



Biodiversity Basics

How are different species in an ecosystem connected?

Objectives:

At the end of this activity youth should be able to:

- Explain what biodiversity means, why it is important, and what could threaten it.

Time to complete activity: 60 minutes

Background/Setting the Stage:

Use questions to get youth thinking about biodiversity:

- Ask them to think about what they had for lunch (or breakfast). Get the youth to commit to agreeing or disagreeing with the following remark: “I think everything you ate came from plants.”
- Who ate plants in their lunch? Discuss.
- What is something you ate that did not come from a plant? Discuss.
- Get the group to discuss how meat and dairy products come from plants in an indirect way.
- Is there anything you could eat that doesn’t come from plants?
- Where does a plant get its energy? Do a quick review of photosynthesis: plants are made of mostly water (H₂O) and carbon dioxide (CO₂), with some nutrients extracted from the soil. The sun powers this process. (See [Learn more about photosynthesis](#) below if time allows.)



Materials:

- Index cards
- Tape
- Ball of yarn
- Diagram of a food web (Print a copy or project image)

Methods

Activity 1: Biodiversity “20 Questions” (20-30 minutes)

1. Hand out the Biodiversity Worksheet (see visuals folder). Using the worksheet as a guide, facilitate a question and answer session with youth, as a way of introducing key vocabulary related to biodiversity (i.e., consumer, decomposer, predator, prey, etc.).
2. Once youth have been introduced to key vocabulary, pass out one index card to each participant with the name of an organism written on it. (One organism per card. Examples are below.) Place the cards face down in front of the youth, so that the names of species cannot be seen. Instruct them that they must not look at the species name on their own cards. Then, at the count of three, youth will flip their cards up to their foreheads, so that they cannot see their own organism, but can see those of others.
3. Working with partners, youth will take turns asking each other a series of “yes or no” questions in order to deduce the name of their organism. For example, they might ask whether their organism is a producer, consumer, predator, prey, mammal, reptile, insect, plant, etc. [Note: The facilitator may wish to model this with the youth.]
4. Youth continue asking questions until they have figured out what species is written on their card.

Examples for index cards:

Honey Bee	Ant	Oak Tree	Squirrel
Mushroom	Spider	Snake	Deer
Mouse	Woodpecker	Frog	Ash Tree
Earthworm	Butterfly	Snail	Robin
Grass	Flower	Hawk	Fly

Activity 2: Web of Life (20-30 minutes)

1. When everyone has figured out what they are, they will gather in a circle (taking their organism cards with them).
2. All these organisms are connected within a food web. We are going to model this with a ball of yarn.
3. When you get the ball of yarn, toss it to someone holding a card with which your organism has a relationship. Encourage youth to describe this relationship using the vocabulary introduced at the beginning of the activity.
4. Each person should get the ball of yarn at least once. You should end with a web of yarn that models the interactions between the organisms.
5. What if one of these species were not here? Ask one participant to tug at the yarn. Then ask those who felt that tug to raise their hands. Then have the people who felt that tug pull on the yarn. Now have all who felt that tug raise their hands.
6. Discuss the term interdependence. Ask what would happen if one species in this ecosystem were to go extinct. Whom would it affect? What if a new species were introduced to this ecosystem? Whom would it affect?
7. Demonstrate the introduction of a new species by repeating this activity. Have the “invader” now tug on the yarn and ask those who felt the tug raise their hands. Then have the people who felt that tug pull on the yarn. Now have all who felt that tug raise their hands.
8. Discuss the term invasive. How did the invasive species affect the ecosystem? Whom all did it affect? What was similar about these two demonstration? What was different?

Reflection Questions (Journal or Discussion)

- What are some ways that organisms in an ecosystem are interdependent? (5-LS2-1, MS-LS2-2)
- Where does the energy in a food web come from? Where does the matter in a food web come from? (5-LS1-1, MS-LS2-3, MS-LS1-6)
- How does a decrease in biodiversity destabilize the ecosystem? (MS-LS2-2)
- What species was introduced that caused the decrease in biodiversity?

Supplemental Information:

- Black ash swamp community: <http://www.maine.gov/dacf/mnap/features/communities/blackashswamp.htm>
- Learn more about plant classification: <http://test.glossopedia.org/plants/>
- Learn more about photosynthesis: <http://www.pbs.org/wgbh/nova/nature/photosynthesis.html>

Vocabulary:

Producer — organisms that use the sun’s energy to produce food

Consumer — organisms that cannot make their own food

Decomposer — organisms that get energy by breaking down dead plants and animals

Photosynthesis — the process by which plants use sunlight to convert water and carbon dioxide into glucose and oxygen

Food web — a group of organisms organized in predator and prey relationships

Interdependence — when members of a group are all dependent upon each other

Biodiversity — the degree of variation of species within a certain area

Matter — the material of which something is made

Invasive species- organisms that are not native and are introduced into a new ecosystem. These species usually have no predators in this new ecosystem and take away vital resources and habitat from native species.

Adapted from: University of Maine 4-H STEM. <http://umaine.edu/4h/youth/4-h-projects/science-engineering-technology/curricula/>

Resources

Food webs- <http://www.mammothmemory.net/biology/organisms-and-their-environment/ecosystems-organisms-and-their-environment/food-web.html>

Habitat and Food web video: <https://youtu.be/p15IrEuhYmo> and <https://youtu.be/Vtb3I8VzIfg>