

Name: _____

FACT TRACKER

In "Animal Trackers" (p. 8), you learned how scientists are using tracking devices to discover more about wild-animal behavior. Below are three statements related to the article. Read the claims and decide whether they are true or false. Circle your answer. Then find two pieces of evidence from the article that support your answer.

1. Tracking devices can be used only to determine an animal's location.

True or False

Supporting Evidence 1: _____

Supporting Evidence 2: _____

2. The design of a tracking device depends on the animal on which it will be used.

True or False

Supporting Evidence 1: _____

Supporting Evidence 2: _____

3. Tracking devices can help scientists protect endangered animals.

True or False

Supporting Evidence 1: _____

Supporting Evidence 2: _____

Name: _____

SEA PROTECTION

In “Animal Trackers” (p. 8), you learned that scientists attach tracking devices to marine animals. If these devices contain metal parts, they must be protected to survive their journeys at sea. Read the following passage to learn how chemical reactions in seawater can cause metals to corrode. Then answer the questions that follow.

MUST IT RUST?

A good sailor knows that saltwater can turn a shiny new metal-clad ship into a rusty wreck. Today, boatbuilders use special materials to make sure vessels can withstand many trips at sea.

Metals like steel rust because they contain iron. This element reacts with oxygen to form the chemical compound *iron oxide*, also known as rust. Water must be present for rusting to occur. That’s because, as part of the reaction, some of the iron atoms’ *electrons* jump to the oxygen atoms. Water helps these negatively charged particles move from one atom to another. Rusting happens faster in the ocean because electrons move even more easily in saltwater than in freshwater.

Today’s boatbuilders use metals coated with other materials to slow rust formation. Protective paints can provide a barrier between the iron in the metal and saltwater. Many metals are also *galvanized* with a coating of another metal, such as zinc. Instead of reacting with the iron to form rust, oxygen reacts with the coating to form zinc oxide. That compound shields the iron from the water.

QUESTIONS

1. What is another word for rust?

- (A) zinc oxide
- (B) iron
- (C) iron oxide
- (D) steel

2. How does water help rust form?

- (A) It speeds up the movement of electrons.
- (B) It decreases the temperature at which rust forms.
- (C) Electrons from the water attach to iron atoms.
- (D) Water weakens the bonds between iron atoms.

3. Galvanized materials ____.

- (A) are coated with protective paints
- (B) rust faster than other metals
- (C) will never rust
- (D) are coated with a rust-resistant metal

4. Which of the following statements is BEST supported by the passage?

- (A) Metals should never be used to build boats.
- (B) Boatbuilders should use rust-resistant materials.
- (C) Zinc has revolutionized the process of building boats.
- (D) Iron is a weak metal.

5. Why do you think engineers still use steel and other iron-containing metals on structures that will be exposed to water?

Name: _____

DEFENDING THE GREAT PLAINS

In “Animal Trackers” (p. 8), you read that Crittercams have been fitted to bison to learn about the animals’ habits. Read the passage below to learn how bison tracking may help protect an important ecosystem in North America. Then use complete sentences to answer the questions that follow.

BRING BACK THE BISON

The North American Great Plains were once packed with wildlife. Tens of millions of bison roamed this *grassland ecosystem*. Development and agriculture have destroyed and disconnected parts of the plains, causing some species to decline in numbers. Now, scientists are building a vast reserve in Montana to help those species make a comeback.

Today, less than 2 percent of the Great Plains is protected. The open lands and tall grasses provide critical breeding grounds for 42 species of birds and vital habitat for the black-footed ferret, one of America’s most endangered animals. If the grasslands were to disappear, these species may follow.

When completed, the American Prairie Reserve will protect more than 3.5 million acres of grassland. (Today, it protects about 470,000 acres.) Researchers hope to return large bison herds to this habitat by transplanting animals from other North American herds.

The bison may even help scientists learn how to restore the ecosystem. By tracking the bison’s movements with GPS-fitted collars, scientists hope to learn how the animals use the land. That may help guide decisions on how best to manage the reserve.

QUESTIONS

1. Describe a grassland ecosystem.
2. How large will the American Prairie Reserve be when it is completed?
3. Find a synonym in the text for the word *critical*.
4. In your own words, give two reasons why the Great Plains are important.
5. Based on what you read, what do you think the author’s opinion is about the Great Plains? Explain your answer.

Name: _____

TRACKING TOP SPEEDS

In “Animal Trackers” (p. 8), you learned that scientists used tracking devices to measure the speeds of wild cheetahs in Botswana, in southern Africa. Sensors in the collars recorded the animals’ position and *acceleration*, or change in speed over time. Cheetahs can accelerate by 14.5 kilometers per hour in one stride. To help scientists accurately measure the cats’ movements, the collars were programmed to record more data per second when the animals began moving quickly.

