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ISSUE DATES	9/5	9/19	10/3	10/24	11/14	11/28	12/12	1/16	2/6-20	3/6	3/27	4/17	5/8
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WELCOME TO A NEW SCHOOL YEAR *Science World* has a lot of exciting articles planned for you. One **highlight** for 2005-2006: We'll be presenting "Science Explorations," a new series produced in partnership with the **American Museum of Natural History**. Each of the six articles in the series will profile one of the Museum's leading scientists, offering readers an unprecedented behind-the-scenes look at one of the world's most renowned scientific institutions. The first installment will be in the October 3 issue. Be sure to look for it.

Coming **next issue**: our annual **Science Project Success Guide**. If you have comments and suggestions, we welcome them at scienceworld@scholastic.com.

—The Editors

AWARD WINNER
Science World wins three awards from the Association of Educational Publishers, including Periodical of the Year 2005.

FEATURES

PAGE	CONTENT	TITLE SUMMARY	NATIONAL SCIENCE EDUCATION STANDARDS	LESSON IDEAS
8 Physical	Forces and Motion	Bumpy Ride The physics of all-terrain vehicles.	Grades 5-8: Motion and forces Grades 9-12: Motion and forces • Conservation of energy and the increase in disorder	Students can learn more about ATV-related accidents with the chart-reading activity on TE 6 .
10 Life	Ecosystem	Koala Chaos! Controlling the koala population on one Australian island.	Grades 5-8: Populations and ecosystems Grades 9-12: Interdependence of organisms	To help students understand population growth, have them complete the hands-on activity on p. 13 .
14 Earth	Hurricanes	Taming the Storm Scientists try to stop hurricanes.	Grades 5-8: Structure of the Earth system Grades 9-12: Energy in the Earth system	Lesson Idea: Introduce students to the Saffir-Simpson scale. For information: www.nhc.goaa.gov/aboutsshs.shtml
18 Physical	Chemistry	Name That Element! Students follow eight clues to sleuth a mystery element.	Grades 5-8: Properties and changes of properties in matter Grades 9-12: Structure of atoms • Structure and properties of matter	Challenge students to study eight clues and the periodic table to answer the "It's Your Choice" questions on p. 20 .

DEPARTMENTS

PAGE	TITLE SUMMARY	CONTENT	LESSON IDEAS
4	Science News Relate textbook science to current events.	Life/Animal Habitats: New Neighbor Life/Immune System: Stressed Out? Earth/Earth's Layers: Digging Deep Earth/Pollution: Fuming Buses Physical/Pressure: Perfect Pop! Physical/Sound: Mouth Music	Check reading comprehension and help students hone state-assessment test-taking skills with the multiple-choice questions on TE 4 .
13	Hands-On Science (No Lab Required)	Have students try this easy-to-do experiment after reading "Koala Chaos!" (p. 10).	
21	Gross Out	The science behind astounding images. This issue: animal mummification.	
22	You Can Do It	Activities to enhance critical-thinking skills: Explain This • Brain Teaser • Crossword	

PHYSICAL: Forces and Motion

PAGE 8 Bumpy Ride

DID YOU KNOW?

- The first all-terrain vehicles (ATV) were developed in Japan in the late 1960s. They were designed to help farmers travel through a variety of terrain—from muddy fields and rugged roads to the paved streets of town. By the early 1970s, these three- and four-wheel vehicles appeared in the United States for recreational use.
- When selecting a helmet for ATV riding, make sure it meets safety standards. Check for an approval label from one of the following organizations: U.S. Department of Transportation (DOT), the American National Standards Institute (ANSI z90.1), or the Snell Memorial Foundation.

CRITICAL THINKING:

- Select a sport besides ATV-riding. Then, describe how Newton's third law of motion is involved in the activity.

CROSS-CURRICULAR CONNECTIONS:

ART: Research safety tips for ATV riding. Then, create a poster to help educate ATV riders in the community on how to stay safe.

RESOURCES

- Learn more about ATV injuries at the National SAFE Kids Campaign site: www.safekids.org/tier3_cd.cfm?folder_id=540&content_item_id=14070
- Visit the ATV Safety Institute to learn some safe-riding techniques: www.atvsafety.org

LIFE: Ecosystem

PAGE 10 Koala Chaos!

