

Exploration Learning Guide

Simple Machines Gallery

Experiment with **gears**! Gears are **wheels and axles**, which are a type of **simple machine**. Simple machines are tools that make work easier or more efficient.

TRY THIS

Exhibit: Gear Wall

Observe what happens if you fit a few gears together and then rotate one gear.

- What can you notice about the gears as they spin? Do they all spin in the same direction? Are they all spinning at the same speed?
 - Does the arrangement of the gears effect how they spin?

As you positioned the gears, did you create any arrangements that did not work? What do you think kept the gears from turning?

Energy is the ability to do work or cause change. Explore **potential energy**, the energy of an object that is stored and ready to use, and **kinetic energy**, the energy of an object in motion.

TRY THIS

Exhibit: Balls & Ramps

Play with the angle of the track pieces. How does the speed of a ball change when the track is steep compared to when the track is almost flat?

Experiment with two tracks that have the same number of pieces in each. If you race a ball down each track, does one ball win? What differences between the two tracks might have affected the outcome of the race?

- Challenge yourself to build one long track and one short track so that a ball started on each track will reach the end at roughly the same time.

Dig Deeper

Reflect and communicate

What questions do you still have? What other things can we try to explore these questions?

Make connections

The gears on the Gear Wall and the ramps in Balls & Ramps are types of simple machines. Other types of simple machines are wheels and axles, levers, screws, pulleys, and wedges. Where do you see simple machines at work around the Museum? Can you build a simple machine using the Rigamajig pieces (next to the Balls & Ramps exhibit)?

Explore more at home

Continue asking questions, making observations, designing experiments, and predicting outcomes: Look around your home, on the playground, or in your neighborhood for each type of simple machine. How is each simple machine used? Does it allow you to do something that might otherwise be difficult?

As you and your child engaged with the exhibits in the Simple Machines Gallery you may have explored concepts that are connected to the Massachusetts Science and Technology/Engineering Curriculum Frameworks and specifically taught in Pre-Kindergarten, Kindergarten and Grades 2 through 4, and 6 through 8.