

RESOURCE LIBRARY

ACTIVITY : 1 HR 15 MINS

Marine Protected Areas

Students explore Marine Protected Areas on an interactive map, compare and contrast marine and terrestrial protected areas, and discuss the importance of Marine Protected Areas.

GRADES

9 - 12+

SUBJECTS*Earth Science, Oceanography, Geography, Human Geography, Physical Geography***CONTENTS**

2 Links, 1 PDF, 1 Video

OVERVIEW

Students explore Marine Protected Areas on an interactive map, compare and contrast marine and terrestrial protected areas, and discuss the importance of Marine Protected Areas.

For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/marine-protected-areas/>

DIRECTIONS

1. Have students use Google Earth to explore Marine Protected Areas.

Explain to students that a Marine Protected Area (MPA) is “any area of the marine environment that has been reserved by federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein.” Ask students to brainstorm reasons a MPA might be established. Write their responses on the board. Project the website Google Earth: Ocean Gallery—Marine Protected Areas on the board. Demonstrate for students how to download the Marine Protected Areas

layer as a .kml file. After downloading, select the Marine Protected Areas layer, and demonstrate how to locate and explore MPAs around the world. Show students the icon they are looking for and how to examine the photos, videos, and stories that accompany each location. For tutorials and additional information regarding the use of Google Earth, refer to this activity's "For Further Exploration" section. Divide students into pairs and assign each group two MPAs from the worksheet Pre-Selected List of Marine Protected Areas. Have each pair use Google Earth's MPA layer to research their assigned MPAs. Tell students to draw four squares on both sides of a piece of paper, and record the following information in the four squares for each of their assigned MPAs:

- Name and location of the MPA
- Ecosystem type
- Purpose of the MPA
- One interesting fact about the MPA

2. Have students share what they learned about their assigned Marine Protected Areas.

After students have had time to record information about both of their assigned MPAs, lead a discussion in which pairs present their findings to the class. Encourage students to think about why the MPAs were established and what natural and cultural resources they are meant to protect. As students discuss their MPAs, have them mark those areas on the Water Planet Mega Map, included in the World Physical MapMaker Kit.

3. Have students compare and contrast marine and terrestrial protected areas.

Draw a T-chart on the board. Ask students to brainstorm differences between terrestrial and marine protected areas. Write students' ideas on the board. If needed, prompt students with the following characteristics:

- Terrestrial Protected Areas—more discrete boundaries; more internally controlled by the life processes of the dominant organisms; people live nearby; food is obtained by farming (cultured); have a longer history
- Marine Protected Areas—relatively open; subject to forces such as tides, circulation patterns, and shifts in overall productivity; people do not live there; food is obtained by

fishing (wild); have not been established as long; animals and pollutants typically travel longer distances due to global currents

Explain that because of these differences, marine systems require different approaches to studying and managing them.

4. Have students reflect on their ideas about Marine Protected Areas in writing.

Write the following questions on the board and ask students to work independently to record their answers:

- *Why do people value national parks and other terrestrial areas that are protected? Does the general population value marine protected areas in the same way? Why or why not?*
- *Do you think a system of marine protected areas is necessary? Why or why not?*
- *What ecological and human factors should be considered when establishing a marine protected area?*
- *Is the establishment of a protected area the only way to preserve the natural and cultural resources of an area? Provide two or three alternatives that could help to protect terrestrial or marine ecosystems.*
- *What value could a marine protected area provide to society?*

If students have difficulty providing alternatives that could help to protect terrestrial or marine ecosystems, provide them with the following examples: fish catches can be managed by limiting the size and amount of fish caught; certain trails may be closed for a time so vegetation and wildlife can reestablish without human interference; and some types of development, such as oil drilling, coal mining, industry, and coastal residences, may be illegal in a particular area due to the presence of a critical habitat or an endangered species.

5. Have a whole-class discussion about students' responses.

After students have finished recording their answers, tell them that thinking about difficult questions and articulating ideas in response to those questions is important to any decision-making process. Have a whole-class discussion about their responses and ideas. Encourage students to also discuss the similarities and differences between the MPAs they researched.

Modification

Have students watch Enric Sala's [TED talk: Glimpses of a Pristine Ocean](#) at home before beginning this activity. The talk presents a case study of the Line Islands that will help students engage in this activity.

Modification

In Step 2, if time is limited, have each group only present one of its assigned MPAs.

