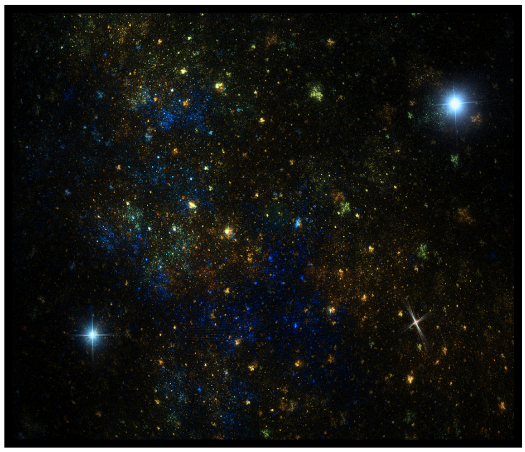
Name: _____ Date: _____ Group: _____

The Universe

(Lexile 770L)



1 Gazing into the sky on a clear night, you'll see thousands of visible stars twinkle and shine. It seems like space and the stars go on forever. What is really out there? Have you ever wondered if maybe we are not alone? Could a little green man land in your backyard? You are not the only one who has asked this question. Scientists have been studying the night sky since the beginning of time. They have a pretty good idea about what is out there and what makes up the universe. The universe, everything that exists, is composed of many objects like galaxies, stars, and nebulae.

2 The universe is home to billions of galaxies. Each galaxy can contain a few million to hundreds of billions of stars. They are held together by gravity. Our galaxy, the Milky Way, is a spiral galaxy. A spiral galaxy forms new stars in its spiral arms. Our solar system is located in one of the spiral arms. On a clear, dark night, a milky band runs across the sky. This is the central area of our galaxy. Including the Sun, the Milky Way contains about 200 billion stars. Along with spirals, another type of galaxy is called an elliptical galaxy. This type of galaxy is shaped like an oval. It contains old, red stars. An elliptical galaxy does not have enough gas to create new stars. Some galaxies have an irregular shape. These are called irregular galaxies. These galaxies come in many shapes and sizes. They keep forming new stars all the time.

3 The universe is full of billions upon billions of stars. Gazing into the night sky, you'll find that it is hard to tell a difference among them. The light that you see may have traveled for thousands, or maybe even millions, of years to reach Earth. The star's age and temperature controls what color of light we see. The hottest stars appear blue, while the coolest stars appear red. Stars come in a large range of sizes. Neutron stars are smaller than Earth. Red supergiants can be 500 hundred times larger than the Sun. When scientists classify stars, they use a scale called the Herztsprung-Russell diagram (HR diagram). Each star is placed on the diagram according to its luminosity and color. Scientists can tell more about the stars based on their HR diagram categories.

4 The universe is full of galaxies and stars, but what is in the black, empty space between them? Dust and gas, which help create new stars, form into clouds. The clouds, called nebulae, appear in a variety of shapes, sizes, and colors. An emission nebula appears to be a pinkish-red color. The hydrogen atoms inside the nebula emit a red light that makes the cloud glow. Reflection nebulae, just like its name, reflect the light of other stars. They appear to be blue. The effect is similar to what makes the sky appear blue on Earth. The nebula cloud scatters the blue light and lets the other colors of light pass through. Dark nebulae do not glow because the stars are not close enough to them. They appear as a dark spot in space. A planetary nebula is a result of a star, like the Sun, expanding to become a red giant. Despite its name, it has nothing to do with the planets. It appears to have a colorful ring around it.

5 The universe is everything that exists. Scientists believe that it could be about 13 billion years old. By studying the galaxies, stars, and nebulae that create stars, scientists understand more and more about how the universe came into existence. The next time you wonder if there really are little green men up in space, think about all the other fantastic objects in the universe.

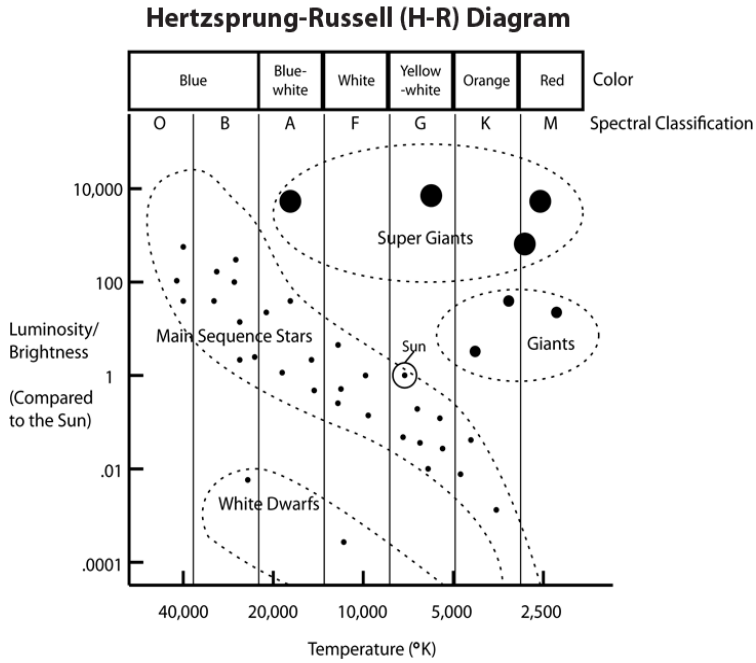
1 Using the information in the passage, rank the types of galaxies by their ability to form new stars, from most to least activity.

A Elliptical, spiral, irregular

B Irregular, elliptical, spiral

C Spiral, irregular, elliptical

D Irregular, spiral, elliptical



2 Examine the Herztsprung-Russell diagram shown. Which category of stars has the greatest brightness?

A Main Sequence

B Supergiants

C Giants

D White Dwarfs

3 The sky on Earth is blue because blue light is scattered through the atmosphere as the other colors of light pass through undisturbed. Which nebulae have something similar going on?

A Emission nebulae

B Dark nebulae

C Reflection nebulae

D Planetary nebulae

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4 Paragraph 2 mentioned different types of galaxies. Scientists discovered a new octagonal galaxy. Based on the context, this galaxy is in the shape of a _____.

A octagon

B triangle

C rectangle

D elliptical

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5 Complete the following analogy:

Reflection nebulae:blue as emission nebula:_____

A greenish-blue

B yellow

C red

D pinkish-red