

Ramps and Friction

Summary

In this activity, we will be learning about simple machines and friction. By using ramps, toy cars, and materials with different levels of friction, we will observe how we can make cars go faster or slower. Which ramp and surface texture will result in the fastest speed?

Materials

- 1 long flat surface
 - *Something that you can pick up and move easily.*
 - *For example, an extra-large and long book, board game case, or long piece of cardboard from a box.*
- Toy car with working wheels
 - *Marbles, small balls, or anything that rolls also work well.*
- Blocks or books to support the ramp at an angle.
 - *You could even place the ramp on the lowest step of some stairs.*
- Various materials that can fit over your ramp.
 - *Dish Towel*
 - *Wax paper*
 - *Aluminum foil*
 - *Fabric*

Steps to Follow *(All activities must be done with adult supervision)*

1. *Can you think of any tools that help you do work around the house?*
 - a. *Tools and machines allow us to perform work more easily by augmenting the force being applied. Simple machines have zero to few moving parts:*
 - i. *Levers, pulleys, inclined planes, screws, wheel & axe, and wedge.*
2. Place your ramp so that it is supported at a lower incline. Take your test car, wheel, or ball and let it roll down the surface.
 - a. Change the surface texture of the ramp with your materials (towel, wax paper, foil) and test your item.
 - i. *Which surface was fastest or slowest?*
 - ii. *Friction is the resisting force between two objects physically sliding past each other. How did friction affect the speed?*
 - b. After trying all the surfaces, change the incline of the ramp too.
 - i. *How does the change in incline help us?*
 - ii. *Gravity is a force that pulls everything down. By increasing the ramp's incline, gravity has a greater pull on our object. By using materials with different levels of friction on the ramp, we can also control its speed.*

Ohio Early Learning and Development Standards

Cognition and General Knowledge/Science/Science Inquiry and Application/Inquiry
Cognition and General Knowledge/Science/Physical Science/Explorations of Energy

Ohio Learning Standards

2.PS.1, 5.PS.1, 8.PS.2, PS.FM.2

New Generation Science Standards (NGSS)

2-PS1-2, 5-PS2-1