The study proved that the cheetah’s speedy reputation is well-deserved. One feline—nicknamed Ferrari—clocked in a top speed of 95 kph. How does that compare with the fastest recorded cheetah speed? Study the chart below to see the top speeds of some swift animals. Then answer the questions that follow.

ANIMALS’ MAXIMUM RUNNING SPEEDS

Animal	Top Measured Running Speed (kph)	Top Measured Running Speed (mph)
Cheetah	104	
Human (Usain Bolt)	37.6	
Dromedary camel	35.3	
Greyhound	69	
North African ostrich	64	
Pronghorn antelope	89	
Thoroughbred racehorse	88	

SOURCE: ANIMAL ATHLETES: A PERFORMANCE VIEW, VETERINARY RECORD JULY 28; 171; 87-94

CONVERT IT

Fill in the rest of the chart by converting the top speeds to miles per hour. Hint: $kph \times 0.621 = mph$

GRAPH IT

Use a separate sheet of paper to create a bar graph of the top running speeds in kph of the animals in the chart. Don’t forget to label the *x*- and *y*-axes and give your graph a title.

ANALYZE IT

1. What is the slowest animal in the chart?
2. What is the top speed in kph of the bird in the chart?
3. How does Ferrari’s top speed compare with the top cheetah speed in the chart?
4. The top cheetah speed in the chart was measured from a cheetah running on a flat surface similar to a track. What factors may have affected Ferrari’s speed in the wild?
5. The average measured speed of wild cheetahs during a hunt is only 53 kph. Why do you think cheetahs don’t always run at top speeds to catch prey?

Name: _____

HEALTHY FOOD CAMPAIGN

In "Food Fright!" (p. 12), you read that the FDA recently published recommendations about reducing exposure to the chemical acrylamide. Suppose the FDA asked you to create a poster that informs people about this potentially dangerous substance. Use this work sheet to gather information from the article to complete your task.

CHEMICAL CULPRIT: What is acrylamide? Choose at least two facts from the article that explain what the substance is and why it may be dangerous.

1. _____

2. _____

RISK FACTORS: Find at least two facts from the article that explain which foods present the greatest risk for acrylamide exposure.

1. _____

2. _____

FOOD GUIDE: Find at least three recommendations from the article about how people can reduce their exposure to acrylamide.

1. _____

2. _____

3. _____

HIGH-IMPACT IMAGE: What image(s) do you think would make the poster the most informative and eye-catching? Choose one from the article or describe your own. Explain your reasoning.

SAFETY MESSAGE: On a separate piece of paper, use the information you gathered to create a poster informing people about acrylamide.

Name: _____

CANCER FACTS

In "Food Fright!" (p. 12), you learned about a chemical in some cooked foods that may increase the chances of developing cancer. Read the passage below to learn more about this disease. Then answer the questions that follow.

OUT-OF-CONTROL CELLS

Every year, more than 1.5 million Americans are diagnosed with cancer—a family of more than 100 diseases. All types of cancer are characterized by the uncontrolled growth of abnormal cells.

Normally, the trillions of cells in the human body go through a cycle of growth, division, and death. As part of the *cell cycle*, a healthy cell divides into two identical daughter cells. The new cells replace worn-out ones and allow the body to grow. Normally this division stops when the cells receive a signal that no more new ones are needed.

Cancer develops because of *mutations*, or changes, in cells' *DNA*. These changes in the cells' genetic material prevent the "stop" signal from functioning properly. The cells divide out of control and a tumor forms.

Not all tumors are cancerous. Benign tumors are harmless. They are surrounded by a membrane that prevents the abnormal cells from invading other tissues. Malignant, or cancerous, tumors are not enclosed, allowing the abnormal cells to invade and destroy other tissues in the body.

QUESTIONS

1. How many cells are in the human body?

- (A) 1 million
- (B) 1.5 million
- (C) billions
- (D) trillions

2. What do all types of cancer have in common?

- (A) They are caused by uncontrolled cell growth.
- (B) The tumors are made up of old, worn-out cells.
- (C) They are not curable.
- (D) Many cells in one part of the body suddenly die.

3. A ____ tumor is ____.

- (A) malignant; surrounded by a membrane
- (B) malignant; non-cancerous
- (C) benign; able to invade other tissues
- (D) benign; surrounded by a membrane

4. Which of the following is NOT true about cancerous cells?

- (A) They divide out of control.
- (B) They can invade different tissues in the body.
- (C) They do not have changes in their DNA.
- (D) The signal to stop dividing does not function properly.

5. Describe one similarity and one difference between benign and malignant tumors.

Name: _____

REDUCING YOUR RISK

In “Food Fright!” (p. 12), you learned that the FDA has recommended that people limit their intake of acrylamide to help reduce cancer risk. Certain environmental exposures can also increase the chance of developing cancer. Read the following passage to learn more about the cancer risks and how to protect yourself. Then use complete sentences to answer the questions that follow.

