



# ScienceWorld®

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ISSUE DATES 9/1 9/15 10/6 10/27 11/10-24 12/8 1/12 2/2 2/23 3/16 4/6 4/20 5/11

melinda mills, an education consultant and retired science teacher from Houston, Texas, with more than 30 years of teaching experience, contributed to this issue's teacher's edition.

This year, *Science World* celebrates its 50th anniversary. In "Happy 50th Birthday" (p. 8), students will read about how science has changed over the years and see how *Science World* has covered these advances. Challenge your students to think of what current cutting-edge science will be commonplace in 2059, and send us their ideas (see TE 6). We also welcome any tips, topics, stories, and suggestions you want to share. E-mail us at [scienceworld@scholastic.com](mailto:scienceworld@scholastic.com).

—The Editors

## Features

PAGE	CONTENT	TITLE SUMMARY	NATIONAL SCIENCE EDUCATION STANDARDS	LESSON IDEAS
8	Special Section	<b>Happy 50th Birthday</b> <i>Science World</i> is celebrating 50 years of science reporting.	<b>Grades 5-8:</b> History of science <b>Grades 9-12:</b> Historical perspectives	What will make headlines in 2059? Students will write their own future <i>Science World</i> stories on <b>TE 6</b> .
12	Physical: Elements	<b>Weight &amp; Switch</b> What one teen is doing to protect waterbirds from lead poisoning.	<b>Grades 5-8:</b> properties and changes of properties in matter <b>Grades 9-12:</b> Natural and human-induced hazards	the teacher to teacher tip (below) includes an <b>activity</b> about designing fishing lures.
14	Earth: Glaciers	<b>Freed From the Ice</b> As glaciers melt, they are revealing amazing finds.	<b>Grades 5-8:</b> Structure of the earth system <b>Grades 9-12:</b> Geochemical cycles	With the <b>Hands-on activity</b> on p. 18, students will model how glaciers move.
20	Life: Genetics	<b>DNA Detectives</b> Scientists are using technology to battle crimes against wildlife.	<b>Grades 5-8:</b> understandings about science and technology <b>Grades 9-12:</b> understandings about science and technology	the activity on <b>TE 7</b> will help students learn more about illegal trafficking of protected species.

### Coming Next Issue

- See how one teen does skate park tricks in his wheelchair.
- Why do baseball bats break at the ballpark?
- Name that element!

## Teacher to Teacher

### Tips for using Science World in the classroom

**Melinda Mills**, this teacher's edition's contributor, suggests: After the class reads "Weight & Switch" (p. 12), tell students they are going to design a new fishing lure. Since lures are designed to catch a particular type of fish, have students use the Fishopedia at [www.takemefishing.org/fishing/fishopedia/species-explorer/details/overview](http://www.takemefishing.org/fishing/fishopedia/species-explorer/details/overview) to pick out a fish species they want to catch. Then, they will write a profile of the fish that includes such details as habitat and fishing method, and what attracts the fish. Provide the class with materials for constructing the lures, such as paper clips, craft sticks, aluminum foil, and construction paper, as well as washers and coins to serve as weights for the lures.



Melinda Mills



Special Section  
**Happy 50th Birthday**

**PRE-READING PROMPTS:**

- What technologies are available today that were unknown before microprocessors were developed?
- Since the Industrial Revolution, human dependence on which natural resource has dramatically increased?
- Which of today's recent scientific developments do you think will become as commonplace in the future as the personal computers that are now found in many homes?

**DID YOU KNOW?**

- The American Automobile Association reported in February 1974 that 1 in 5 gas stations had no fuel at all! To accommodate this shortage, gas was rationed according to license plate numbers. People whose license plate ended in an odd number (or a letter) could get gas only on odd-number days of the month, while those with an even ending could get gas on even-number days.
- The first computer filled an entire 9 meter (29 foot) by 15 meter (49 foot) room, but stored only five megabytes. Today's computers can store 400,000 megabytes on a hard drive that is barely bigger than 3.5 inches (8.9 centimeters) in diameter. That's smaller than a paperback book.