DID YOU KNOW?

- The word “koala” means “no drink” in the language of the Katang aborigines. That's because koalas obtain most of their liquid needs through eating eucalyptus leaves.
- Koalas are the only non-primates to have unique sets of fingerprints.

CRITICAL THINKING:

- One way to manage the deer population in the United States is to have hunting seasons. How is the idea of culling koalas on Kangaroo Island similar or different?

CROSS-CURRICULAR CONNECTIONS:

GEOGRAPHY: Australia is filled with natural wonders and unique wildlife. Research to create a travel guide to this island continent. Be sure to include a map and a list of 10 unusual facts about the nation.

RESOURCES

- This teaching guide created by the Australian Broadcasting Corporation, contains a thought-provoking activity to educate your students about the koala situation on Kangaroo Island: www.abc.net.au/tv/btn/teachers/activitysheets/0222koala.pdf
- For basic facts about koalas, visit: www.sandiegozoo.org/animalbytes/t-koala.html

EARTH: Hurricanes

PAGE 14 Taming the Storm

DID YOU KNOW?

- When Hurricane Charley was approaching the Florida coast in 2004, scientists tracked sharks swimming toward deeper waters. The researchers think the sharks sensed the nearing storm and moved out of harm's way.
- Hurricanes are called typhoons in the northwest Pacific Ocean. They are known as severe cyclonic storms in the north Indian Ocean, and tropical cyclones in the southwest Indian Ocean.

CRITICAL THINKING:

- How might natural resources be affected by a hurricane?

CROSS-CURRICULAR CONNECTIONS:

HISTORY: Research and report on how the naming of hurricanes originated. Be sure to describe the current naming process and a list of this year's storm names.

RESOURCES

- This Federal Emergency Management Agency Web site contains hurricane facts and safety tips: www.fema.gov/kids/hurr.htm
- Some scientists brave the stormy skies and fly planes into hurricanes. Check out this Web site to learn more: www.hurricanehunters.com/
- NOAA's National Hurricane Center has lots of information on hurricanes, including data on the most intense storms: www.nhc.noaa.gov/

PHYSICAL: Chemistry

PAGE 18 Name That Element!

DID YOU KNOW?

- The chemical symbol for iron, “Fe,” stands for “ferrum.” It is the Latin word for “made of iron.”
- Earth's core is made of molten iron and nickel. At more than 2,890 kilometers (1,796 miles) beneath the planet's surface, these elements get so hot—up to 4,149°C (7,500°F)—that they flow like liquid. The movement of these molten metals causes Earth's magnetic field.

CRITICAL THINKING:

- When carbon combines with iron, it forms steel, an alloy. What are five things that are made out of steel? Look around the classroom or think about items at home for clues.

CROSS-CURRICULAR CONNECTIONS:

HEALTH: The Food and Drug Administration recommends that teens take in 12 to 15 milligrams of iron every day. Research what foods are good sources of iron. Then, create a day's menu that will meet the recommended daily allowance of iron.

RESOURCES

- For an in-depth guide to iron, visit: www.webelements.com/webelements/scholar/elements/iron/key.html
- Learn about meteors and meteorites at: www.solarviews.com/eng/meteor.htm
- Explore big structures made with steel at: www.pbs.org/wgbh/buildingbig/

IT'S YOUR CHOICE, p. 20

1. iron 2. c 3. a 4. d 5. a 6. d

YOU CAN DO IT, p. 22

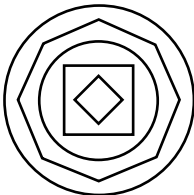
Crossword



Explain This!

Last spring, nine bison escaped from a farm near Baltimore, Maryland. After receiving calls about the breakout, the local police set out with 13 cruisers and a helicopter to track down the animals. The bearded cattle roamed 5 kilometers (3 miles) from home before wandering into a gated community. There, the police corralled the animals into a fenced-in tennis court. Trying to evade capture, the animals—which can weigh 900 kilograms (2,000 pounds) and grow to a height of 1.8 meters (6 feet)—used their powerful legs to jump over the tennis net. It took the police and volunteers three grueling hours to round up the animals and load them into a trailer headed for home.

Brain Teaser



The sequence is based on "expanding geometric figures." In other words, after each figure reaches the outside perimeter, it starts again at the center.

