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ISSUE DATES 9/7 9/21 10/5 10/26 11/9-23 12/7 1/11 2/1 2/22 3/15 4/5 4/19 5/10

Science can be found in the most unlikely places. In this issue, we explore where science intersects with football, the art of origami, and a day at the beach. Have you or your students ever wondered if there was science behind other seemingly unscientific things? Have your students submit their questions to our "Ask *Science World*" column. Our address can be found online at www.scholastic.com/scienceworld.

And feel free to e-mail tips, comments, or suggestions to us at scienceworld@scholastic.com.

—The Editors

Visit www.scholastic.com/scienceworld for more resources!

Features

PAGE	CONTENT	TITLE SUMMARY	NATIONAL SCIENCE EDUCATION STANDARDS	LESSON IDEAS
8	Life: Human Body	Cures From the Field Injured football players are advancing medicine.	Grades 5-8: Understandings about science and technology Grades 9-12: Understandings about science and technology	Have students research the history of football helmets in the cross-curricular activity on TE 2 .
12	Life: Viruses	Disease Detectives What does it take to track new diseases?	Grades 5-8: Science and technology in society Grades 9-12: Science and technology in local, national, and global challenges	Test your students' reading comprehension with the "It's Your Choice" quiz on p. 15 .
16	Earth: Estuaries	Oyster Gardeners Students are helping restore aquatic habitat.	Grades 5-8: Populations and ecosystems Grades 9-12: Environmental quality	Use the hands-on activity on p. 19 to have students experiment with filtering.
20	Physical: Technology	Operation Origami Paper folding solves technological problems.	Grades 5-8: Abilities of technological design Grades 9-12: Abilities of technological design	Have your students make their own origami with the hands-on skills sheet on TE 7 .

Coming Next Issue

- Got blood? Get the scoop on vampire animals.
- A new program to stop cactus thieves
- The physics behind pumpkin-chunking contests
- Scientific secrets of the Silk Road

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: I find

that students have difficulty with place value and how large or small a number should be. So, in order to help them understand the concept of scale, I take the "Numbers in the News" numerals and separate them from the written description. Then, I challenge students to use their number-sense skills to match up which numeral goes with which description.



Priscilla Chan





LIFE: Human Body
Cures From the Field

PRE-READING PROMPTS:

- What parts of the body might be prone to injury during sports like football?
- What is hypothermia? Is hypothermia normally beneficial or dangerous? Under the care of a skilled doctor, what type of injury do you think moderate hypothermia may help treat?
- What are platelets? How are they important in helping your body to heal itself?

DID YOU KNOW?

- Only 14 weeks after suffering a severe neck injury, Kevin Everett walked again for the first time in public on December 23, 2007, at the Buffalo Bills' last home game of the season. Initially, doctors had feared he might never walk again.
- There are between 140,000,000 and 400,000,000 platelets in a milliliter of an average person's blood.

CRITICAL THINKING:

- A concussion is a mild traumatic brain injury. Last fall, 12 athletes—including six retired NFL players—agreed to donate their brains to science when they die. Brain researchers hope to understand the long-term effects of the repeated head injuries sustained in these high-impact sports. What kind of evidence do you think repeated concussions might leave behind? If you were an athlete, would you donate your body parts to science after you die so researchers could learn more about the effects of your sport on the body?

CROSS-CURRICULAR CONNECTIONS:

HISTORY: Since footballers took to the field in the late 1800s, the players' protective gear has changed dramatically. Check out this article from *Popular Mechanics* about the history of the football helmet: www.popularmechanics.com/outdoors/sports/4281378.html. Then, draw a scaled timeline of the development of football helmets from the first ones made of leather to the ones currently used by NFL players. Which advances seem most noteworthy to you?

RESOURCES

- You can access these Web links at www.scholastic.com/scienceworld.
- Getting ready for football tryouts? Be sure to check out this site about five ways to avoid sports injuries: http://kidshealth.org/kid/watch/out/sport_safety.html.
 - Keep tabs on the Steelers' Hines and Polamalu with the NFL's Web site for kids: www.nflrush.com.
 - Want to learn more about platelet-rich plasma therapy? Check out this *New York Times* article: www.nytimes.com/2009/02/17/sports/17blood.html.

