

Nova's Solar System Expedition

Learning objective: To describe the movement of the Earth and other planets relative to the Sun in the solar system.

Nova the owl is preparing for a flight across the solar system! Use your knowledge of space to sort the following statements into two groups: 'The Sun's Gravity' (which keeps planets in orbit) and 'The Earth's Movement' (which explains our days and seasons). Then, complete the challenge questions to demonstrate your understanding of celestial mechanics.

Word bank: Orbit · Axis · Gravity · Rotation · Revolution · Solar System

1. Explain why the Earth does not simply float away into the darkness of deep space. Reference the role of the Sun in your answer. (2 marks)

2. Compare and contrast the terms 'rotation' and 'revolution'. How does each movement affect life on Earth? (3 marks)

3. Justify why we experience night and day. If the Earth stopped rotating, what might happen to the temperature on the side facing the Sun? (3 marks)

4. Nova observes that Mercury completes an orbit much faster than Neptune. Propose a scientific reason for this difference in orbital speed. (2 marks)

5. If the Earth were tilted at a much steeper angle on its axis, predict how this would change the seasons we experience in the UK. (2 marks)

6. Evaluate the statement: 'The Sun moves across the sky.' Is this scientifically accurate? Explain the perspective of an observer standing on Earth. (2 marks)

Draw: Draw a diagram of the Earth orbiting the Sun. Clearly label the Earth's axis, the path of the orbit, and show which side of the Earth is experiencing 'day' and which side is experiencing 'night'.



Extension challenge: Imagine you are an astronomer living on a planet that has two suns. Write a short, creative diary entry describing how this might change the way your planet experiences shadows, heat, or the length of a 'day'.