



SCHOOLHOUSE NEWS

The Purcell Register

High School

Environmental Science

Lesson Objectives:

- Describe the study of ecology.
- Explain how biotic and abiotic factors influence an ecosystem.
- Define primary producers.
- Describe how consumers obtain energy and nutrients.
- Trace the flow of energy through living systems.

Lesson Summary

Studying Our Living Planet: Ecology is the scientific study of interactions among organisms and between organisms and their environment.

- Earth's organisms live in the **biosphere**. The biosphere consists of the parts of the planet in which all life exists.
- Ecologists may study different levels of ecological organization:
 - Individual organism
 - An assemblage of individuals that belong to the same species and live in the same area is called a **population**.
 - An assemblage of different populations that live together in an area is referred to as a **community**.
 - An **ecosystem** includes all the organisms that live in a particular place, together with their physical environment.
 - A group of ecosystems that have similar climates and organisms is called a **biome**.

Biotic and Abiotic Factors: Ecosystems include biotic and abiotic factors.

- A **biotic factor** is any living part of an environment. Ex. dead organisms, waste products, or anything that was once living.
- An **abiotic factor** is any nonliving part of an environment. Ex. wind, water, and air.

Primary Producers: Sunlight is the main energy source for life on Earth. Organisms that can capture energy from sunlight or chemicals and use that energy to produce food are called **autotrophs**, or **primary producers**.

Consumers: Organisms that rely on other organisms for their energy and food are called **heterotrophs**. Heterotrophs are also referred to as consumers.

- **Herbivores**, such as cows, obtain energy by eating only plants.
- **Carnivores**, such as snakes, eat only animals.
- **Omnivores**, such as humans, eat both plants and animals.
- **Detritivores**, such as earthworms, feed on dead matter.
- **Decomposers**, such as fungi, break down organic matter.
- **Scavengers**, such as vultures, consume the carcasses of other animals.

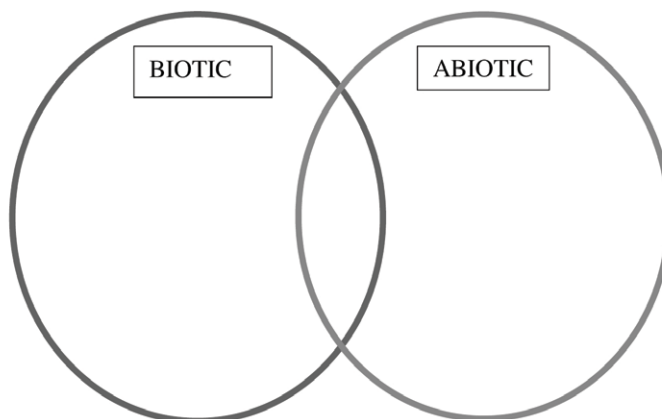
Food Chains and Food Webs: Energy flows through an ecosystem in one direction from primary producers to various consumers.

- A **food chain** is a series of steps in which organisms transfer energy by eating and being eaten.
- A **food web** is a network of all the food chains in an ecosystem.

Trophic Levels: Each step in a food chain or food web is called a **trophic level**. Producers make up the first trophic level. Consumers make up higher trophic levels. (first-level consumer, second-level consumer, etc.) Each consumer depends on the trophic level below it for energy.

Environmental Science Questions

1. What is ecology? _____
2. What does the biosphere contain? _____
3. Explain the relationship between ecosystems and biomes. _____



5. Complete the table about the types of heterotrophs.

Type	Definition	Examples
Herbivore		Cows, rabbits
	Heterotroph that eats animals	
Omnivore		Humans, bears, pigs
Decomposer		
	Heterotroph that consumes the carcasses of dead animals but does not typically kill them itself	

6. What is a consumer? _____
7. How would you categorize a consumer that usually catches and eats prey, but also eats dead animal carcasses? _____

Answer True or False to the following questions.


8. _____ Primary consumers always make up the first trophic level in a food web.
9. _____ Algae is considered a primary producer.
10. _____ A food web is a series of steps in which organisms transfer energy by eating and being eaten.

4. Use the following terms to fill in the Venn diagram, either as biotic or abiotic. Animals, bacterial, heat, tree branch, sunlight, wind, dead carcass.

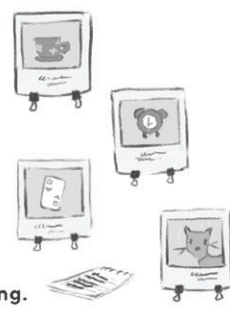
Name _____ Date _____

AT-HOME ACTIVITY CHOICE BOARD


directions: Choose one or more activities to complete at home.




Select a book that everyone in your home is familiar with. Assign everyone a character. Decide that any arguments that day must take place in character.




Take pictures of at least four random objects around the house. Then create a story which includes these objects, either as characters or important objects, in the story. You can write the story down, or narrate it, creating a video or audio recording.




Improvise a story with another person. You start the story, and another person adds onto the story. Take turns until all storytellers agree on the ending. If you cannot agree, flip a coin to decide who gets to end the story. If the other person is long-distance, send emails back and forth or use a shared document for the story.



Challenge family members to construct a building that can fit into a small box while you create your own building. Then join all the buildings to create a town. As you assemble the town, ask yourself questions like, "Where do people live and what do they do? What is the environment like? How are these people connected?"



Find two plants in your home, preferably in different rooms, and imagine they are penpals. Write letters from one to another throughout the day, and read them to them.




Choose a time of day that is called Bad Mood O'Clock. It is when everyone is usually in a low mood. When Bad Mood O'Clock strikes, start a dance party or work out together to work the mood away!


Name _____ Date _____

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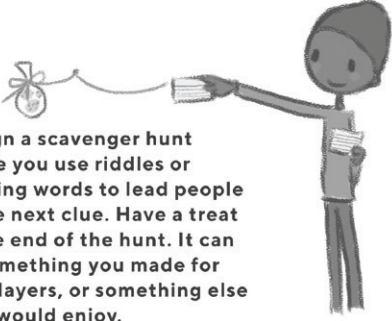
directions: Choose one or more activities to complete at home.




Take a walk around the block and imagine what is a bird's view of your neighborhood. Look on Google Maps in Satellite mode to envision the bird's view. Then draw a map of your neighborhood, from a bird's perspective.




Create an indoor competition. How many events will you have? What tools do you need? How long will it last? Establish the rules and expectations of the competition, gather the supplies, and set-up the fun. Take pictures or a video to capture the competition!




Design a scavenger hunt where you use riddles or rhyming words to lead people to the next clue. Have a treat at the end of the hunt. It can be something you made for the players, or something else they would enjoy.



Make a game to play with other family members with objects you have around the house. Write down the directions for the game, and be sure to include how to win!



Make a travel brochure for an imaginary city. What will people want to see or do? It can be realistic or a fantasy place you would like to visit.



Draw a chalk game board outside. It can be as simple or as complicated as you can imagine. How many players will you have, and what are some tricks to win faster?