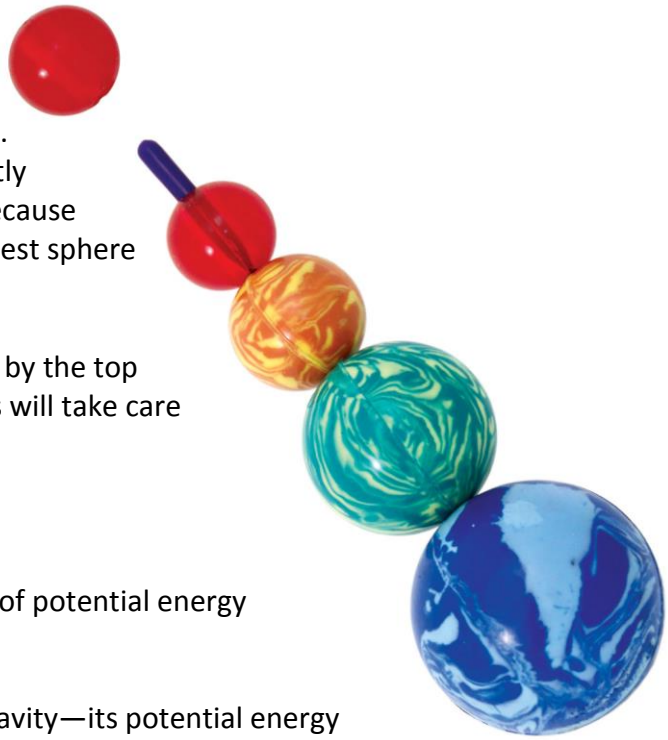
Seismic Accelerator

SS-150



How does it work?

Four rubber spheres are threaded on a plastic shaft. You will notice that the largest sphere is permanently affixed to the shaft and the next two are held on because the shaft widens at the end, allowing only the smallest sphere (on top) to remain unattached.

Using the Seismic Accelerator is simple: just hold it by the top of the plastic shaft and drop it! The Laws of Physics will take care of the rest.

Be sure your students understand this process:

The Seismic Accelerator has the maximum amount of potential energy BEFORE it is dropped.

As the Seismic Accelerator begins to fall—due to gravity—its potential energy decreases and its kinetic energy increases.

When the Seismic Accelerator hits a solid surface (such as the ground or a tabletop), it no longer has any potential energy. In fact, we could say that the Seismic Accelerator is now at its maximum kinetic energy.

What happens next is the fun part!

When the bottom sphere hits the table, it begins to compress. Because it is made out of rubber, that energy is stored in the sphere. Then, as the sphere expands, the energy is re-emitted.

The energy that is re-emitted from the bottom sphere transfers up to each of the subsequent spheres until it is transmitted to the top sphere, which will rebound to a height significantly higher than the original drop.

And there you have it!

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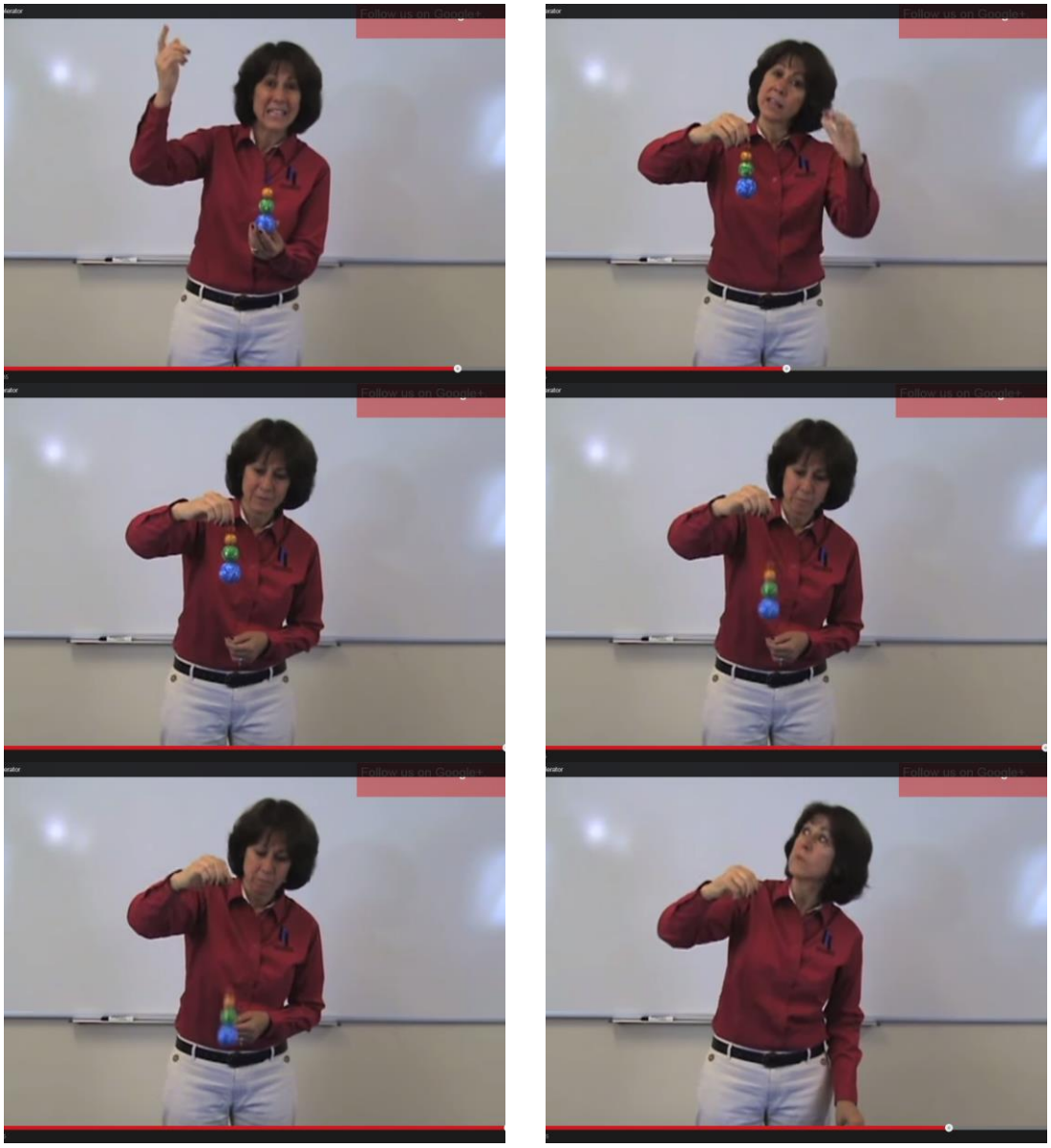
Introducing the Seismic Accelerator

