

Year 5 Science Assessment: Forces and Magnets

Learning objective: To demonstrate understanding of magnetic materials, poles, and the forces of attraction and repulsion.

Read each question carefully. Use your scientific knowledge to provide clear explanations. Ensure all units and spellings are accurate.

Nova the owl has been experimenting in her woodland laboratory. She has a collection of objects including a steel paperclip, a copper coin, a plastic button, an iron nail, and a gold ring. She uses a bar magnet to test which items are attracted to it.

Word bank: attract · repel · magnetic field · poles · iron · nickel · cobalt · force

1. Nova identifies three materials that are magnetic. From the list in the passage, identify which objects will be attracted to the magnet. (2 marks)

2. Explain why Nova's copper coin and gold ring are not attracted to the magnet. (2 marks)

3. If Max the monkey brings two bar magnets together, what happens when he places the North pole of one magnet against the North pole of the other? Describe the force he would feel. (2 marks)

4. Describe what is meant by the term 'magnetic field' and explain how we might observe one using iron filings. (3 marks)

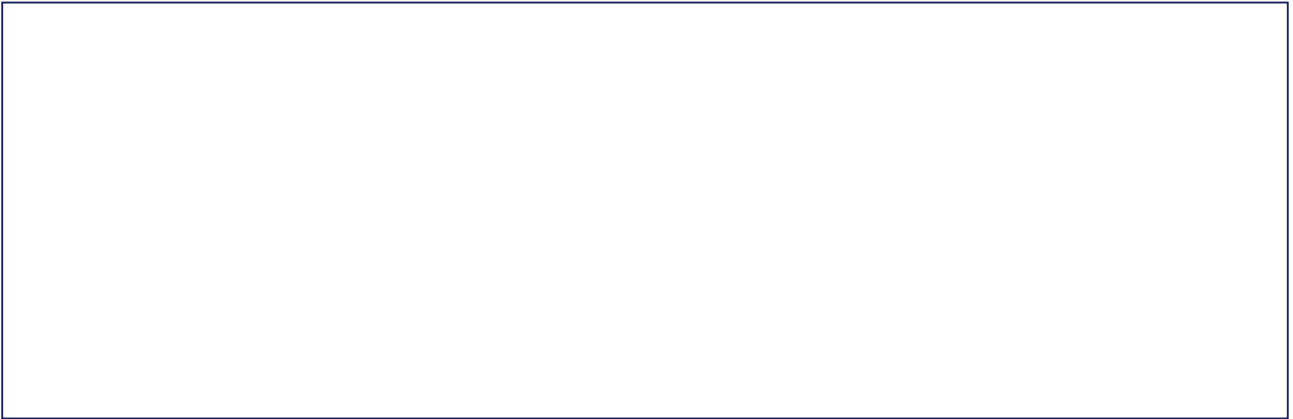
5. Compare and contrast the properties of a permanent magnet and a temporary magnet (such as an electromagnet). Why might a scientist choose an electromagnet for a scrapyard crane? (4 marks)

6. Justify this statement: 'All metals are magnetic.' Is this true or false? Use evidence from your experiments to support your answer. (3 marks)

7. Imagine you are helping Kit the fox build a magnetic sorting machine to separate recyclable materials. Write a brief plan (5 marks) explaining how you would use magnets to sort a mixture of aluminium cans, iron nails, and plastic bottles. Include how you would ensure the process is efficient. (5 marks)

8. What might happen if the Earth's magnetic field were to weaken significantly? Consider the impact on migratory animals like birds. (2 marks)

Draw: Draw a diagram of two bar magnets placed end-to-end with opposite poles facing each other. Use arrows to show the direction of the magnetic force between them.



Extension challenge: Total: /25. Challenge: Research and explain how a compass works using the Earth's magnetic properties. If you were stranded in the woods, how could you turn a sewing needle into a temporary magnet to help you find North?