

Astronomy Objectives

Objective		
1. Explain the origin of the Earth's motion based on the origin of the galaxy and its solar system.		
2. Recall Earth's role in the hierarchy of organization within the universe and in the developmental continuum. (Universe is made of galaxies which are made of many stars. Some stars have planetary systems similar to our solar system. Earth is a satellite planet of one particular star.)		
3. Explain planetary orbits, especially that of the Earth, using Kepler's laws.		
4. Explain relative motion of the Earth in the solar system, the solar system in the galaxy, and the galaxy in the universe—including the expanding nature of the universe; Orbital motion (Earth around the Sun—once/year, seasons depend upon an approximate 23.5 degree tilt); Rotation around our axis (day/night,)		
5. Explain Precession—change in direction of the axis, but without any change in tilt—this changes the stars near (or not near) the Pole, but does not affect the seasons (as long as the angle of 23.5 degrees stays the same)		
6. Explain nutation—wobbling around the precessional axis (This is a change in the angle—½ degree one way or the other. This occurs over an 18 year period and is due to the Moon exclusively. This would very slightly increase or decrease the amount of seasonal effects.)		
7. Explain barycenter—the point between two objects where they balance each other (For example, it is the center of mass where two or more celestial bodies orbit each other. When a moon orbits a planet, or a planet orbits a star, both bodies are actually orbiting around a point that lies outside the center of the primary (the larger body).		
8. Summarize that the Sun is not stationary in our solar system. It actually moves as the planets tug on it, causing it to orbit the solar system's barycenter. The Sun never strays too far from the solar system barycenter.		
9. Describe daily changes due to rotation, seasonal changes due to the tilt and revolution of the Earth.		
10. Develop a cause and effect model for the shape of the Earth explaining why the circumference around the equator is larger than that around the poles.		
11. Compare combustion and nuclear reactions (fusion and fission) on a conceptual level. Identify fusion as the process that produces radiant energy of stars.		
12. Identify the forms of energy (electromagnetic waves) produced by the sun and how some are filtered by the atmosphere (X-rays, cosmic rays, etc.).		
13. Summarize how energy flows from the sun to the Earth through space.		
14. Explain how the tilt of the Earth's axis results in seasons due to the amount of solar energy impacting the Earth's surface.		
15. Explain how solar energy is transformed into chemical energy through photosynthesis.		

16. Explain how the earth's magnetic field protects the planet from the harmful effects of radiation.

--

--