

Study Guide

Chapter 17 – Stars, Galaxies, and the Universe

GPS:S6E1. Students will explore current scientific views of the universe and how those views evolved.

a. Relate the Nature of Science to the progression of basic historical scientific models (geocentric, heliocentric) as they describe our solar system, and the Big Bang as it describes the formation of the universe.

b. Describe the position of the solar system in the Milky Way and the universe.

1. Scientists call the light that you can see visible light.
2. The light spreads out to make a range of different colors with different wavelengths called a spectrum.
3. The electromagnetic spectrum includes the entire range of radio waves, infrared radiation, visible light, ultraviolet radiation, X-rays, and gamma rays.
4. Telescopes are instruments that collect and focus light and other forms of electromagnetic radiation.
5. Characteristic used to classify stars include color, temperature, size, composition and brightness.
6. The coolest stars, with a surface temperature of about 3,200 degrees Celsius, appear red in the sky.
7. Astronomers use spectrograph to determine the elements found in stars.
8. When the star's light is seen through a spectrograph, each absorbed wavelength is shown as a dark line on a spectrum.
9. The absolute brightness of a star depends upon both its size and temperature.
10. A light-year is the distance that light travels in one year, about 9.5 million million kilometers.
11. Most of the stars in the Hertzsprung-Russell diagram (H-R diagram) form a diagonal area called the main sequence.
12. All stars begin their lives as parts of nebula.
13. In the densest part of a nebula, gravity pulls gas and dust together.
14. A contracting cloud of gas and dust with enough mass to form a star is called a protostar.
15. A star is born when the contracting gas and dust from a nebula become so dense and hot that nuclear fusion starts.
16. How long a star lives depends on its mass.
17. The most massive stars may become black hole when they die.
18. Some galaxies appear to have a bulge in the middle and arms that spiral outward, like pinwheels are called spiral galaxies.
19. Some galaxies do not have regular shapes and are known as irregular galaxies.
20. Our solar system is located in a spiral galaxy called the milky way.
21. Scientific Notation uses powers of ten to write very large or small numbers in shorter form.
22. The universe exploded in what astronomers call the big bang theory.
23. According to Hubble's Law, the farther away a galaxy is the faster it is moving away from us.
24. A giant cloud of gas and dust collapsed to form our solar system.
25. New observations lead many astronomers to conclude that the universe will likely expand forever.