ENVIRONMENTAL HAZARDS

Most people know that exposure to substances like the chemicals in cigarette smoke can lead to cancer. But many other *carcinogens* exist naturally in the environment. Fortunately, there are simple ways to reduce your exposure to these cancer-causing agents.

One famous culprit is *ultraviolet (UV) radiation* emitted by the sun. These high-energy waves cause changes to skin cells that may lead to melanoma and other types of skin cancer. Scientists recommend putting on sunscreen and wearing protective clothing to reduce your exposure to this carcinogen.

Other hazards are hidden beneath Earth’s surface. *Radon* is a radioactive element that exists at low levels in most soil. When the element breaks down, it emits high-energy radiation that can damage cells. Radon naturally occurs as a gas, so it can seep into basements and reach dangerous levels. Ventilation systems can dramatically reduce the level of radon in homes.

One unavoidable factor is the ultra-high-energy radiation that enters Earth’s atmosphere from space. But scientists believe these *cosmic rays* pose only a small cancer risk.

QUESTIONS

1. What are two carcinogens mentioned in the text?
2. Why do scientists recommend reducing your exposure to sunlight?
3. Why is it important that basements in homes have ventilation systems?
4. What are cosmic rays?
5. What is the central idea of this passage?

Name: _____

BRING ON THE HEAT

In "Food Fright!" (p. 12), you learned that high temperatures can create a potentially dangerous substance in some foods. From frying to boiling to baking, there are many ways to transfer heat to food. The chart below shows the different methods of heat transfer and how they relate to cooking. Study the chart and then answer the questions that follow.

HEAT TRANSFER IN COOKING

Process	How It Works	Cooking Examples
Conduction	Heat transfers through direct contact between two materials with different temperatures. Heat moves from the hot material into the cooler one.	<ul style="list-style-type: none"> • Heat moves from a hot pan into food through conduction. • Conduction moves heat from the outside of a piece of food to the middle. • Conduction heats water molecules touching the bottom of a hot pot.
Convection	Heat moves from one place to another within a fluid—a gas or liquid—by the movement of molecules. Hot fluids are less dense than cold ones. Hot air or liquid moves upward, carrying heat with it. As the fluid cools, it becomes denser and sinks.	<ul style="list-style-type: none"> • Heat moves through the air in an oven by convection. • Special "convection ovens" have fans that circulate hot air faster. • Convection transmits heat throughout the water in a pot.
Radiation	Heat is transferred through energy waves emitted by a source.	Microwaves emit high-energy waves to heat food. The waves cause the molecules in the food to move faster and heat up.

QUESTIONS

1. Which process transfers heat through direct contact between two materials?
2. What type of heat transfer is used to cook a bag of microwave popcorn?
3. In which two states of matter does convection occur?
4. Suppose you are frying an egg in a pan. What are two ways conduction contributes to cooking the egg?
5. Explain how conduction and convection contribute to boiling a pot of water.

Name: _____

A TOWERING DEBATE

In “Attack of the Buildings” (p. 14), you learned that some buildings’ designs have posed unexpected dangers. The article below describes a skyscraper in Taiwan that one scientist says could be causing earthquakes. Do you agree with the scientist’s claim? Read the article, taking note of facts that support each side of the debate. Then use the organizer on the next page to write a persuasive essay on the topic.

A Rising Debate

In December 2005, an earthquake rattled Taipei, Taiwan. Scientists say that Taipei 101—once the world’s tallest building—may have triggered the ground-shaking quake.

A scientist has proposed that the 101-story skyscraper may increase stress on underground faults. When the stress increases enough along these rock boundaries, the rocks slip past one another and an earthquake occurs. “The stress added by the tower’s weight is like the straw that breaks the camel’s back,” says Cheng-Hong Lin, a seismologist who studies earthquakes at Taipei’s Institute of Earth Sciences, Academia Sinica.

His evidence? Each year between 1990 and 1997—before the skyscraper’s construction—Taipei experienced roughly one minor earthquake of magnitude 2.0 or less. From October 2004 to December 2005—after the tower’s completion—three stronger quakes with magnitudes of 3.2 to 4.0 jolted Taipei.

Some seismologists are not convinced: Leonardo Seeber, of Lamont-Doherty Earth Observatory in New York, says that Taipei’s earthquakes are focused 10 kilometers (6 miles) underground. There, the tower’s weight would be distributed over a broad area. As a result, the stress would not build up enough on individual faults to trigger an earthquake.

Still, Lin plans to continue monitoring the city’s tremors to determine if the 705,000-ton tower is truly earthshaking.

continued on following page

Name: _____

A TOWERING DEBATE CONTINUED

Does Taipei 101 cause earthquakes? Do you think tall buildings like Taipei 101 should be built in earthquake-prone regions? Use the questions below to guide you in writing an essay persuading other readers to agree with your view.