Preview the Seismic Accelerator in action:

Our YouTube channel includes a video explaining how the Seismic Accelerator can be used to demonstrate the Law of Conservation of Energy:



www.youtube.com/watch?v=ZqN7qOawP8Q

Activity 2

Seismic Accelerator Experiment

Instructions

It is best to work in teams of two.

1. Set up a measure tape next to a wall.

2. Work in pairs. While one person holds the Seismic Accelerator, the other person makes sure the largest sphere is at the desired height. Drop the Seismic Accelerator. Record the highest point the top sphere flew on the data sheet (see next page).

3. Repeat step 2 above two more times so you have a total of three drops. Calculate the average height of the drops.

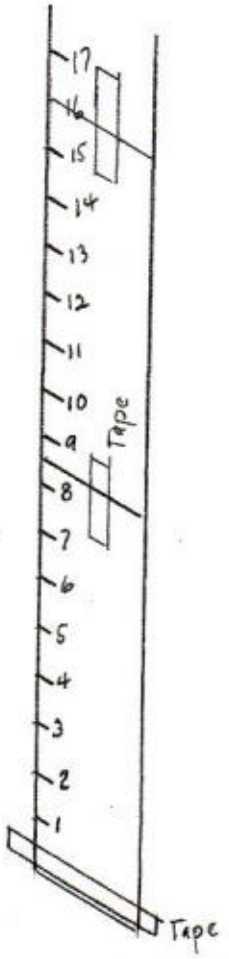
4. Repeat at increasing heights. Stop when the smallest sphere hits the ceiling.

5. Graph the results, using the graph sheet on page 5.

Optional:

Each team can make its own measuring tape using strips of paper (calculator tape will work well).

Mark increments on the strips and tape them to the wall. This will make collecting data easier.



Question:

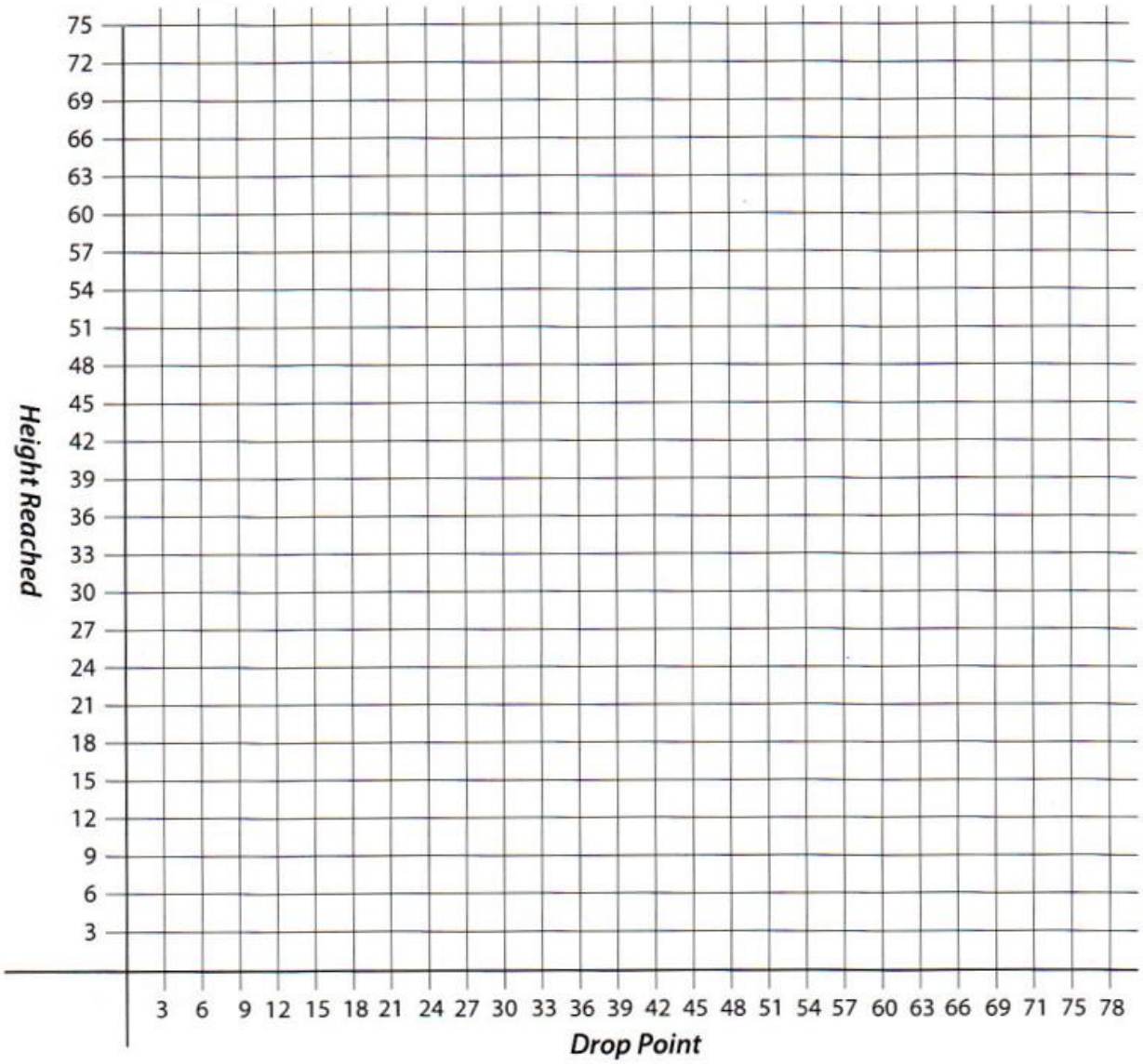
Was the increase constant or did it change? Why?

Activity 2 (continued)

Seismic Accelerator Experiment Data Sheet

Drop Height	Sphere Height			
Data	**1st drop**	**2nd drop**	**3rd drop**	**Average**
6”				
9”				
12”				
15”				
18”				
21”				
24”				
27”				
30”				
33”				
36”				
39”				
42”				
45”				
48”				
51”				

Seismic Accelerator Experiment Graph



Observations:

Take Your Lesson Further

As science teachers ourselves, we know how much effort goes into preparing lessons. For us, "*Teachers Serving Teachers*" isn't just a slogan—it's our promise to you!

Please visit our website for more lesson ideas:

www.TeacherSource.com

Check our blog for classroom-tested teaching plans on dozens of topics:

http://blog.TeacherSource.com

To extend your lesson, consider these Educational Innovations products:

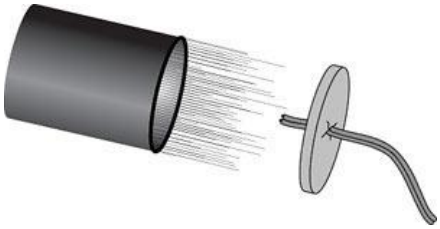
Reaction Rocket (RKT-625)

Appearances can be deceiving. This rubber ball launcher and foam rocket may look simple, but they're a sure-fire way to provoke a WOW reaction—and introduce students to Newton's Laws. Hold the launcher by its straw and drop straight down onto a hard surface. The rocket shoots up dramatically higher than its original drop height. Explaining energy conversion was never this easy... or this much fun!

Mighty Seltzer Rocket (RKT-555)

This cleverly designed rocket with nose cone and fins will travel 20 to 30 feet into the air. Simply pour in water, drop in a seltzer tablet, replace the end cap, and the rocket is prepared for launch. To activate, simply invert the rocket, place it on a flat surface and move away. The rocket is 10 cm (4 in.) long.

Piezo Popper Kit (HS-2A)



These amazing piezoelectric devices generate a few thousand volt sparks at the touch of a button. No batteries required. The discharge is created when a small hammer inside the device strikes a quartz crystal. It can be used as a safety lesson to demonstrate the flammability of alcohol or perfume. Igniting two drops of alcohol in a film canister will cause the canister to fly more than 20 feet into the air! Kit includes piezo igniter, instructions, film canister, wire and butt connector.

Dropper Popper (POP-107)

This incredible device seemingly defies the laws of physics by bouncing higher than where you dropped it from! Requires a small amount of activation energy to work. It is molded into a special shape that allows it to store elastic potential energy and then convert it to kinetic energy with a POP when dropped from a low height. Makes a great activation energy demonstration.