NEWS QUIZ, TE 4

1. d 2. c 3. b 4. b 5. a 6. c 7. c 8. b 9. b 10. c

CHECK FOR UNDERSTANDING, TE 5

Bumpy Ride

- centripetal force; inertia
- friction
- third, motion, equal, opposite
- kinetic energy; potential energy

Koala Chaos!

1. For thousands of years, koalas thrived all over Australia. But when the European settlers arrived in the late 1700s, they hunted millions of the animals for their fur. They also destroyed as much as 80 percent of the koalas' forest habitat for farmland. This left koalas with little room in which to live and their sole food source—eucalyptus leaves—drastically declined. The koala populations tumbled.

2. Kangaroo Island was sparsely inhabited by humans. It was also free of koalas' natural predators such as dingoes. With lots of eucalyptus leaves to eat and nothing to hunt the animals on the island, scientists believed the koalas would thrive there.

3. Koalas eat as many as 1,000 eucalyptus leaves per day. If a koala keeps stripping branches of leaves and does not allow the tree to grow new ones, the branch will die. Koalas can kill a tree one branch at a time. When this happens, it will affect many endemic species that depend on the tree for survival. Losing trees could also be troublesome for the island's farmers. The topsoil on Kangaroo Island is very shallow, and the tree roots help hold the soil in place. Without the trees, rain could wash

away the soil, degrading the quality of farmable land. Losing eucalyptus trees could also affect future generations of koalas. The island's koala population is estimated to double in the next five years. The animals may not have enough food to eat in the future.

4. The Australian government has sterilized thousands of Kangaroo Island koalas. They have also relocated hundreds of the animals to the mainland.

5. A marsupial is a mammal that usually features a pouch in which to nurse and carry its young. Young marsupials are called joeys.

Taming the Storm

Answers will vary, but they should contain the following points:

1. Hurricanes that strike the United States and Caribbean islands develop over warm waters in the Atlantic Ocean. As sun-heated seawater evaporates, the newly formed water vapor rises. As the moist air inches upward, it cools and eventually condenses to create liquid water in the form of rain and clouds. At the same time, the climbing warm air lessens air pressure. Winds whip into this low-pressure area. These gusts pull in more warm, moist air and help to build more clouds. As the system draws air faster and faster inward, a storm begins to form. Large-scale winds over the Atlantic drive these growing storms west toward shores in the southeastern United States and Caribbean islands. A hurricane can form when one of these storms grows stronger, creating a spiraling band of thunderstorms with a central eye.

2. Since the 1940s, people have been attempting to devise ways to harness hurricanes—either by sapping their strength or by driving the storms out to sea. Ideas have included building giant fans to blow hurricanes away from the shore or using bombs to blast the storms out of the water. A project idea that never took off called for coating sections of the ocean surface with a thin film of oil. Ships sailing ahead of a hurricane would spread an oily layer across the sea surface. The oil would keep the ocean water from evaporating. When the hurricane passed over the oil slick, its source of rising moist air would suddenly shut off. Winds would die down and the hurricane would break up. Another unsuccessful scheme: In the 1960s, the U.S. government tested Project Stormfury. The government sent aircraft into hurricanes. As Project Stormfury pilots flew through the band of clouds just outside the eyewall, they released particles of the chemical compound silver iodide. They hoped that a special type of water vapor in the atmosphere would freeze onto the particles and cause clouds to grow faster in that area. Scientists believed that the growth of these clouds would rob energy from the eyewall. Eventually, the clouds would spread out and slow the hurricane's winds.

Name That Element!

- Dispute: Iron combines with sulfur to form pyrite. Pyrite's yellow-gold color and sparkly surface can fool people into thinking they've found precious gold. That's why pyrite is also known as fool's gold.
- Defend: When carbon is combined with iron, an alloy called steel is formed. Steel is superstrong and is an important material for constructing skyscrapers.
- Dispute: Although spinach is packed with iron, it also contains a salt that prevents blood from absorbing the element. Eating meats, beans, or nuts is a better way of getting your daily dose of iron.

