

Nova's Scientific Investigation: The Mystery of Moving Objects

Learning objective: To identify and explain how different surfaces affect the amount of friction acting on a moving object.

Follow this experiment record to test how far a toy car travels on different surfaces. First, choose three different floor types (e.g., carpet, wood, tile). Use a ramp to ensure your car always starts with the same amount of force. Measure the distance travelled in centimetres using a meter ruler. Be a scientist like Nova and record your findings carefully!

Word bank: friction · surface · resistance · force · distance · smooth · rough · investigation · variable · prediction

1. Prediction: Which surface do you think will create the most friction and why? Use your scientific knowledge to justify your choice. (2 marks)

2. Method: Explain how you will ensure this is a fair test. What variables must you keep the same each time you roll the car? (3 marks)

3. Observation: Describe the motion of the car on the 'rough' surface compared to the 'smooth' surface. What did you notice? (2 marks)

4. Analysis: Compare and contrast the surfaces you tested. Explain why the car travelled further on one surface than the other. (3 marks)

5. Evaluation: If you were to repeat this experiment, what might happen if you increased the height of the ramp? Explain your reasoning. (3 marks)

6. Conclusion: Based on your results, how would you design a surface for a playground slide to make it as fast as possible? Justify your answer. (3 marks)

Extension challenge: Imagine you are an engineer. Write a short paragraph explaining how friction can be helpful in everyday life (e.g., for car tyres or shoe soles). What might happen if there was zero friction in the world?