

Ecosystem Services Knowledge Check Activity

Primary

Key Inquiry Questions

1. What are ecosystem services?
2. Why are ecosystem services important for us?

Learning Outcomes

1. Students will be reminded of what an ecosystem is and be able to discuss the basics of what ecosystem services are by the end of the lesson.
2. Students will be able to relate their personal lives to ecosystem services by the end of the lesson.

Sustainability Education Curriculum Goals

Systems Thinking:

1. Our planet - the biosphere - is a complex system that supplies resources and creates conditions that sustain life on Earth.
2. All forms of life, including humans, are connected to each other through man-made and natural ecosystems on which their well-being depends on.
3. Sustainable living relies on the interdependence of viable, healthy social, economic, ecological, and political systems.
 - a. Without a healthy ecological system, human life cannot be supported by the biosphere.

Worldviews and Mental Models:

1. To achieve sustainability, worldviews must recognize the interdependence between living and nonliving things on healthy ecosystems, value diversity in nature and in human perspective, and social justice.

Activities/Goals:

1. Students should be able to explain what sustainability is, the importance of ecosystem services and biodiversity.

Overview

Students will further examine ecosystem services in their environment by completing a scavenger hunt using BINGO cards. This promotes a little bit of healthy competition, attention to detail engages their curiosity, and critical thinking skills. The lesson will conclude with students

answering questions about how ecosystem services relate to sustainability and how climate change can impact them.

Materials

SolarSPELL Resource:

1. BINGO Worksheet (3 different cards included below)

Other:

1. Pencils
2. Colored pencils, crayons, or markers
3. Clipboards, binders, or any mobile hard surface students can take outside to write on

Suggested Procedure

Before beginning the lesson, it is recommended that you review the document titled, “Ecosystem Services” and the subsequent lessons about specific ecosystem services, including soil, forests, and oceans.

During Lesson:

- Pass out Ecosystem Service Bingo Sheet so that there is one per each pair of students.
 - Ask students what ecosystem services are.
 - Answer: Ecosystem services are the free benefits humans receive from nature.
- Take students outside.
- Explain to the students that they will be playing a game to help them remember some of the key ecosystem services they have learned about.
- Tell the students that you [the teacher] will be asking them questions about what they have learned. When they know the answer to the question, they should circle it on their card and write down how the specific ecosystem service is done.
 - For example: If you ask “find something on your card that positively impacts air quality,” students can circle trees. Then the student will write down, the leaves in trees absorb pollutants from the air like carbon dioxide.
- Give students 2 minutes per question and allow students to talk with their partner.
- Remind students that there are multiple correct answers for each question.
 - Example: For the “harms the soil” slot, students could write in “fires, not farming with multiple crops, or pesticides”.
- **If you are not able to print:**
 - Divide students into pairs.
 - Have each pair write down the topics from the BINGO card as a team (each student should write 12 down) in any order they want.

- Continue playing until all the students:
 - Fill in 2 BINGO lines
 - Fill in the entire card
 - Fill in an X
 - Note: the first students to complete the chosen BINGO game will win!!
 - A BINGO consists of having answers under each letter so that a continuous line is made.
 - Bingos can be horizontal, vertical or diagonal
 - See Card 4, for an example.



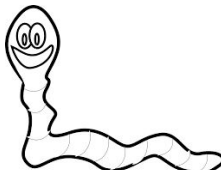



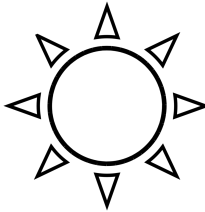

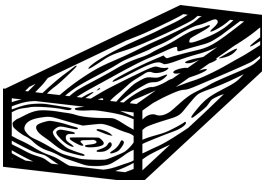



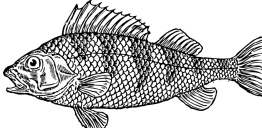

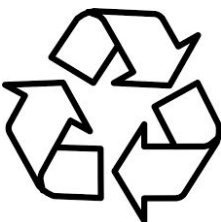








After Lesson:




