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ISSUE DATES	9/6	9/27	10/18	11/8-22	12/6	1/3	1/24	2/14	3/7	3/21	4/4-18	5/9
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We hope that you will enjoy using both the *Science World* magazine and Web site throughout the 2010-2011 school year.

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

—The Editors

FEATURES	CONTENT AND SUMMARY	NATIONAL SCIENCE EDUCATION STANDARDS	ONLINE MATERIALS www.scholastic.com/scienceworld
LEAP FROM SPACE PAGE 8	EARTH: Atmospheric Layers Skydiver Felix Baumgartner prepares for a record-breaking jump.	Grades 5-8: Structure of the Earth system Grades 9-12: Science as a human endeavor	
FIGHTING FOR SCRAPS PAGE 12	BIOLOGY: Decomposers Meet the creatures that dine on carcasses on land and undersea.	Grades 5-8: Structure and function in living systems Grades 9-12: Matter, energy, and organization in living systems	Test your students' attention to detail by challenging them to rewrite false statements with the Check for Understanding online reproducible .
RACE FOR THE BEST MILEAGE PAGE 18	PHYSICS: Fuels Teens build their own fuel-efficient cars.	Grades 5-8: Abilities of technological design Grades 9-12: Abilities of technological design	Find a two-part vocabulary quiz on the Check for Understanding online reproducible .

COMING NEXT ISSUE

- Is offshore oil drilling the answer to America's demand for energy?
- Find out how different animals' eyes see the electromagnetic spectrum.
- Teens track DNA in an urban environment.



Priscilla Chan

TEACHER TO TEACHER

Priscilla Chan, a science teacher at Brooklyn School for Collaborative Studies in New York City, suggests: One way to show that scientific research and science-related events happen around the world is to keep track of the places mentioned in *Science World's* articles. Put up a world map at

the beginning of the school year. As you read each issue of *Science World*, place a mark or pushpin where each story takes place. Students can also make labels with a short summary of the article. At the end of the year, you can see where on the globe science news made headlines. You can also color-code the pushpins for Earth, biology, physics, and chemistry, and see where those subjects' hot spots lie.



visit WWW.SCHOLASTIC.COM/SCIENCEWORLD for more resources.





EARTH: Atmospheric Layers

Leap From Space

PRE-READING PROMPTS:

- Can you name three layers of Earth's atmosphere?
- In which layer of Earth's atmosphere do you live?
- What sort of safety precautions do people take when they travel high into Earth's atmosphere?

Download a *Science World* PowerPoint about Felix Baumgartner's record skydive attempt at www.scholastic.com/scienceworld.

DID YOU KNOW?

- The lowest layer of Earth's atmosphere, called the troposphere, contains 75 percent of the atmosphere's mass and 99 percent of its water vapor.
- In addition to parachuting from aircraft, Felix Baumgartner is a BASE jumper. BASE jumping is when a person with a packed parachute jumps off a fixed object. BASE is actually an acronym that stands for the four categories of objects that one can jump from: buildings, antennae, spans (or bridges), and Earth (typically cliffs).

CRITICAL THINKING:

- Engineers have built Baumgartner a special suit to combat the extreme temperatures, pressures, and speeds he'll encounter during his leap from space. Can you think of any other extreme environments on Earth? What factors would affect your ability to explore these exotic places? What kind of specialized suit would you need?

PROJECT-BASED LEARNING:

HISTORY/ART: The first astronauts went into space in the early 1960s. Pick your favorite astronaut from the list of biographies of former (http://www11.jsc.nasa.gov/Bios/astrobio_former.html) and current (<http://www11.jsc.nasa.gov/Bios/astrobio.html>) astronauts. Then make a trading card for your chosen astronaut with his or her biographical data and important space missions on one side and a picture on the reverse side.

RESOURCES

- You can access these Web links at www.scholastic.com/scienceworld.
- Want to learn more about the Red Bull Stratos project? Visit its Web site at: www.redbullstratos.com.
 - Learn more about the layers of the atmosphere at: www.nasa.gov/audience/forstudents/9-12/features/912_liftoff_atm.html.
 - Do you have what it takes to go into space? Learn more about the history of NASA's human spaceflight program here: <http://spaceflight.nasa.gov/history/index.html>.

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BIOLOGY: Decomposers

Fighting for Scraps

PRE-READING PROMPTS:

- What happens to an animal's body when it dies?
- What is a scavenger? What is a decomposer?
- Do you think things decompose quickly or slowly at the bottom of the ocean?

