Name: _____

KNOW YOUR TEXT FEATURES

Use the chart below to analyze the nonfiction text features in this month's article "When the Universe Went Bang!" (p. 8).

FEATURE	EXAMPLE OF FEATURE IN THE ARTICLE	PURPOSE OF THE FEATURE
Headline	When the Universe Went Bang!	to grab the reader's attention; to summarize the article
Section Heading		
Quote		
Diagram		
Sidebar		
Italicized Word		

Name: _____

A SWEET DISCOVERY

In "When the Universe Went Bang!" (p. 8), you learned that a sensitive telescope may have detected ripples in space that hold clues to how the universe was born. Scientists are also using telescopes to search for clues that life exists elsewhere in the cosmos. Read the following passage to learn about the discovery of molecules related to life that were found far from Earth. Then answer the questions that follow.

SUGAR IN SPACE?

How's this for a sweet discovery: Astronomers have found sugar floating in the gas around a star trillions of miles away. The presence of sugar suggests the possibility of life existing on Earthlike planets orbiting the star.

Many people simply think of sugar as the tasty ingredient in foods like candy and cakes. But to scientists, sugar is an *organic molecule*—a group of two or more atoms bonded together that contains carbon. Organic molecules are the basic building blocks of life on Earth. Scientists think that they may be essential for life on other planets too.

Astronomers are now pointing their telescopes at the star where the sugar was found to look for other organic molecules. They are also measuring the astounding amount of sugar they've found so far.

"All that sugar weighs as much as 36 times the weight of our moon," says astronomer Tyler Bourke of the Harvard-Smithsonian Center for Astrophysics in Massachusetts. "That could make a lot of cookies!"

QUESTIONS

1. **How far away is the sugar discovered in space from Earth?**
Ⓐ 36 times as far away as the moon
Ⓑ billions of miles away
Ⓒ millions of miles away
Ⓓ trillions of miles away

2. **What is an organic molecule?**
Ⓐ a molecule on Earth
Ⓑ a carbon atom
Ⓒ a group of two or more atoms bonded together that contains carbon
Ⓓ a carbon molecule in space

3. **Which of the following is a synonym for the word *essential*?**
Ⓐ critical
Ⓑ disastrous
Ⓒ unwanted
Ⓓ trivial

4. **Which of the following statements BEST represents the central idea of the passage?**
Ⓐ Life needs organic molecules like sugar to form.
Ⓑ The discovery of sugar in space is a promising development in the search for alien life.
Ⓒ Telescopes can detect sugar molecules.
Ⓓ Life on other planets is probably the same as life on Earth.

5. **In your own words, explain why the discovery of sugar in space is a clue that life could exist around another star.**

Name: _____

GATHERING DUST

In "When the Universe Went Bang!" (p. 8), you learned about the birth of the universe 13.8 billion years ago. The universe grew and developed for billions of years before our solar system came into existence. Read the following passage to find out how the sun, Earth, and other planets in our solar system were born. Then use complete sentences to answer the questions that follow.

THE ORIGIN OF THE SOLAR SYSTEM

Our *solar system* is made up of the sun and the objects that orbit it, including the planets, their moons, and smaller space rocks like asteroids. Five billion years ago, these bodies didn't exist. How did they form?

Astronomers believe the solar system formed from a giant cloud of dust and gas called a *nebula*. Roughly 4.5 billion years ago, the pull of *gravity* caused material in the cloud to begin clumping together. This tugging force caused the cloud to collapse in on itself.

The collapse created a large, central spinning mass surrounded by a flat disk of material. Within the disk, smaller masses of dust and gas clumped together to form the planets.

Meanwhile, the spinning mass in the center was heating up. When it reached about 5,000,000°C (9,000,000°F), hydrogen atoms within it began to collide forcefully. They bonded to create helium atoms. This *fusion* reaction released a lot of energy. The central mass ignited, and our star, the sun, was born.
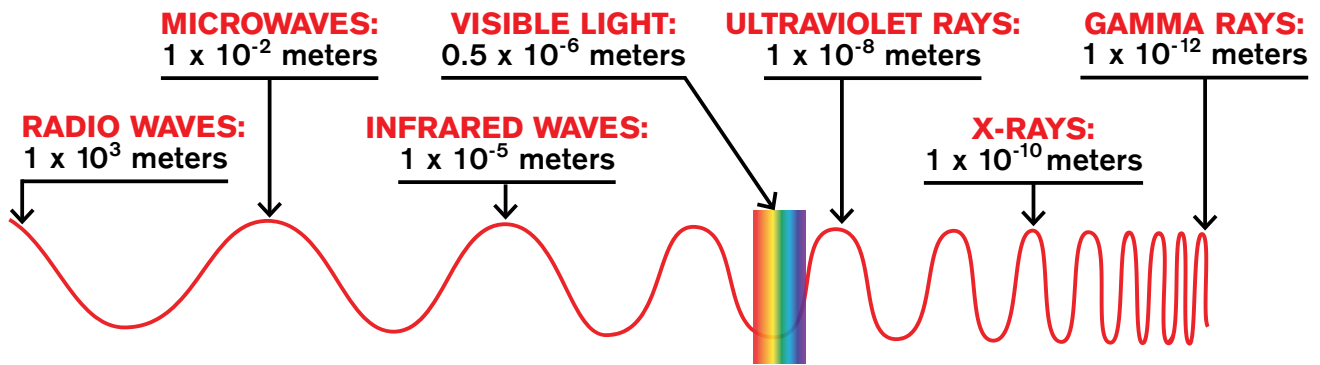
QUESTIONS