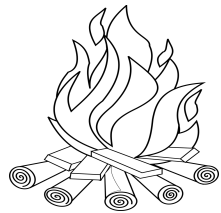

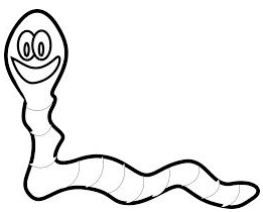
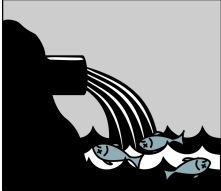




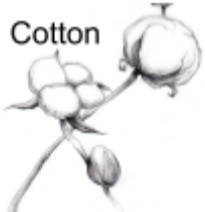

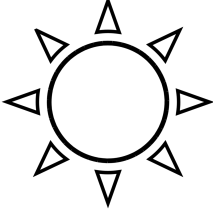


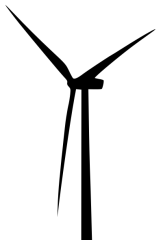


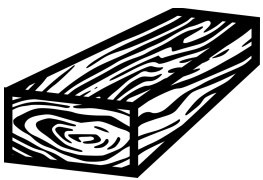


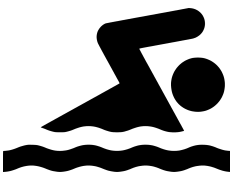
- Tell the pairs of students to group up so there are 4 students per group.
- Give students 10 minutes to share and compare their answers.
 - Walk around to hear some of the answers and discuss any that may not be correct.
- Tell students to raise their hands when they are done. Go to each group of students and check their answers. Discuss any of the incorrect answers with them.
- Lastly, ask students the following question:
 - Why do they think ecosystem services are important for sustainability?
 - Call on a few students to share their answers.
 - Possible Answer: Without these resources protected and available, humans will not be able to survive as we do now. For example, if we overfish the fish in the ocean, they will eventually run out because they can't reproduce as fast as we are taking them out. Therefore, we should make sure the population is stable and that we are not taking out all of the super big fish in the ocean.

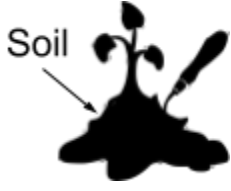

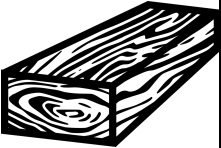



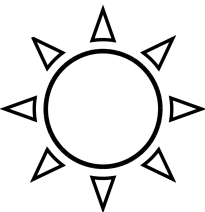



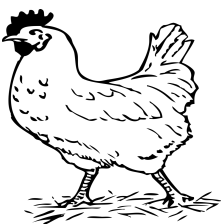




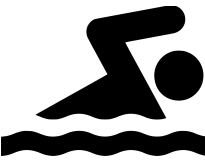
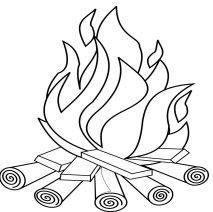
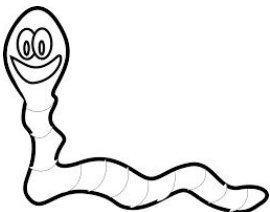


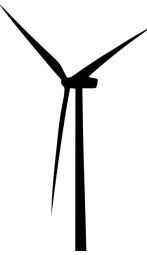

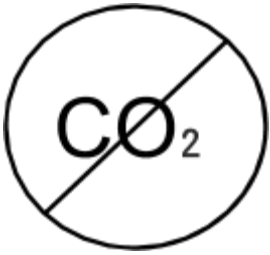
Ecosystem Services: Questions for Teacher

