



EARTH: Oceans  
**Protected Paradise**

**PRE-READING PROMPTS:**

- Have you ever visited a national park, or any other protected land—even a city park? Is it important to set aside land for preservation? Why or why not?
- How do you think studying marine preserves will help scientists and governments protect and manage oceans all over the planet?

**DID YOU KNOW?**

- The Mariana Trench is the deepest place on Earth. The deepest part of the trench is called the Challenger Deep; it is 10,911 meters (35,797 feet) below the ocean's surface.
- In 1875, the crew on the *H.M.S. Challenger's* scientific expedition first measured the Challenger Deep. They used a sounding device, which consisted of a 200 kilogram (441 pound) lead weight attached to 232 kilometers (144 miles) of rope with flags attached at regular intervals. The crew would toss the rope overboard and watch how fast the flags went into the water and counted them. They knew it hit bottom when the speeding flags stopped.

**CRITICAL THINKING:**

- The marine monuments were created under the Antiquities Act, signed in 1906 by President Teddy Roosevelt. This act allows the President to set aside places of historic or scientific significance so they can be preserved for future generations without consulting Congress. What do you think may be the advantages and disadvantages of having the President be able to set aside areas without Congress's input? If you were President, what areas would you set aside for protection?

**CROSS-CURRICULAR CONNECTIONS:**

**SOCIAL STUDIES:** Visit the National Park Service Web site to learn more about the Antiquities Act of 1906: [www.nps.gov/history/history/hisnps/NPSHistory/antiq.htm](http://www.nps.gov/history/history/hisnps/NPSHistory/antiq.htm). At the bottom of the page is a list of Presidents and the national monuments they proclaimed. Have students make a timeline showing the national monuments in your state, when they were set aside, and which President established the monument.

**RESOURCES**

- Take a virtual trip to the Mariana Islands' volcanoes with the scientists of Scripps Institution of Oceanography via this Web site: <http://sio.ucsd.edu/marianas/expedition>.
- Learn more about the unusual fish that live near the geothermal vents on the Pacific Ocean's floor at the U.S. Geologic Survey's Web site: <http://pubs.usgs.gov/gip/dynamic/exploring.html>.

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PHYSICAL: Technology  
**So Long to Sorting**

**PRE-READING PROMPTS:**

- Do your school and/or community recycle?
- Do you know what happens to your recycled goods once they are dropped off at the recycling center?
- What are some strategies you think would get more people in your community to recycle?

**DID YOU KNOW?**

- Some say the current recycling movement was started in 1987 by the *Mobro 4000*, a barge that hauled the same load of garbage from New York to Central America and back, looking for a facility that would accept the trash. It took a long legal battle to get an incineration facility in Brooklyn to burn the garbage, and the ashes were eventually buried in the Long Island community where the garbage originated.
- According to the EPA, in 2007 Americans generated about 254 million tons of trash. That works out to be about 2.1 kilograms (4.6 pounds) of trash from every person every day! Approximately 85 million tons (33.4 percent) was recycled.

**CRITICAL THINKING:**

- What are we going to do in the next 20 years to reduce the amount of garbage we create and increase the percent that we recycle? What combination of incentives and penalties would be most effective? How committed are you personally to reducing the amount of garbage you contribute to the pile?

**CROSS-CURRICULAR CONNECTIONS:**

**MATH:** Have your students calculate the approximate amount of garbage generated by their family on a daily basis (2.1 kg multiplied by the number of family members). What about on a weekly and annual basis? Take it further and calculate the amount of garbage generated each day in the city or town you live in! (*Answer: For a four-person household: 8.4 kg per day; 58.8 kg per week; and 3,057 kg per year.*)

**RESOURCES**

- Can I recycle that? Plug in the material you want to recycle and your postal code here to find out what your local recycling plant takes: [www.earth911.com](http://www.earth911.com).
- Learn more about each step of the single-stream recycling system at this interactive Web site: [www.explorethecycle.com](http://www.explorethecycle.com).
- Check out the most recent facts and figures about Municipal Solid Waste in the U.S. at the EPA's Web site: [www.epa.gov/osw/conserves/rrr/recycle.htm](http://www.epa.gov/osw/conserves/rrr/recycle.htm).