1. What do you think was the author's purpose in writing this passage?

2. What bodies make up our solar system?

3. Roughly how many years passed between the birth of the universe and the formation of our solar system?

4. What caused the mass in the center of the solar system to ignite?

5. Do you think the following statement is true? "Without gravity, Earth wouldn't exist." Use evidence from the text to support your answer.

SCHOLASTIC
ScienceWorld

Name: _____

ENERGY WAVES

In "When the Universe Went Bang!" (p. 8), you read that scientists have been learning about the big bang by studying the *cosmic microwave background*, a type of ancient light energy traveling through the universe. Light waves are arranged on the *electromagnetic spectrum* according to their wavelength, the distance between the wave's peaks. As the energy of a wave increases, its wavelength decreases. The diagram below shows the electromagnetic spectrum with typical wavelengths for different kinds of light. Use the diagram to answer the questions that follow.
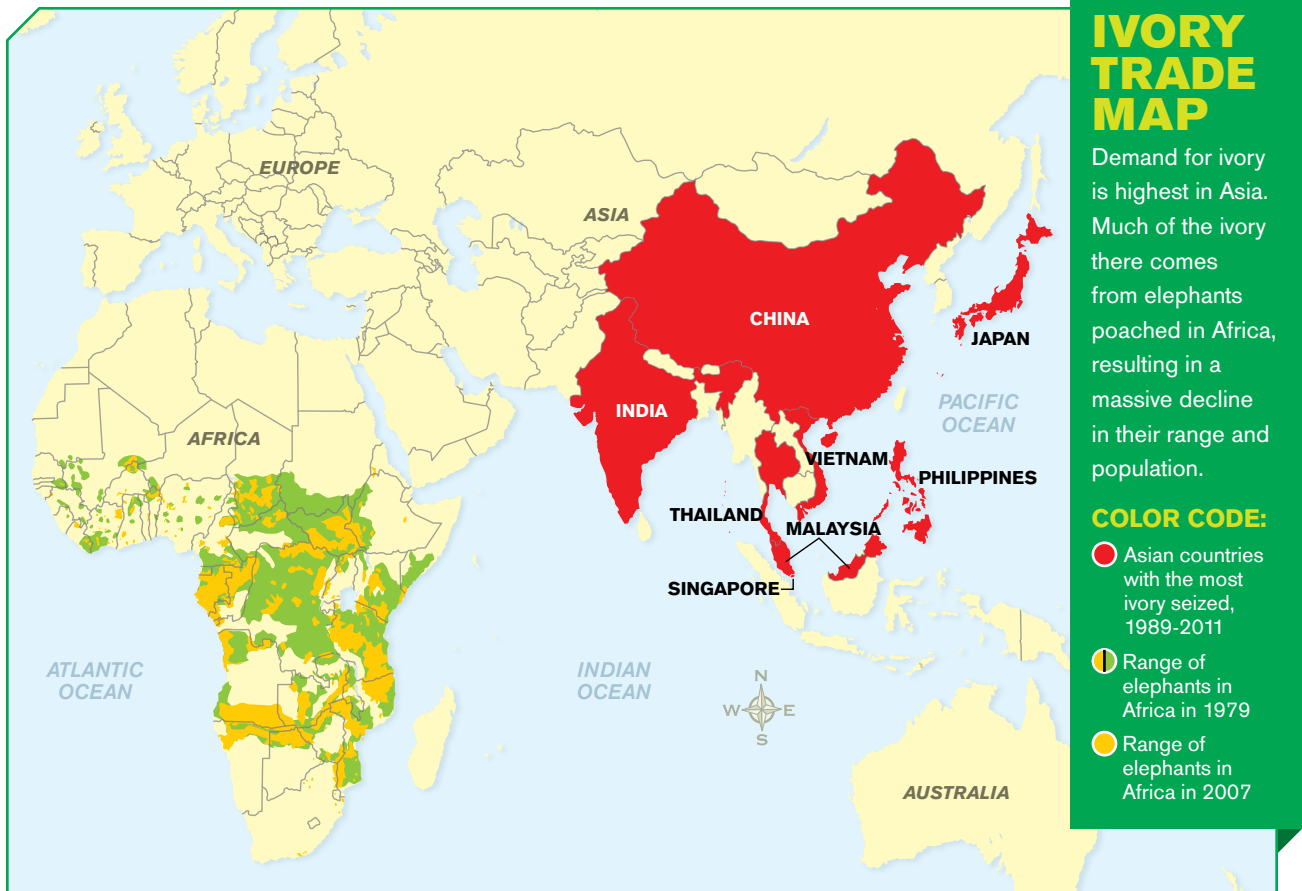
ELECTROMAGNETIC SPECTRUM

