

Name: _____ Date: _____

Answer Key: Stellar Structures and Silent Space: 11th Grade Survey

Junior level students recall fundamental cosmic structures and identifying traits of deep-space phenomena used by professional astrophysicists to map our sky.

1. Which specific morphological class is characterized by a smooth, featureless appearance and a lack of active star formation, such as the massive galaxy IC 1101?

Answer: B) Elliptical

Elliptical galaxies are generally composed of older stars and contain very little interstellar gas or dust, leading to low rates of new star birth.

2. The 'Great Attractor' is a massive gravitational anomaly in intergalactic space that is pulling the Milky Way and other galaxies toward it.

Answer: A) True

The Great Attractor is a gravity anomaly in central southern heavens that reveals the existence of a localized concentration of mass equivalent to tens of thousands of Milky Ways.

3. Vast, empty regions between galaxy filaments that contain very few or no galaxies are known as cosmic _____.

Answer: C) Voids

Cosmic voids are the large, relatively empty spaces between filaments, which are the largest-scale structures in the universe.

4. The Sombrero Galaxy (M104) is famous for its bright nucleus and a large, dark dust lane. What is its primary classification?

Answer: C) Spiral

The Sombrero Galaxy is an unbarred spiral galaxy, though it has a particularly large and dominant central bulge.

5. Redshift is the phenomenon where the light from a galaxy shifts toward longer wavelengths as it moves closer to the observer.

Answer: B) False

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Redshift occurs when light moves away from the observer; light from an object moving closer undergoes blueshift (shorter wavelengths).

6. The process by which two galaxies collide and combine into a single, larger structure is called a galactic _____.

Answer: B) Merger

Galactic mergers happen when the gravitational pull between galaxies leads them to join, often resulting in elliptical galaxies.

7. What is the name of the nearest major spiral galaxy to our own, which is currently on a collision course with the Milky Way?

Answer: B) Andromeda

The Andromeda Galaxy (M31) is the closest large spiral galaxy to the Milky Way and is part of our Local Group.

8. The theoretical 'hidden' mass that does not emit light but provides the gravity needed to hold galaxies together is called _____ matter.

Answer: A) Dark

Dark matter is required to explain why galaxies rotate as fast as they do without flying apart, as visible matter doesn't provide enough gravity.

9. The 'Laniakea Supercluster' is the specific galaxy supercluster that home to the Milky Way.

Answer: A) True

Laniakea is a Hawaiian name meaning 'immense heaven'; it defines the supercluster that contains the Milky Way and 100,000 other nearby galaxies.

10. Which of these is the most distant and energetic type of object in the universe, believed to be powered by supermassive black holes in the centers of galaxies?

Answer: C) Quasar

Quasars are extremely bright, distant objects powered by gas spiraling at high speeds into a supermassive black hole.