

Ecosystem Services Knowledge Check

Secondary

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.
3. Students will understand the 4 different categories of ecosystem services and examples that fall under each 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 coloring their BINGO sheets to reflect the 4 different types of ecosystem services, and answering questions about how ecosystem services relate to sustainability and how climate change can impact them.

Materials

SolarSPELL Resource:

1. BINGO Worksheet (4 different cards included below)
2. Pacific Islands > Environment > Teaching Resources > Environment and Sustainability > Ecosystem Services - Wikipedia

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.
 - Explain to students that ecosystem services are a part of everyday life and can be seen and found everywhere.
- Explain to the students that they will be examining their local environment in order to fill in the blanks on their BINGO cards.
- Tell the students that when they find something outside that fits in one of the blanks on their card to write in details about what they found.
 - Example: For the “protects from natural disasters” slot, the students could write “plants and trees”.
 - For students who may not be able to write, allow them to draw images instead.
- Next, inform students that they may not be able to see everything. Let them know that they can add in their own answers for things they can’t see.
 - Example: For the “harms the soil” slot, students could write in “fires, not farming with multiple crops, or pesticides”.
- Let the students know that they can use an answer multiple times on the BINGO sheet.
- Next, tell the students the first pair to fill out the entire sheet wins a prize as decided upon by you.
 - Examples: extra credit or pieces of candy.



- Once outside, allow the students to walk around at their own pace, but keep a watchful eye on them.
- Feel free to give them hints by narrating some of the ecosystem services you see.
 - Example: “Wow, I can’t believe trees can help clean the air and water”.
- **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.

After Lesson:

- After the first pair wins, give students about 5 more minutes to fill out their cards.
- Once all of the students have completed their cards, sit in a circle outside or bring the students back inside to discuss the cards.
- Give students 10 minutes to find another pair and share their answers.
 - Walk around to hear some of the answers and discuss any that may not be correct.
- Remind students that the ecosystem services they found can be grouped into 4 different categories of ecosystem services:
 - Provisioning Services: a material benefit that humans take from nature. Examples of these services include food, water, and raw materials for creating products like clothing.
 - Regulating Services: the benefits humans get from the regulation of natural processes in the ecosystem. Examples of these services include climate, water, and air quality, protection from extreme heat, diseases, and natural disasters.
 - Cultural Services: non-material benefits humans gain from nature. Examples of these services include recreational activities that promote mental/physical health, tourism, and a sense of place.
 - Supporting Services: processes that support the other ecosystem services. Examples of these services include maintaining species and genetic diversity, and photosynthesis.
- Assign a color to each of the 4 different services.
 - Example:
 - Provisioning Services: Red
 - Regulating Services: Green
 - Cultural Services: Blue
 - Supporting Services: Orange
- Tell each group of 4 students (each group now has 2 cards filled out) to look at their BINGO sheets and color in/draw a circle around the slots that correspond with each type of service.
 - Example: For the “protects from natural disasters”, students would color it green for regulating services.
- 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 questions:
 - 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.
- How does climate change affect ecosystem services?
 - Possible Answer: Climate change can force species to migrate to different latitudes or higher elevations where the temperature is better for them. This may result in non-native (invasive) species coming in, which can eat all of the resources the native species need to survive, reducing overall diversity and rupturing the balance of the ecosystem and the services it provides.



Card 1 - Ecosystem Services: Find Something that... (fill in the blank with the item you see or saw).

B	I	N	G	O
Positively impacts air quality:	Provides recreational activities:	Can be used as a raw material:	Can be used to create clothing:	Provides shelter for humans:
Promotes physical activity:	Keeps the climate stable:	Positively impacts water quality:	Is a source of energy (renewable):	Provides food for humans:
Positively impacts human health:	Reduces carbon dioxide in the air?	FREE SPACE	Provides paper for class:	Provides protection from natural disasters:
Is a source of energy (nonrenewable):	Provides pollen for pollinators:	Allows for plants to grow:	Is a habitat for animals:	Is pleasing to the eye:
Provides humans with light:	Has economic value:	Reduces the negative effects of flooding:	Provides a habitat for animals:	Name one not already on here:



Card 2 (Alternative) - Ecosystem Services: Find Something that... (fill in the blank with the item you see or saw).

B	I	N	G	O
Can be used to create clothing:	Provides protection from natural disasters:	Provides a habitat for animals:	Positively impacts air quality:	Paper is made out of:
Can harm rivers?	Is a source of energy:	Positively impacts water quality:	Provides pollen for pollinators:	Provides recreational activities:
Name one not already on here:	Provides shelter for humans:	FREE SPACE	Keeps the climate stable:	Provides humans with light:
Is a habitat for animals:	Reduces the negative effects of flooding:	Allows for plants to grow:	Releases pollutants into the air?:	Is pleasing to the eye:
Can be used as a raw material:	Can harm the soil?	Reduces carbon dioxide in the air?:	Provides food for humans:	Positively impacts human health:



Card 3 - Ecosystem Services: Find Something that... (fill in the blank with the item you see or saw).

B	I	N	G	O
Allows for plants to grow:	Can be used as a raw material:	Is pleasing to the eye:	Keeps the climate stable:	Is a source of energy (renewable):
Positively impacts air quality:	Has economic value:	Name one not already on here:	Positively impacts human health:	Provides a habitat for animals:
Provides recreational activities:	Provides protection from natural disasters:	FREE SPACE	Promotes physical activity:	Provides humans with light:
Provides shelter for humans:	Reduces the negative effects of flooding:	Provides food for humans:	Is a habitat for animals:	Can be used to create clothing:
Is a source of energy (nonrenewable):	Provides pollen for pollinators:	Provides paper for class:	Positively impacts water quality:	Can reduce carbon dioxide in the air?



Card 4 - Ecosystem Services: Find Something that... (fill in the blank with the item you see or saw).

B	I	N	G	O
Provides food for humans:	Reduces carbon dioxide in the air?	Provides recreational activities:	Provides pollen for pollinators:	Promotes physical activity:
Keeps the climate stable:	Provides humans with light:	Is a source of energy (nonrenewable):	Has economic value:	Is a source of energy (renewable):
Is a habitat for animals:	Allows for plants to grow:	FREE SPACE	Provides paper for class:	Name one not already on here:
Can be used to create clothing:	Reduces the negative effects of flooding:	Provides protection from natural disasters:	Positively impacts human health:	Positively impacts water quality:
Can be used as a raw material:	Is pleasing to the eye:	Positively impacts air quality:	Provides shelter for humans:	Provides a habitat for animals:



Card 1 - Ecosystem Services: ANSWER KEY				
B	I	N	G	O
Positively impacts air quality: Trees	Provides recreational activities: The water	Can be used as a raw material:	Can be used to create clothing:	Provides shelter for humans:
Promotes physical activity:	Keeps the climate stable:	Positively impacts water quality:	Is a source of energy (renewable):	Provides food for humans:
Positively impacts human health:	Reduces carbon dioxide in the air?	FREE SPACE	Provides paper for class:	Provides protection from natural disasters:
Is a source of energy (nonrenewable):	Provides pollen for pollinators:	Allows for plants to grow:	Is a habitat for animals:	Is pleasing to the eye:
Provides humans with light:	Has economic value:	Reduces the negative effects of flooding:	Provides a habitat for animals:	Name one not already on here:

