

Predicting and Observing Changes in Energy

1. Compare the two ramp systems.

Predict the observable changes and changes in energy in the ruler-marble-Styrofoam ramp system.



Before the collision: Compare the speed of the marble as it reaches the end of each ramp.

I predict the marble on ramp 2 will roll _____ than the marble on ramp 1.


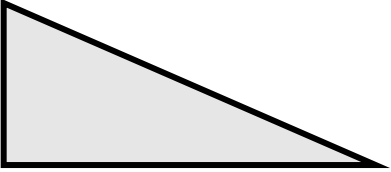
I think this because _____

The red marble has just hit the Styrofoam block: Compare the distance the marble and Styrofoam block will move after the collision.

I predict the marble and Styrofoam block at the bottom of ramp 2 will move _____ than the marble and Styrofoam block on ramp 1.

I think this because _____

2. Test your predictions and add your data to the table below.

		 ramp 1	 ramp 2
Height of ramp (cm)			
Distance the Styrofoam moved (cm)	Trial 1		
	Trial 2		
	Trial 3		

3. After you complete the trials, compare your data to your predictions. Then answer the following questions:

What patterns do you observe in your data?

Do the patterns you observe support your predictions?

Explain your thinking:

4. Consider ramp 2.

- Using symbols, draw a representation of the marble before it is released, halfway down the ramp, and when it collides with the Styrofoam.
- Color in the energy bars to represent the amount of energy.
- Label the form of energy: P = position energy M = motion energy.

Ramp 2

Energy bars

red energy bars for the red marble

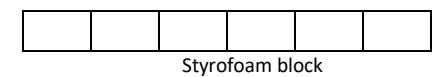
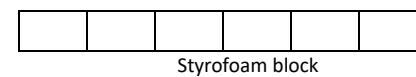
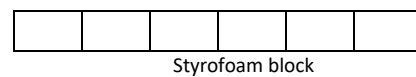
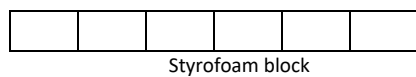
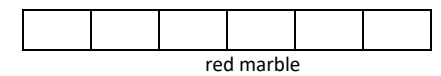
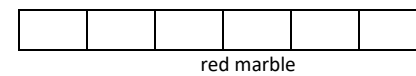
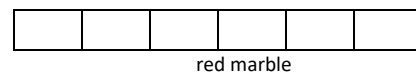
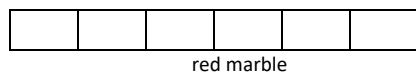
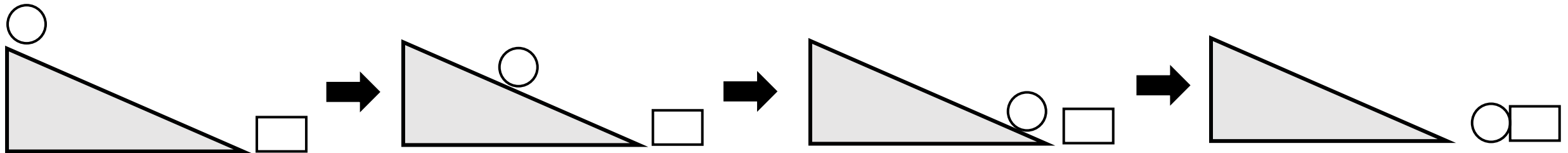
blue energy bars for the Styrofoam block

1. The red marble is at the top of the ramp.

2. The red marble is halfway down the ramp.

3. The red marble is at the bottom of the ramp.

4. The red marble has just hit the Styrofoam block.



Energy Changes Card Sort Set 1

Make one card set for each pair of students.

1

When the red marble crashed into the blue marble, the red marble stopped and the blue marble started moving.

2

The faster the red marble was moving, the faster and farther the blue marble moved after the collision.

3

When the red marble was released at the top of the ramp, it started moving faster and faster as it rolled down the ramp.

4

The higher the ramp, the faster the red marble was moving at the bottom of the ramp.

A

Energy can be transferred from one object to another through collisions.

B

Stored energy can be transformed into energy of motion.

C

The more energy of motion an object has, the more energy it can transfer through a collision.

D

The more stored energy an object has, the more energy can be transformed into energy of motion.

Energy Changes Card Sort Set 2

Make one card set for each pair of students.

5

When the launcher bar crashed into the car, the launcher bar stopped, and the car started moving.

6

The faster the launcher bar was moving, the faster and farther the car moved after the collision.

7

When the rubber band was released, it moved back to its original size, causing the launcher bar to move forward.

8

The more the rubber band is stretched back, the faster the launcher bar will move.