

# Ramps Exploration

Exploring with ramps looks like play, but the concepts behind what's happening are absolutely science! By experimenting with designing and building ramps, children become mini engineers. And by exploring and observing how different objects move or remain static on the ramps, they're introduced to concepts in physics (friction, energy) and math (speed, angles, measurements).

## Try It

1. Provide various materials that can be used to build ramps, like blocks of any kind, sandbags, anything flat and long (like wooden or rubber moldings), cardboard tubes, furniture (to provide height), fasteners, etc.
2. Also provide varied items to use on the ramps. There should be items that roll naturally (balls of various sizes and weights, round containers, plastic lids, etc.), toys with wheels, items that don't roll naturally (rocks, toy animals, seashells, etc.), and anything else that you can find that children can test on their ramp.
3. Let the fun begin! Children seem to naturally want to build a ramp when the materials are available. Let them experiment with using different materials to build the ramp itself and then let them play with trying to roll various items down the ramp.



### TINY TIP!

Start with balls and move on to using cars later. The balls help younger children focus on how the ramp is working without the distraction of the car itself.

## Learning Opportunities

Children will learn about how things roll down an incline, remain motionless on a flat surface, or might require a push (or other force applied) to move. The concept of friction—the resistance of motion when two objects rub against one another—can also be explored. When using a ramp, the wheels or round objects that roll down the ramp produce energy in the form of motion. They meet resistance (friction) while rolling, which eventually slows them down.



## Open-Ended Questions

- What height ramp do you need to get something to roll down it?
- How can we make a longer ramp?
- How far can you get that \_\_\_\_\_ to go? How can you move it farther?
- What materials make the \_\_\_\_\_ move faster on the ramp?
- How can we put a curve in the ramp? Can you make a ramp like a roller coaster with a loop-de-loop?
- How can you make the ramp go over something and under something else?

When the children are experimenting to see what items go down the ramp, questions could include:

- Why do you think that \_\_\_\_\_ didn't go down the ramp?
- Why did the \_\_\_\_\_ fall off of the loop?
- Why didn't it go around the curve?
- Why is it slower on that ramp than on that one (if there are contrasting materials on each ramp or if they're at differing heights)?



### TINY TIP!

Give this activity as much room as possible. Ramps encourage cooperative play; the more kids, the more space is needed. Be creative with the space you use and don't be afraid to include places like the library stacks as well.

### WORDS AND CONCEPTS TO EMPHASIZE

- Design
- Construction
- Friction
- Motion
- Energy
- Speed
- Angles
- Distance measurements