1. Find something on your card that positively impacts air quality.
 - a. Trees, avoid burning trash, healthy soils
2. Find something on your card that is an outdoors activity that couldn't happen without the environment.
 - a. Swimming in the river
3. Find something on your card that can be used to create clothing.
 - a. Cotton, wool, silk
4. Find something on your card that provides humans with shelter.
 - a. Clay bricks
5. Find something on your card that helps keep our climate stable.
 - a. Ocean currents, forests, reduced greenhouse gases in the atmosphere
6. Find something on your card that positively impacts water quality.
 - a. Plants, organic matter
7. Find something on your card that is a source of energy.
 - a. Oil, wind
8. Find something on your card that provides humans with food.
 - a. Vegetables, livestock, fruits, fish
9. Find something on your card that reduces carbon dioxide, a greenhouse gas, in the atmosphere.
 - a. Recycling, planting a tree, reducing trash
10. Find something on your card that is an example of how the environment protects you from the negative effects of floods.
 - a. Rivers direct water to the ocean, vegetation protects soil from erosion.
11. Find something on your card that is a source of energy for the SolarSPELL.
 - a. Sun
12. Find something on your card that is important for plants to grow.
 - a. Earthworms
13. Find something on your card that helps keep you cool outside.
 - a. Shade from trees
14. Find something on your card that your papers are made of.
 - a. Wood from trees
15. Find something on your card that is important to protecting against floods and tsunamis, and provides a habitat for fish eggs.
 - a. Mangroves
16. Find something on your card that is harmful to the environment.
 - a. Plastic, sewage
17. Find something on your card that is causing fish to die.
 - a. Overfishing, plastic
18. Find something on your card that is an example of something that is a chemical used on plants to kill organisms, but that also kills important living organisms in soil.
 - a. Pesticides
19. Find something on your card anchors trees to the ground, soaks up water from the ground allowing trees to grow, and prevents erosion.



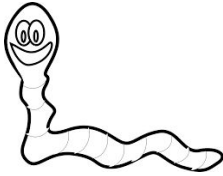


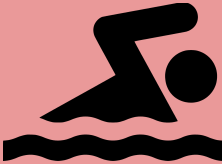
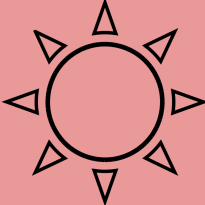





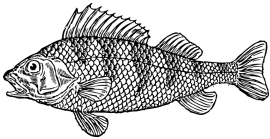








- a. Roots
- 20. Find something on your card that are ocean species that are colorful when alive, and can be killed by too warm of water.
 - a. Coral
- 21. Find something on your card that can harm all ecosystems we have been learning about, and is the main factor in global warming.
 - a. Warmer temperatures
- 22. Find something on your card that causes damage to forests.
 - a. Fire
- 23. Find something on your card that you can do to help the oceans.
 - a. Pick up trash from the beach.
- 24. Add your own ecosystem service.

Card 1 - Ecosystem Services				
B	I	N	G	O
			Plants 	ADD YOUR OWN ECOSYSTEM SERVICE
Mangroves 			Pesticides 	
River 		FREE SPACE		
Clay Bricks 		Shade from Trees 		 Silk
		Forests 	Overfishing 	

Card 2 - Ecosystem Services				
B	I	N	G	O
		<p>Shade from Trees</p> 		<p>Organic Matter</p> 
			<p>Clay Bricks</p> 	
	<p>Cotton</p> 	<p>FREE SPACE</p>	<p>Mangroves</p> 	
<p>Ocean Currents</p> 			<p>River</p> 	<p>Plants</p> 
		<p>ADD YOUR OWN ECOSYSTEM SERVICE</p>	<p>Pesticides</p> 	

Card 3 - Ecosystem Services				
B	I	N	G	O
<p>Soil</p> 			<p>Organic Matter</p> 	
<p>Mangroves</p> 	<p>ADD YOUR OWN ECOSYSTEM SERVICE</p>		<p>Wool</p> 	
		<p>FREE SPACE</p>	<p>Pesticides</p> 	<p>River</p> 
<p>Shade from Trees</p> 				
<p>Clay Bricks</p> 	<p>Overfishing</p> 			

Card 4 - Ecosystem Services: The red background is the BINGO.

B	I	N	G	O
			Plants 	ADD YOUR OWN ECOSYSTEM SERVICE
Mangroves 			Pesticides 	
River 		FREE SPACE		
Clay Bricks 		Shade from Trees 		 Silk
		Forests 	Overfishing 