

Physical Science
Friction

Name: _____
Date: _____

Background:

Friction is a force that resists _____. It is caused by the interaction of 2 _____.

Objective of Lab:

To determine factors that influence the amount of friction on an object.

We will answer the following questions:

- (1) How does mass of an object affect amount of friction it experiences?
- (2) How does surface on which an object is sliding affect the amount of friction it experiences?

Activity 1:

How does surface TEXTURE affect the amount of FRICTION?

In this portion of the lab, we will slide the *same* weight across *different* surfaces and find the force of friction.

What is the independent variable? _____

What is the dependent variable? _____

Place the friction board flat on the lab bench. Feel each of the surfaces on the friction board.

Predict: Which one do you think will cause the greatest amount of friction for the block of wood? _____ Which one do you think will cause the least? _____

Place the block on the first surface and mass on block. Hook the spring scale to the block of wood and pull it slowly across the surface. *Read the spring scale while the block is moving at a constant velocity.* Record your data in the table below:

| | Cardboard | Sandpaper | Aluminum Foil | Wax Paper | Duct Tape |
|--|------------------|------------------|--------------------------|------------------|------------------|
| Force of Friction on Block & mass | | | | | |

Questions:

1. Did your result match your prediction? _____
2. Which surface created the least friction? _____
 - a. How could you tell? _____
3. What about this surface made it resist motion the least? _____

4. Which surface created the most friction? _____
 - a. How could you tell? _____
5. What about this surface made it resist motion the most? _____

6. Imagine you must move a large sofa (that is too heavy to lift) in your house. You can either push it over the carpet in the living room, or over the tile in the hallway. Which route do you think will have the least friction? _____ Why? _____
_____ Which route would you choose? _____

Activity 2:

How does MASS affect the amount of FRICTION?

In this portion of the lab, we will slide *different* masses across the *same* surface and find the force of friction in each case.

What is the independent variable? _____

What is the dependent variable? _____

Name two things that must remain constant in this experiment _____

Predict: Will a bigger mass have more friction or less friction? _____

You may choose any one surface (cork, rubber, sandpaper, or cardboard) to use in this activity. With your group select the surface you will use and write it here _____

Place the block on your surface and set one mass on top. Hook the spring scale to the block of wood and pull it slowly across the surface. *Read the spring scale while the block is moving.* Record your data in the table below. Repeat adding 100g masses to complete the table:

| | Block | Block with 1 book | Block with 2 books | Block with 3 books |
|----------------------------------|-------|-------------------|--------------------|--------------------|
| Force of friction (N) | | | | |

Questions:

1. Do the results of the experiment match your prediction? _____
2. Which mass had the most friction? _____
3. Which mass had the least friction? _____
4. If you did this experiment again on a different surface, which mass do you think would have the most friction? _____ The least? _____