MICROWAVES:
1×10^{-2} meters

VISIBLE LIGHT:
0.5×10^{-6} meters

ULTRAVIOLET RAYS:
1×10^{-8} meters

GAMMA RAYS:
1×10^{-12} meters

RADIO WAVES:
1×10^{3} meters

INFRARED WAVES:
1×10^{-5} meters

X-RAYS:
1×10^{-10} meters

QUESTIONS

1. How does wavelength change as you move from left to right on the spectrum?

2. Which unit is used to measure wavelength in the diagram?

3. The waves in the cosmic microwave background are microwaves. What is the approximate wavelength of these waves on the chart?

4. Which type of light wave has more energy, infrared waves or radio waves?

5. Describe two ways in which ultraviolet light differs from infrared light.

Name: _____

TRACKING IVORY

In "Drones Take Off" (p. 14), you learned that the World Wildlife Fund plans to launch camera drones to help track down poachers who illegally hunt endangered animals. Elephants are frequently killed for their ivory tusks. The map below shows how elephant ranges have decreased and where ivory is in highest demand. Study the map and then answer the questions that follow.

IVORY TRADE MAP

Demand for ivory is highest in Asia. Much of the ivory there comes from elephants poached in Africa, resulting in a massive decline in their range and population.

COLOR CODE:

- 🔴 Asian countries with the most ivory seized, 1989-2011
- 🟡 Range of elephants in Africa in 1979
- 🟠 Range of elephants in Africa in 2007

QUESTIONS

1. Which two continents shown on the map are most involved in the ivory trade?

2. Name three countries with a high demand for ivory.

3. Which ocean separates the elephant population from the countries where most of the ivory is bought?

4. How many years separate the surveys that were used to determine the extent of the two elephant ranges shown on the map?

5. Do you think fewer people would poach elephants if there were camera drones watching over the animals?

Name: _____

CLEARING THE AIR

In "Drones Take Off" (p. 14), you learned about some ways drones could be used in civilian life. Read the following passage to find out how drones are helping clean polluted skies. Then answer the questions that follow.

SMOG-FIGHTING DRONES

In 2014, the Chinese government declared war on air pollution. Some of the fighters aiming to clean up the skies are unmanned drones.

China's air quality is among the worst in the world. Cars, coal-burning power plants, and industrial processes release toxic chemicals that fill the skies with choking smog. In many Chinese cities, the density of *PM2.5 particle pollution* (particles small enough to enter people's lungs and cause health problems) is often 20 times higher than the safe level recommended by the World Health Organization.

Chinese officials have now begun using aerial drones to try to clear the skies. The drones spray "smog-clearing" chemicals into the air. The chemicals react with floating smog pollution, forming a product that falls to the ground.

Traditional drones are expensive. This spring, Chinese officials began testing a new type of drone called a parafoil plane. Instead of sporting fixed wings like an airplane, the parafoil plane hangs from a wide parachute that allows it to glide through the skies. Parafoil drones cost 90 percent less than traditional drones.

QUESTIONS

1. What are three sources of air pollution in China?

2. What is PM2.5 particle pollution?

3. Why do you think scientists closely monitor levels of PM2.5 particle pollution?

4. What is one benefit of the new parafoil plane drones?

5. Critics of this method of fighting smog say it doesn't really eliminate pollution from the environment. Use evidence from the text to explain what they mean.

Name: _____

WHAT'S YOUR OPINION?

In "Drones Take Off" (p. 14), you read about the possible uses of drones as well as the concerns that some critics have about the flying machines. Are drones a good idea? Gather evidence from the article and combine it with your own opinions to argue each side of the debate. Write the information on the lines below.

YES, drones are good!

1. _____

_____

2. _____

_____

3. _____

_____

NO, drones are bad!

1. _____

_____

2. _____

_____

3. _____

_____

DECIDE WHAT YOU THINK: Examine the evidence you have gathered. Then state your opinion about drones in one sentence below.

_____

_____

_____

On a separate piece of paper, write an argument about the topic. Your essay should clearly state your opinion and include at least three pieces of evidence that support your argument.

Scholastic ScienceWorld

Name: _____

BIRD'S-EYE VIEW

In "Drones Take Off" (p. 14), you learned about some uses for drones. Read the following passage to learn how scientists are using the vehicles to gather data about the toxic materials that spew from volcanoes. Then use complete sentences to answer the questions that follow.

