

Friction: Ramp & Surface Investigation

Name: _____ **Date:** _____

LEARNING OBJECTIVE

Students will investigate how different surfaces affect friction and its effect on motion.

MATERIALS NEEDED

- a board or stiff cardboard for a ramp
- books to prop the ramp
- toy car or block
- surface materials such as sandpaper, wax paper, and fabric scrap
- measuring tape
- stopwatch

HANDS-ON ACTIVITY

1. Build a ramp by propping one end of your board on a stack of books at a fixed height, marking the same starting point for every trial.
2. Release a toy car or block from the top of the bare ramp and measure how far it travels after reaching the bottom flat surface; repeat and average 3 trials.
3. Tape a different surface material onto the ramp one at a time (sandpaper, then wax paper, then fabric), repeating the release-and-measure process for each (3 trials each).
4. Record all results in a data table: Surface, Trial 1/2/3 distance, and Average distance.
5. Rank the 4 surfaces from least to most friction based on your average distance results, where a shorter distance means more friction.

QUESTIONS

1. **What is friction?**

2. **Which surface produced the most friction in your test, and how do you know?**

3. **Which surface produced the least friction?**

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4. Name one everyday example where more friction is helpful, and one where less friction is helpful.
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