

# Nova's Invisible Forces: The Mystery of Magnetism

*Learning objective: To understand the properties of magnets, including attraction, repulsion, and magnetic materials.*

Read the text carefully and answer the questions below. Use your scientific knowledge and evidence from the passage to justify your reasoning.

Nova the barn owl spends her nights soaring over the forest, observing the natural world. One evening, she discovered that certain metals possess a peculiar, invisible power. When Nova brought two magnets together, she noticed they either snapped together instantly or pushed each other away with a strange, springy resistance. She learned that magnets have two ends, known as the North and South poles. If you try to push the same poles together, they repel; however, opposite poles attract. This invisible area surrounding the magnet is called a magnetic field. Not every object reacts to this force. Only materials containing iron, nickel, or cobalt, known as ferromagnetic materials, are attracted to magnets. Nova tested a wooden twig, a plastic pebble, and an iron nail. To her delight, only the iron nail jumped to meet her magnet. She concluded that magnetism is a marvellous, invisible force that acts at a distance, connecting objects without a single touch. Understanding these properties is essential for many inventions, from simple compasses that help us navigate to powerful machines that lift heavy scrap metal.

*Word bank: magnetic · attract · repel · poles · force · ferrous · field*

**1. Identify the two specific poles mentioned in the text and describe what happens when you try to bring two identical poles together. (2 marks)**

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**2. Based on the text, which three specific metals are described as being magnetic? (2 marks)**

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**3. Explain why Nova's wooden twig and plastic pebble did not react to the magnet. (2 marks)**

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**4. What might happen if a scientist tried to pick up a copper coin using a magnet? Justify your answer using the evidence provided. (2 marks)**

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**5. Why is it advantageous for humans to understand how magnetic fields work? Provide a reason based on the text. (2 marks)**

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**Draw:** Draw a diagram of two bar magnets side-by-side. Use arrows to show the magnetic field lines, and label where the magnets are 'attracting' or 'repelling'.



*Extension challenge: Imagine you are an engineer designing a new way to sort rubbish at a recycling centre. Write a short paragraph explaining how you would use your knowledge of magnetism to separate metal cans from plastic bottles. Use the vocabulary: 'ferrous', 'attract', and 'force'.*