

Nova's Magnetic Mystery Investigation

Learning objective: To identify magnetic materials, understand the properties of magnetic poles, and predict the behaviour of magnets through experimental inquiry.

Nova the Barn Owl has been collecting items for her star-charting kit. Some are magnetic, and some are not! Read the list of items below. For each item, predict whether it will be attracted to a magnet. Then, use your knowledge of magnetic poles and materials to answer Nova's scientific questions.

Word bank: attract · repel · poles · iron · magnetic field · steel · non-magnetic · force

1. Nova has a paperclip made of steel and a wooden pencil. Explain why the paperclip is attracted to her magnet, but the pencil remains stationary. (2 marks)

2. Nova places two magnets on her desk. She pushes the North Pole of one magnet towards the North Pole of the other. What will she observe, and why does this happen? (2 marks)

3. If Nova wants to test if a mysterious metal key is made of iron, what experiment should she perform? Justify your method. (2 marks)

4. Compare and contrast the behaviour of two bar magnets when they are placed North-to-South versus North-to-North. (3 marks)

5. What might happen if Nova tried to use a magnet to pick up a plastic button on her desk? Explain your reasoning using the term 'magnetic material'. (2 marks)

6. If you were to cut a bar magnet in half, what would happen to the poles? Predict the result and explain your scientific reasoning. (3 marks)

Draw: Draw a diagram of two bar magnets side-by-side that are repelling each other. Label the poles (N and S) and use arrows to show the direction of the invisible magnetic force pushing them apart.



Extension challenge: Design a 'Magnetic Maze' game for Nova. Explain the rules, list the materials you would need to build it (e.g., a cardboard base, a magnet, and a small metal ball), and describe how you would use a magnet underneath the board to guide the ball through the maze without touching it.