Western Engineering

Outreach

Potential Energy Game

Grade Sk-2

Meet Today's ENG HERO!

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Since joining the Faculty of Engineering at Western in 1999, Dr. Wood's field of research has primarily been on Lightweight Structural Materials with a particular focus on process-structure-property relationships for die-cast magnesium alloys and polymer composite materials.

To learn more about Dr. Wood visit:
https://www.eng.uwo.ca/mechanical/faculty/wood_j/index.html

Learning Goal:

- Students will consider what energy is and how it is conserved while playing a game
- Curriculum Connections: Grade 1- Energy in Our Lives; Grade 2 - Movement

Materials Needed:

- Popsicle Sticks
- 2 Plastic Eggs or Bottle Caps
- String
- 2 Clothes Pins
- Glue

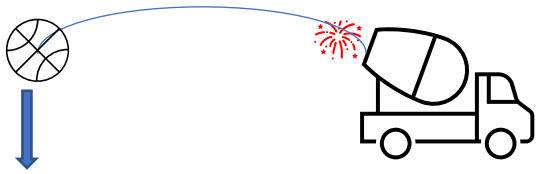
Engineering and Science Connections:

Today we will become mechanical engineers. Mechanical engineers solve problems to design and create things that move.

One thing Mechanical Engineer's have to consider when designing something that moves is energy. What is energy? Energy is the ability to do work. Energy is how things change and move. It's everywhere around us and takes all sorts of forms.

There are many forms of energy, here is a list of some of them!
Gravitational - Large objects such as the Earth and the Sun create gravity and gravitational energy.
Motion - Anything that is moving has energy. This is also called kinetic energy.
Potential - Potential energy is energy that is stored. One example of this is a spring that is pressed all the way down. Another example is a clothes pin held open that wants to close.

Now that we have gone through energy let's go over the next important topic to understand how our game works. This is projectile motion, which is the motion of an object thrown or shot into the air, subject to the force of gravity. The object is called a projectile, and its path is called its trajectory.



Gravity

Video Recommendation: *What is Energy? | Types of Energy: Light, Heat, Water, Electrical and Wind | Kids Academy* https://www.youtube.com/watch?v=4HdxOhBRDUI

Activity:

Before beginning, think about the following questions:

- Where do we see energy?
- What is energy used for?

- Can you spot anything around your house that is using energy?

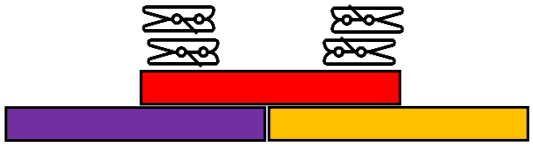
Time to Begin

Today's activity we will be learning how energy is transferred from your hand into kinetic energy

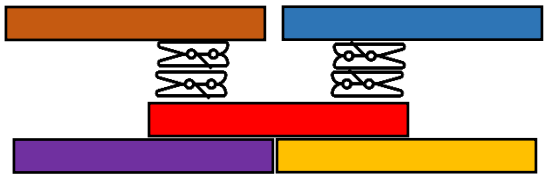
Step 1. Place the two craft sticks side by side like this.

Step 2. In the center of the 2 craft sticks, glue a third on top to bind them together

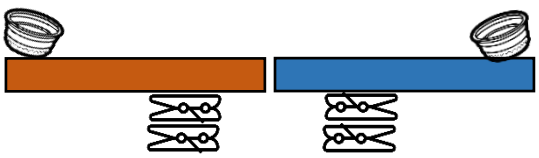
Step 3. From the center again, glue a clothespin with the handle on the outside. Glue a second clothespin on top, repeat on the other side.



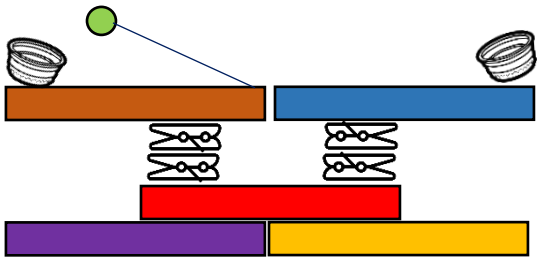
Step 4. On top of each clothespin stack, glue the 4th and 5th craft sticks;



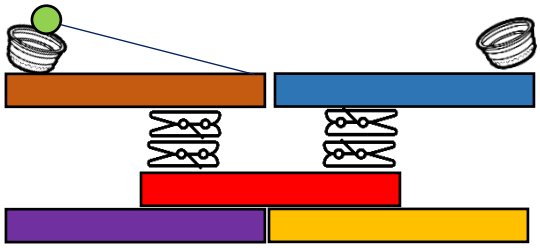
Step 5. At the far ends of the craft sticks on top, glue the half shell of an Easter egg or similar prize capsules. Alternatives: bottle caps, or even a spoon!



Step 6. Glue a pom pom or ball to a string. Measure your string from the center, trimming if it is too long. The pom pom should be able to rest inside the cup nicely, without too much extra string. Glue the string to the center.



Step 7. Place the pom pom into the launching capsule. Use your finger to fling the pom pom, aiming for the landing capsule. The ball won't land perfectly every time but that's okay!



Debrief

Now that the game is assembled you should be able to see energy and projectile motion in action. We first start out with potential energy getting stored by the clothespin when you pull it back. The clothes pin then transfers its potential energy to kinetic energy to move, which is then transferred to gravitational energy that pulls the pom pom down. While all of this is happening the pom pom is moving in a projectile motion path.

What Did You Learn?

- What is Energy?
- What are the different forms of Energy?
- What is Projectile Motion?
- Examples of Projectile Motion

Future Learning

- Discover other forms of energy such as nuclear and thermal.
- Look at Newtons laws to understand why Projectile motion exists.

Share your creations!

We would love to see what you made. Email as at discover@uwo.ca or tag us on social media.

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Thanks for discovering with us!