

Nova's Cosmic Exploration: Understanding 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 identify the spherical shapes of celestial bodies.

Read each question carefully and use your scientific knowledge of the solar system to provide detailed, reasoned explanations. Think like an astronomer!

Nova the owl has been stargazing through her telescope all night. She has been tracking the movement of planets and thinking about how our Earth journeys through space. She knows that everything in our solar system is shaped like a sphere, held together by the Sun's immense gravitational pull.

Word bank: Orbit · Axis · Rotation · Spherical · Gravity · Solar System · Celestial · Ellipse

1. Nova observes that the planets are spherical. Explain why planets and stars naturally take on a spherical shape in space. (2 marks)

2. Compare and contrast the movement of the Earth on its axis with its movement around the Sun. What does each movement result in? (3 marks)

3. Justify why we experience 'day' and 'night' here on Earth. How does the Sun's position remain constant while our experience changes? (2 marks)

4. If the Earth were to stop rotating on its axis, what might happen to the length of our days and the temperature on our planet? Explain your reasoning. (3 marks)

5. Max the monkey is trying to calculate the cost of a space mission. If a fuel pod costs £4,500 and the mission requires 12 pods, what is the total cost in pounds? Show your working. (2 marks)

Draw: Draw a diagram of the solar system, ensuring the planets are shown as spheres, and use arrows to clearly indicate the path of their orbits around the Sun.



Extension challenge: Nova wants to know what would happen if the Earth were closer to the Sun. Write a short paragraph justifying whether life would be possible, considering the impact on temperature and the Earth's orbit.