

Study Guide for Stars and Galaxies Quiz

ANSWER KEY

I. Characteristics of Stars (Chapter 4, Section 2)

1. Identify the 5 characteristics used to classify stars:

- a. color
- b. temperature
- c. chemical composition
- d. size
- e. brightness

2. Which 2 things does the brightness of a star depend on?

- a. size
- b. temperature

3. What is a light-year?

The distance that light travels in one year, about 9.5 million million kilometers.

4. Define and describe parallax. Why is it useful for only nearby stars?

The apparent change in position of an object when seen from different places.

Astronomers can use parallax to measure distances up to a few hundred light-years from Earth. The parallax of any star that is farther away is too small to measure accurately.

5. What is the purpose of an H-R diagram?

Astronomers use H-R diagrams to classify stars and to understand how stars change over time.

6. What variables are plotted on the H-R diagram?

Temperature and the absolute brightness of stars.

7. Where does the sun plot on the diagram?

In the middle.

8. Which stars are hotter: blue stars or red stars?

Blue.

9. What is the difference between apparent brightness and absolute brightness?

A star's apparent brightness is its brightness as seen from Earth. A star's absolute brightness is the brightness the star would have if it were at a standard distance from Earth.

10. Given an H-R diagram, be able to determine which stars have a greater absolute brightness.

Stars at top of graph will have a higher absolute brightness. Stars toward the left will be hotter than stars toward the right.

11. Know the most common type of star (answer = main sequence)

II. Lives of Stars (Chapter 4, Section 3)

1. Where are stars born?

In a nebula

2. How are stars born?

Gas and dust collapses under gravity and nuclear fusion begins.

3. Define nebula.

Cloud of gas and dust spread out over an immense volume.

III. Star Systems and Galaxies (Chapter 4, Section 4)

1. Are stars usually by themselves or in groups of two or more?

Stars are usually found in groups of two (binary stars) or three (triple stars)

2. List the three types of galaxies, and give properties of each. Be able to sketch each.

a. elliptical - contains old stars and little gas/dust

b. irregular - contains young stars and a lot of gas/dust

c. spiral - contains young stars and a lot of gas/dust

3. What is the name of the galaxy that our solar system is in? What type of galaxy is it?

Milky Way - spiral galaxy

4. Are there planets around other stars?

Yes. The recently discovered Kepler 22-b is a good example.

5. Place the following in order from smallest to largest: galaxy, solar system, universe

Solar system then galaxy then universe

6. What are two types of clusters?

Open and globular

IV. Formation of the Solar System (Chapter 4, Section 5)

1. How long ago did our solar system form?

5 billion years ago

2. What is a solar nebula?

A large cloud of gas and dust, such as the one that formed our solar system.

3. What happened as gravity pulled the solar nebula together?

Slowly, gravity began to pull the solar nebula together. As the solar nebula shrank, it spun faster and faster. The solar nebula flattened, forming a rotating disk. Gravity pulled most of the gas into the center of the disk, where the gas eventually became hot and dense enough for nuclear fusion to begin. The sun was born.

4. What are planetesimals? How did they form the planets?

One of the small asteroid-like bodies that formed the building blocks of the planets.

Planetesimals collided and grew larger by sticking together, eventually combining to form the planets.

5. Why is there a difference in the inner and outer planets?

It was so hot close to the sun that most water and other ice-forming materials simply vaporized. Most gases escaped the gravity of the planets that were forming in inner planet region. Farther from the sun it was much cooler. As the planets in this region grew, their gravity increased and they were able to capture much of the hydrogen and helium gas in the surrounding space.

6. What evidence do we have for the age of the solar system? meteorites