**CRITICAL THINKING**

- What do you think the world would be like without each of the developments discussed in the article? Have a classroom discussion about it.

**CROSS-CURRICULAR CONNECTIONS:**

**SOCIAL STUDIES:** Split the class into six groups. Have each group research the history of individual topics covered in the story: satellites, Mars exploration, climate change, energy consumption, computers, and growing tissues and organs. Have the teams make a timeline of the key discoveries that made these predictions realities and then have them present their findings to the class.

**Resources**

- I learn more about energy at this informative, interactive site: [www.alliantenergykids.com](http://www.alliantenergykids.com).
- See what's new in mars exploration at NASA's Web site: <http://marsprogram.jpl.nasa.gov/allabout>.
- Find out more about growing tissues using nanotechnology at the new exhibit at the Science museum in London: [www.sciencemuseum.org.uk/antenna/nano/skin/index.asp](http://www.sciencemuseum.org.uk/antenna/nano/skin/index.asp).

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PHYSICAL: Elements  
**Weight & Switch**

**PRE-READING PROMPTS:**

- What do you think an ecotoxicologist studies?
- Lead is known to be dangerous to humans when it is in products like paint, which can peel and be ingested. Based on this information, how might lead fishing weights affect birds?
- If lead weights are unsafe, do anglers have to abandon fishing as a hobby? What could they do instead?

**DID YOU KNOW?**

- More than 3,000 years ago, fishing lures and weights were made of bronze and bone.
- One of the biggest lures ever made is the 2.4 meter (8 foot)-long torpedo-shape wooden lure called "Bassmonger." It weighs more than 90 kilograms (200 pounds), and Ron Mirabile, the man who made it, hauls his lure across the country on the back of a trailer because it won't fit in his tackle box. He uses it to publicize his fishing-lure business.
- By studying six strands of hair and a few small pieces of skull, scientists recently concluded that Ludwig van Beethoven died of lead poisoning.

**CRITICAL THINKING**

- Michael Browne, the teen featured in the article, went to fishing derbies to educate anglers about the dangers of lead weights. What other methods would be helpful in spreading the word? Which education methods would be most effective in your community? Why?

**CROSS-CURRICULAR CONNECTIONS:**

**ART:** You decide it's time to help spread the word about lead sinkers so you reserve a booth at the local Outdoor Anglers' Show. Prepare the following items to display: 1) an eye-catching sign that will "lure" participants to your booth, 2) a fact sheet describing the dangers of lead fishing weights to birds and other wildlife, and 3) a list of safer alternatives to lead weights. For more ideas, read: [www.usgs.gov/newsroom/article.asp?ID=1972](http://www.usgs.gov/newsroom/article.asp?ID=1972).

**Resources**

- Visit the Centers for Disease Control and prevention's Web site to learn about ways to avoid lead exposure: [www.cdc.gov/Features/ChildhoodLead](http://www.cdc.gov/Features/ChildhoodLead).
- See videos on lead mining, dangers, recycling, and more here: <http://videos.howstuffworks.com/discovery/34893-howstuffworks-show-lead-recycling-video.htm>.
- I learn how to make your own fishing lures at this site: [www.tacklemaking.com](http://www.tacklemaking.com).

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EARTH: Glaciers  
**Freed From  
 the Ice**

**PRE-READING PROMPTS:**

- In what parts of the world would you expect to find glaciers?
- Many glaciers are rapidly melting. What might be the cause?
- What do you know about mummies? What conditions do you think are necessary for a mummy to be preserved for thousands of years?

