

MARINE MAMMAL RESCUE



EARTH SCIENCE

Grades: 4-6

Objectives: Students brainstorm and analyze competing ocean resources and uses. They experiment with designating a marine protected area along an imaginary coastline and discuss the challenges of deciding on rules and restrictions within it.

Sources: National Geographic

RESOURCE LIBRARY

ACTIVITY : 1 HR 30 MINS

Create a Marine Protected Area

Students brainstorm and analyze competing ocean resources and uses. They experiment with designating a marine protected area along an imaginary coastline and discuss the challenges of deciding on rules and restrictions within it.

GRADES

3 - 5

SUBJECTS*Biology, Ecology, Earth Science, Oceanography, Geography, Human Geography***CONTENTS**

1 Link, 1 PDF

OVERVIEW

Students brainstorm and analyze competing ocean resources and uses. They experiment with designating a marine protected area along an imaginary coastline and discuss the challenges of deciding on rules and restrictions within it.

For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/create-a-marine-protected-area/>

DIRECTIONS

1. Activate students' prior knowledge.

Review the vocabulary term resource. Explain that humans use a variety of natural resources that come from the ocean. Draw a vertical line dividing the board in half. You will use the left side for tasks in this step, and the right side for step 4. Draw a two-column chart on the far

left side of the board with the following heads: Ocean Users and Ocean Uses. Have students use what they already know to brainstorm all the ways humans use the ocean. Ask: *Who uses the ocean? How do they use it?* Examples include:

- Fishermen—fish from boats or from shore
- Ships—bring products and materials across the ocean
- Navy/Military—defend, attack, and test military systems
- Hotels, Resorts—use coastlines for rooms and tourist services
- Tourists & Locals—visit the beach, ocean, and tidepools to sunbathe and swim
- Surfers—access waves from the beach
- SCUBA Divers/Snorkelers—use the ocean for recreation
- Scientists—research and test theories and practices

Next to the two-column chart, have students list ocean resources that may not be visible but are important for human use. For each, ask: *How are those resources collected?* Examples include: minerals (from mining); gas and oil (from offshore drilling); and wind and wave energy (from wind turbines and buoys). Finally, to the right of this list, have students list animals that live in the ocean and the ways in which they use ocean resources. Examples of use include: food, shelter/habitat, finding a mate, and giving birth and raising young.

2. Have students make connections by identifying how different ocean resources have competing uses.

Explain to students that sometimes one of these uses of the ocean competes, or gets in the way of, another use. For example, some hotels and resorts along the beach are only open to guests and members, but not to locals who may want to swim, surf, or use the beach. Another example is that fishing makes it harder for fish to survive in their habitat. Invite volunteers to come up to the board and draw a line connecting any two ocean uses that could compete with one another. As each student draws a line, ask what the conflict is and write the conflict on the line. For example:

- Connect “fishermen” and “food” and write “fishermen take fish out of the sea that other fish might eat” on the line.
- Connect “offshore drilling” and “shelter/habitat” and write “an oil spill could pollute the animals’ habitat” on the line.
- Connect “surfers” and “ships” and write “surfers can’t surf where ships travel” on the line.

Give students time to react to the uses their classmates are connecting to inspire new ideas and discussion.

3. Discuss the reasons some areas of the ocean are protected.

Ask students to imagine what would happen if everyone could use the ocean as much as they wanted and exactly the way they wanted. Ask: *What do you think would happen to the ocean? To the animals? To the people who use the ocean?* Write the following question on the board: *Why would people want to protect certain areas of the ocean?* After students have had a chance to respond, read the following reasons aloud:

- to protect some habitats and animals from too many people and/or pollution
- to set aside some areas as recreational, or fun, areas for activities like snorkeling, sailing, or surfing
- to make sure humans are not taking too many fish from the ocean
- to protect a landmark or point of cultural interest (like the *USS Arizona*, which serves as a memorial at Pearl Harbor)
- to make sure there will be healthy, clean habitats in the ocean with many animals for future generations to enjoy and use

Explain to students that the reasons you read aloud are some of the reasons the government sets aside protected ocean areas and these areas are called marine protected areas, or MPAs. Use the board to illustrate for students how MPA is an acronym, or abbreviation using the first letter of each word to make a shorter word. Explain that “marine” means that the area is located in the ocean, and “protected” means that there are rules about what can and can’t happen in the area. These areas are like national or state parks, but in the ocean. Go to the provided NOAA: National Marine Protected Areas Center website and have students locate a marine protected area close to their region.

4. Designate a marine protected area along an imaginary coastline.

Use the provided Our Marine Protected Area: Example as a model to complete this step with students. On the right side of the board, write the head Our Marine Protected Area. Draw an imaginary coastline and label the land and the ocean. Explain to students that, as a class, they are going to create an imaginary state and then create a marine protected area along the coast.

- First, ask students to suggest ideas about types of people, cities, industries, and other uses that could happen in their state. As they offer ideas, ask where on the coastline the people or location should go, and label or draw it.
- Next, ask students to refer to their original lists of Ocean Users and Ocean Uses and create and label places on the drawing for each of the uses. The drawing should be fairly crowded, with overlapping uses.
- Finally, prompt students to think about ways that all the different users could share the coastline and where students would like to designate a marine protected area along the coastline. Ask students to create rules and restrictions that protect ocean uses and resources and write those rules and restrictions in a different color on the drawing. For example, the class could decide that naval ships have to enter the docks around the oil rigs, instead of cutting into the public surfing area. Or they could decide that no fishing is allowed around the resort, but only along the docks and on the fishing grounds. If discussion arises about where to put a use or a rule, encourage students to argue or debate with the goal of trying to come to a consensus.