DID YOU KNOW?

- The strongest insect on Earth is a species of dung beetle. *Onthophagus taurus* can pull 1,140 times its weight. That's the equivalent of a 68 kilogram (150 pound) person pulling two double-decker buses full of people!
- Vultures have very acidic stomachs. This allows them to digest toxic and disease-causing bacteria like botulism and anthrax, which can be lethal to other animals.
- Hat-thrower fungi grow in cow dung and help break it down. When fully grown, the fungi fling spores up to 2 meters away onto fresh grass. When a cow eats the grass, the spore travels through the animal's digestive system and emerges from the other end ready to grow a new fungus in the cowpat.

CRITICAL THINKING:

- When cattle ranchers settled into the Australian outback, they had a major problem with cow dung. All of the native dung beetle species lived in forests and couldn't survive in the hot grasslands. What do you think they did to solve this serious dung problem? Be sure to think about the pros and cons of your solutions. (*Answer: They imported dung beetles from around the world to eat the dung, making sure to pick species that would not harm the native dung beetle populations.*)

PROJECT-BASED LEARNING:

LANGUAGE ARTS: Imagine that you are an Osedax worm eating the carcass of a dead whale deep on the ocean floor. Write a first-person short story describing your environment and all of the other animals eating the different parts of the whale carcass.

RESOURCES

- You can access these Web links at www.scholastic.com/scienceworld.
- VIDEO EXTRA: Watch as various scavengers eat the remains of a whale fall at: www.youtube.com/user/MBAR1video#p/search/0/URi8KccVvks.
 - Most dung beetles are in the scarab family of insects. Visit the University of Nebraska State Museum's Web site to find out more about these creatures: www.museum.unl.edu/research/entomology/Scarabs-for-Kids/home.html.
 - Read a first-hand account of a search for whale falls: www.audubonmagazine.org/truenature/truenature0911.html.

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PHYSICS: Fuels Race for the Best Mileage

PRE-READING PROMPTS:

- What is gas mileage? What would you consider to be good gas mileage?
- Can you name three different fuels that cars can run on?
- How would you design a car so it gets great gas mileage?

DID YOU KNOW?

- The first Shell Eco-Marathon was held in 1939. It was a friendly bet between engineers trying to get the best fuel mileage. Over the next few decades, the program grew. In 1985, the Eco-Marathon took the form that it has today, with competing teams of engineering students.
- In 2005, a Swiss Eco-Marathon team set the world record for best fuel mileage. Their hydrogen fuel cell *Pac-Car II* gets 5,385 kilometers per liter (12,666.3 miles per gallon)!
- Although drag-racing cars are very aerodynamic, their fast speeds make them gas guzzlers. A dragster uses 56 liters of gas to go one kilometer (24 gallons to go one mile).

CRITICAL THINKING:

- The students in the Eco-Marathon used all different types of fuels to get better gas mileage, such as solar, fuel cell, diesel, and regular-unleaded gasoline. If you were going to enter the contest, which type of fuel would you use? Why?

PROJECT-BASED LEARNING:

MATH: You can estimate how far a car can travel on a tank of gas by multiplying its fuel economy by the amount of gas in its tank. Cicero North High School's car got 780.9 km/l (1,836.8 mi/gal) and the best cars on the road in the United States average 21.3 km/l (50 mi/gal). If you have 60 liters (16 gallons) of fuel, how far could you travel with each vehicle? (*Answer: Cicero North High School's car: 780.9 km/l × 60 liters = 46,854 km. The best car in the U.S.: 21.3 km/l × 60 liters = 1,278 km.*) Take it further by calculating how far your favorite car could travel on a highway with 60 l (16 gal) of fuel using the information found at www.fueleconomy.gov/feg/findacar.htm.

RESOURCES

- You can access these Web links at www.scholastic.com/scienceworld.
- **VIDEO EXTRA:** Watch an Eco-Marathon team build and test its car at: http://abclocal.go.com/ktrk/story?section=resources/lifestyle_community/green&id=7340548.
 - There's still time to form a team for next year's Eco-Marathon. Visit Shell's Web site for more information: www.shell.com/home/content/ecomarathon/americas.
 - Learn more about fuel cells at this online exhibit from the Smithsonian Institution: <http://americanhistory.si.edu/fuelcells/basics.htm>.

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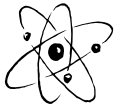


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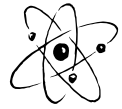
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Name: _____



Science News



DIRECTIONS: Read the Science News section on pages 2 to 7.

