

The Brightness, Color, and Distance of Stars

Look up at the sky on a clear night. You will see that **stars** are everywhere. They are too numerous to be counted. A star is a hot ball of glowing gases. They give off light and heat. From Earth, stars look like tiny flickering dots in the sky. They are not as small as they look. They look small because they are very far away from us. However, some stars are small and some are huge.

The Sun is a star. It is the closest star to Earth. The Earth can fit in the Sun over one million times. **Matter** is anything that has mass and takes up space. 98.99% of the mass of the Solar System is in the Sun. This mass causes everything that is in our Solar System to spin around it. This invisible force is the force of **gravity**. Gravity is a pulling force that some matter gives off because of its huge size. Our Solar System is a sun-centered system. The planets, including Earth, revolve around the Sun. The Sun, like other stars, does not move. They appear to move because we are moving. The Earth revolves around the Sun. When the Earth makes one complete orbit; it is called a full revolution around the Sun. This takes 365 days.

When you look up at the sky, you will notice that the stars make a pattern of things you know. Some look like objects, and others look like people and animals. These patterns are **constellations**. A constellation is a group of stars that makes a familiar pattern. 88 of them have been identified. Stars do not move. They are so far away that any movement that they make is barely noticeable. Therefore, constellations do not change. They appear to move because the Earth is rotating and revolving. As the Earth rotates, the part of the sky you see changes. This movement causes the place where constellations are seen to change. As a result, different constellations are seen at different times of the year. The stars you see in the summer are different from the stars you see in winter. Therefore, carefully observing constellations can allow you to measure the different seasons.

Not all stars are the same. Stars vary based on their size and color. Stars have different colors if you look closely. The colors of stars depend on how hot the stars are. The hottest stars are blue or blue-white stars. They are huge. They are called supergiants. They are the youngest stars in the sky. One of the brightest and hottest stars in the sky is Rigel. It is a part of the constellation Orion. The smallest stars in the sky are red or orange stars. The Sun's closest neighbors are red stars. They are the coolest and oldest stars in the sky. Antares is an example of a red star. It is the largest and brightest star in the constellation Scorpius. The Sun is a yellow star. Our Sun is a middle-aged star. It is hotter than a red or orange star. It is not as hot as a blue or blue-white star. The next time you stare into the night sky, try and see if you can imagine the different sizes, colors, and brightness of the stars that are out there.

Name: _____ Date: _____

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1. Stars can help us to tell the seasons because
 - A. Some constellations only show up when it is very cold
 - B. Different constellations are shown based on the season of the year
 - C. The earth rotates exposing different constellations throughout the year
 - D. Constellations are only visible on winter nights
2. Planets orbit
 - A. the Sun.
 - B. Earth.
 - C. the Moon.
 - D. the solar system
3. Stars appear small because
 - A. They are close to planets
 - B. They are far away from us
 - C. They are balls of burning gasses
 - D. They can only be seen using telescopes
4. Which of the following is a reason why constellations appear to move?
 - A. They are very close to the earth and the planets
 - B. they are very far away from the earth
 - C. The earth is moving and the stars aren't
 - D. Constellations create differences in the sky
5. All of the following are given off by stars, EXCEPT:
 - A. Light
 - B. Heat
 - C. Color
 - D. Precipitation
6. Which of the following is not correct about gravity?
 - A. It is a pushing force that forces smaller objects away from it
 - B. It is a pulling force that pulls smaller objects toward it
 - C. It is an invisible force
 - D. It causes smaller objects to move around the sun
7. Rigel is considered a supergiant because
 - A. It is the brightest star when viewed from the Earth
 - B. It is a Yellow star
 - C. It is one of the brightest stars in our solar system
 - D. It is one of the largest objects in the sky
8. Which of the following statements is correct about stars?
 - A. There are 2 billion stars in the sky
 - B. There are too many to be counted
 - C. Stars are rocky
 - D. The stars are all hot and yellow
9. Which of the following is true about the Sun
 - A. It is a medium-sized star
 - B. It is not the largest star out there
 - C. It is the brightest and largest star when viewed from Earth
 - D. All of the above
10. A constellation is a _____
 - A. pattern created by the solar system
 - B. pattern created by stars
 - C. pattern created by planets
 - D. pattern created by the moons of planets

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