

Nova's Magnetic Mysteries

Learning objective: To identify magnetic materials, understand magnetic poles, and predict the interaction between magnets.

Read each question carefully. Use your knowledge of magnetic forces to provide detailed, scientific explanations. Ensure you justify your reasoning where asked.

Nova the owl is investigating the secret forces of the woods. She has discovered that some objects are drawn to her magnet, while others remain completely still. Remember, magnets have two poles: North and South. Like poles push away, while opposite poles pull together.

Word bank: attract · repel · magnetic pole · force · iron · steel · nickel · non-magnetic · repulsion · attraction

1. Nova has a pile of items: a steel paperclip, a plastic button, an iron nail, a rubber eraser, and a nickel coin. Identify which items are magnetic. Explain why these items react to a magnet while others do not. (3 marks)

2. If Nova holds two magnets together so that the North pole of one faces the North pole of the other, what will she observe? Use the term 'repel' in your answer. (2 marks)

3. Explain why a magnet is able to attract a metal object even when they are not touching. What does this suggest about the area surrounding a magnet? (3 marks)

4. Compare and contrast the behaviour of a magnet when it encounters a piece of aluminium foil versus a piece of iron. Why does this difference occur? (3 marks)

5. Justify your answer: If Nova breaks a bar magnet in half, will she have one 'North-only' magnet and one 'South-only' magnet? Explain what happens to the poles. (3 marks)

Draw: Draw a diagram showing two bar magnets placed end-to-end. Use arrows to show the direction of the force if the magnets are attracting each other, and label the North and South poles clearly.



Extension challenge: What might happen if we placed a strong magnet inside a wooden box and tried to move a metal object on top of the lid? Write a short hypothesis explaining if the material of the box would stop the magnetic force from working and why.