**DID YOU KNOW?**

- Glaciers cover 10 percent of the world's land area and store approximately 70 percent of its fresh water. If all the glaciers on Earth were to melt, the sea level would rise about 70 meters (230 feet).
- Glaciers are found on all of the world's continents. Although the island of Australia doesn't have any glaciers, its neighbor New Zealand (which is considered part of the continent of Oceania, along with Australia) boasts two famous ones: Fox Glacier and Franz Josef Glacier.

**CRITICAL THINKING**

- Bacteria and fungi are simple organisms. In order to thrive, they require an environment that provides food, water, and air, is not too hot or cold, and is not too acidic or alkaline. With this in mind, explain why ice mummies remain so well preserved while frozen but begin to decompose once thawed? What might museum curators do to prevent the decomposition of ice mummies and other artifacts on display?

**CROSS-CURRICULAR CONNECTIONS:**

**SOCIAL STUDIES:** When archaeologists find human remains in a glacier or at any other site, they are presented with a dilemma: Should they examine the remains to learn more about the culture of the deceased or should they turn the body over to its descendants or to a final resting place? Split into two groups and debate each option.

**Resources**

- Look at dramatic pictures showing how Glacier National park's glaciers have changed over the years at the United States Geological Survey's Repeat photography project Web site: [www.nrmisc.usgs.gov/repeatphoto/overview.htm](http://www.nrmisc.usgs.gov/repeatphoto/overview.htm).
- Find everything you ever wanted to know about all the different kinds of mummies at [www.mummytombs.com](http://www.mummytombs.com).
- This site from NoVA, which accompanied the original broadcast of *Mummies*, has classroom activities and ideas from teachers: [www.pbs.org/wgbh/nova/icemummies](http://www.pbs.org/wgbh/nova/icemummies).



LIFE: Genetics  
**DNA  
 Detectives**

**PRE-READING PROMPTS:**

- What are some illegal products made from threatened or endangered species?
- Does a person need to have any special permits to import products that are made from legally protected species?
- How do you think scientists are working to prevent illegal imports of products made from threatened and endangered species?

**DID YOU KNOW?**

- In 2007, the U.S. Humane Society tested what claimed to be faux fur trim on several imported name-brand jackets. Unfortunately, it wasn't "fake fur"—but "Fido fur" instead. The importation was illegal, because it has been against the law to bring products containing dog and cat fur into the country since 2000.
- After observing a tourist's hair moving and making noise, a U.S. Customs official searched her and found a tiny drugged marmoset in her hairdo. The woman was attempting to smuggle the small monkey into the country.

**CRITICAL THINKING**

- Television dramas about crime scene investigations are very popular. In a phenomenon known as the "CSI effect," viewers believe they have gained a basic understanding of DNA testing and other forensic techniques from these shows. However, many law enforcement officials and scientists disagree, saying the information presented on the shows is generally incomplete, misleading, or simply incorrect. Do you believe the "CSI effect" could affect a juror's ability to fairly evaluate evidence? Explain.

**CROSS-CURRICULAR CONNECTIONS:**

**LANGUAGE ARTS:** While many people know that poaching is illegal, they may not know that importing goods made from poached and endangered species is against the law as well. Write a letter to a fictional traveler explaining this difference and reminding the person to be wary of some of the goods he or she may encounter on vacation.

**Resources**

- Learn more about the laws governing the trade in animal products at the Convention on International Trade in Endangered Species of Wild Fauna and Flora Web site: [www.cites.org](http://www.cites.org).
- Find out about other cool ways scientists at the U.S. Fish and Wildlife Service are using forensics to solve crimes against animals: [www.lab.fws.gov](http://www.lab.fws.gov).
- Have students create their own DNA aliases: [www.nature.ca/genome/05/051/0511/0511\\_m205\\_e.cfm](http://www.nature.ca/genome/05/051/0511/0511_m205_e.cfm).

Name: \_\_\_\_\_



# Science News



**DIRECTIONS:** Read the Science News section on pages 3 to 7.

Then, test your knowledge by filling in the letters of the correct answers below.