FLYING INTO AN ERUPTION

The skies above active volcanoes are dangerous spots. Toxic gases poison the air, and ash particles can damage the engines of planes that fly too close. To stay safe, volcanologists are flying unmanned aerial vehicles into volcanic plumes.

Last year, scientists launched the first drone mission above Costa Rica's Turrialba volcano. A cloud of toxic gases and ash streams steadily from vents on the active volcano's top. That makes it an ideal spot to learn about the characteristics of volcanic plumes.

These clouds of noxious gases and ash can be a health hazard to surrounding communities. Plus, sulfur dioxide gas can react with water in the air to create acid rain that kills vegetation. If scientists can predict how the plumes will act, they can help keep people safe.

To collect data from Turrialba, scientists fitted three retired military drones with cameras and equipment to collect air samples and take measurements such as temperature and sulfur dioxide concentration. The first 10 flights were a success, and scientists are now busy planning future missions.

QUESTIONS

1. Why is it dangerous for an airplane to fly close to a volcano?

2. Where was the first drone flown over a volcano?

3. What do you think the word *noxious* means?

4. What type of information did the drones gather from the Turrialba volcano?

5. Find two pieces of evidence from the passage that support the following statement: "Volcanoes can affect living things that surround them."

SCHOLASTIC
ScienceWorld®

Name: _____

SUIT SOLUTIONS

In "Deep-Sea Suit" (p. 18), you read about a new type of personal diving machine called the Exosuit. Engineers followed a design process to create the suit. They determined the functions it needed, such as maintaining pressure throughout a dive. Then they designed features for the suit to address those needs. Review the article to identify both the required functions of the Exosuit and how engineers came up with solutions. Use the chart below to analyze the different features of the suit.

REQUIRED FUNCTION	ENGINEERING SOLUTION
It must allow the diver to communicate with people above the ocean surface.	A fiber-optic cable connects the suit to the ship.

Name: _____

UNDER PRESSURE

In "Deep-Sea Suit" (p. 18), you learned about a new pressurized suit that allows divers to descend deeper and stay underwater longer than they could without it. The suit maintains a constant pressure around the diver. Read the following passage to learn how changing pressure can affect the human body. Then answer the questions that follow.

DIVING DANGER

One of the biggest hazards of scuba diving is decompression sickness. This painful and sometimes fatal condition is the result of the pressure seawater exerts on a diver's body as he or she descends in the water.

If you are sitting at sea level, the air around you presses on your body with 1 atmosphere (14.7 pounds per square inch) of pressure. Water exerts more pressure than air. So when divers go underwater, the pressure on their bodies increases. The added pressure causes nitrogen gas from the air they breathe to dissolve into their blood. If the divers then move back to the surface too quickly, the nitrogen gas can be violently released from their blood, fizzing out like the bubbles in an opened soda bottle.

To avoid this dangerous condition, divers often limit the length of their dives. That restricts the amount of nitrogen that enters the blood. The guidelines divers follow for time spent underwater depends on the depth of the dives, since the higher pressures in deep dives cause nitrogen to enter the blood more quickly.

QUESTIONS

1. **What pressure do you experience if you are sitting at sea level?**
Ⓐ 1 atmosphere
Ⓑ 3 atmospheres
Ⓒ 5 atmospheres
Ⓓ 14 atmospheres

2. **How does pressure change as you move deeper underwater?**
Ⓐ It decreases.
Ⓑ It increases.
Ⓒ It stays the same.
Ⓓ It decreases and then increases.

3. **What happens to a diver as he or she descends deeper in the water?**
Ⓐ The diver begins breathing more nitrogen gas.
Ⓑ The pressure in the diver's body decreases.
Ⓒ The diver requires less oxygen.
Ⓓ Nitrogen gas enters his or her blood.

4. **How can a diver decrease the likeliness of decompression sickness?**
Ⓐ limit the length of a dive
Ⓑ limit the depth of a dive
Ⓒ breathe more nitrogen gas
Ⓓ both A and B

5. **Use your own words to explain how the Exosuit described in "Deep-Sea Suit" helps scuba divers avoid decompression sickness.**

Name: _____

METALLIC MATERIALS

In "Deep-Sea Suit" (p. 18), you learned that the Exosuit personal diving machine is made of aluminum alloy. Read the following passage to learn about alloys and how they are used. Then answer the questions that follow.

METAL MIXTURES

Alloys are all around you. If you used a spoon at breakfast or rode in a vehicle to school, you encountered at least one type of these materials.

To create alloys, a metal is combined with other elements, which may be metals or non-metals. The steel used to create everything from cars to buildings is an alloy made from iron and carbon, a non-metal. Another common alloy is *brass* (made from the metals copper and zinc).