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

1. A pulling force in a rope is called

- _____.
 Ⓐ torque
 Ⓑ tension
 Ⓒ leverage
 Ⓓ inertia

2. Why has a foal named Einstein become famous?

- Ⓐ He is the youngest horse to ever win the Kentucky Derby.
 Ⓑ His coat is completely white.
 Ⓒ He might be the world's smallest horse.
 Ⓓ Einstein has become best friends with a dog.

3. What is a prominence?

- Ⓐ a cool spot on the sun
 Ⓑ a burst of solar wind blown into space
 Ⓒ an eruption of gases from the sun's surface
 Ⓓ a phenomenon when the moon passes in front of the sun

4. A robot called Hanako mimics all of the following human actions EXCEPT _____.

- Ⓐ drooling
 Ⓑ sneezing
 Ⓒ wiggling her tongue
 Ⓓ coughing

5. Why do mangalitsa pigs have curly, sheeplike hair?

- Ⓐ They are bred to have thick coats.
 Ⓑ They share some genes with sheep.
 Ⓒ Breeders curl the pigs' hair before displaying them at livestock shows.
 Ⓓ The animals are a cross between pigs and sheep.

6. Which of the following best summarizes what scientists think about the number of earthquakes this year?

- Ⓐ No more earthquakes than usual have occurred this year.
 Ⓑ This year is on track to have the least number of major quakes on record.
 Ⓒ Earthquakes are stronger than in years before.
 Ⓓ This year will see an unusually high number of earthquakes.

7. A fish that made the Top-10 New Species list has what unusual feature?

- Ⓐ glow-in-the-dark stripes
 Ⓑ vampirelike fangs
 Ⓒ no eyes
 Ⓓ see-through skin

8. The record for the longest hibernation is held by a _____.

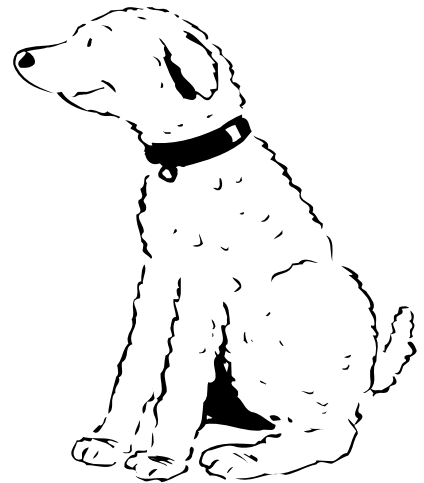
- Ⓐ chipmunk
 Ⓑ brown bat
 Ⓒ grizzly bear
 Ⓓ pygmy opossum

9. Which statement about pet-related accidents is NOT true?

- Ⓐ Pet accidents send more than 86,000 people to the emergency room each year.
 Ⓑ Only 1 percent of falls treated in hospitals are caused by pets.
 Ⓒ Most pet-related accidents occur while playing with a pet.
 Ⓓ Dogs cause more injuries to owners than cats.

10. How did scientists bring some dogs back from death?

- Ⓐ They temporarily replaced their blood with a salt solution.
 Ⓑ They chilled the dogs' bodies in ice.
 Ⓒ They placed electrodes in the animals' brains.
 Ⓓ They gave the dogs artificial hearts.



Name: _____

Record-Breaking Feats

In “Leap From Space” (p. 8), you learned how skydiver Felix Baumgartner is preparing to break the world record for highest free fall. If he succeeds, this won’t be the first record he’s shattered. In 2003, he became the first person to fly across the English Channel without using an airplane. Read the passage below to learn how he did it, and then answer the questions that follow.

Flying High

On July 31, 2003, high over the city of Dover on the southeast coast of England, Felix Baumgartner looked out the open door of an airplane. At an altitude of almost 9,000 meters (29,528 feet), he couldn’t even see the ground below. He checked the sturdy carbon-fiber wing strapped to his back to make sure it was secure. Then, at 6:09 a.m., he jumped!

Baumgartner soared through the air at 360 kilometers (224 miles) per hour. Normally, when skydivers leap from airplanes, they fall straight down to the ground because of *gravity* (the force that pulls everything toward Earth). But Baumgartner soared 35 km (22 mi) across the sky to reach French soil on the other side of the English Channel. How did he manage this feat? He used a specially designed wing and the very same forces that keep planes aloft in the sky.

