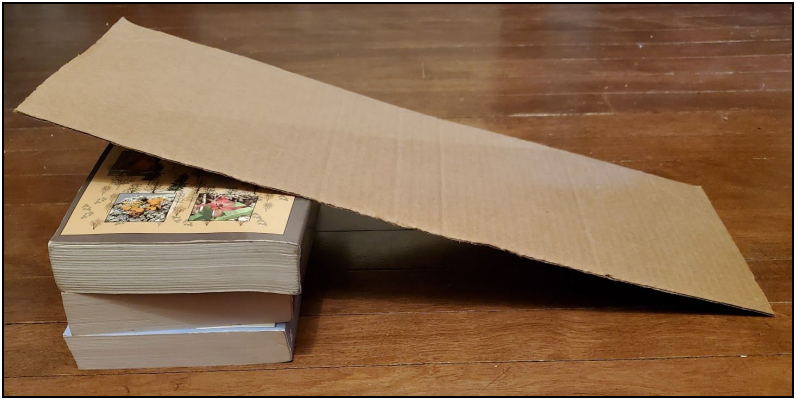


Friction: Fun with Ramps		Grade 1 Materials, Objects, and Everyday Structures
Lesson Plan	Safety Notes	Cardboard can be hard to cut, get an adult to help you cut the strips for your ramps!
<p>Description Students will explore friction using a simple machine and investigate how different materials create different amounts of friction.</p>		
<p>Materials</p> <ul style="list-style-type: none"> • 4 strips of cardboard, wood or other similar material (to make ramps) • 1-4 toy cars (similar type/wheel size is best) • 3 materials of different textures (e.g. sand paper, foil, a towel, paper towel, a plastic bag...) • Tape • Books, blocks or boxes to prop up ramps (same objects for all ramps is best) • Optional: measuring tape and/or stopwatch 		
<p>Science Background For this activity you will be building a set of ramps. A ramp is an inclined plane, or in other words, a flat surface tilted on an angle. You will be using these ramps to explore friction in different materials. Remember, a material is the substance something is made out of. When two things rub against each other they experience something called friction. If you put your hands together and rub them back and forth you'll start to notice them get hot. This is because of friction. As you rub your hands together the surfaces of your hands are fighting against each other because they are moving in different directions. That fight is called friction.</p>		
<p>Activity Procedure</p> <ol style="list-style-type: none"> 1. Prop your strips of cardboard (or wood) up on the stacks of books (or blocks) to create 4 ramps like the one in the picture 		
		

2. Cover the surface of 3 of your 4 ramps each with a different one of the textured materials. You can use a bit of tape to help hold the material in place on the ramps. Leave the 4th ramp as is



3. Make predictions about what you think will happen when you let the cars drive down the ramps. What car will go the fastest? Which one will travel farthest?
4. Test your predictions. You can drop all the cars at the same time if you have a helper or you can test your ramps one at a time by using a timer to see how long it takes the car to get from the top of the ramp to the bottom. If you have a measuring tape you can measure how far the cars travelled too!

Debrief

Did you notice that the cars went faster down some ramps than others? Did some of the cars go farther than others? This is because different materials create different amounts of friction. Friction fights against the moving car so the more friction a material creates the slower the car will go and the less distance it will travel. Smooth materials create less friction than rough ones. Did you notice that the cars travelled farther and faster on the ramps with smooth materials?