Alloys are often more useful than a single metal. Iron, for instance, rusts easily when it is exposed to oxygen and water. To make a corrosion-resistant material, scientists mix the metal chromium with iron and carbon to make *stainless steel*. This alloy is often used to make kitchen utensils that can survive thousands of dishwasher cycles.

Like many metals, silver is quite soft and malleable in its pure form. The *sterling silver* used to make some jewelry contains 7.5 percent copper. The combination of copper and silver atoms creates a stronger substance that is not as easily scratched or bent.

QUESTIONS

1. Which of the following statements is FALSE?
Ⓐ Steel is a type of alloy.
Ⓑ Alloys are common in everyday life.
Ⓒ Alloys are made only from metals.
Ⓓ Iron is used in some alloys.

2. Use context clues to find a synonym for the word *corrosion*.
Ⓐ rust
Ⓑ heat
Ⓒ metallic
Ⓓ color

3. Steel is made from . . .
Ⓐ chromium and iron.
Ⓑ two metals.
Ⓒ iron and copper.
Ⓓ a metal and a non-metal.

4. Choose the BEST alternate title for the passage.
Ⓐ Metals vs. Non-Metals
Ⓑ Useful Alloys
Ⓒ The Downside of Metals
Ⓓ Heavy Metals

5. Use evidence from the text to support this statement: "Alloys are a critical part of the modern world."

Name: _____

SUNKEN SUBMERSIBLE

In "Deep-Sea Suit" (p. 18), you learned about a personal diving suit that can reach depths of 305 meters (1,000 feet). Submersible machines need to be able to hold up to the pressure of the surrounding water when they dive. Read the following passage to learn about a vehicle that was crushed in deep ocean depths. Then use complete sentences to answer the questions that follow.

DEEP DEMISE

A submersible built to explore the ocean's depths couldn't handle the pressure. On May 10, 2014, scientists lost the *Nereus* (rhymes with serious) robotic submersible while exploring a deep ocean trench. They believe the vehicle may have imploded under crushing ocean pressures.

Nereus was collecting samples from the Kermadec Trench in the southern Pacific Ocean. At more than 10 kilometers (6.3 miles) deep, it's one of the world's deepest trenches. *Nereus* was nearing the end of a dive when scientists on the surface lost contact with the vehicle. Shortly afterward, they spotted pieces of the vehicle floating in the water.

The $8 million vehicle was built from ceramic materials, which are lightweight but extremely strong. When a submersible dives beneath the surface, the pressure exerted on it from the surrounding water increases by roughly 1 atmosphere for every 10 meters (33 feet) of depth. One atmosphere is equal to the air pressure at sea level.

Nereus was experiencing a pressure of roughly 1,090 atmospheres when it disappeared. Scientists don't know what went wrong. The robot had already explored the Challenger Deep in the Pacific Ocean's Mariana Trench—thought to be the deepest point in the ocean.

QUESTIONS

1. What likely caused the *Nereus* robotic submersible to implode?

2. What evidence did scientists find that indicated that the vehicle imploded?

3. In which trench is the deepest point in the ocean thought to be located?

4. How much does pressure increase with every 100 meters (328 feet) depth in the ocean?

5. Do you think scientists were surprised that *Nereus* imploded in the Kermadec Trench? Support your answer with evidence from the text.

SCHOLASTIC ScienceWorld

Name: _____

IS THAT A FACT?

Read the following sentences related to "Super Sniffers" (p. 20). Write an "F" on the line if the statement is a fact and an "O" if the statement is an opinion.

FACT	OPINION
• True statement	• Shows what someone thinks
• Can be tested or proved	• May include emotions
• May have numbers such as years or percentages that can easily be checked through other sources	• May use words like *believe* or *think*
	• May contain bias, an attitude for or against something

STATEMENTS

_____ **1.** Working dogs begin training when they are 2 months old.

_____ **2.** Service dogs with outgoing personalities tend to be well-suited for search-and-rescue missions.

_____ **3.** Materials with different chemical makeups have different smells.

_____ **4.** German shepherds are the best kind of search-and-rescue dogs.

_____ **5.** Working dogs enjoy trying to detect different smells.

_____ **6.** Trained dogs can determine the difference between a blood sample from a healthy person and a sample from a person with ovarian cancer.

_____ **7.** The dog Tsunami correctly detects ovarian cancer samples roughly 90 percent of the time.

_____ **8.** Dogs need a year of training to master cancer detection.

_____ **9.** Dogs' sense of smell is roughly 10,000 times better than a person's.

_____ **10.** Electronic noses will replace dogs' noses in scientific research.

Name: _____

SMELL TEST

In "Super Sniffers" (p. 20), you learned that a dog's strong sense of smell allows it to distinguish a cancerous blood sample from a healthy one. All substances get their scents from the chemicals they contain. The different mixes of chemical compounds give materials their unique scents. Try this activity to find out if you can use only your sense of smell to identify different ingredients.

PREDICT

Can you identify 10 items using only your sense of smell?

