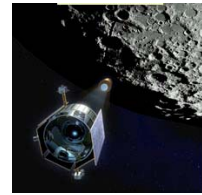




Inelastic Collisions



LCROSS

Group Activity:

You have just spent some time learning about momentum and ways that energy is transferred from one object to another. Let's see if you can apply what you have learned. I have the greatest confidence in you!

The device you see before you is called Newton's Cradle. It is named after Sir Isaac Newton, a famous mathematician and scientist, who is credited with a number of discoveries and scientific insights. Newton's Cradle is a fun demonstration of the principles of momentum.

It's time for your first prediction.

If you pull one ball from the left end of the cradle and then let it fall back into the other four balls, what will happen? Why?

What did you observe? Why did it happen that way?

If you pull two balls from the left end of the cradle and then let them fall back into the other three balls, what will happen? Why?

What did you observe? Why did it happen that way?

Do you have it figured out now? Let's try something different.

What will happen if you pull three balls from the left end of the cradle and then let them fall back into the remaining two balls? Why do you think this will happen?

What did you observe? Why did it happen that way?

What will happen if you pull the end ball from each side (left and right) and then let them fall back into the other three balls at the same time? Why?

What did you observe? Why did it happen that way?

It is getting more interesting!

What will happen if you pull two balls from each end and then let them fall back into the one remaining ball in the middle? Why?

You know the routine now. What happened and why did it happen?

Although there are a lot of different combinations we could try, here is our last try for today.



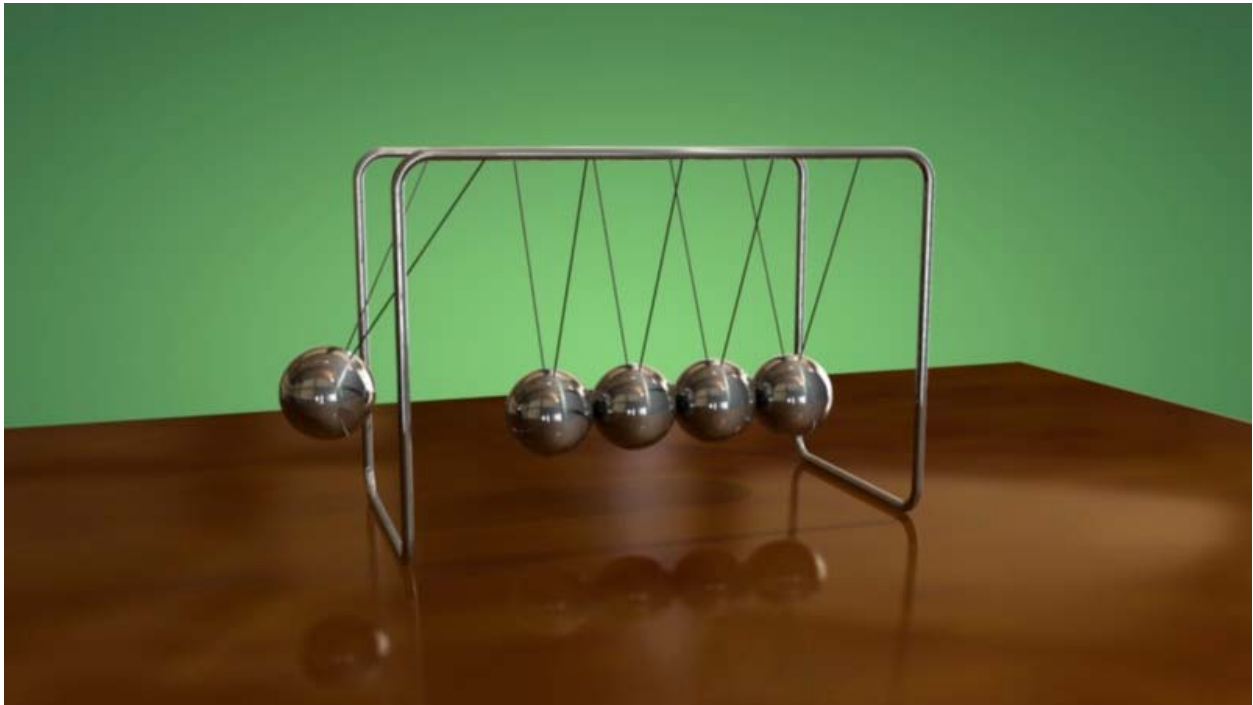
What will happen when you pull one ball up from the left side and two balls up from the right side, then release them at the same time? Hmmmm...

What happened and why?

You have spent a lot of time learning about momentum and the transfer of energy from one object to another. There are some important things to remember about momentum, energy and the LCROSS Impactor.

When the spent fuel tank strikes the Moon's surface, it will transfer energy to the Moon. Because the Moon is so much larger than the fuel tank, the Moon will not move, much like the example of the camel and the flea.

However, the energy from the fuel tank will send a plume of Moon dust and debris outward from the surface of the moon. It is this plume that will be examined for signs of ice or hydrogen indicating that there may be frozen water on the moon.



Student Activity Worksheet

1. If you pull one ball from the left end of the cradle and then let it fall back into the other four balls, what will happen? _____
Why? _____

What did you observe? _____
Why did it happen that way? _____

2. If you pull two balls from the left end of the cradle and then let them fall back into the other three balls, what will happen? _____
Why? _____

What did you observe? _____
Why did it happen that way? _____

3. What will happen if you pull three balls from the left end of the cradle and then let them fall back into the remaining two balls? _____
Why do you think this will happen? _____
What did you observe? _____
Why did it happen that way? _____



4. What will happen if you pull the end ball from each side (left and right) and then let them fall back into the other three balls at the same time? _____

Why? _____

What did you observe? _____

Why did it happen that way? _____

5. What will happen if you pull two balls from each end and then let them fall back into the one remaining ball in the middle? _____

Why? _____

What happened and why did it happen? _____

6. What will happen when you pull one ball up from the left side and two balls up from the right side, and then release them at the same time? _____

What happened and why did it happen? _____

