

Year 4 Science Assessment: The Force of Discovery

Learning objective: To assess understanding of forces, including friction, air resistance, magnets, and contact versus non-contact forces.

Read each question carefully. Use your scientific vocabulary to provide clear, detailed explanations. Ensure your answers are written in full sentences where required.

Nova the owl is observing the forest floor, while Max the monkey is experimenting with toys to understand how things move. They notice that a ball rolling on grass stops much faster than a ball rolling on a smooth wooden floor. Meanwhile, Kit the fox is using a bar magnet to sort through a box of mixed items, discovering that some objects are pulled towards the magnet while others remain still.

Word bank: friction · resistance · magnetic · repel · attract · surface · contact · gravity

1. Identify two types of contact forces mentioned or implied in the passage and define what a contact force is. (3 marks)

2. Max notices the ball stops faster on grass than on wood. Explain why this happens using the term 'friction'. (3 marks)

3. Compare and contrast how magnetic poles behave when they are identical versus when they are opposite. Use the terms 'attract' and 'repel'. (3 marks)

4. Kit finds a steel paperclip and a plastic button. Justify why the magnet attracts one but not the other. (2 marks)

5. Explain why gravity is classified as a non-contact force, even though it keeps our feet firmly on the ground. (3 marks)

6. What might happen if we tried to design a toy car to travel as far as possible on a carpeted floor? Suggest two modifications to the car or the surface and explain the science behind your choices. (6 marks)

7. Design a short experiment to test which surface creates the most friction. Include your prediction, your method, and how you will ensure the test is fair. (5 marks)

Draw: Draw a diagram of a magnet interacting with a metal object. Use arrows to show the direction of the magnetic force and label the 'north' and 'south' poles of your magnet.



Extension challenge: Total: /25. Extension Task: Imagine a world without friction. Write a paragraph explaining how our daily lives would change, focusing on movement and safety. Why is friction considered both a help and a hindrance?