WHAT DO YOU THINK? (Start your essay with a position statement. This should clearly and concisely state your opinion about the topic.)

SUPPORT YOUR CLAIM (Provide at least two convincing reasons that support your opinion. Include facts you learned from the article.)

REASON 1: _____

REASON 2: _____

CONCLUDE (End your essay with a concluding paragraph. This should show your reader why he or she should agree with your statement.)

Name: _____

BUILDING ROOTS

In “Attack of the Buildings” (p. 14), you learned about the drawbacks of some unique buildings. One reason for these construction failures is that the buildings were innovative designs. Engineers are always thinking up new types of groundbreaking structures. Read the following passage to learn about one of these. Then answer the questions that follow.

GROWING UP

Could farms one day be sprouting up in skyscrapers? Around the world, indoor farms are popping up in warehouses and buildings everywhere from Japan to Chicago's O'Hare airport.

These so-called “vertical farms” are built with tall stacks of plant-growing beds. The layered beds mean that even small spaces provide plenty of growing room. Most vertical farms use artificial light and have controlled temperatures and humidity. That means they can grow veggies year-round, even during harsh winter weather.

Many vertical farms also use different growing methods such as *hydroponics*, in which plants grow in a nutrient-rich water solution instead of soil. The soilless environment prevents insect infestation and disease.

The biggest drawback? Vertical farming requires a lot of energy for lighting and heat. Some indoor farmers are turning to renewable solar or wind energy to power their facilities. Instead of using artificial lights, one vertical farm in Singapore has a glass ceiling and walls with rotating beds so the plants can absorb sunlight.

QUESTIONS

1. Why are the new farms called “vertical farms”?

- (A) They are built at high altitudes.
- (B) They are made of tall stacks of growing beds.
- (C) Plants grow upside down.
- (D) The plants grow to taller heights than normal.

2. What is hydroponics?

- (A) a method of growing plants without soil
- (B) the way all plants are grown in vertical farms
- (C) a way to grow plants without water
- (D) growing plants with natural light

3. Which of the following is NOT a benefit of vertical farms?

- (A) They can be built in urban areas.
- (B) They require little electricity.
- (C) Plants can be grown year-round.
- (D) They allow farmers to use different growing methods.

4. What is the purpose of the last paragraph?

- (A) to convince the reader that vertical farms are a good idea
- (B) to describe a vertical farm in Singapore
- (C) to explain why people have built vertical farms
- (D) to explain the drawbacks of vertical farms

5. Vertical farms could allow fruits and vegetables to be grown closer to your home. Much of the produce in your grocery store has been grown in distant places and spent long periods of time being transported on ships, airplanes, trains, or trucks. Do you think it's important to eat food that's grown locally? Explain.

Name: _____

BREAKING THE ICE

In "Attack of the Buildings" (p. 14), you learned about the dangerous ice falling from the slanted sides of One World Trade Center in New York City. Read the passage below to learn about materials that can prevent ice from building up on surfaces. Then use complete sentences to answer the questions that follow.

ICE STOPPER

From winter roads to airplane wings, a coating of ice can be a serious hazard. Now, scientists have created a material that prevents ice buildup.

Traditionally, workers stop ice from forming on surfaces like highways by applying salt or other chemicals. The substances lower the *freezing temperature* of water. Ice normally forms at 0°C (32°F). Salt and other antifreeze chemicals cause water to solidify at lower temperatures. However, these substances can corrode the underlying materials.

Now, engineers from Harvard University in Massachusetts have created a material that prevents ice from forming without using damaging chemicals. They learned that ice begins to build up when a cold-water droplet hits a surface and flattens out. The water then freezes and becomes a base for more droplets.

The new ice-repellent material has *nanostructures* that cause droplets to bounce away from the surface instead of spreading out and freezing. The material repels ice to temperatures of roughly -30°C (-22°F). The nanostructures can be molded into materials and could one day be used to coat structures that need to be kept ice-free.