**1** Which of the following is the least deadly natural hazard for people in the United States?

- Ⓐ Hurricanes, earthquakes, and wildfires
- Ⓑ Winter weather
- Ⓒ Heat and drought
- Ⓓ Tornadoes

**2** What was the first step in the study to test dogs' sense of fairness?

- Ⓐ Researchers petted and verbally praised one dog but not the other.
- Ⓑ Two dogs were asked to shake paws with a researcher.
- Ⓒ The dogs were asked to switch places with each other.
- Ⓓ One dog received a treat, but the other did not.

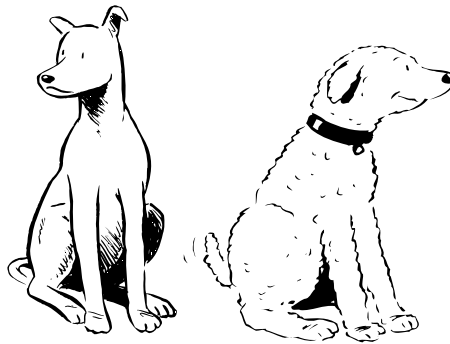
**3** What was the outcome of rewarding dogs unequally for completing the same task?

- Ⓐ The dogs became jealous and snapped at each other.
- Ⓑ The dogs tossed aside rewards that were not as attractive as those received by other dogs.
- Ⓒ Unrewarded dogs refused to repeat the task when asked.
- Ⓓ Dogs that didn't get a treat barked at the researchers.



**4** Coal ash is a \_\_\_\_.

- Ⓐ by-product of burning coal to generate electricity
- Ⓑ dust emitted from the smoke stacks of power plants
- Ⓒ residue left over from mining coal
- Ⓓ type of dangerous chemical



**5** Which sentence best summarizes why environmentalists and scientists are worried about coal-ash pits?

- Ⓐ The spill in Tennessee sickened local residents.
- Ⓑ Coal-ash pits are not sturdily constructed.
- Ⓒ There are no federal laws to regulate the pits, which contain toxic heavy metals.
- Ⓓ Coal-ash spills are extremely expensive to clean up.

**6** A new theory suggests that people yawn \_\_\_\_.

- Ⓐ because their bodies are too warm
- Ⓑ when they are bored
- Ⓒ to take in more oxygen
- Ⓓ to help to cool their brains

**7** Which animal is NOT a vertebrate?

- Ⓐ bird
- Ⓑ human
- Ⓒ snake
- Ⓓ lobster

**8** How does the Key2SafeDriving device help keep teen drivers safe?

- Ⓐ The device disables cell phones, so teens can't chat while driving.
- Ⓑ It prevents teens from starting a car without parents' permission.
- Ⓒ It sends a signal to parents, notifying them of their teen's location when behind the wheel.
- Ⓓ The device alerts drivers that they are going too fast.

**9** An electrical generator connected to an exercise bike's spinning wheels converts \_\_\_\_.

- Ⓐ kinetic energy into mechanical energy
- Ⓑ mechanical energy into electrical energy
- Ⓒ chemical energy into potential energy
- Ⓓ potential energy into mechanical energy

**10** What fastest-feat record did a group of Canadian adventurers recently break?

- Ⓐ climbing to the top of Mount Everest
- Ⓑ crossing Antarctica to reach the South Pole
- Ⓒ sailing around the world
- Ⓓ swimming the English Channel

Name: \_\_\_\_\_

Page **12** **Weight & Switch****DIRECTIONS:** Correctly match the sentence in the left column with the word or phrase in the right column.

- |   |                              |
|---|------------------------------|
| ___ 1. This toxic heavy metal can disrupt many organ systems in humans and animals. | a. tin, ceramic, and steel   |
| ___ 2. These safe materials can be used to replace lead in fishing weights.         | b. pebbles                   |
| ___ 3. Waterbirds swallow these on purpose to aid in digestion.                     | c. trumpeter swans and loons |
| ___ 4. Lead poisoning is responsible for the death of many of these waterbirds.     | d. lead                      |
| ___ 5. This side effect of lead poisoning makes birds easy targets for predators.   | e. poor balance              |

Page **14** **Freed From the Ice****DIRECTIONS:** Circle the incorrect word or phrase below, and write the correct word or phrase above it.

