



Week Five: May 18th -22nd

Hello Scientists and Engineers!

I hope your family is healthy and safe. Keep sending those texts and emails! I especially love the pictures!!! Last week, I heard lots of bird callers and noise makers and saw some great paper gliders! This week, both activities involve ENGINEERING! You will create your own miniature golf course and a Rube Goldberg Machine. 😊 Be sure to first **watch the video**, so you know what that is. As you complete these two investigations, **HAVE FUN!** If you have an older or younger sibling in your house who attends Dye, work together. Instead of making two golf courses or two Rube Goldberg Machines, work together to create one AWESOME course or machine!

Remember, there is **reading material, vocabulary, discussion questions and an online quiz** that correlates with each lesson. However, these are for **enrichment** and are **not required**. They are great opportunities to learn something new and test your knowledge without worrying about a grade.

This week you will need those **clean, recyclable materials** (pop bottles, toilet paper rolls, cardboard, cereal boxes, grocery bags, old mail, cans, bread ties, etc.) you have been collecting. 😊

I want to hear from you this week! A few have sent me messages and pictures, but **I WANT MORE!** ;-) Send me a **picture** of you doing STEM work. If you take the quiz, **share your score** with me. Tell me something you learned **from the video or the reading material**. Did you **take the lesson a step further?** Tell me how. I share pictures on my website so you can see all the great things students are doing for STEM.

If you contact me with any of these things I will send you back a Science Joke!

Contact Information: Class Dojo-STEM Teacher Mrs. Thomas, email clthomas@carmanainsworth.org, or text 810-412-8829 or visit my website dyelementarystem.weebly.com.

I hope your family is healthy and safe. Have fun with S.T.E.M. this week, and let me know how it goes!

Adios amigos,

Mrs. Thomas

Activity 1

<https://www.generationgenius.com/?share=14E7B>



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ALWAYS QUESTION. ALWAYS WONDER.

DIY ACTIVITY

MINI GOLF

OBJECTIVES

- Experiment with forces commonly used in golf.
- Compare strong and weak forces.
- Make an object move in different directions.

MATERIALS NEEDED

- 20-30 books
- 2 plastic cups
- Scissors
- Roll of masking tape
- Yardstick
- Golf ball

PROCEDURE

1. Design the shape of your golf course by placing the books next to each other.
2. Cut the bottom out of one plastic cup to make a "tunnel" for the golf ball.
3. Tape the plastic cup to the floor with the larger end towards the front.
4. Tape another plastic cup to the floor to serve as the hole.
5. Using a yard stick, have students hit the ball through the tunnel cup and into the hole.

WHAT IS GOING ON HERE?

Using the yardstick, you can apply a force to push the ball through the tunnel and into the hole. The golfer will use different amounts of force (strong or weak) to make the ball move. They can hit the ball in different directions. The ball moves in the direction that the force was applied. With practice you can get better at making the ball move in the right direction and with the right amount of force.

FURTHER EXPLORATION

Take the students outside and use a soccer ball as the object to be moved. Have them use their feet to provide the force to stop, start, or change the direction of the ball.

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Suggestions for Mini Golf: Send me a picture or video of your final course.

- **Instead of elevating the course with books, create a miniature golf course using any available household items or recyclables.**
- **Use a rubber band, hair band, or circle of string for the hole.**
- **If you don't have a yardstick, use a broom stick or pencil.**
- **Use any ball you have available or make one by crumpling paper or foil. Be sure to adjust the size of the hole to fit the ball you use.**

Activity 2

<https://www.generationgenius.com/?share=9BFE6>



DIY ACTIVITY

MAKE YOUR OWN RUBE GOLDBERG MACHINE

OBJECTIVES

- Use the transfer of energy of motion from one object to another to move candy into a dish.
- Utilize their understanding of energy transfer and collisions to design their own Rube Goldberg machine.

PROCEDURE

1. Explain to students that they will be building a Rube Goldberg machine like Zoe's on the video.
2. Arrange several books into a stack on a table or counter top. Move a desk or table that is lower than the first surface to the counter top. Place a bowl on the lower counter.

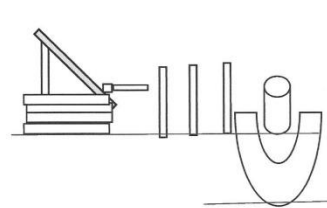


3. Pour your favorite candy (or other non-liquid material) into a cup. Tape the cup to the edge of the table above the bowl.
4. Set up a ramp between two books. Stand one book upright at the far side of the pile. Prop a ruler or piece of wood at an angle on top of the stack of books. Then insert a pencil lengthwise through the center part of a binder clip. Fold the handles of the binder clip open and insert the end of a marker perpendicularly to hold the pencil in place.
5. Next set up a series of books like dominoes - arrange the books on end in a row so that the last will fall near the cup at the edge of the table.
6. Tape a pencil perpendicularly across a highlighter to create a teeter-totter.
7. Place the eraser end of the pencil where the last book will land, with the tip of the pencil under the cup so that it is tilted toward the bowl.
8. If necessary, watch this portion of the video again. (8:09-9:25).

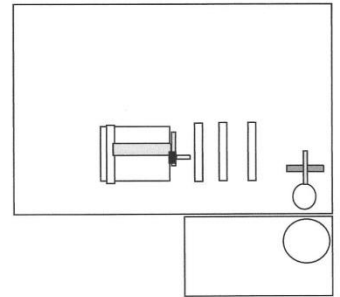
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9. When everything is set up, students can slide a battery or similarly sized item from the top of the ruler to set off the chain reaction of energy transfers that eventually tips the contents of the cup into the bowl.

ARRANGEMENT OF MATERIALS FROM SIDE



ARRANGEMENT OF MATERIALS FROM ABOVE



WHAT IS GOING ON HERE?

This Rube Goldberg style energy transfer machine uses strategically placed interactions to transfer energy to complete a task. The goal is to dump the candy from the cup into the bowl. This is accomplished using the initial energy of the battery sliding down the ramp. This energy is transferred as the battery collides with the pencil at the bottom of the ramp, which causes the pen to collide with - and transfer energy to - the first book. In turn, the books collide with each other as they fall. The last book eventually falls on the eraser end of the pencil. This hinges over the highlighter and under the cup to tip the cup and pour the candy into the bowl. With each interaction energy is transferred to do work.

FURTHER EXPLORATION

Now that students have experience building energy transfer mechanisms, they can engineer their own using the Engineering Design Process. Provide a variety of materials and a task as a challenge to students, or let students define the problem on their own and use any materials that they think will work. Add constraints to the challenge by defining the number of energy transfers that must take place as the machine completes the task.

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Suggestions for Rube Goldberg Machine: Send me a picture or video of your final machine.

- **If you don't have everything for the activity's suggested machine design, improvise. There is no wrong way to do this activity.**
- **Get creative and design your own machine!**
- **Research "Rube Goldberg machine" to find more examples of machines people have created. Some are extremely impressive and took a LOT of patience! 😊**