QUESTIONS

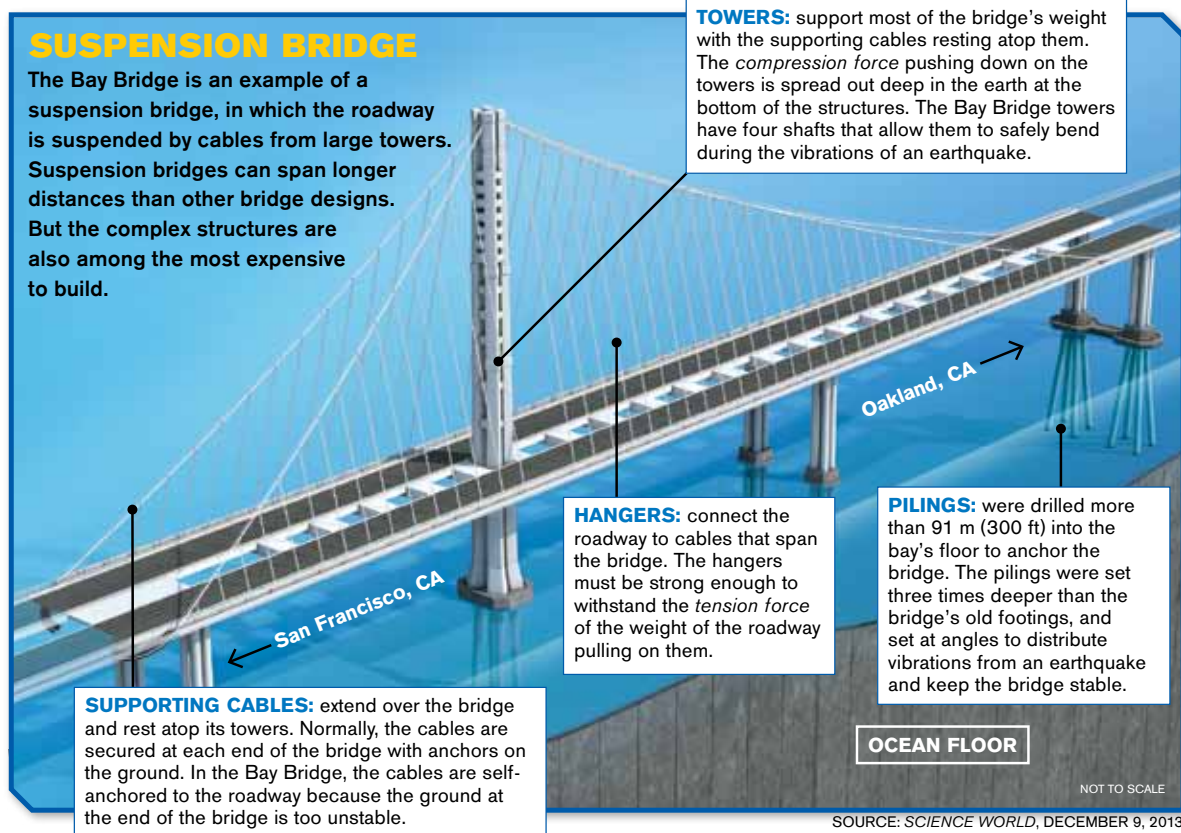
1. What is the freezing temperature of a liquid?
2. What is the disadvantage of using salt to keep ice off roads?
3. Explain how the new material prevents ice from forming on a surface.
4. At what temperatures will ice form on the newly created material?
5. What are some other situations in which an ice-repellent material would be advantageous?

Name: _____

BRIDGE DESIGN

In “Attack of the Buildings” (p. 14), you read about the unexpected problems of some building designs. When planning any new structure, engineers must consider many factors, such as appearance, safety, and ability to withstand natural disasters like hurricanes and earthquakes.

The diagram below shows the features of the recently updated Bay Bridge in San Francisco. The bay-spanning structure was designed to withstand earthquakes like the one that destroyed part of the bridge in 1989. Study the diagram and then answer the questions that follow.



QUESTIONS

1. What is one benefit of suspension bridges compared with other bridge designs?
2. How are the supporting cables on the Bay Bridge different from those of most suspension bridges?
3. What structures support most of the weight of a suspension bridge?
4. Which type of force is experienced by the hangers that attach to the roadway?
5. How are the Bay Bridge's towers specially designed to withstand an earthquake?

Name: _____

FIND THE BIG IDEA

Read about how scientists are working to restore the delta of the Colorado River in "Back on Course" (p. 20). Then use this skills sheet to identify the central idea of each section of the story and of the article as a whole. For each section, record at least two details from the article that support the central idea you identified.

"Taming a River"

CENTRAL IDEA: _____

SUPPORTING DETAIL 1: _____

SUPPORTING DETAIL 2: _____

"Tapped Out"

CENTRAL IDEA: _____

SUPPORTING DETAIL 1: _____

SUPPORTING DETAIL 2: _____

"Rescue Plan"

CENTRAL IDEA: _____

SUPPORTING DETAIL 1: _____

SUPPORTING DETAIL 2: _____

Use the information you collected above to determine the central idea of the whole article. Write it in the space below.

Name: _____

RAGING DEBATE

In “Back on Course” (p. 20), you learned that dams along the Colorado River prevent water from reaching the river’s delta. Dams also affect wildlife that live in and around rivers. Read the following passage to learn how dams threaten some species and what happens when a dam is removed. Then use complete sentences to answer the questions that follow.

