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Welcome to *Science World's* Teen Life double issue! It is jam-packed with stories covering everything from a student who built his own earth-friendly vehicle to a special teen-focused installment of our "Name That Element!" series.

As always, e-mail any tips, topics, or suggestions to us at scienceworld@scholastic.com.

—The Editors

Take the Science World Survey online at www.scholastic.com/scienceworldfall09survey

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For more resources, PowerPoints, and Web links visit www.scholastic.com/scienceworld/

Teacher to Teacher

Tips for using *Science World* in the classroom

Priscilla Chan, a science teacher at Brooklyn School for Collaborative Studies in New York City, suggests: To stimulate

students' curiosity and questioning, I cut out pictures from *Science World*, and give them to small groups of students. Then, I ask them to write down what questions they think that the scientists may have been posing about the picture's subject. When they're done, the students read the associated article and see if their predictions were accurate, and if not, they learn what area of investigation scientists are really studying.



Priscilla Chan

PAGE **8**

LIFE: Nutrition

Plumped Up Portions

DID YOU KNOW?

- The U.S. Department of Agriculture defines standard serving sizes for dietary guidance, while the Food and Drug Administration defines standard servings for food labels.

CRITICAL THINKING:

- Why do you think that portion sizes are growing? What are some strategies to monitor your portion sizes?

CROSS-CURRICULAR CONNECTIONS:

GEOGRAPHY: Visit the slideshow at www.time.com/time/photogallery/0,29307,1626519,00.html that is based on Peter Menzel and Faith D'Aluisio's book *Hungry Planet*, Ten Speed Press, 2005. Each slide shows what a family in various parts of the world eats each week and the cost of these foods. Using a map of the world, mark the various countries represented, the family's favorite foods, and their weekly expenditures. How do the tastes and budgets compare?

RESOURCE Find this link at www.scholastic.com/scienceworld
■ Want to devise a healthy eating plan? Check out the USDA's MyPyramid Web site for tips, tools, and more: www.mypyramid.gov.

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EARTH: Water Cycle

Would You Drink Toilet Water?

DID YOU KNOW?

- The average American uses approximately 150 gallons of water per day.

CRITICAL THINKING:

- Normally, the cleaned product from wastewater treatment plants is released into rivers and oceans. If treated wastewater is already in our rivers and oceans that feed the groundwater basin, how radical do you think Orange County, California's drinking-water program is?

CROSS-CURRICULAR CONNECTIONS:

COMPUTERS/SOCIAL STUDIES: Imagine you are on your town's city council, and you are debating installing a water treatment plant like the one in Orange County, California. Using the facts from the article, build a PowerPoint in support of the initiative to present at the next town meeting.

RESOURCE Find this link at www.scholastic.com/scienceworld
■ Check out the EPA's Water Sourcebooks for grades K-12 which are filled with facts, figures, lesson plans, and more: www.epa.gov/safewater/kids/wsb.

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EARTH: Alternative Energy

Futuristic Wheels

DID YOU KNOW?

- The first recorded example of a person using a pedal-powered quadracycle was during the 1853 Exhibition of the Industry of All Nations World's Fair in New York City.

CRITICAL THINKING:

- David Dixon chose to make a solar bike with four wheels instead of two or three. What are some advantages and disadvantages of this configuration? If you were to build your own solar bike, what design would you choose? Explain.

CROSS-CURRICULAR CONNECTIONS:

HISTORY: In 1896, Henry Ford took his first vehicle, dubbed the "Quadricycle," on the road. It was a gasoline-powered vehicle with four bicycle tires. In what ways was this first automobile like the SOHH? How was it different? Use this Web site to guide your research and present your findings to the class: www.hfmgv.org/exhibits/showroom/1896/quad.html.

RESOURCE Find this link at www.scholastic.com/scienceworld
■ Find out everything you want to know about solar energy from Solar Energy International's Web site for kids: www.solarenergy.org/older-kids.

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LIFE: Human Brain

Your Teenage Brain

DID YOU KNOW?

- An adult human's brain has about 100 billion neurons and makes up only about 3 percent of his or her total body weight, but it gobbles up one sixth of the energy the body needs each day.

CRITICAL THINKING:

- In the article, you learned that there is still time to train your brain in a new activity. What sports, hobbies, or skills would you like to try out or improve? Why?

CROSS-CURRICULAR CONNECTIONS:

PHYSICAL EDUCATION: What are some ways you could train your brain and become a better athlete? Split the class into groups. Have them pick a sport and identify the key skills involved in each sport. Then, devise a training program that will highlight each of these skills, and present it to the class.

RESOURCE

■ Want to know more about your brain? Check out this illustrated guide to the human brain: *The Great Brain Book: An Inside Look at the Inside of Your Head* by HP Newquist, Scholastic Reference, 2005.

PAGE **14**

PHYSICAL: Chemistry

Name That Element!

DID YOU KNOW?