OFF-ROAD DAMAGE, TE 6

- In 2001, the highest number of ATV-related deaths was reported. There were 494 deaths and 4.9 million ATVs in use that year.
- In 1995, 52,200 ATV-related injuries were reported. In 1996, there were 53,600 treated injuries.
- Between 1996 and 1997, the number of injuries decreased from 53,600 to 52,800.
- Between 2001 and 2003, the number of ATV-related injuries continued to rise. But the number of ATV-related deaths decreased every year during that period.
- It is approximately 31 percent.

Take It Further

For a complete list of state laws and regulations involving ATVs, visit:

www.off-road.com/atv/kidskorner/state_regs.htm

VOCABULARY BUILDER, TE 7

Across:

- electrons
- pole
- microorganisms
- steel
- alloy

Down:

- biologists
- hemoglobin
- Fe
- nickel
- pyrite
- rusts
- meteor

Bonus:

- Ben
- Franklin

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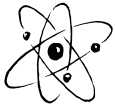
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Name: _____



SCIENCE NEWS

DIRECTIONS: Read the Science News section on pages 4 to 7.

Then, test your knowledge by filling in the letter of the correct answer below.

1. Which of the following is NOT a clue that led scientists to identify the grizzly bear on Melville Island?

- Ⓐ paw prints
- Ⓑ DNA
- Ⓒ hair samples
- Ⓓ droppings

2. Melville Island is located in

- Ⓐ the Antarctic.
- Ⓑ Alaska.
- Ⓒ the Arctic.
- Ⓓ Iceland.

3. Leukocytes are

- Ⓐ stress hormones.
- Ⓑ germ-killing cells.
- Ⓒ skin cells.
- Ⓓ disease-fighting genes.

4. The ___ system is the body's disease-fighting system.

- Ⓐ cardiovascular
- Ⓑ immune
- Ⓒ circulatory
- Ⓓ respiratory

5. Recently, scientists bore a hole to the bottom of Earth's

- Ⓐ crust.
- Ⓑ mantle.
- Ⓒ inner core.
- Ⓓ outer core.

6. Which of the following statements about school buses is false?

- Ⓐ Older buses trap more pollutants than newer buses.
- Ⓑ Most school buses burn diesel fuel for power.
- Ⓒ Most school districts in the United States will be switching to hybrid buses by 2007.
- Ⓓ Buses aren't as tightly sealed as most vehicles.

7. A scientist discovered that popcorn kernels that don't explode have a structure that

- Ⓐ expands at a right angle.
- Ⓑ contains no popcorn fluff inside.
- Ⓒ leaks moisture.
- Ⓓ retains heat.

8. Tooth Tunes sends sound waves to your ears through

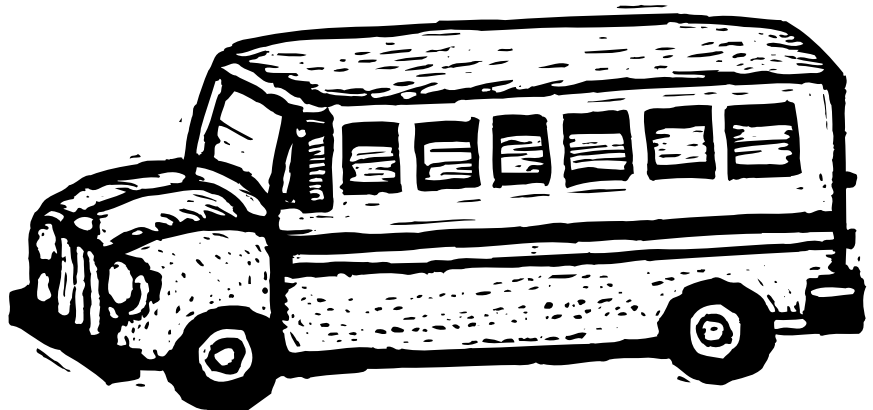
- Ⓐ the air.
- Ⓑ your teeth.
- Ⓒ mini earplugs.
- Ⓓ a tiny MP3 player.

