

Ramp Lab

Name:

Period:

Date:

Big Question: How will changing the height of ramps affect the potential and kinetic energy of a ball? ALSO, how will changing the mass of a ball affect the potential and kinetic energy of a ball?

Procedures Part 1:

1. Build a ramp using a piece of cardboard and a textbook.
2. Place a cup at the bottom of the ramp for the marble to roll in to.
3. Place a meter stick at the end of the ramp.
4. Let the marble roll down the ramp so it lands in the cup. Measure how far the cup moves backward and record your data in the data table below. Take your measurements in centimeters. Do 3 trials and take the average.
5. Lift your ramp up by placing 2 textbooks under the cardboard.
6. Repeat step 4.
7. Lift your ramp up by placing 3 textbooks under the cardboard.
8. Repeat step 4.

Hypothesis Part 1: What do you think will happen to the distance the cup moves as the height of the ramp increases?

Type of Ball	# Books	Trial 1 (cm)	Trial 2 (cm)	Trial 3 (cm)	Average (cm)
Marble	1				
Marble	2				
Marble	3				



Procedures Part 2:

1. Set up your ramp with 3 textbooks just like you did in part 1.
2. For part 2, you will not be changing the height of your ramp, but the size of your ball.
3. Roll a ping pong ball down the ramp so it lands in the cup. Measure how far the cup moves backward and record your data in the data table below. Take your measurements in centimeters. Do 3 trials for each ball and take the average.
4. Repeat step 3 with a marble.
5. Repeat step 3 with a golf ball.

Hypothesis Part 2: What do you think will happen to the distance the cup moves as the mass of the balls increase?

Type of Ball	# Books	Trial 1 (cm)	Trial 2 (cm)	Trial 3 (cm)	Average (cm)
Ping Pong Ball	3				
Marble	3				
Golf Ball	3				

Follow-up Questions:

1. Which type of ball made the cup move the farthest distance? _____
2. What is the relationship between the height of the ramp and the distance the marble moved the cup?

3. What is the relationship between the mass of the ball and the distance the cup moved?

4. If the height of the ramp *increases*, the amount of potential energy the marble has:
increases / decreases (circle one)
5. If the mass of the ball *decreases*, the amount of potential energy the ball has:
increases / decreases (circle one)

Answer Key:

1. Golf Ball
2. As the height of the ramp increases, the distance the cup moved also increased.
3. As the mass of the ball increases, the distance the cup moved also increased.
4. Increases
5. Decreases

Teacher Notes:

- You can build the ramp out of pieces of cardboard or if you have plenty of meter sticks on hand, give each group 3. Two can be placed on the books to form a ramp with a gap in-between for the balls to roll down, and one at the bottom for measurement.
- Any of the balls can be swapped out for whatever you have on hand.
- If you would like the students to calculate the amount of potential energy each ball has, check out my high school version of this lab in my store.



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