TAKING DOWN A DAM

Building a dam can provide clean hydropower electricity and store freshwater for people living near rivers. But these water-diverting structures can devastate river wildlife. As scientists better understand the environmental effects of dams, some structures are being removed. Since 1990, roughly 680 dams in the U.S. have been taken down.

Migratory fish are especially threatened by dams. Many species, like Atlantic salmon, swim upriver to lay eggs. The fish can’t swim through dams to reach their spawning spots, which causes their numbers to decline.

Fish populations plummeted, and the local fishing industry took a hit, when the Edwards Dam in Maine was built in 1837. The dam was removed in 1999, and populations of migratory fish, including Atlantic salmon, striped bass, and the endangered shortnose sturgeon, have rebounded.

Since its construction, the Marmot Dam in Oregon has held back gravel and other sediment that was normally deposited downstream. The gravel transported by the river once provided critical fish habitats. The dam was dismantled in 2007, and scientists hope that the fish-friendly deposits will return.

QUESTIONS

1. What are two benefits of dams?
2. How many U.S. dams have been dismantled since 1990?
3. Explain how migratory fish can be affected by dams.
4. How did the construction of the Marmot Dam affect wildlife?
5. Hydropower provides roughly 7 percent of the electricity in the U.S. Do you think more hydroelectric dams should be built? Support your answer.

Name: _____

FLUSH, RECYCLE, DRINK

In “Back on Course” (p. 20), you learned that water demand in the American Southwest is part of what’s draining the resources of the Colorado River. Read the following passage to find out how a California water plant is fighting water shortages by recycling sewage into drinking water. Then answer the questions that follow.

FROM TOILET TO TAP

Growing water demands have depleted California’s groundwater supplies. That’s one reason why the Orange County Water District recycles sewage into drinking water. The treatment facility cleans wastewater from everything from dishwashers to toilets and adds it to the drinking water supply.

Wastewater undergoes several cleaning steps to ensure it exceeds all potable water standards. First *microfiltration* removes larger solids, including bacteria. The water passes through filters with holes just 0.2 micrometer in diameter—roughly 1/300 the width of a human hair. Once the larger particles are removed, the water undergoes *reverse osmosis*. It is pushed at high pressures through a membrane that catches even smaller particles, such as dissolved chemicals and viruses. Finally, the water is exposed to *ultraviolet (UV) light*. The high-energy waves destroy any remaining organic material.

The facility has recycled water for non-drinking purposes since the 1970s. In 2008, after educating the public about the water’s safety, it began adding the facility’s recycled water to the drinking supply. Now the facility is increasing its recycled output to 100 million gallons daily—enough for the water needs of roughly 850,000 people in one day.

QUESTIONS

1. When did the treatment facility begin adding recycled water to the drinking supply?

- (A) 1970s
- (B) 1980s
- (C) 2008
- (D) 2014

2. Use context clues to determine the meaning of the word *potable*.

- (A) drinkable
- (B) recycled
- (C) toxic
- (D) waste

3. What is the purpose of exposing the water to ultraviolet light?

- (A) to remove solids from the water
- (B) to destroy organic material
- (C) to heat up the water
- (D) to destroy chemicals in the water

4. Which of the following BEST represents the central idea of the passage?

- (A) People don’t want to drink recycled water.
- (B) California is experiencing water shortages.
- (C) Sewage can be recycled into drinking water.
- (D) Recycled water provides drinking water to all of California.

5. Why do you think that the water-treatment facility began a public education campaign before including recycled water in the drinking supply?

Name: _____

WATER POWER

In “Back on Course” (p. 20), you learned that dams on the Colorado River provide electricity for the American Southwest. These hydropower dams harness the *kinetic energy* of the river’s water. The moving water turns blades of a turbine. A generator converts the kinetic energy of the spinning blades into electricity.

The amount of electricity produced by hydropower varies, depending on how much water is available each year. The chart below shows how the annual production of hydropower electricity compares with the amount generated by other renewable energy sources, such as solar and wind power, in the U.S. each year. Use the data in the chart to answer the questions that follow.

ELECTRICITY PRODUCTION FROM RENEWABLE SOURCES

Year	Hydropower (million megawatt-hours)	Other renewable energy sources (million megawatt-hours)
2000	276	81
2001	217	71
2002	264	79
2003	276	79
2004	268	83
2005	270	87
2006	289	96
2007	247	105
2008	255	126
2009	273	144
2010	260	167

SOURCE: U.S. ENERGY INFORMATION ADMINISTRATION

GRAPH IT

On a separate piece of paper, use the data in the chart to create a double line graph that compares the electricity production from hydropower with other renewable sources. Be sure to label the *x*- and *y*-axes and the two lines and give your graph a title.