MATERIALS

10 small paper cups (Important: You should not be able to see through the cups.) • 10 items to smell, such as: lime piece, lemon piece, orange piece, cotton ball soaked in vanilla extract, cotton ball soaked in vinegar, chocolate, coffee beans, onion piece, garlic slice, freshly cracked black pepper • aluminum foil • scissors • tape • marker • pencil • paper

PROCEDURE

TEACHERS:

1. Place one smelly item in each of the cups.
2. Cut 10 pieces of aluminum, each large enough to cover the top of a cup, roughly 9 centimeters (3.5 inches) x 9 cm (3.5 in.).
3. Cover each of the cups with a piece of aluminum foil. Use tape to hold the foil in place.
4. Use a marker to label the cups from 1 to 10.
5. Place the cups in order in a line at the end of a table
6. Use the sharpened end of a pencil to poke a small hole in the top of each cup.

STUDENTS:

7. Write the numbers 1 through 10 on a piece of paper.
8. Starting with cup 1, lean over and smell the scent in the cup. (Do not peek inside the hole or pick up the cup!) What do you think is inside?
9. Write your answer next to the correct number on your paper.
10. When you have finished, take the lids off the cups and check your answers.

CONCLUSION

1. Were you able to guess all of the items correctly?

3. Do you think you would get the same number correct if you had a cold? Explain.

2. Were any of the scents similar? If so, which ones?

Name: _____

TO THE RESCUE

In "Super Sniffers" (p. 20), you learned that trained dogs are used in search-and-rescue operations. Read the following passage to find out how the dogs' sense of smell helps in the aftermath of a natural disaster. Then answer the questions that follow.

SEARCH FOR SURVIVORS

Most of the roughly 1,200 tornadoes that rip through the United States each year cause only minor damage. But when powerful twisters strike populated areas, search-and-rescue teams head into the wreckage to hunt for survivors. Dogs are valuable members of these teams.

In May 2013, one of the deadliest U.S. tornadoes struck Moore, Oklahoma. The twister was rated a 5—the highest level on the *Enhanced Fujita Scale*, used to measure the strength of tornadoes. Scientists estimate that the winds whipped at up to 340 kilometers (211 miles) per hour.

With entire neighborhoods leveled, officials brought in a team of five rescue dogs to help search for people trapped in the wreckage. The dogs used their powerful sense of smell to track human scents through the air. The dogs can detect the smell of skin, sweat, or even air exhaled by a person. When they find a survivor or a body, they bark to alert their handlers. With the dogs' help, people were saved from the rubble.

QUESTIONS

1. **Which of the following statements is FALSE?**
(A) On average, more than 1,000 tornadoes strike the U.S. each year.
(B) Most tornadoes that strike the U.S. cause severe damage.
(C) Winds in a tornado can reach speeds of more than 322 km (200 mi) per hour.
(D) A massive tornado struck Oklahoma in 2013.

2. **What is the Enhanced Fujita Scale?**
(A) a method of rating the strength of a tornado
(B) a measurement of the number of people harmed by a tornado
(C) the way scientists measure the height of a tornado
(D) a scale used for measuring the area of land hit by a tornado

3. **What is the highest level on the Enhanced Fujita Scale?**
(A) 1
(B) 3
(C) 5
(D) 10

4. **Which of the following statements is BEST supported by the passage?**
(A) Tornadoes are a common natural disaster in the U.S.
(B) Search-and-rescue dogs can help after a natural disaster.
(C) Search-and-rescue dogs have many skills.
(D) Natural disasters kill many people.

5. **What do you think are some benefits of having dogs search wreckage instead of people?**

Name: _____

A PICTURE OF HEALTH

In "Super Sniffers" (p. 20), you read that dogs are being used to try to develop a new cancer-detection test. Read the following passage to learn about the imaging techniques that are often used to detect the disease today. Then use complete sentences to answer the questions that follow.

X-RAY VISION

One of the most important tools in fighting cancer is *medical imaging*. This technique uses energy waves to produce pictures of the inside of your body. The images help doctors diagnose cancer—giving people a greater chance of survival.

There are different types of medical imaging. Doctors choose tests depending on the part of the body they want to examine. For instance, X-rays can detect lung-cancer tumors.

Technicians create X-ray images, called *radiographs*, by exposing a body to *X-rays*—a form of high-energy radiation. The X-rays travel through the body and strike a special film. The shading on the radiograph is determined by how many X-rays hit the film. Bones, for example, appear white because they absorb a lot of X-rays, causing fewer to hit the film. Tumors appear on radiographs because cancerous cells absorb X-rays differently than normal tissue does.

Computed tomography (CT) scans use similar techniques. But instead of producing one X-ray image, a machine creates a series of images of slices of the body. Computer programs can combine the slices to make a 3-D image.

QUESTIONS

1. The first sentence of the passage states that medical imaging is an important tool in fighting cancer. What are two pieces of evidence from the text that support this statement?