Baumgartner’s 1.8 m (6 ft)-long wing was shaped like an airplane wing. It was curved on the top and flat on the bottom. When Baumgartner sped through the sky, that shape caused the air on the bottom of the wing to move more slowly than the air moving across the top. The slow-moving air put pressure on the bottom of the wing. The result: an upward force, or *lift*. This force not only slowed Baumgartner’s descent, but allowed him to cruise across the sky.

1. Which of the following BEST summarizes the passage above?

- (A) Felix Baumgartner is a world-class skydiver and has broken many skydiving records.
- (B) Most skydivers use only a parachute to fall straight to Earth, but Baumgartner used a special wing to set a new record soaring across the English Channel.
- (C) Stunts like skydiving across the English Channel are dangerous and should be performed only by professionals.
- (D) Scientists designed a special wing and parachute apparatus so Baumgartner could soar across the English Channel.

2. What is the purpose of the last paragraph?

- (A) to explain how the carbon-fiber wing produces lift
- (B) to talk about Felix Baumgartner’s other records
- (C) to describe the safety of using a fixed wing
- (D) to explain why using a fixed wing is a more exciting way to skydive

3. At about what height did Baumgartner leap from the plane?

- (A) 2,000 meters
- (B) 2,500 meters
- (C) 6,500 meters
- (D) 9,000 meters

4. The English Channel lies between England and ____.

- (A) Germany
- (B) Ireland
- (C) France
- (D) Italy

5. The force of ____ pulls objects toward Earth.

- (A) lift
- (B) fast-moving air
- (C) altitude
- (D) gravity

6. Using the description in the third paragraph, draw a diagram on a separate sheet of paper showing how you think Baumgartner’s carbon-fiber wing is shaped.

Name: _____

Literary Devices

In “Fighting for Scraps” (p. 12), you read about the different decomposers and scavengers that break down and eat rotting carcasses on land and underwater. In this article, the writer used two literary devices, *metaphors* and *similes*, to describe the different scavengers and their habitats. Both similes and metaphors compare things with each other, but similes use the words “like” or “as,” while metaphors directly compare two things.

Below are examples of similes and metaphors from the article. Read the phrases that follow and determine whether each one is a simile or a metaphor (circle the correct answer). Then, in your own words, explain what the simile or metaphor means.

1. hagfish are the maggots of the sea
Circle one: Simile / Metaphor

Meaning: _____

4. tanner crabs are little buzz saws
Circle one: Simile / Metaphor

Meaning: _____

2. a gray whale was covered with what looked like a red shag carpet
Circle one: Simile / Metaphor

Meaning: _____

5. some organisms keep carcasses from piling up like a scene from a bad horror movie
Circle one: Simile / Metaphor

Meaning: _____

3. eel-like hagfish
Circle one: Simile / Metaphor

Meaning: _____

6. the bottom of the ocean is not necessarily a tomb
Circle one: Simile / Metaphor

Meaning: _____

Now it's your turn!

Write your own similes and metaphors to describe what these creatures from the article do or look like.

- 1. vultures
- 2. insects
- 3. rainbow scarabs
- 4. whale fall

Name: _____

Race Results

In “Race for the Best Mileage” (p. 18), you read about students who build and race their own fuel-efficient cars. The chart below shows the results from the Urban Concept category of the 2010 Shell Eco-Marathon. Use the data to complete the activity below.

Results for the Urban Concept Category of the 2010 Shell Eco-Marathon

Car Name	School	Fuel Type	Fuel Efficiency (Kilometers per liter)
<i>Blue B'vetti</i>	Louisiana Tech University	Gasoline	106.7
<i>Caroline</i>	Penn State	Diesel	65.1
<i>Concept Zero</i>	Polytechnic Institute of NYU	Gasoline	61.2
<i>George</i>	Mater Dei High School	Gasoline	185.9
<i>Red B'vetti</i>	Louisiana Tech University	Gasoline	60.4

SOURCE: SHELL ECO-MARATHON

Graph It

Create a bar graph to show the fuel efficiency of the cars that competed in the Urban Concept category of the 2010 Shell Eco-Marathon. Be sure to give your graph a descriptive title and label the *x*- and *y*-axes.

Analyze It

- Which team in the Urban Concept category got the best fuel efficiency in the 2010 Shell Eco-Marathon?
- Did any of the participating schools enter more than one car in this category? If so, which one(s)?
- Mater Dei High School’s car, *George*, was about three times more efficient than which other car(s)?
- What percent of cars in the chart above ran on regular gasoline? (Hint: Divide the number of cars running on gasoline by total number of cars and multiply by 100.)