QUESTIONS

- In which year on the chart was the most hydropower electricity produced?
- What was the total amount of electricity produced by all renewable sources in 2010?
- How did the amount of electricity produced by renewable sources other than hydropower change between 2000 and 2010?
- What happened to the amount of electricity produced by hydropower over the same period?
- How might a drought across a large part of the U.S. affect the amount of hydropower electricity produced?

Name: _____

SCIENCE NEWS

DIRECTIONS: Read the “Science News” section on pages 2–7. Then test your knowledge, filling in the letters next to the correct answers below.

1. Biologists recently determined that dinosaurs were ____.

- (A) cold-blooded
- (B) warm-blooded
- (C) mesotherms
- (D) sluggish

2. How do birds and mammals maintain their body heat?

- (A) by eating often
- (B) by conserving meals
- (C) by using the sun and shade
- (D) by staying active

3. An ocean’s worth of water that exists beneath Earth’s surface is contained within ____ that release(s) water under pressure.

- (A) plates
- (B) boulders
- (C) sand
- (D) minerals

4. The water contained within Earth gives clues to ____.

- (A) how ice forms
- (B) how oceans on Earth’s surface formed
- (C) how plates move
- (D) how deep water moves

5. The magic glove can teach people to play a piano song by creating ____.

- (A) spinal cord signals
- (B) muscle memory
- (C) vibrations
- (D) motor skills

6. Muscle memory allows a person to ____.

- (A) repeat actions without having to think about it
- (B) use muscles instead of his or her brain
- (C) make muscles train themselves
- (D) tell muscles when to fire

7. Why have microbeads been banned in Illinois?

- (A) They exfoliate protective layers of skin.
- (B) They don’t break down, polluting waterways.
- (C) They break down in water.
- (D) They clog drains.

8. To help the European hamster, farmers in France are ____.

- (A) growing more wheat
- (B) growing more corn
- (C) building small shelters for the hamsters
- (D) switching to indoor farming

9. The purpose of a plane’s black box is to ____.

- (A) record who is on the plane
- (B) alert pilots to incoming storms
- (C) record passenger conversations
- (D) record clues to help investigators determine the cause of a plane crash

10. The crash survivable memory unit contains which one of the following?

- (A) the flight data recorder
- (B) the cockpit voice recorder
- (C) flash memory chips
- (D) the power supply

reset answers

Name: _____

ANIMAL TRACKERS Page 8

DIRECTIONS: Answer the following questions in complete sentences.

1. According to the article, why are great white sharks endangered? _____

2. Why didn't scientists anesthetize Lydia when they brought the shark onboard the boat? _____

3. Describe two tests scientists did on Lydia while the shark was on the boat. _____

4. What data is collected by the tracking collars worn by cheetahs in Botswana? _____

5. Why did scientists show video recordings of Hawaiian monk seals to the local community? _____

FOOD FRIGHT! Page 12

DIRECTIONS: Read each statement below and decide if it is true (T) or false (F). Write your response in the space provided.

1. _____ Acrylamide is a chemical that causes people to gain weight more quickly.
2. _____ French fries are the only food that contains acrylamide.
3. _____ Overcooked foods are more likely to have higher concentrations of acrylamide.
4. _____ Using potatoes with lower amounts of sugar can reduce the amount of acrylamide in french fries.
5. _____ Tests on humans have shown that acrylamide causes cancer in people.

Name: _____

ATTACK OF THE BUILDINGS! Page 14

DIRECTIONS: Fill in the blanks in the following sentences.

1. The Walt Disney Concert Hall was built in _____.
2. The concert hall's curved panels reflected _____ into nearby windows.
3. Unlike the concert hall's outer walls, the exterior panels of the "Walkie-Talkie" building are made of _____.
4. The _____ shape of the panels on the Walkie-Talkie concentrates sun rays into a central point.
5. Temperatures in the concentrated hot spot created by the Walkie-Talkie can reach _____.
6. _____ is the tallest building in the U.S.
7. Falling ice from the tallest building in the U.S. caused a nearby _____ to be closed last winter.
8. Ice can form on any _____ surface on a building.
9. A _____ is caused by powerful winds moving in a circular motion.
10. Structures called _____ can be used to redirect gusts of wind around a building.

