

Friction & Surfaces

Name: _____ **Date:** _____

LEARNING OBJECTIVE

The student will test how different surface textures affect friction by measuring how far an object slides on each surface.

MATERIALS NEEDED

- A small toy car, block, or coin
- a ramp (board or clipboard)
- books to prop the ramp
- at least 3 different surface materials (carpet, sandpaper, foil, wax paper, tile, towel)
- ruler or measuring tape
- paper
- pencil

HANDS-ON ACTIVITY

1. Set up a ramp at a fixed, consistent angle using books to prop it up.
2. Choose four different surface materials to test at the bottom of the ramp (e.g., bare wood/table, carpet square, towel, aluminum foil), placing each one at the base where the object will slide after leaving the ramp.
3. Release the same object from the same height on the ramp for each surface, and measure how far it slides past the bottom of the ramp before stopping.
4. Repeat each surface test two more times and average the sliding distance for each surface.
5. Rank the four surfaces from least friction (object slid farthest) to most friction (object slid shortest distance).

QUESTIONS

1. Rank your four tested surfaces from least friction to most friction, based on your measured sliding distances.

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2. What was the average sliding distance for your least-friction surface and your most-friction surface?
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3. Why did you release the object from the same height and the same ramp angle for every surface test?

4. Explain, in terms of friction, why a car's tires are designed with deep treads (grooves) instead of being perfectly smooth.
