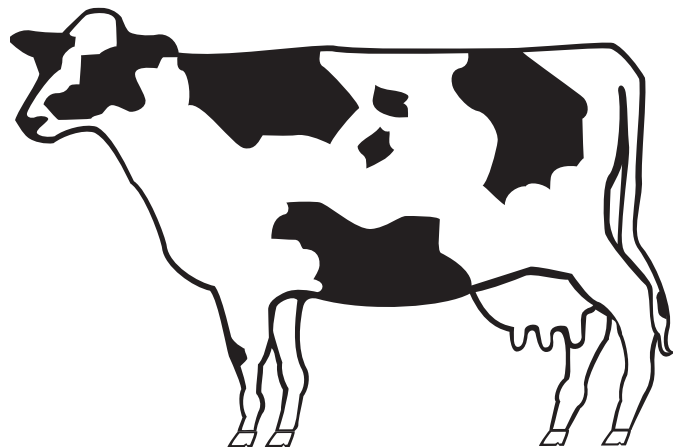
Words to use as titles for the warm-up activity:

- Producer
- Consumer

Producer



Consumer



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TEACHER HANDOUT



What is the difference between a producer and a consumer?

A producer is an organism that has the ability to produce its own food. A consumer is an organism that must feed on other organisms in a food chain or food web in order to survive.

What does it mean to be interdependent?

To be interdependent means that organisms depend on one another as food sources to survive in their particular habitat.

Give an example of one organism depending on another one.

A mouse depends on plants for survival because they eat the little seeds and berries from them. A hawk depends on mice and small squirrels as a food source in order to survive.

What happens if an organism disappears from an ecosystem?

If one organism disappears from an ecosystem every animal that depends on that animal suffers. They either will die or they have to move away to where they are able to survive.

What happens if an organism is placed in an ecosystem with which it is unfamiliar?

The organism will probably die. It does not have the food sources it is used to eating and all organisms exist in certain habitats and ecosystems because they meet their specific needs. In an unfamiliar ecosystem or habitat, those needs will go unmet.

Grades K-1: Students draw an example of how organisms are interdependent and write one or two sentences to explain their picture.