

Don't Slip



OVERVIEW

Friction is a common and pervasive force that students experience every day. And yet, little thought is given to the nature and uses of friction. Your young scientist recently investigated frictional forces between a block of wood and 3M™ Sandpaper. They measured, recorded, and graphed the force needed to move the block of wood across various grades of 3M™ Sandpaper using either spring scales or rubber bands.

In this Don't Slip Family Activity, you can help your young scientist extend their investigation into friction in the form of a demonstration, a short activity, a problem to solve, research to conduct, or an exploration activity.

OBJECTIVES

Students will be able to:

- collect data regarding the force of friction.
- identify friction as a force that slows motion between two surfaces.
- propose a model to explain how friction works.

BACKGROUND INFORMATION

Friction is one of the four fundamental forces of nature. Friction affects us in countless ways throughout our daily lives. Friction can be commonly defined as: a measure of the resistance felt when sliding one surface over another. As a force, the amount or strength of friction can be measured and expressed as a number. The amount of friction between two surfaces depends on a number of factors: type of surface, amount of surface area contact, the force that presses the two surfaces together, and the presence or absence of any lubricating substance between the two surfaces to name a few.

MATERIALS (BY ACTIVITY)

- Demonstration Activity
 - Objects that can be dragged across the floor to demonstrate friction (backpack, heavy box, etc.)
- Short Activity
 - Heavy items (backpack, heavy box, etc.)
 - Various surfaces (wood floor, tile, carpet, lawn, concrete, etc.)

- Problem to Solve Activity
 - Notebook paper
 - Pen/pencil
- Research Activity
 - Computer/phone with internet access
- Explore Activity
 - 3M™ Sandpaper of various grit
 - Heavy objects (backpack, box, etc.)
 - Computer/phone with internet access

HOME ACTIVITY

1. **Demonstration:** if your young scientist has investigated friction, ask them to demonstrate and explain friction to you using common objects and materials found around the house. For example, they could drag their backpack across a table, push a heavy box along the floor, or carefully pull a kitchen drawer out (comparing the force necessary to pull out different drawers.)
2. **Short activity:** your young scientist and you could compare how hard it is to pull a heavy backpack or other object across different surfaces in the home: wood floor, carpet, tile, lawn, etc.
3. **Problem to solve:** If you had a slippery rug in the house that was a safety hazard for a long time, what ideas can your child come up with to make the rug less slippery?
4. **Research:** Your young scientist and you could research adhesives such as tapes and glues to develop a better understanding of how they work. What is the history of Scotch Brand Tape? How many different kinds of Scotch Brand tapes and glues are there and what does each one do?
5. **Explore:** If you have different grits of 3M™ Sandpaper available in your home, try comparing how differently heavy objects can move across the surfaces. You may wish to demonstrate how differently those 3M™ Sandpaper types work on wood. Use the 3M site to view the hundreds of different kinds of abrasives available.

VOCABULARY

- **Friction:** a force that acts between two objects that are in contact with one another. It slows or stops movement between the two surfaces that are touching.
- **Force:** a push or pull on an object.

THOUGHT/CONVERSATION STARTERS

- How would you describe friction?
- Why is friction important?
- How does a surface affect friction?
- What does force have to do with friction?

DOCUMENT THE LEARNING IDEA

- Take pictures and/or videos of the activities as you complete them. You may choose to turn these into a digital collage or video to showcase your findings.
- Draw pictures of your family completing the activities and what you found in your explorations.
- Print any research completed on the internet or write notes about what you researched.

*Work together as a family to document your learning. Add a short description to your creation, explaining what you did and what you learned. Bring the creation to school to share with the class.

CONTINUE MAKING CONNECTIONS

Next time you leave the house as a family, make note of any frictional forces you see in public. Have your young scientist make a list and then discuss each one when you get home. You may also have your student draw a picture of a few frictional forces they saw to share with their class at school.