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LIFE: Viruses
Disease Detectives

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- The word “pandemic” comes from the Greek root words “pan,” which means all, and “dem,” which means people. What do you think a flu pandemic is?
- How are seasonal flu and H1N1 (swine) flu different?

DID YOU KNOW?

- The CDC estimates that 36,000 people die each year from seasonal flu in the U.S.
- Flu season in the U.S. generally runs from October to May, peaking sometime between late December and March.
- Yearly flu vaccines contain three strains of flu virus. Vaccines are made long before the start of each year's flu season, so health officials must choose in advance the strains that they think are most likely to strike when flu season hits in the fall.

CRITICAL THINKING:

- You can't catch H1N1 flu from eating cooked pork, but it can be passed from pigs to humans and from person to person by coughing and sneezing. If you were asked to write a script for a public service announcement describing measures people should take to prevent the spread of H1N1 flu, what might you include? Visit this site from the CDC for flu prevention tips: www.cdc.gov/h1n1flu/schools/toolkit/posters.htm.

CROSS-CURRICULAR CONNECTIONS:

GEOGRAPHY: One reason that H1N1 flu spread so quickly from one country to another is that people are traveling the world more than ever before. Using a world map, retrace the spread of H1N1 flu. Mark each country on the map with the date of the first reported cases, using the timeline reports on the left-hand navigation of the interactive timeline found on the World Health Organization's H1N1 Influenza Web site: <http://gamapserver.who.int/h1n1/atlas.html>.

RESOURCES

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 - Students can test their disease detective skills with this interactive game from Rice University: <http://medmyst.rice.edu>.
 - Visit this Web site from the National Institutes of Health for lesson plans and activities on infectious diseases: <http://science.education.nih.gov/customers.nsf/HSDiseases?OpenForm>.

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EARTH: Estuaries
Oyster Gardeners

PRE-READING PROMPTS:

- What is an oyster?
- Where do oysters live?
- Do you think that oysters can survive in the waters around New York City? Why or why not?

DID YOU KNOW?

- While all oysters may produce a dingy pearl, the pearl oyster that is famous for making the round gemstones isn't, biologically speaking, an oyster. It's actually an organism that is more closely related to a mussel.
- Early New York City settlers commonly found oysters the size of a dinner plate, with a diameter of 25.4 centimeters (10 inches) or greater.
- The Dutch originally called Liberty Island (which is home to the Statue of Liberty) and Ellis Island (which was the first stop for new immigrants) Great Oyster Island and Little Oyster Island because of the massive oyster reefs surrounding them.

CRITICAL THINKING:

- Students in the Bayonne school district in New Jersey are taking care of oysters to restore the habitat and clean their local waters. As a keystone species, oysters provide many other animals in their ecosystem with food and shelter. Can you think of any organisms in your region that could be considered keystone species?

CROSS-CURRICULAR CONNECTIONS:

MATH: An adult oyster can filter 50 gallons of water in a day. How many gallons of water will an oyster filter in a week? A year? (*Answer: $50 \times 7 = 350$ gallons per week; $350 \times 52 = 18,200$ gallons per year*)

RESOURCES

- You can access these Web links at www.scholastic.com/scienceworld.
- Find out more about the importance of estuaries around the U.S. at this interactive Web site. It is full of information, teaching tools, and interactive maps: www.estuaries.gov.
 - Want to learn more about the history of oysters in New York City? Check out Mark Kurlansky's book *The Big Oyster*, Random House, 2006.
 - Listen to estuary-related Podcasts produced by Florida's Rookery Bay National Estuarine Research Reserve: www.rookerybay.org/Podcasts.html.



PHYSICAL: Technology
Operation Origami

PRE-READING PROMPTS:

- What is origami?
- What kinds of things do you fold every day?
- Do you think origami is an art or a science? How could it be used for both?
- Which do you think would be harder to fold: something very small or something very big?