9. Dentists recommend that you brush your teeth ___ a day for ___ each time.

- Ⓐ twice, 1 minute
- Ⓑ twice, 2 minutes
- Ⓒ three times, 1 minute
- Ⓓ four times, 30 seconds

10. About ___ percent of Americans brush their teeth after every meal.

- Ⓐ 0.4
- Ⓑ 1.6
- Ⓒ 24.8
- Ⓓ 53.2

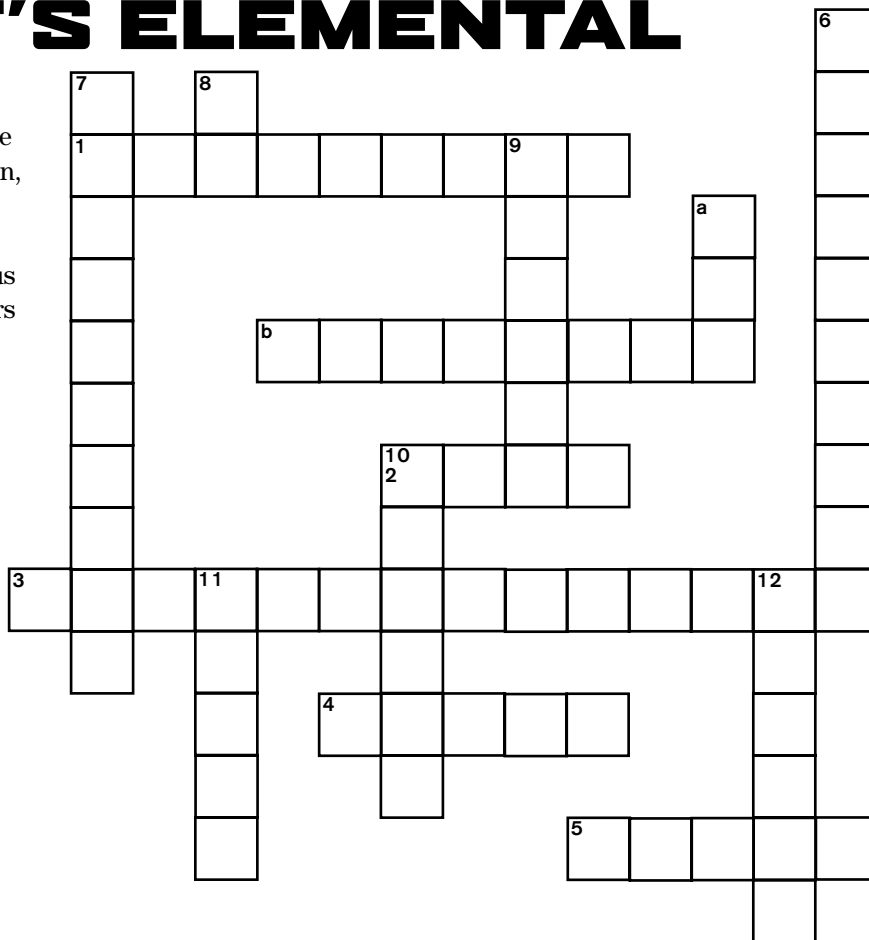
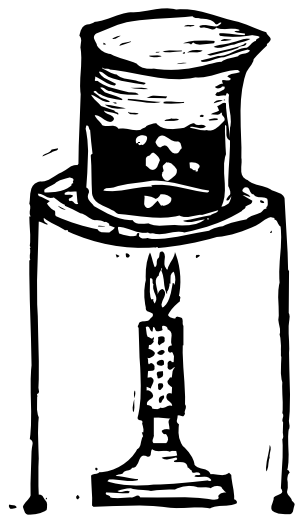


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Name: _____

IT'S ELEMENTAL

Directions: First, read "Name That Element!" on p. 18. Then, solve the clues below to complete this crossword puzzle. To spell out the bonus words, unscramble the letters in parentheses.



ACROSS

- _____ () _ are negatively charged particles.
- A magnet has a north and a south _ _ () _.
- _____ () () _____ are tiny organisms that can only be seen with a microscope.
- _____ () is a superstrong material that is used to build skyscrapers and bridges.
- When a metal combines with another metal, an _____ is formed.

DOWN

- Marine _____ are scientists that study life in the ocean.
- _____ () () is part of your blood, and carries oxygen from your lungs to the rest of your body.
- The chemical symbol for iron is () _.

- Stainless steel is made up of the mystery element, chromium, and _ _ _ () _ _.
- Fool's gold is also known as _ _ () _ _.
- When iron is exposed to water and air, it oxidizes, or _____.
- A _____ () is also called a shooting star.

