



Comparing Energies

Engage

What To Do:

1. If a classmate or your teacher held a horizontal board and a balled up piece of paper at shoulder height, predict which would hit the floor first.

2. If a classmate or your teacher held the same board vertically and a balled up piece of paper at shoulder height, predict which would hit the floor first.

3. Watch the video “Dropping objects of Different Mass” at <https://www.youtube.com/watch?v=xZs9rve5LdY>

4. There are problems with the bowling ball and basketball parts of this video so don’t bother with them.

5. What did you observe when the horizontal board was dropped at the same time the balled up piece of paper?

6. Was your prediction correct?

7. What did you observe when the vertical board was dropped at the same time the balled up piece of paper?

8. Was your prediction correct?

Explore

Part 1

Materials: meter stick, tennis ball, masking tape, calculator

What To Do:

1. Tape the meterstick to the edge of your table with the 0 cm at the bottom.
2. Have one member of your group sit on the floor directly in front of the meter stick so they can watch for the rebound.
3. Drop the tennis ball from a height of 100 cm and measure the rebound on the meter stick.
3. Record under Trial 1. Do this 2 more times and record.
4. Continue to drop the tennis ball and record its rebound and fill in the table below.
5. Find the average of each height.

Starting Height	Ball Rebound Heights			Average
	Trial 1	Trial 2	Trial 3	
100 cm				
80 cm				
60 cm				
40 cm				

Questions:

1. At which height did the ball rebound the highest? _____
2. At which height did the ball rebound the least? _____
3. Why do think this is true? _____





Part 2

Materials: 3 rubber bands, roll of masking tape, ruler, Meter stick or tape measure, calculator

What To Do:

1. Go out into the hallway and place a piece of masking tape on the floor to indicate the starting position.
2. One member of the group should stand at the starting position with the ruler and the rubber band.
3. Shoot the rubber band by hooking on the front edge of the ruler, then stretching it back 10 cm and letting it go. Do this with 3 rubber bands.
4. Use the meter stick or tape measure to measure the distance each rubber band flew. Record in the data table below.
5. Gather the rubber bands and do this for 15 cm and 20 cm.
6. Calculate the average for each stretch length.

Stretch Length	Rubber Band Flying Distance			
	Trial 1	Trial 2	Trial 3	Average
10 cm				
15 cm				
20 cm				

Questions:

1. At which stretch length did the rubber band fly the farthest?

2. At which stretch length did the rubber band fly the shortest?

3. Why do you think this is true?



Part 3

What To Do:

1. Watch the video “Chemical Potential Energy in Food” at <https://www.youtube.com/watch?v=bhScokTJUQg>
2. As you watch the video fill out the chart below and then answer the questions.

Food	Water Temperatures		
	Starting	Ending	Difference
Marshmallow			
Cheeto			

Questions:

1. According to the video, what is burning in the marshmallow?

2. According to the video what is burning in the Cheeto?

3. Which food caused the temperature of the water to rise the most? _____
4. What does this tell you about the energy in marshmallows vs. Cheetos? _____

Do Not Glue in until your teacher says to.

Work with your teacher to define the following terms on the lines of your notebook and write examples on the back of the flap.

Types of Potential Energy

Explain

Gravitational Potential Energy

Elastic Potential Energy

Chemical Potential Energy

Elaborate

Materials: colored pencils

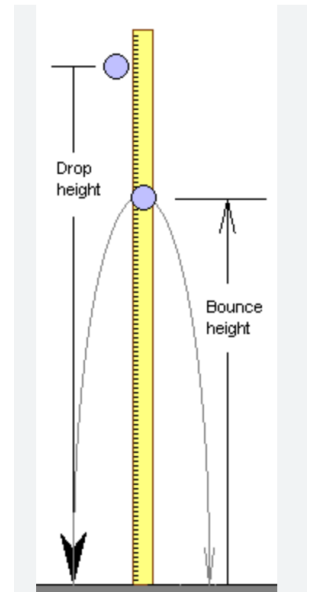
What to Do:

This is a diagram of the activity you completed in Part 1.

1. Color the ball that has the most potential energy red.
2. Color the ball that has the least potential energy blue.
3. Color the arrows that show when the ball has kinetic energy green.

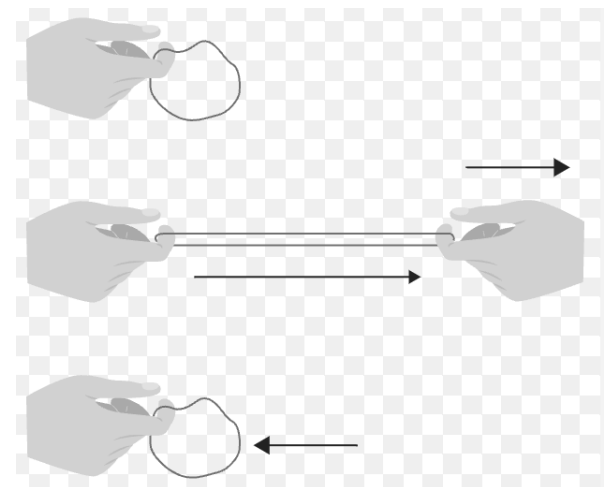
Questions:

1. What type of potential energy does the red and blue balls have?
2. What type of energy did the gravitational potential energy change into? _____



This is a drawing of two students stretching a rubber band. It is like the rubber band activity you completed in Part 2

1. Circle the picture that shows just the rubber band in red.
2. Color the arrows that shows a force storing the potential energy in the rubber band in blue.
3. Color the arrow that shows when the rubber band has released the stored energy and changed it to kinetic energy in green.





Questions:

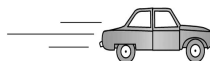
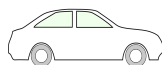
1. What type of potential energy is being stored when the rubber band is being stretched? _____
2. What type of energy did the elastic potential energy turn into?

Below you see two cars. They are like the food burning video you watched in Part 3.

1. Color the picture of the car that has some stored potential energy in red.
2. Color the car that is using the stored energy in blue.

Questions:

1. What type of potential energy is being stored in the car? _____
2. What type of energy did the chemical potential energy turn into? _____



Write three sentences comparing the three types of potential energy with kinetic energy on the lines below.

Name _____

period ____



EXIT TICKET

Comparing Energies

1. Which of the following is NOT a type of potential energy?

- a. chemical
- b. gravitational
- c. running
- d. elastic

2. Chemical potential energy turns into kinetic energy when the substance –

- a. is blown in the wind
- b. burns
- c. is placed on a high shelf
- d. is stretched out

3. Gravitational potential energy turns into kinetic energy when something on a high shelf –

- a. falls to the floor
- b. stays on the shelf
- c. is burned in a fire
- d. is opened on that shelf

4. Elastic potential energy turns into kinetic energy when a wind up car –

- a. sits on a shelf
- b. falls off a shelf
- c. is placed on a shelf
- d. speeds across the floor after being wound up