LESSON PLANS

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LIFE: Parasites

Biting Back

PRE-READING PROMPTS:

- What is a parasite? What human parasites can you think of?
- What are bedbugs? Do you think that they are a problem in the United States?
- What factors might be allowing bedbugs to spread?

DID YOU KNOW?

- While you may think that bedbugs are attracted to blood, it's actually your body's warmth and the carbon dioxide you exhale while sleeping that lures these mainly nocturnal creatures from their daytime hiding places.
- Bedbugs prefer human hosts, but they have been known to also feed on rodents, dogs, cats, bats, and even birds.
- Unlike head lice, which live on human scalps and hair, bedbugs usually do not live on people. Rather, these pests hide near where people sleep. They seek out places such as cracks and crevices in furniture and baseboards, seams of mattresses and carpeting, and behind loose wallpaper.

CRITICAL THINKING:

- Bedbugs are notorious hitchhikers, and scientists believe that their recent resurgence is due to an increase in people traveling internationally. What are some other pests, invasive species, and diseases that have (or could) come to the U.S. with an unaware globetrotter? What sort of precautions do you think can be taken to avoid the importing of each of these types of undesirables?

CROSS-CURRICULAR CONNECTIONS:

LANGUAGE ARTS: Have your students create an informational brochure about bedbugs that could be placed in travel agent offices and airports. Using some of the Web sites in the Resources section below, students can find information about the life cycle of bedbugs, how to look for evidence of bedbug infestations, and how dogs can help hotels, hospitals, and homeowners stay bedbug-free.

RESOURCES

You can access these Web links at **www.scholastic.com/scienceworld**.

- The Harvard School of Public Health's Web site answers your frequently asked questions about bedbugs: **www.hsph.harvard.edu/bedbugs**.
- Check out a slide show about bedbugs at WebMD: **www.webmd.com/skin-problems-and-treatments/slideshow-bedbugs**.
- The University of California's Integrated Pest Management Web site has information about the life cycle and management of bedbugs: **www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7454.html**.

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EARTH: Fossils

Teen Dinosaur Hunters

Be sure to download a *Science World* PowerPoint about fossils at www.scholastic.com/scienceworld.

PRE-READING PROMPTS:

- What is a fossil?
- How is a fossil formed?
- Would you want to attend a high school with a museum on its campus and special paleontology classes? What other specialized science classes do you wish your school offered?

DID YOU KNOW?

- The word "fossil" comes from the Latin word *fossilis*, which means "dug up."
- The first nearly complete dinosaur skeleton ever found in the U.S. was that of a Hadrosaurus. While on vacation in Haddonfield, New Jersey, in 1858, amateur geologist William Parker Foulke heard that workers had found a giant bone 20 years earlier. He decided to explore the site, and excavated most of the dinosaur's skeleton over the next several months.

CRITICAL THINKING:

- The fossils that the Webb students study are petrified fossils, where minerals replace an organism's bones. Amber is another type of fossil; it forms when an organism is trapped within a plant's resin and then the resin hardens into amber. Based on this knowledge of how petrified and amber fossils form, how might the information gathered by studying these two types of fossils be different?

CROSS-CURRICULAR CONNECTIONS:

HISTORY/MATH: Create a geologic timeline by taping together sheets of paper to make a 4.6-meter-long (15 feet) strip. The timeline's scale will be: 1 centimeter (.39 inches) = 10 million years. Label the left end "Earth formed" and the right end "Today." Using textbooks or other research materials, mark the length of time on the paper that represents the Cenozoic, Mesozoic, Paleozoic, and Precambrian eras. Take it further by adding major events of geologic time (e.g. K-T extinction) and illustrations of each era's organisms.

RESOURCES

You can access these Web links at **www.scholastic.com/scienceworld**.

- Check out the University of California Museum of Paleontology's Web site for teacher and student resources: **www.ucmp.berkeley.edu/education**.
- Visit the San Diego Natural History Museum's Dinosaur Dig Web site: **http://sdnhm.org/kids/dinosaur/index.html**.
- Play games, take quizzes, and more at the American Museum of Natural History's PaleontOLogy Web site: **www.amnh.org/ology/index.php?channel=paleontology**.