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LIFE: Farms  
**Farm-Fresh Perspective**

**PRE-READING PROMPTS:**

- Where does your food come from and what happens to it before it ends up on your grocery-store shelf?
- Would you want to go to school on a farm and learn how to care for animals, grow vegetables, or gather maple syrup?
- What do you think “organic” means and how is organic food different from other food sold in our grocery stores?

**DID YOU KNOW?**

- According to the U.S. Department of Agriculture, the total number of certified organic farms in the country has more than doubled from 3,587 in 1992 to 8,493 in 2005.
- On average, the produce you eat in the U.S. travels approximately 2,100 kilometers to 3,200 kilometers (1,304 miles to 1,988 miles) from where it is grown to your house.
- According to the National Sustainable Agricultural Information Service, a nonprofit organization, approximately 80 percent of energy used in the U.S. food system goes to processing, packaging, transporting, storing, and preparing food. Only 20 percent of the total energy consumed is used to grow the food.

**CRITICAL THINKING:**

- Over the past few years, people have become more interested in where their food comes from. Some people believe that eating locally-produced food is better for them and for the environment. Can you think of some advantages and disadvantages of becoming a “locavore” (a person who is committed to eating local food as much as possible)? Would you like to become a locavore? Why or why not?

**CROSS-CURRICULAR CONNECTIONS:**

**ART:** Some organic farms use a method called companion planting, where they plant certain plants near each other to control pests or improve yield. For example, many gardeners plant marigolds near their tomato plants so that the pests will be attracted to the bright flowers instead of the tomato plant. Using the chart of companion plants at this Web site:

<http://attra.ncat.org/attra-pub/complant.html>, have students draw a plan for an organic garden at school that abides by these companion planting principles.

**RESOURCES**

- Find out ten ways to become a locavore and watch a video about growing local and eating local on this PBS Web site: [www.pbs.org/now/shows/344/locavore.html](http://www.pbs.org/now/shows/344/locavore.html).
- How far has your food traveled? Check out this food miles calculator: [www.organiclinker.com/food-miles.cfm](http://www.organiclinker.com/food-miles.cfm).
- Read all about Michael Pollan’s quest to find out where his food comes from in his book *The Omnivore’s Dilemma* (Penguin, 2007).



EARTH: Rivers  
**Rough Waters**

**PRE-READING PROMPTS:**

- Do you know where the Congo River is?
- Africa’s Congo River has one of the most diverse fish populations of any river on Earth. What do you think created this exceptional diversity?
- What human activities do you think could be threatening the Congo River’s habitat?

**DID YOU KNOW?**

- The Congo River is Africa’s most powerful river and Earth’s second largest river by volume, after the Amazon River in South America. The Congo River drains a basin of 3.68 million square kilometers (1.42 million square miles).
- At 4,700 km (2,920 mi) in length, the Congo is the eighth longest river in the world and the second longest river in Africa (after the Nile).
- The Congo River drains water from both the Northern and Southern Hemispheres and crosses the equator twice. This unique route causes the river’s volume to be relatively stable throughout the year because some part of its watershed is always in a rainy zone.

**CRITICAL THINKING:**

- The Congo River has the potential to be a rich source of hydroelectric power for West Central Africa. It also is a transportation and communication resource for large areas not served by roads. How do you think the people and governments of the countries surrounding the Congo River balance their needs for power and transportation with the need to protect the river’s incredible diversity of plant and animal life?

**CROSS-CURRICULAR CONNECTIONS:**

**LANGUAGE ARTS:** When Melanie Stiassny studies the Congo River, she enlists the help of world-class kayakers that navigate the rough waters. Have students write a short story about what it is like to brave those rapids in search of the special fish that Stiassny researches.

**RESOURCES**

- Take a look at the American Museum of Natural History’s animation of land-cover mapping of the Congo River using satellites and computers: [www.amnh.org/sciencebulletins/bio/v/congoriver.20060601](http://www.amnh.org/sciencebulletins/bio/v/congoriver.20060601).
- Check out the nonprofit group International River’s fact sheet about the proposed hydroelectric dams on the Congo River. [www.internationalrivers.org/en/node/345](http://www.internationalrivers.org/en/node/345).
- Watch clips from National Geographic’s Explorer episode about the bizarre fish of the lower Congo at their Web site: <http://channel.nationalgeographic.com/series/explorer/3826/Overview>.