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?

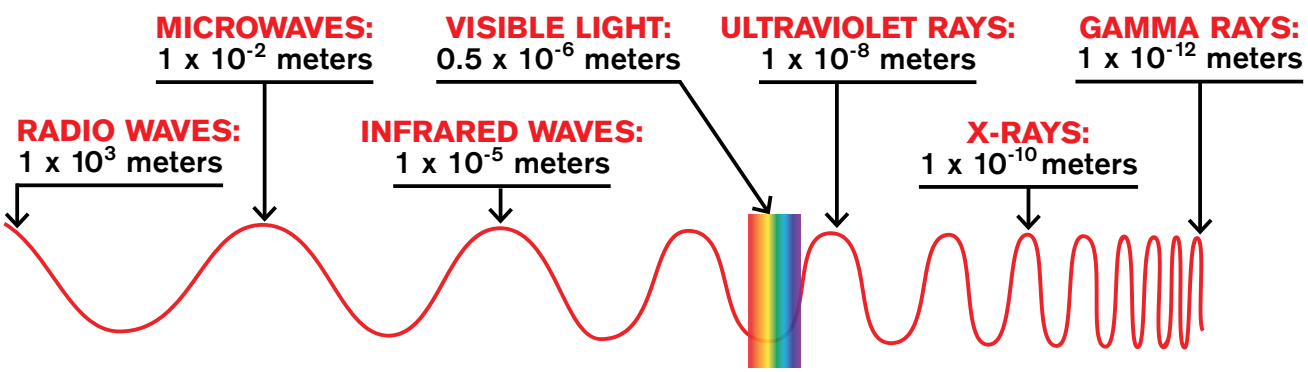
5. Do you think the following statement is true? "Without gravity, Earth wouldn't exist." Use evidence from the text to support your answer.

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



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.