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LIFE: Endangered Species

In Search of Snow Leopards

PRE-READING PROMPTS:

- Snow leopards are big cats that live in the Himalayas. What sorts of challenges would these animals encounter in such a high, rugged terrain?
- The snow leopard is an endangered species. What threats might snow leopards face?
- There is great tension between snow leopards and some local farmers and herders. What might be the source of this tension?

DID YOU KNOW?

- A snow leopard is able to kill prey up to three times its weight. Usually, it hunts wild sheep and goats. Once they successfully catch their prey, snow leopards will eat slowly, taking three or four days to consume the entire animal.
- The snow leopard was declared "endangered" and added to the International Union for Conservation of Nature and Natural Resources' Red List of Threatened Species in 1972.
- While they are members of the cat family, snow leopards can neither purr continually like small cats can, nor can they roar like most big cats do.

CRITICAL THINKING:

- Snow leopards are rarely seen in the wild, even by people who live in the same remote mountain habitat. Yet, humans are the main threat to their existence. What do you think is the most important strategy for preserving snow leopards? What would you do to help keep the farmers and herders from killing these cats?

CROSS-CURRICULAR CONNECTIONS:

ART: Snow leopards are perfectly adapted to their harsh environment. They have white, yellowish, or smoky-gray fur patterned with dark-gray-to-black spots and rosettes. These markings camouflage them against the rocky slopes, helping them sneak up on their prey. Each cat's spot pattern is unique and can be used to identify it. Check out the pictures of snow leopards at this Web site: **www.snowleopard.org/photos/photogallery**, and draw a habitat that you believe reflects this unique patterning.

RESOURCES

You can access these Web links at **www.scholastic.com/scienceworld**.

- Check out some classroom activities provided by the Snow Leopard Conservancy at this Web site: **www.snowleopardconservancy.org/kids/text/activities.htm**.
- The Planet Earth "Mountains" segment shows rare footage of a snow leopard hunting prey: **http://dsc.discovery.com/videos/planet-earth-mountains-snow-leopard-hunt.html.**
- Learn more about threatened species at the International Union for Conservation of Nature and Natural Resources' Web site: **www.iucnredlist.org**.

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PHYSICAL: Atoms

Saving the Ozone Layer

Note to Teachers: In "Hands-On Science" on p. 21, students will act out the key steps in the breakdown of ozone by CFCs. This is only part of the complex interaction among UV light, chlorine, and ozone taking place in the upper atmosphere. While chlorine atoms further break apart oxygen molecules, ozone is also constantly being created and destroyed as UV light strikes pairs and trios of oxygen atoms.

PRE-READING PROMPTS:

- What is ozone? Why is it important?
- A major hole in the ozone layer has formed over one continent. Which continent do you think that is?
- What human activities do you think contributed to the hole in the ozone layer?

DID YOU KNOW?

- Just as the ozone hole expands over Antarctica in the fall, an ozone hole forms over the Arctic Ocean each spring.
- French physicists Charles Fabry and Henri Buisson first discovered the ozone layer in 1913.
- Ozone molecules are constantly being broken apart by ultraviolet light and recombining to form new ozone in the upper atmosphere.

CRITICAL THINKING:

- How is the issue of ozone depletion similar to today's topic of global warming? Do you think the Montreal Protocol could be used as a prototype to tackle climate change? Why or why not?

CROSS-CURRICULAR CONNECTIONS:

SOCIAL STUDIES: CFCs aren't the only chemicals to be banned after they were discovered to damage the environment. Last summer, Spokane, Washington, banned the use of phosphates in dishwashing detergents, due to concerns about the chemicals' effect on the local waterbodies. Should this ban be made national? Split into two groups: those in favor of a national ban, and those against it. For more information on phosphates, check out this site on reducing phosphorus from Washington State's Department of Ecology: **www.ecy.wa.gov/programs/wq/nonpoint/phosphorus/PhosphorusBan.html**.

RESOURCES

You can access these Web links at **www.scholastic.com/scienceworld**.

- For lesson ideas using atmospheric data from NASA, go to **http://mynasadata.larc.nasa.gov/L9_Murphy.html**.
- Learn more about what you can do to protect yourself from harmful UV rays, at the EPA's SunWise Kids Web site: **www.epa.gov/sunwise/kids/kids_ozone.html**.
- NASA's Ozone Hole Watch Web site has a multimedia gallery full of ozone-related videos and animations: **http://ozonewatch.gsfc.nasa.gov/multimedia/index.html**.