- Glaciers form in areas of low latitude and high altitude.
- Ice patches are like tiny glaciers that rapidly move.
- Global warming is causing glaciers to freeze faster than they ever have in recent times.
- Once exposed to air, a wooden tool could last unfrozen for only 50 to 100 years.

Page **20** **DNA Detectives****DIRECTIONS:** Fill in the blanks to complete the following statements.

- Scientists can use \_\_\_\_\_, or the chemical that carries hereditary information, to identify the animal that was used to make leather products like handbags.
- DNA is made up of four different chemicals called \_\_\_\_\_.
- Short sections of DNA, known as the \_\_\_\_\_, are searched against a computer database of sequences to help determine if a product is made from a legally protected species.
- For a machine to easily read a DNA sequence, scientists must first \_\_\_\_\_, or copy, the barcode region.

Name: \_\_\_\_\_

# You're the Reporter

After you've read "Happy 50th Birthday" (pp. 8-11), write an article about a science story that you think will be making headlines in the year 2059. Be sure to include how everyday life will be different because of the scientific advancement. Make sure to include: 1) an exciting headline describing the scientific event, 2) an illustration to get the reader's attention, and 3) a summary of what has occurred and why it is so remarkable.

<p>Headline:</p>	<p>Illustration:</p>
<p>Story Summary:</p>	
<p>Written By: _____</p> <p>School: _____</p> <p>School Address: _____</p> <p>_____</p>	

**Take it Further!** On the back of this sheet of paper, draw a *Science World* cover featuring your news story. If you want to share your story with us, mail it to: **Science World, Scholastic Inc., 557 Broadway, New York, NY 10012.**

Name: \_\_\_\_\_

# Illegal Goods

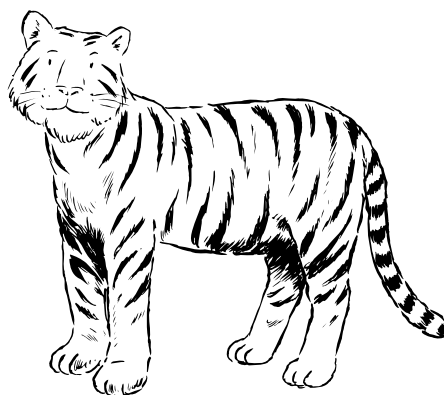
As you read in “DNA Detectives” (pp. 20-21), scientists are inspecting DNA to determine if imported animal goods like some handbags are made from legally protected species. Organizations exist to monitor the trade of animal goods. Below is a data selection from 2007 of goods made from several species of legally protected animals that were illegally imported into the United States. Complete the activity to learn more.

**Number of Goods Made From Various\* Legally Protected Species Found to Be Illegally Imported into the U.S. in 2007**

Species	Number of Goods
American alligator	1,073
Asian black bear	92
Brown caiman	467
Leopard	847
Longsnout sea horse	83
Reticulated python	243
Tiger	434
Yellow-headed Amazon parrot	37



SOURCE: Convention on International Trade in Endangered Species and Wild Flora and Fauna Database, 2007  
 \*Note: Not all species are included.



**Graph it**

On graph paper, create a bar graph comparing the number of goods from each species that was found to be traded illegally. Give your graph a title, and don't forget to label the x- and y-axes.

**Analyze it**

1. According to your graph, goods made from which legally protected species were imported into the U.S. in greatest numbers? Fewest?
2. Of the goods found to be made from legally protected animals, were the majority made from mammals, birds, fish, or reptiles?
3. What is the total number of goods made from legally protected species?
4. What percent of the total goods were made from mammals?