BONUS:

This 18th-century American scientist was also a politician and an inventor. One invention: An iron stove to help people warm their homes with less wood than they would normally use in a fireplace. The stove's iron shell would get extremely hot from the burning wood inside. Since iron retains heat, the stove warmed the home long after the fire went out. He was: **a.** _ _ _ **b.** _ _ _ _ _

CHECK FOR UNDERSTANDING

Name: _____

PAGE 8 BUMPY RIDE

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

1. When Brittany Snider makes a turn on her ATV, center-seeking _____ pushes her bike around the arc. But _____ is resisting the change in motion, keeping her body moving in a straight line.
2. The protrusions on ATV tires help increase _____, a slowing force caused by two surfaces rubbing together.
3. If you fall onto the ground, Newton's _____ law of _____ explains that the ground pushes back on you with an _____ and _____ force.
4. _____ is the energy of motion. And _____ is stored energy.

PAGE 10 KOALA CHAOS!

DIRECTIONS: On a separate piece of paper, answer the following questions in complete sentences.

1. How did the arrival of European settlers affect the koala populations in Australia?
2. Why did scientists in the 1920s believe that Kangaroo Island would make an ideal home for koalas?
3. Give three reasons why some conservationists believe Kangaroo Island's koala population should be culled.
4. What is the Australian government's current method of koala control on Kangaroo Island?
5. What is a marsupial, and what are young marsupials called?

PAGE 14 TAMING THE STORM

DIRECTIONS: On a separate piece of paper, use details from the story to help you write the following essays:

1. A hurricane is fast approaching. You are a meteorologist assigned to cover the storm. Write the script to your next broadcast report.
2. You're a hurricane expert, and you've been invited to be a guest on a talk show. The host wants you to explain the methods that various organizations, including the U.S. government, have considered to try to hold back a hurricane.

PAGE 18 NAME THAT ELEMENT!

DIRECTIONS: On a separate piece of paper, *defend* or *dispute* the following statements. (**Hint:** Defend means to explain why a statement is correct. Dispute means to explain why a statement is incorrect.)

1. Iron combines with pyrite to create an expensive substance called gold.
2. Carbon combines with iron to form an alloy called steel.
3. Eating spinach is the best way to get your daily dose of iron.

Name: _____

OFF-ROAD DAMAGE

In “Bumpy Ride” (p. 8), you learned about the importance of ATV safety. Below is a chart showing the number of ATV-related injuries and deaths in the United States between 1993 and 2003. Use the information in the chart to complete the sections that follow.

Number of ATV-Related Injuries and Deaths

Year	Treated Injuries	Reported Deaths	Number of ATVs in use (in millions)
1993	49,800	183	1.9
1994	50,800	198	2.0
1995	52,200	200	2.2
1996	53,600	248	2.4
1997	52,800	241	2.7
1998	67,800	251	3.1
1999	82,000	399	3.6
2000	92,200	448	4.2
2001	110,100	494	4.9
2002	113,900	473	5.5
2003	125,500	407	6.2

SOURCE: UNITED STATES CONSUMER PRODUCT SAFETY COMMISSION 2003 ANNUAL REPORT OF ALL-TERRAIN VEHICLE (ATV)-RELATED DEATHS AND INJURIES

A. Graph It!

On a separate sheet of paper, use the above data to construct the following:

1. A bar graph showing the number of ATV-related deaths during a given year.
2. A line graph showing the number of ATVs in use between 1993 and 2003.

Hint: Label the *x*-axis as the year, and the *y*-axis as the number of deaths or the number of ATVs in use.

B. Analyze the Data

Study the data table and your graphs to answer the following questions:

1. In which year did the highest number of ATV-related deaths occur? How many cases were there, and how many ATVs were in use that year?

2. How many treated ATV-related injuries were reported in 1995? How many treated injuries were there in 1996?

3. Between which two years was there a decrease in ATV-related injuries?

4. Compare the number of ATV-related injuries and deaths between 2001 and 2003. Describe the unusual trend.

5. In 2003, 38,600 kids under the age of 16 suffered ATV-related injuries. Approximately what percentage of the year’s total ATV-related injuries is that?

Take It Further:

Do you think that it’s a good idea for young kids to ride ATVs? Some states don’t think so, and have made it illegal for anyone under a certain age to ride one. Does your state have such a law? If so, what is the age limit to ride? Research to find out.