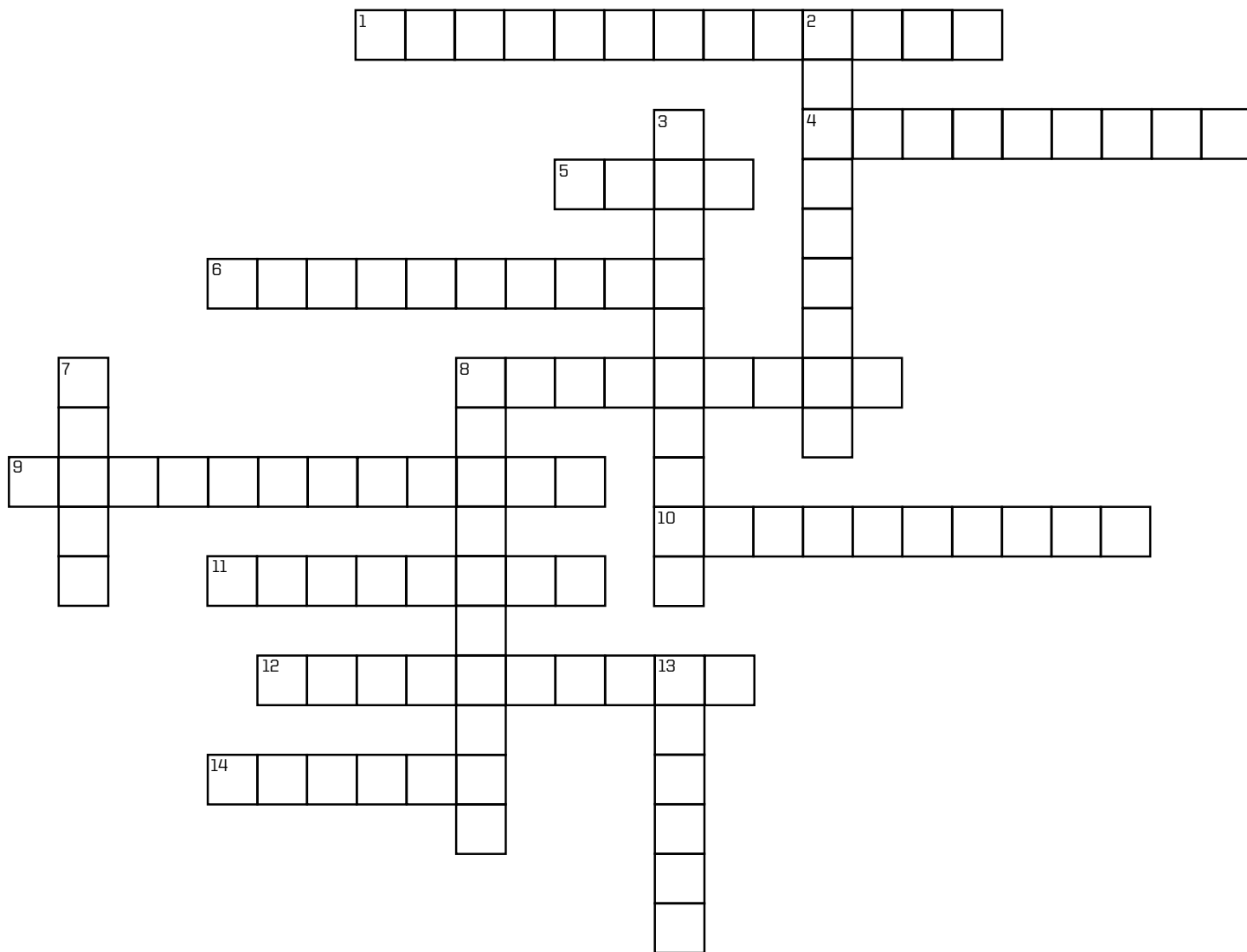
BACK ON COURSE, Page 20

DIRECTIONS: Match each item in the left column below with its definition in the right column.

- | | |
|-------------------------|--|
| _____ 1. dam | a. surge of water used to mimic natural floods in a river |
| _____ 2. reservoir | b. a tree found in the Colorado delta that relies on floods to reproduce |
| _____ 3. Colorado River | c. largest reservoir in the U.S. |
| _____ 4. delta | d. barrier built to control flow of water in a river |
| _____ 5. pulse flow | e. source of water for 30 million people |
| _____ 6. drought | f. electricity produced using the energy of moving water |
| _____ 7. hydropower | g. an artificial lake |
| _____ 8. groundwater | h. area at the mouth of a river |
| _____ 9. cottonwood | i. a long, dry period |
| _____ 10. Lake Mead | j. water trapped in soil and rock |

Name: _____

DIRECTIONS: Use the clues below to fill in the crossword puzzle. All answers can be found in this issue.



ACROSS

- 1. Devices that heat the exterior of a building
- 4. The world's largest aquatic insect
- 5. An illness caused by a virus that can result in severe difficulty breathing
- 6. Someone who studies viruses
- 8. A temporary release of water from a dam
- 9. Instruments that measure movements inside Earth
- 10. A cancer-causing chemical that forms in many common foods during cooking

- 11. The first state to ban the sale of products containing microbeads
- 12. Power derived from the energy of moving water
- 14. The country where the European hamster primarily lives

DOWN

- 2. Form of high-energy waves or particles
- 3. The name of a popular animal tracking device
- 7. The only egg-laying female in a bee colony
- 8. Chemical scents that animals use to communicate
- 13. A molecule that aids a chemical reaction