Nova’s Cosmic Journey: Exploring the Solar System

Learning objective: To describe the movement of the Earth and other planets relative to the Sun in the solar system, and to understand how the spherical nature of these bodies influences their orbits.

Read each question carefully and use your knowledge of space to provide detailed, scientific explanations. Think about how the Sun’s gravity affects our solar system.

Word bank: orbit · spherical · axis · gravity · solar system · rotate · revolution

1. Nova the owl is stargazing. She observes that the planets move in a path around the Sun. Explain why the planets stay in their orbital path rather than drifting off into deep space. (2 marks)

2. Compare and contrast the movement of the Earth on its axis with its movement around the Sun. What does each motion cause us to experience on Earth? (3 marks)

3. All planets in our solar system are roughly spherical. Justify why this shape is the natural result for large bodies in space that are formed by gravity. (2 marks)

4. If the Earth were significantly closer to the Sun, what might happen to the length of our year and the temperature on our planet? Explain your reasoning. (3 marks)

5. List the order of the planets starting from the one closest to the Sun. Why is it difficult for scientists to study the furthest planets compared to the closest ones? (3 marks)

Draw: Draw a diagram of the solar system showing the Sun at the centre. Use arrows to show the direction of the planets' orbits. Label the Sun, the Earth, and the Moon.

Extension challenge: Imagine you are an astronomer living in a colony on Mars. Write a short journal entry explaining how the length of your day and year would feel different compared to living on Earth, using your knowledge of planetary rotation and orbit.