

How can you change how fast or slow an object moves? TE

Investigate Lab

How can you **change** how **fast** or **slow** an object moves?

Scientists test how fast or slow an object can move. How can you make a ball change how fast or slow it moves?

Procedure

1. Use all of the materials. Plan a way to **measure** how fast or slow the ball moves using forces. Show your plan to your teacher.
2. Conduct your investigation. Do three trials. Record your data.

Materials

- ball
- ramp
- stopwatch
- tape

Science Practice

You **measure** to collect data and gather information.

Observations

Sample answer: The groups had similar results. The ball went faster when I used more force. The ball went slower when I used less force.

Analyze and Interpret Data

3. **Compare** Compare your data with another group. Tell what happened when you used different amounts of force.

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Guiding Inquiry

If the students need more direction on this lab, use the following procedure.

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1. Set up the ramp. Changing the height of the ramp changes the amount of force that pulls the ball down the ramp.
2. Use the meter stick to measure one meter from the end of the ramp and mark both ends of the meter distance with tape.
3. Roll the ball down the ramp and start the stopwatch when the ball reaches the first tape. Stop the stopwatch when the ball crosses the second piece of tape.
4. Record the time in the data table.
5. Repeat the test three times, changing the force on the ball for each trial.

Investigate Lab

INVESTIGATE

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Objective Students observe how the speed of a ball changes when the amount of force that pulls it down the ramp is changed.

Time 25 **Grouping** 2

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Understanding the Science Practice

Students measure the amount of time it takes a ball to travel a certain distance to collect data. Groups compare data to see if their investigations yield similar results.

Materials Go online to download the master materials list, which also identifies kit materials.

What to Expect Students can change the angle of the ramp to change the amount of force on the ball. With a steeper ramp, the component of the downward gravitational force that is parallel to the ramp is greater, so the ball will roll faster. For a shallower ramp, this component of force is smaller, so the ball will roll slower.

Go online to the Lab Center to get an editable

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Focus on Mastery!

Comparing Observations Remind students that they will compare data to see if they draw similar conclusions as others. Tell students to look for patterns when comparing data.

- How do both sets of data tell what happens when less force is used? How do both sets of data tell what happens when more force is used? (Sample: Data shows that objects move slower with less force and faster with more force.)