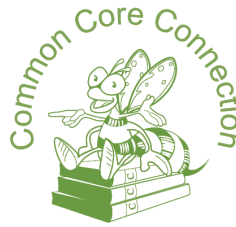


Lesson Plan



Note: This lesson plan should be used with the *Natural Inquirer* Ecosystem Services edition (<http://www.naturalinquirer.org/Ecosystem-Services-i-26.html>).

Time Needed:

3 class periods

Materials (for each student or group of students):

- *Natural Inquirer* Ecosystem Services edition (<http://www.naturalinquirer.org/Ecosystem-Services-i-26.html>)
- Ecosystem Services Graphic Organizer
- Ecosystem Services Key
- Writing utensil
- Blank paper
- Computer (optional)
- Internet (optional)

This lesson plan has students analyze how an article fits into the broader theme of the journal, specifically ecosystem services.

Methods:

Prep

Familiarize yourself with the *Natural Inquirer* Ecosystem Services edition. Make copies of the Ecosystem Services Graphic Organizer.

Day One

Provide copies of the *Natural Inquirer* Ecosystem Services edition to the students. Direct students to first scan the Table of Contents and read the “Welcome to the Ecosystem Services Edition” section.

Then divide the students into groups and assign each group one of the four articles in the journal. Tell students that they will be responsible for reading the article assigned to them, completing the graphic organizer, and finally, sharing the information with the rest of the class.

Provide students copies of the Ecosystem Services Graphic Organizer.

As the students read, they should fill out the various sections of the graphic organizer. Ask students to finish for homework if they haven’t completed the task before class finishes. Remind students to bring their journals and the completed graphic organizers to the next class.

Day Two

Students should use their journals and completed graphic organizers to have a brief discussion with their group about the article they were assigned. During this discussion, students should be picking out the important points to highlight when presenting the article to the rest of the class.

Once every group has discussed and chosen some information to share, provide some time for each group to present or report to the class. The presentation can be one student, or alternatively, each student from the group could say one important point from the article. Ideally, this presentation gives the other students a simple understanding of the article.

Once all students have presented, have students return to their groups to re-read the “Welcome to the Ecosystem Services Edition” section. While they read, write on the board, “How does your article fit into the topic of ecosystem services?”

Give students ten minutes to answer the question on a blank piece of paper. Then come together and ask each group how their article fit into the broader concept of ecosystem services.

Extension

If students have access to computers and the Internet, it’s possible to explore how different land use around the United States impacts ecosystem services. **Note:** This activity can be done as a class with one computer if the screen is projected for all to view.

On the Internet, go to the National Atlas (<http://www.nationalatlas.gov>) and click MAP MAKER. The screen show a map of the United States. Students can access different features on the right side of the screen. First, direct students to add CITIES AND TOWNS and COUNTIES by clicking the box next to each title. STATES should also be selected. Then click “redraw the map” located on the top of the features box. Any time you add or subtract a feature, you must click the “redraw a map” for the map to update.

Direct students where to focus on their map, or alternately, ask students to pick a location. That area can be a state, county, city, or smaller area. Students should zoom in on the chosen area. Students should try to pick a different area than the people sitting immediately adjacent to them.

Once students have zoomed in on their chosen area, ask them to subtract all the features and click “redraw the map.” Then, students should choose “Basic maps,” the BIOLOGY feature, and LAND COVER RESOLUTION 200 feature. Remind students to click “redraw the map.” The map should then show the different colors which represent different land cover types.

Have students click WATER, then click STREAMS AND WATERBODIES. Remind students to click “redraw the map.” Then, explain that land cover is the physical material at the Earth’s surface, including grass, asphalt, trees, bare ground, water, etc. Each land cover impacts ecosystem services. Ask students to click “map key” on the bottom of the map.