- In the burial pits of China's famous Terra-cotta Army, archaeologists found 2,000-year-old shiny bronze arrowheads that didn't rust because they were chromium-coated.

CRITICAL THINKING:

- Chromium makes rubies red. Not only can rubies be found in nature, but they can also be made in a lab. What do you think some uses of synthetic rubies would be?

CROSS-CURRICULAR CONNECTIONS:

MATH/NUTRITION: Chromium is an important mineral that helps your body use insulin. There are 11 micrograms (mcg) of chromium in ½ cup of broccoli. If the average teen girl (ages 14 to 18) needs 24 mcg of chromium per day, according to the National Institutes of Health, how much broccoli would she have to eat to fulfill this requirement? (*Answer: 24 mcg per day/11 mcg per serving = 2.18 servings/day × .5 cups/serving = 1.09 cups of broccoli per day*)

RESOURCE Find this link at www.scholastic.com/scienceworld

- Visit the Jefferson Lab's It's Elemental Web site to learn more: <http://education.jlab.org/itselemental/ele024.html>.

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EARTH: Climate Change

Phones, Facebook, and the Environment

DID YOU KNOW?

- The average American generates 20 tons of carbon dioxide per year, which is well above the world average of 4 tons of carbon dioxide per person per year.

CRITICAL THINKING:

- The students featured in the article used their cell phones to track their CO₂ emissions and then posted their results on Facebook. Would you want to be part of a similar program at your school? Why or why not?

CROSS-CURRICULAR CONNECTIONS:

ART: Check out the suggestions of ways to reduce your carbon footprint in this article: www.guardian.co.uk/environment/2009/sep/01/how-to-reduce-emissions-10-10. Then, pick one of the ideas and make an informative poster.

RESOURCE Find this link at www.scholastic.com/scienceworld

- Check out the Environmental Protection Agency's Climate Change Kids Site that's full of information, activities, and lesson plans: <http://epa.gov/climatechange/kids>.

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PHYSICAL: Chemistry

Ingredients for a Good Hair Day

DID YOU KNOW?

- There are approximately 100,000 to 150,000 strands of hair on a person's head.
- The word "shampoo" comes from a Hindi word meaning "head massage."

CRITICAL THINKING:

- In the article, researcher Peter Kaplan says: "As companies tinker with chemicals, they gain little bits of insight that improve the product. The next generation of shampoos and conditioners will be better than the current one." How might shampoos and conditioners change in the future? What other hair-care products might hit the market?

CROSS-CURRICULAR CONNECTIONS:

LANGUAGE ARTS: Using facts from the article, write a commercial for your own brand of shampoo and conditioner that tells about the chemistry at each stage of hair washing.

RESOURCE Find this link at www.scholastic.com/scienceworld

- Check out NPR's Hair Extravaganza Web site at: www.npr.org/templates/story/story.php?storyid=102067582.

ATTENTION TEACHERS

Is *Science World* fitting your teaching needs?

Do our stories help bring excitement to your classroom? Tell us by filling out our brief online survey at

www.scholastic.com

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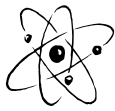
And if you want to share your teaching tips and lesson ideas on the cover of our Teacher's Edition, send your "Teacher to Teacher" tips to

scienceworld@scholastic.com

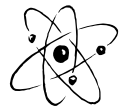
Also, check out our new Web site at www.scholastic.com/scienceworld

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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 NOT a piece of information horses can learn from other equines' whinnies?

- (A) their age
- (B) their gender
- (C) their size
- (D) their identity



2. According to an analysis of words in online blogs, scientists found that _____ was the happiest day of the week.

- (A) Sunday
- (B) Monday
- (C) Friday
- (D) Saturday

3. Approximately what number of sharks end up as bycatch each year?

- (A) 20,000
- (B) 500,000
- (C) 2 million
- (D) 12 million

4. How does a coin-size gadget help keep sharks away from fishing gear?

- (A) The gadget releases a chemical that repels sharks.
- (B) It gives off a high-pitched noise detected by sharks' ampullae of Lorenzini.
- (C) The metal gives off an electrical signal that overwhelms sharks' electrical senses.
- (D) It produces a small jolt of electricity that shocks sharks.

5. What can people do to avoid inhaling toxins from candles?

- (A) Only burn paraffin candles occasionally.
- (B) Be sure to burn candles in a well-ventilated area.
- (C) Swap paraffin candles for vegetable-based ones.
- (D) all of the above

6. What do scientists believe may lie beneath the icy surface of one of Saturn's moons?

- (A) liquid water
- (B) molten rock
- (C) an ocean of frozen ammonia
- (D) dangerous gases



7. Enceladus's plume is mostly made of _____.

- (A) argon
- (B) methane
- (C) water vapor
- (D) carbon dioxide

8. An isotope is an atom that has the same number of _____ but a different number of _____ than other atoms of the same element.