DID YOU KNOW?

- Origami is an art form that dates back to sixth-century Japan. In Japanese, the word "ori" means to fold and "gami" means paper.
- The origami figure with the most folds of any made so far is the "Red Sea Urchin" by Hans Birkeland. It has a whopping 913 folds.
- Scientists are using origami to understand how protein molecules fold together in the body. These folds are key to their biological function and could help researchers develop more effective medicines.

CRITICAL THINKING:

- Origami is being used to fold many things in an effort to improve science. A current project has scientists folding "nano-origami" shapes to create better computer memory storage and cram more songs and information into iPods and cell phones. Can you think of any other engineering challenges to which origami could be applied?

CROSS-CURRICULAR CONNECTIONS:

HISTORY: The paper crane has become known as a symbol of peace, due to the quest of a young Japanese girl named Sadako Sasaki to fold 1,000 paper cranes. Research her life and then make a PowerPoint presentation on your findings to share with the class. Start your research here: www.hiroshima-is.ac.jp/index.php?id=64 or check out the book *Sadako and the Thousand Paper Cranes* by Eleanor Coerr, Putnam Juvenile, 1999.

RESOURCES

- You can access these Web links at www.scholastic.com/scienceworld.
- Watch a clip from a new documentary film, *Between the Folds*, which investigates the beauty of origami and how it relates to math and science: www.greenfusefilms.com.
 - OrigamiUSA is an organization devoted to paper folding. To learn more about origami and the group's activities in the U.S., visit its Web site: www.origami-usa.org.
 - This site has everything you could ever want to know about origami! Check it out for history, folding patterns, cross-curricular ties, and more: www.origami-resource-center.com.



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Cures From the Field

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Name: _____

PAGE **8** Cures From the Field**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.)

- Using a hyperbaric chamber is the best treatment for a sprained knee.
- Hypothermia may someday become a standard treatment for spinal cord injuries.
- Surgery is the only way to repair damaged tendons and ligaments.

PAGE **12** Disease Detectives**DIRECTIONS:** Match the words in the left column with the words or phrases in the right column.

- | | |
|-----------------------|--|
| ___ 1. epidemiologist | a. worldwide outbreak |
| ___ 2. immunity | b. proteins that target and kill an invading virus |
| ___ 3. pandemic | c. basis for a new vaccine strain |
| ___ 4. seed strain | d. person who studies the spread of disease |
| ___ 5. antibodies | e. protection against disease |

PAGE **16** Oyster Gardeners**DIRECTIONS:** Answer the following questions in complete sentences.

- What services do oysters provide for organisms in their ecosystem?
- What are three factors that contributed to the decrease in New York City's oyster population?
- When Drennan's class goes to monitor its oysters, what data do they record?
- Is it safe for people to eat the oysters that the class raises? Why or why not?

PAGE **20** Operation Origami**DIRECTIONS:** Circle the incorrect word or phrase in each item and write the correct word or phrase above it.

- Origami is the Australian process of folding squares of paper into various shapes.
- Scientists are studying the history of origami to solve technological challenges.
- To make a foldable lens for a space telescope, Lang suggested the makers use an origami pattern containing a variety of complex shapes.
- Doctors insert a stent into a patient's arteries to keep blood from flowing through.

Name: _____



Flu Season

In “Disease Detectives” (p. 12), you read about how epidemiologists are tracking an influenza virus. During flu season, the Centers for Disease Control and Prevention publishes weekly tallies of confirmed flu cases. Complete the activity below to learn more about flu trends in the United States in three consecutive flu seasons starting with fall 2005.

Weekly Totals of Confirmed Influenza Cases in the U.S.

First Date of Week	Number of Cases
October 17, 2005	23
December 19, 2005	635
February 6, 2006	1,007
April 10, 2006	431
June 12, 2006	25
August 14, 2006	12
October 16, 2006	80
December 18, 2006	729
February 5, 2007	2,532
April 9, 2007	515
June 11, 2007	26
August 13, 2007	19
October 15, 2007	43
December 17, 2007	305
February 4, 2008	4,575
April 7, 2008	587

SOURCE: CENTERS FOR DISEASE CONTROL AND PREVENTION

Graph It

Create a line graph showing the weekly total number of confirmed influenza cases in the U.S. from the week of October 17, 2005, through the week of April 7, 2008. Be sure to give your graph a descriptive title, and label the *x*- and *y*-axes.

