

Name: _____ Date: _____

Stellar Choreography: 12th Grade Orbital Mechanics Quiz

Imagine predicting the exact moment the moon blocks the sun—high schoolers will identify the celestial geometries and tidal forces governing our solar neighborhood.

1. Which astronomical phenomenon results specifically from the Moon being at its 'apogee' during an alignment with the Sun and Earth?

- A. Total Solar Eclipse
- B. Annular Solar Eclipse
- C. Partial Lunar Eclipse
- D. Penumbral Lunar Eclipse

2. The _____ describes the apparent deflection of moving objects, such as global wind patterns, caused by Earth's rotational velocity varying by latitude.

- A. Milankovitch Cycle
- B. Doppler Effect
- C. Coriolis Effect
- D. Precession Constant

3. True or False: A 'Syzygy' refers to the straight-line configuration of three celestial bodies in a gravitational system, such as during an eclipse.

- A. True
- B. False

4. During which lunar phase would a coastal community experience 'Neap Tides,' characterized by the smallest tidal range?

- A. New Moon
- B. Full Moon
- C. First Quarter
- D. Waning Gibbous

5. The Earth's axis is currently tilted at approximately _____ degrees relative to its orbital plane, which is the primary driver of seasonal variations.

- A. 15.5
- B. 23.5
- C. 45.0
- D. 90.0

6. True or False: The Earth is closest to the Sun (perihelion) during the Northern Hemisphere's summer month of June.

- A. True

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B. False

7. Which term describes the 26,000-year cycle where the orientation of Earth's axis slowly traces out a cone in space?

- A. Revolution
- B. Nutation
- C. Precession
- D. Eccentricity

8. A ____ day is the time it takes for Earth to rotate once relative to the distant stars, lasting approximately 23 hours and 56 minutes.

- A. Solar
- B. Sidereal
- C. Synodic
- D. Lunar

9. True or False: During an equinox, the Sun's rays are perpendicular to the Earth's surface at the Equator.

- A. True
- B. False

10. What is the primary reason why we do not experience a solar eclipse every single month during the New Moon phase?

- A. The Moon's orbit is tilted 5 degrees relative to the Ecliptic.
- B. The Earth's rotation is too fast.
- C. The Sun's gravity pulls the Moon out of alignment.
- D. The Moon is usually too far away (at apogee).