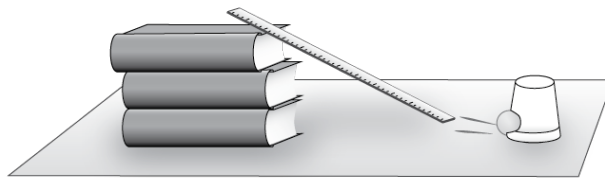


LAB: RAMPING UP THE CLAIM

You will make a model to help you determine how the steepness of a ramp would affect a skateboarder’s impact if he or she crashed. You will roll a ball down ramps of different heights and measure how far the cup at the bottom of the ramp gets pushed when the impact occurs. If the cup goes farther, there is a greater impact.



Materials each team will need:

- three books
- ruler for making a ramp (the kind with a groove in the middle is best)
- ruler for measuring book stacks and cup movement
- small ball
- Styrofoam cup with an opening cut into it for the rolling ball to enter



Procedure:

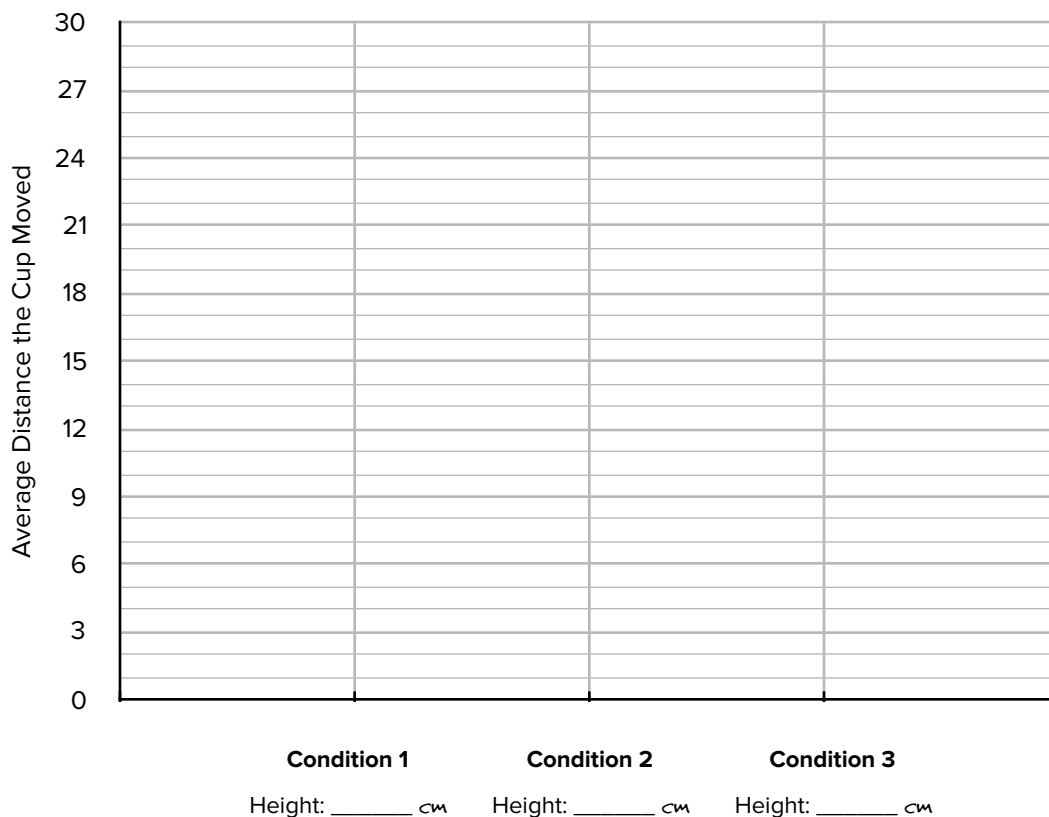
1. Set up your ramp and cup as shown in the first picture in the data table below. Start by putting one book under the ruler.
2. Measure the height of the book or stack of books for each condition. Record this in your data table.
3. Hold the ball at the top of the ramp.
4. Let go of the ball and let it roll down the ramp to hit the cup.
5. Measure how far the cup moved because of the impact. Record this measurement in your data table.
6. Roll the ball down the ramp three times for each condition. Each of these rolls is a “trial.” Average the measurements you recorded for the three trials in each condition.

		Trial #1 distance the cup moved	Trial #2 distance the cup moved	Trial #3 distance the cup moved	Average
	Condition 1 (ramp made with one book) height: _____ cm	_____ cm	_____ cm	_____ cm	_____ cm
	Condition 2 (ramp made with two books) height: _____ cm	_____ cm	_____ cm	_____ cm	_____ cm
	Condition 3 (ramp made with three books) height: _____ cm	_____ cm	_____ cm	_____ cm	_____ cm

Graph your results, and look for patterns in your data.

Add the height of the book stack to the labels on the *x-axis* (\longrightarrow).

Use the *y-axis* (\uparrow) to enter your data about how far the cup moved.



Interpret your data:

What can you learn from your data? What claim can you make about the effect of the steepness of the ramp on the speed of the ball? What is your evidence for this claim?

Good **claim** starters:

I claim that...

The pattern is...

My data show that...

Other things to think about:

- What else might change the speed of the ball?
- How could you test these factors?