- (A) protons, neutrons
- (B) neutrons, electrons
- (C) positrons, negatrons
- (D) electrons, protons

9. Which would be the best alternate headline for the article about an ancient squidlike creature?

- (A) "Fossilized Tentacles Discovered"
- (B) "Inked!"
- (C) "Turned to Stone"
- (D) "Life 500 Million Years Ago"

10. NASA's Stardust space capsule did all of the following EXCEPT _____.

- (A) land on an asteroid
- (B) collect dust from a comet
- (C) travel millions of miles
- (D) discover a building block of life in comet dust

Name: _____

PAGE 8 **Plumped Up Portions**

DIRECTIONS: Use information in the article to help you *defend* or *dispute* the statements below. (**Hint:** Defend means to explain why a statement is correct. Dispute means to explain why a statement is incorrect.)

1. Americans are now consuming hundreds more calories per day than they did a generation or two ago.
2. People are good at judging how much food they consume.
3. The portion sizes in *The Joy of Cooking* have remained the same since the 1930s.

PAGE 12 **Futuristic Wheels**

DIRECTIONS: Answer the following questions in complete sentences.

1. What makes the SOHH different from an ordinary bike?
2. What is green technology? Why is the SOHH considered a green technology?
3. Where does the SOHH's energy come from?
4. Can the SOHH be used for long-distance travel? Why or why not?

PAGE 14 **Name That Element!**

DIRECTIONS: Fill in the blanks to complete the following sentences.

1. Rubies are the mineral _____ containing traces of chromium.
2. Chromium combines with _____ to create a yellow pigment that once was used to paint school buses.
3. A stainless steel razor blade is an _____ that contains chromium; this element keeps the blades from _____.
4. Car manufacturers bond chromium to the nickel in wheels using an _____ process to prevent scratching and tarnishing.

Name: _____

PAGE **18** **Ingredients for a Good Hair Day**

DIRECTIONS: Use your own words to define the following terms. Use complete sentences.

1. follicles
2. sebum
3. polar molecule
4. cuticle

PAGE **20** **Would You Drink Toilet Water?**

DIRECTIONS: The sentences below describe events that Orange County, California, uses to transform its sewage into drinking water. In the blanks below, place the letters of the sentences in the order the events occur from first to last.

- a. Sewage runs through pipes that lead to the sewage treatment plant.
- b. Water seeps into the groundwater basin, where it will eventually be pumped out and end up back in people's taps.
- c. Treated water undergoes a three-step purification process to remove salt, chemicals, prescription drugs, chemicals, and viruses.
- d. Sewage is treated to the point where it is clean enough that technically it could be dumped into the ocean.
- e. A person flushes the toilet.
- f. Half of the water is injected into the coast to prevent salty water from flowing into the groundwater basin, and the other half is pumped into lakes.

First → _____, _____, _____, _____, _____, _____ ← Last

PAGE **22** **Your Teenage Brain**

DIRECTIONS: Match the words in the left column with the word or phrase in the right column.

- | | |
|---------------------------|--|
| ____ 1. gray matter | a. white, fatty substance that insulates nerve cells |
| ____ 2. white matter | b. slow, regular waves that occur during the deepest part of the sleep cycle |
| ____ 3. synapses | c. area of the brain that governs insight, judgment, planning, and the interpretation of social cues |
| ____ 4. myelin | d. connective tissue that links the different areas of the brain |
| ____ 5. prefrontal cortex | e. wrinkly outer layer of brain tissue that processes and stores information |
| ____ 6. delta waves | f. connections between neurons in the brain |

PAGE **26** **Phones, Facebook, and the Environment**

DIRECTIONS: Answer the following questions in complete sentences.

1. What tools did the students at Urban School use to track their carbon dioxide emissions?
2. What lifestyle changes does the article mention that can reduce your carbon footprint?
3. How is the Go Green Foundation planning to expand its program?

Name: _____

Portion Distortion

In “Plumped Up Portions” (p. 8), you read about how portion sizes have increased over the years. As the portions get bigger, the calories people consume increase. Complete the following activity to learn more about how the number of calories people are consuming has changed over the past 20 years.

**The Number of Calories
in Food Portions**

Food	Then (calories)	Now (calories)
Hamburger	330	590
Bucket of Popcorn		
Turkey Sandwich		
Cola		
French Fries		



Graph It

1. Find the calorie counts listed in the article to complete the chart above. We did the first one for you.
2. On a separate sheet of paper, create a double bar graph showing the calorie counts of the featured foods then and now.

Analyze It

1. Which of the featured foods that we eat today has the most calories per serving? The fewest?
2. The calorie count of which of the featured foods has increased by the greatest number of calories over the past 20 years? The fewest?
3. Which two of the featured foods contained roughly the same number of calories as each other 20 years ago? Do they have such similar calorie counts now?
4. If you went to a restaurant 20 years ago and ordered a hamburger, french fries, and a cola, and you ate everything, how many calories would you have consumed? How many calories would it be if you ordered the same meal today? How do these figures compare?