Name: _____ **Date:** _____

Answer Key: Star Wars: The Empire Strikes Back 10th Grade Orbital Quiz

How does the sun stay in the same spot while we move? Identify the mechanics of barycenters, obliquity, and orbital velocity in our solar system.

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1. Which term describes the slight 'wobble' in Earth's axial direction that takes approximately 26,000 years to complete a full cycle?

Answer: B) Precession

Axial precession is the slow, continuous change in the orientation of Earth's rotational axis, similar to a spinning top.

2. The Earth is physically closer to the Sun during the Northern Hemisphere's winter than it is during the summer.

Answer: A) True

Earth reaches perihelion (closest point) in early January. Seasons are caused by axial tilt, not distance from the Sun.

3. The _____ is the common center of mass around which two or more bodies revolve, such as the Earth and the Moon.

Answer: C) Barycenter

The barycenter is the balance point of a celestial system; for the Earth-Moon system, it actually lies within the Earth's mantle.

4. What is the primary reason the Moon lacks an atmosphere compared to Earth's robust gaseous envelope?

Answer: C) Insufficient gravitational pull

The Moon has significantly less mass than Earth; its gravity is too weak to prevent atmospheric gases from escaping into space.

5. Earth's orbit is not a perfect circle but an _____ shape, a discovery attributed to Kepler's First Law.

Answer: B) Elliptical

An ellipse is an elongated circle; Earth's eccentricity is low, but its orbit is definitely elliptical.

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6. The side of the Moon that faces away from Earth is always dark.

Answer: B) False

The 'Far Side' of the Moon receives sunlight during the New Moon phase when the side facing Earth is dark.

7. Which phenomenon refers to the periodic variation in the 'tilt' of Earth's axis between approximately 22.1 and 24.5 degrees?

Answer: A) Obliquity

Obliquity is the technical term for axial tilt, which oscillates over a 41,000-year cycle, affecting climate severity.

8. When the Moon is at its furthest point from Earth in its monthly orbit, it is said to be at _____.

Answer: D) Apogee

Apogee is the point in the orbit of an object orbiting the Earth that is most distant from the center of the Earth.

9. The Sun's gravity has a greater influence on Earth's tides than the Moon's gravity because of the Sun's massive size.

Answer: B) False

While the Sun is more massive, the Moon is much closer. Tidal force is more sensitive to distance than total mass.

10. How many degrees does the Earth rotate on its axis in exactly one hour?

Answer: B) 15 degrees

Since a full rotation (360 degrees) takes 24 hours, dividing 360 by 24 results in 15 degrees per hour.