

Nova's Cosmic Explorer Log: Understanding Our Solar System

Learning objective: To describe the movement of the Earth and other planets relative to the Sun in the solar system, and to use the idea of the Earth's rotation to explain day and night.

Welcome, Junior Astronomer! Join Nova the barn owl on an interstellar mission. Use your scientific knowledge to observe, record, and analyse the mechanics of our solar system. Fill in each section below using your best scientific vocabulary. Ensure your explanations are precise and clear.

Word bank: axis · rotation · orbit · spherical · geocentric · heliocentric · equinox · solstice · gravitational pull · celestial body

1. Explain the mechanics of day and night: How does the Earth's rotation on its axis create the cycle of day and night for people living on different parts of the planet? (3 marks)

2. Compare and contrast: How does the Earth's orbit around the Sun differ from the way the Moon orbits the Earth? Describe the path and the time taken for each. (3 marks)

3. Justify your answer: Why do we perceive the Sun moving across the sky throughout the day, even though it is the Earth that is actually moving? (2 marks)

4. What might happen if the Earth's axis were not tilted? Explain the consequences this would have on the Earth's seasons. (4 marks)

5. Scientific modelling: If you were to create a scale model of the solar system, why is it challenging to accurately represent both the size of the planets and the distance between them? (3 marks)

6. Evidence-based reasoning: Explain why ancient civilisations originally believed the Earth was the centre of the universe (the geocentric model) and what evidence led scientists to change this to the heliocentric model. (4 marks)

Extension challenge: Creative Task: Imagine you are a space travel agent in the year 2150. Write a persuasive brochure entry for a trip to a planet of your choice. You must include details about the planet's distance from the Sun, the length of its 'day' (rotation), and its 'year' (orbit), using scientific facts to make your destination sound scientifically fascinating.