5. Discuss the MPA designation.

Once the marine protected area drawing is completed, use the following prompts for a whole-class discussion:

- *What were some of the challenges of deciding what rules to create?*
- *What were some of the challenges of deciding where to place the rules?*
- *Did any of your classmates' ideas change your mind about a rule or a use you wanted to include? If so, explain.*
- *Most marine protected areas are agreements between governments, scientists, and local people. Decisions about rules and uses are based on what is best for the environment and what is best for the local people. Do you think it is challenging for scientists and governments to design MPAs? Why or why not?*
- *Do you think MPAs are important? Why or why not?*

Modification

In step 4, provide the following support if students are struggling with creating a realistic coast with multiple uses. Show students the provided example of an imaginary coast and marine protected area. Ask: *On our drawing, where do you think a big city might be located?*

Draw or label the city. Continue with other details such as: a school, a university, a small coastal town, a fishing dock, major ports, a naval port, hotels, and a fish farm.

Informal Assessment

Ask students to write a brief response to the prompt: *Do you think MPAs are important? Why or why not?* Encourage them to include specific details they learned during the activity.

Evaluate their writing based on content.

Extending the Learning

Divide students into small groups. Give each small group the handout *Our Marine Protected Area: Example*. Have each group add additional users, uses, and regulations. As a class, have groups compare and contrast their ideas and work to come to a consensus.

OBJECTIVES

Subjects & Disciplines

Biology

- [Ecology](#)

Earth Science

- [Oceanography](#)

Geography

- [Human Geography](#)

Learning Objectives

Students will:

- identify competing ocean resources and uses
- explain what an MPA is and why they are important
- describe the challenges of designating an area as an MPA

Teaching Approach

- Learning-for-use

Teaching Methods

- Brainstorming
- Discussions
- Information organization
- Modeling

Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
 - Learning and Innovation Skills
 - Communication and Collaboration
 - Creativity and Innovation
 - Critical Thinking and Problem Solving
- Critical Thinking Skills
 - Analyzing
 - Applying

National Standards, Principles, and Practices

NATIONAL GEOGRAPHY STANDARDS

- **Standard 1:**

How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information

- **Standard 13:**

How the forces of cooperation and conflict among people influence the division and control of Earth's surface

- **Standard 4:**

The physical and human characteristics of places

NATIONAL SCIENCE EDUCATION STANDARDS

- (5-8) Standard F-2:

Populations, resources, and environments

- (K-4) Standard F-3:

Types of resources

- (K-4) Standard F-4:

Changes in environments

OCEAN LITERACY ESSENTIAL PRINCIPLES AND FUNDAMENTAL CONCEPTS

- Principle 6g:

Everyone is responsible for caring for the ocean. The ocean sustains life on Earth and humans must live in ways that sustain the ocean. Individual and collective actions are needed to effectively manage ocean resources for all.

Preparation

What You'll Need

MATERIALS YOU PROVIDE

- Colored pencils
- Pencils

REQUIRED TECHNOLOGY

- Internet Access: Required
- Tech Setup: 1 computer per classroom, Projector

PHYSICAL SPACE

- Classroom

GROUPING

- Large-group instruction

OTHER NOTES

Before starting the activity, refer to the handout *Our Marine Protected Area: Example*. Familiarize yourself with Parts 1 and 2 before you complete step 4 of the activity with students.

BACKGROUND & VOCABULARY

Background Information

In the United States, the definition of a marine protected area (MPA) is, by presidential executive order, "any area of the marine environment that has been reserved by federal, state, territorial, tribal or local laws or regulations to provide lasting protection to part or all of the natural or cultural resources therein." Examples of MPAs include national marine sanctuaries, fishery management zones, national parks, marine reserves, and wildlife refuges.

Marine protected areas are designed to protect ocean resources and manage the competing interests of ocean users. Creating and managing MPAs is an important tool to aid in the preservation and restoration of ocean health. They protect vulnerable habitats and species, increase biodiversity, prevent overfishing, conserve resources for future generations, and aid in scientific research. Successful MPAs include an enforcement program aimed at obtaining compliance, a coordinated public communication strategy, and broad-reaching outreach and long-term education initiatives, as well as analysis of the social and economic costs and benefits. Successful planning and designation of MPAs depends on cooperative stewardship and the involvement of all affected stakeholders.

Prior Knowledge

[]

Recommended Prior Activities

- None

Vocabulary

Term	Part of Speech	Definition
buoy	<i>noun</i>	floating object anchored to the bottom of a body of water. Buoys are often equipped with signals.
coast	<i>noun</i>	edge of land along the sea or other large body of water.
coastline	<i>noun</i>	outer boundary of a shore.
habitat	<i>noun</i>	environment where an organism lives throughout the year or for shorter periods of time.
landmark	<i>noun</i>	a prominent feature that guides in navigation or marks a site.
marine protected area (MPA)	<i>noun</i>	area of the ocean where a government has placed limits on human activity.
mining	<i>noun</i>	process of extracting ore from the Earth.
natural resource	<i>noun</i>	a material that humans take from the natural environment to survive, to satisfy their needs, or to trade with others.
ocean	<i>noun</i>	large body of salt water that covers most of the Earth.
oil drilling	<i>noun</i>	process of digging below the surface of the Earth for oil.
pollution	<i>noun</i>	introduction of harmful materials into the environment.
region	<i>noun</i>	any area on Earth with one or more common characteristics. Regions are the basic units of geography.
resource	<i>noun</i>	available supply of materials, goods, or services. Resources can be natural or human.

For Further Exploration

Websites

- [NOAA: National Marine Sanctuaries](#)
- [NOAA: Marine Protected Areas of the United States](#)
- [NOAA: National Marine Protected Areas Center](#)

FUNDER



© 1996-2022 National Geographic Society. All rights reserved.