2. If a doctor suspects you have a broken bone, he or she may ask a technician to take an X-ray. What is another word for this image?

3. Why do bones appear white on an X-ray image?

4. How is a CT scan different from an X-ray?

5. Too much exposure to high-energy radiation can increase a person's risk of cancer. Do you think that fact affects a doctor's decision about whether or not to order a medical-imaging test? Explain your answer.

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. A new robotic kangaroo has a spring that mimics which part of the animal's body?
Ⓐ bicep
Ⓑ Achilles tendon
Ⓒ ligament
Ⓓ calf muscle

2. An energy project in New York City relies on microbes to produce ___ from food waste.
Ⓐ oil
Ⓑ gasoline
Ⓒ methane gas
Ⓓ carbon dioxide

3. The microbes will produce fuel in tanks known as ___.
Ⓐ digesters
Ⓑ oil tanks
Ⓒ boilers
Ⓓ eggs

4. How do zebras' stripes help the animals, according to a recent study?
Ⓐ They provide camouflage.
Ⓑ They help zebras recognize one another.
Ⓒ They distract predators.
Ⓓ They repel flies.

5. Which choice below best describes the difference between lava and magma?
Ⓐ Lava is black; magma is red.
Ⓑ Lava is hotter; magma is cooler.
Ⓒ Lava has reached the surface; magma is underground.
Ⓓ Lava is underground; magma has reached the surface.

6. An analysis of selfies from around the world revealed ___.
Ⓐ differences among major cities
Ⓑ differences among American states
Ⓒ differences between men and women
Ⓓ all of the above

7. The tallest trees on the planet are ___.
Ⓐ maples
Ⓑ redwoods
Ⓒ oaks
Ⓓ pines

8. Icy objects in space may have helped to create Earth's ___.
Ⓐ mountains
Ⓑ oceans
Ⓒ continents
Ⓓ volcanoes

9. A recent analysis found that the average dollar bill has about ___ bacteria on its surface.
Ⓐ 3
Ⓑ 30
Ⓒ 300
Ⓓ 3,000

10. The fastest animal on Earth, relative to its body size, is a ____.
Ⓐ cheetah
Ⓑ dragonfly
Ⓒ mite
Ⓓ horse

reset answers

SCIENCE World

Name: _____

WHEN THE UNIVERSE WENT BANG! Page 8

DIRECTIONS: Match the term or phrase in the left column with its definition or description in the right column.

_____ **1.** big bang

_____ **2.** quarks

_____ **3.** inflation

_____ **4.** gravitational waves

_____ **5.** multiverse

_____ **6.** cosmic microwave background

_____ **7.** BICEP2

_____ **8.** protons

_____ **9.** *The First Three Minutes*

_____ **10.** electrons

a. a rapid growth spurt in the universe

b. a structure that may contain many universes

c. particles that, together with neutrons, form the nucleus of atoms

d. ripples in the fabric of space

e. particles that bind together to form neutrons and protons

f. a book about the birth of the universe

g. the event in which the universe was born

h. the first light to travel across the universe

i. particles that orbit an atom's nucleus

j. a sensitive telescope used to study deep space

DRONES TAKE OFF, Page 14

DIRECTIONS: Fill in the blanks in the following sentences.

1. A drone is an _____ aerial vehicle.

2. Today, drones make up nearly one in _____ military aircraft.

3. The MQ-9 Reaper drone can carry _____-pounds of weaponry.

4. The military built the first drones for military pilots to use as _____ _____.

5. Many Hollywood filmmakers are now using drones instead of _____ to capture tricky shots.

6. Currently, many farmers purchase _____ photographs to monitor their extensive farmland.

7. Barometers onboard drones measure _____ _____.

8. Scientists are planning a project to monitor the _____ _____ of black bears to see if drones stress the animals.

9. The Federal Aviation Administration is debating _____ and _____ issues surrounding drones.

10. Amazon has said it will begin a drone delivery service called Prime Air as early as _____.

Name: _____

DEEP-SEA SUIT, Page 18

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

1. _____ Divers can use the Exosuit to reach depths of up to 1,000 meters.

2. _____ Divers in the Exosuit have enough oxygen to stay underwater for 50 hours.

3. _____ The pressure inside the Exosuit remains the same as the water pressure surrounding it.

4. _____ The Exosuit is extremely lightweight so divers can move freely underwater.

5. _____ Divers use foot pedals to steer the Exosuit.

SUPER SNIFFERS, Page 20

DIRECTIONS: Answer the following questions in complete sentences.