Students should now be ready to explore the land cover and ecosystem services in the location they have chosen. On a blank piece of paper, have students write down the general location they have chosen and whether it is a state, county, city, or something smaller. Then, students should list the land cover types they see on the map, as well as the ecosystem services provided by that land cover. A list of ecosystem services can be found on the Ecosystem Services Key.

Hold a class discussion about the ecosystem services the students found on their maps. Ask students:

- What kind of location did students choose?
- What kind of land cover was in the location?
- What kind of ecosystem services did they determine were provided in the area?

- What differences did people see between the scale (state, county, city, etc.)?
- What differences did people see between the land cover types?

Natural Inquirer Ecosystem Services Graphic Organizer

In one or two sentences summarize the main idea of each section listed below.

Thinking About Science

Thinking About the Environment

In one or two sentences summarize the main idea of each section listed below.

Introduction

Method

Findings

Discussion



Ecosystem Services Key

- 1. Water:** Water provides aquatic species habitat, food, and shelter. Water also provides drinking water for humans and animals and water for plants. People may use the waterways as a way to get from one place to another.
- 2. Perennial ice and snow:** Provides fresh water for plants and animals.
- 3. Low-intensity residential:** Provides edge habitat for birds, small mammals, and insects. Open areas maybe used by predators to find prey.
- 4. High-intensity residential:** Some insects and a few songbirds or other birds may be found in the area. Some small mammals may find shelter in houses or in other buildings.
- 5. Commercial/industrial/transportation:** A few birds may nest in the buildings or bridges.
- 6. Bare rock/sand/clay:** Different minerals come from each material. Some plants and animals only live on, under, or around rocks. Bare rock provides a place for reptiles to bask in the sun.
- 7. Quarries/strip mines/gravel pits:** Large pools of water can form in quarries after a rain and provide temporary water for animals.
- 8. Transitional:** This area provides food and shelter for many different types of animals.
- 9. Deciduous forest:** Provides food, shelter, and habitat for a wide variety of animals. Wood can be harvested to make homes and other products. Leaves fall to the ground and provide nutrients to the soil. Soil erosion is reduced in deciduous forests. Trees also take in and hold carbon, which reduces the amount of carbon dioxide in the atmosphere.
- 10. Evergreen forest:** Provides food, shelter, and habitat for animals. Cover is available to animals all year long. Wood can be harvested to make homes and other products. Trees also take in and hold carbon, which reduces the amount of carbon dioxide in the atmosphere.
- 11. Mixed forest:** Provides food, shelter, and habitat for animals. Some cover is available to animals all year long. Wood can be harvested to make homes and other products. Leaves fall to the ground and provide nutrients to the soil.
- 11. Shrubland:** Food, shelter, and habitat for animals. Soil erosion is reduced because plants hold the soil together.
- 12. Orchards and vineyards:** Insects and birds use the edge for shelter and look for food. Shelter is available for small mammals.
- 13. Grasslands/herbaceous:** Grazing habitat for different animals. Habitat for insects and small mammals. The plants reduce soil erosion.
- 14. Pasture/hay:** Grazing habitat for different animals. Habitat for insects and small mammals. The plants reduce soil erosion. People can use the hay for livestock and can sell the hay for money.
- 15. Row crops:** Insect and songbird habitat. A source of food for people. Some wild animals will also eat the crops.
- 16. Small grains:** Songbird, small mammals, and people food sources.
- 17. Fallow:** Habitat and food source for insects, songbirds, and mammals.
- 18. Urban/recreational grasses:** Insect and songbird habitat. Some small mammals may use this area for habitat.
- 19. Woody wetlands:** Great habitat for many different animals—ducks, amphibians, reptiles, and mammals. Many animals will use this area to raise their babies. Source of water for animals. Wetlands filter the water to keep it clean and to reduce flooding in the areas.
- 20. Emergent herbaceous wetlands:** Great habitat for many different animals—ducks, amphibians, reptiles, and mammals. Many mammals will eat the plants that grow in this area.

