

Activity 4: Elastic Interactions

Name _____

Date _____

Class _____

Key Question

We Think

1. When the pinball is launched in a pinball machine, where does its motion energy come from?

2. When the beanbag is launched by a slingshot, where does the beanbag's motion energy come from?

Explore Your Ideas

In the tennis video, you saw the ball come into contact with the racquet, slow down, then stop for an instant.

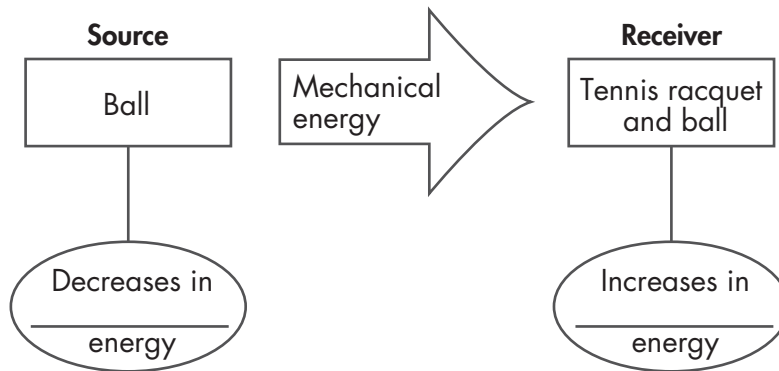
1. What is the evidence that an elastic interaction has occurred?

After momentarily stopping, the ball sped up toward the left, and the ball and racquet strings returned to their normal un-stretched shapes.

2. What is evidence that an elastic interaction has occurred?

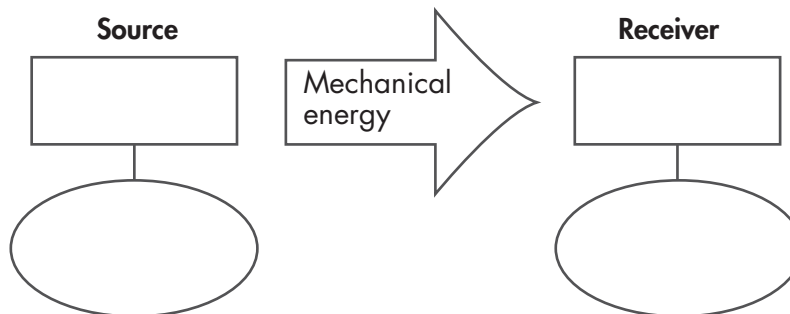
Make Sense of Your Ideas

1. Complete the energy diagram for the ball colliding with the racquet.



2. Why is the ball included as a receiver in the previous energy diagram?

3. Complete an energy diagram for the ball leaving the racquet:



Explore Your Ideas

The experiment question is:

Does how much an elastic object is stretched affect its interaction with another object?

1. Rewrite the experiment question in the form of a relationship.

If _____ (*manipulated variable*) changes,
 what happens to _____ (*responding variable*)?

2. Write your hypothesis and reason.

I think that if the _____ (*manipulated variable*) increases,
 the _____ (*responding variable*) will
 _____ (*increase, decrease, or stay the same*) because

 _____ (*reasons that support your hypothesis*).

In Table 1, list the variables in the elastic interaction experiment, and describe how each of these variables will be controlled (held constant).

Table 1: Control Variables	
Variable	How it Will be Controlled

Measure how far the rubber band is stretched and enter this into Table.

Average your results. Then write the averages in Table 2.

Table 2: Distance Object Moves versus Distance Rubber Band Is Stretched				
	Distance Rubber Band Is Stretched (cm)			
Distance Object Moves (cm)	Trial 1			
	Trial 2			
	Trial 3			
	Trial 4			
Average				

Make Sense of Your Ideas

1. What conclusion can you make from your experiment? Write the conclusion in this form:

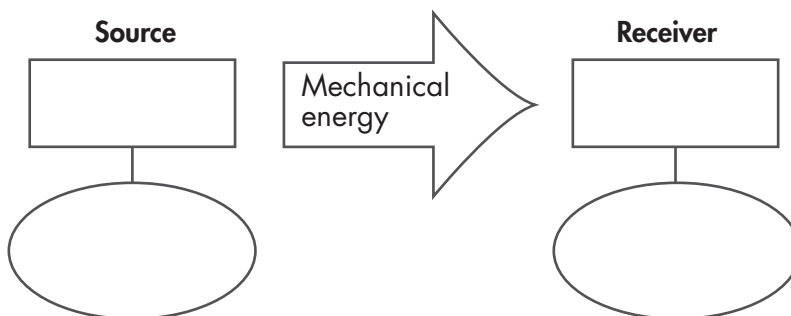
If the _____ (*manipulated variable*) increases,
 then the _____ (*responding variable*) will _____
 _____ (*increase, decrease, or stay the same*) because

 _____ (*reasons supported by evidence*).

Use the checklist entitled *How To Evaluate an Experiment Conclusion* to evaluate whether your conclusion is good. If it is poor, rewrite your conclusion.

2. How does your conclusion compare with your hypothesis?

3. Draw an energy diagram to describe the interaction between the rubber band and the object you launched in your experiment.



4. From your experiment, what evidence do you have to support the claim that energy can be stored in an elastic object?

Our Consensus Ideas

The key question for this activity is:



What happens to energy in an elastic interaction?

1. Write your answer to the key question.

2. Write the class consensus idea.