1. According to Otto, what are the best characteristics for a search-and-rescue dog? _____
_____
_____

**2.** Describe how a dog's olfactory system works. _____
_____
_____

3. How do doctors usually detect ovarian cancer today? _____
_____
_____

4. Explain the process Preti uses to try to collect the odor signature from ovarian cancer. _____
_____
_____

5. How will Preti know when he has collected the molecules that match the cancer scent? _____
_____
_____

Name: _____

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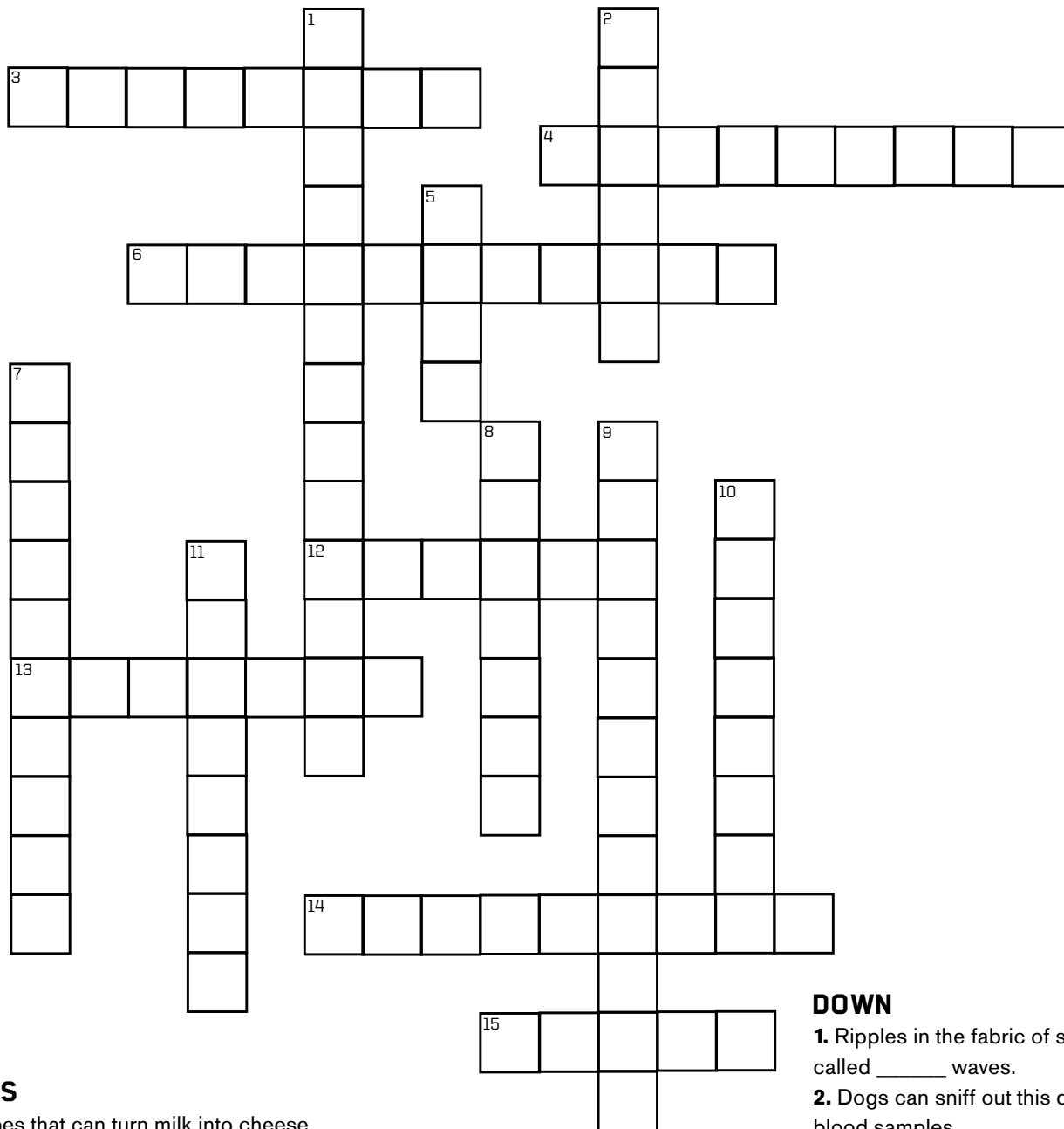
ACROSS

3. Microbes that can turn milk into cheese
4. Rapid growth of the young universe
6. Drones are replacing these piloted aircraft in the filming of movies.
12. The Exosuit carries tanks of this gas for the diver.
13. Drones equipped with these can be used to monitor and study wildlife.
14. Sense of smell
15. Tangled masses of milk proteins

DOWN

1. Ripples in the fabric of space are called _____ waves.
2. Dogs can sniff out this disease in blood samples.
5. Scientists hope to develop an electronic version of this organ to help detect diseases.
7. Drones might someday dispense these insect-killing chemicals to protect crops.
8. A theory about the birth of the universe
9. These attachable tools help a diver in the Exosuit collect samples.
10. German engineers have developed a robotic version of this jumping animal.
11. Water exerts _____ on submerged objects.