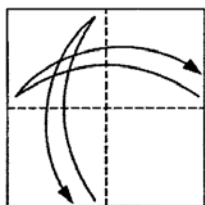
Analyze It

1. During which week was the total number of flu cases the greatest? The least?
2. What is the overall trend in the data?
3. In which season do the fewest flu cases tend to occur?

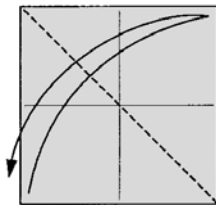
Name: _____

Folding Frenzy

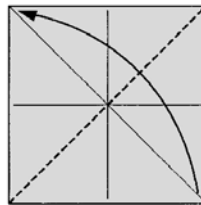
In "Operation Origami" (p. 20), you read about how engineers are turning to the art of paper folding to solve technological problems. Try your hand at origami by following the folding pattern for a "balloon" below. Then, answer the questions at the bottom.



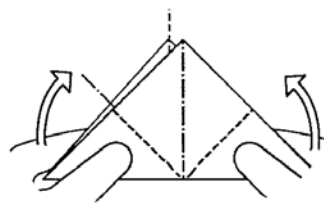
1. Start with an 8" by 8" square of paper. Fold it in half like a book and unfold. Fold it in half the other direction and unfold. Flip the paper over.



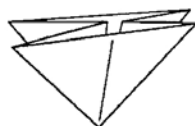
2. Fold it in half diagonally and unfold.



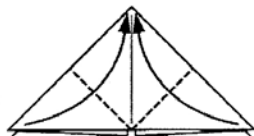
3. Fold it in half diagonally the other way.



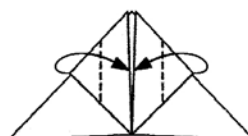
4. Hold the outer edges of the triangle, and push them together. The result will look like a plus sign.



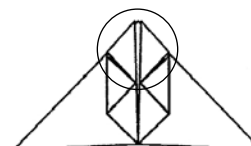
5. Press flat so that there are two flaps meeting each other at the corners. Flip it over so that the apex of the triangle is at the top.



6. Fold the corners of the upper flaps to the apex.



7. Fold the outside corners of the newly made diamond to the center.



8. The next three steps occur in a close-up of the circled section.



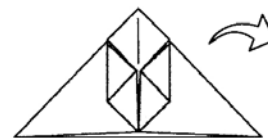
9. Fold the free right-hand corner down so that its edge lines up alongside the pocket flap made in step 7.



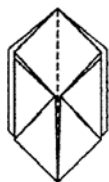
10. Grab the top left edge of this flap and tuck it into the pocket flap made in step 7.



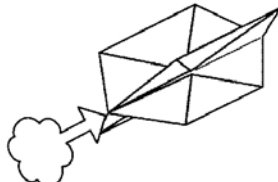
11. Repeat steps 9 and 10 for the left-hand corner.



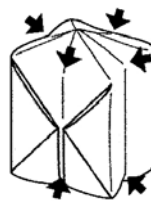
12. Turn over and repeat steps 6 through 11 on the other flaps. When finished, you will have a folded paper that is hexagonally shaped when flat.



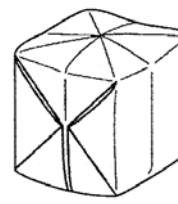
13. Now it's time to blow up the balloon.



14. There will be a hole at the bottom end. Hold the paper gently and blow a strong puff of air into the hole.



15. Push down the top and bottom points to make a cubelike shape.



16. You're finished!

Answer the following in complete sentences:

1. Can you think of one advantage to having your balloon start out flat?

2. In your opinion, would this design have been a good option for an airbag? Why or why not?