Informal Assessment

Review students' written responses to see how well they articulated their ideas. Be sure to identify and address any questions they still have.

Extending the Learning

Have students identify a marine or terrestrial area in their community that is in need of protection, and then write a brief article about the area. Ask students to include the environmental issues the area faces, the natural and cultural resources that are in need of protection, and any stories of local environmental stewardship projects or other human actions that have helped or are currently helping the area.

OBJECTIVES

Subjects & Disciplines

Earth Science

- [Oceanography](#)

Geography

- [Human Geography](#)
- [Physical Geography](#)

Learning Objectives

Students will:

- list reasons a Marine Protected Area might be established
- compare and contrast marine and terrestrial protected areas
- give and support their opinions about resource management of marine areas

Teaching Approach

- Learning-for-use

Teaching Methods

- Brainstorming
- Discussions
- Multimedia instruction
- Writing

Skills Summary

This activity targets the following skills:

- 21st Century Themes
 - Global Awareness
- Critical Thinking Skills
 - Analyzing
 - Understanding
- Geographic Skills
 - Acquiring Geographic Information
 - Analyzing Geographic Information

National Standards, Principles, and Practices

NATIONAL COUNCIL FOR SOCIAL STUDIES CURRICULUM STANDARDS

- Theme 3:

People, Places, and Environments

NATIONAL GEOGRAPHY STANDARDS

- Standard 14:

How human actions modify the physical environment

- **Standard 16:**

The changes that occur in the meaning, use, distribution, and importance of resources

- **Standard 5:**

That people create regions to interpret Earth's complexity

NATIONAL SCIENCE EDUCATION STANDARDS

- **(9-12) Standard F-3:**

Natural resources

- **(9-12) Standard F-6:**

Science and technology in local, national, and global challenges

OCEAN LITERACY ESSENTIAL PRINCIPLES AND FUNDAMENTAL CONCEPTS

- **Principle 5c:**

Some major groups are found exclusively in the ocean. The diversity of major groups of organisms is much greater in the ocean than on land.

- **Principle 6e:**

Humans affect the ocean in a variety of ways. Laws, regulations and resource management affect what is taken out and put into the ocean. Human development and activity leads to pollution (such as point source, non-point source, and noise pollution) and physical modifications (such as changes to beaches, shores and rivers). In addition, humans have removed most of the large vertebrates from the ocean.

- **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

- Paper
- Pencils

REQUIRED TECHNOLOGY

- Internet Access: Required
- Tech Setup: 1 computer per small group, Projector, Speakers

PHYSICAL SPACE

- Classroom

GROUPING

- Large-group instruction
- Small-group instruction

OTHER NOTES

Before starting this activity:

- Download Google Earth and the Marine Protected Areas layer and familiarize yourself with how to navigate to different MPAs. If needed, complete one or more of the Google Earth tutorials.
- Using the MapMaker Kit Assembly video as a guide, print, laminate, and assemble the Water Planet Mega Map.
- Write out the reflection questions for Step 4, but conceal them from students until that part of the activity.

BACKGROUND & VOCABULARY

Background Information

The term *Marine Protected Area* is widely used around the world, but its meaning in one country may be different from its meaning in another. 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.

Prior Knowledge

["An understanding of the types of Marine Protected Areas as well as human impacts on the ocean addressed throughout this unit."]

Recommended Prior Activities

- [Marine Protected Areas: Case Studies](#)
- [Marine Protected Area: Stakeholder Debate](#)
- [MPA Designation and Management](#)
- [Protecting the Ocean](#)

Vocabulary

Term	Part of Speech	Definition
marine protected area (MPA)	<i>noun</i>	area of the ocean where a government has placed limits on human activity.

For Further Exploration

Websites

- [NOAA: National Marine Protected Areas Center](#)
- [TED: Enric Sala—Glimpses of a Pristine Ocean](#)
- [Partnership for Interdisciplinary Studies of Coastal Oceans: Ocean in Google Earth and the Science of Marine Reserves](#)
- [Google Earth: Tutorials](#)
- [Google Earth: Showcase—Ocean](#)
- [Protect Planet Ocean: The WCPA Marine Protected Area Portal](#)
- [National Geographic Education: National Teacher Leadership Academy \(NTLA\)](#)
- [NOAA: Marine Protected Areas of the United States](#)

FUNDER

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