STEM activities

Exploring different elements of Science, Technology, Engineering and Maths.

Most children enjoy picking apart how something works and creating, and it's so important to nurture these creative and analytical skills.

They encourage children to explore ideas, work together, and to problem solve.



Can you make a bridge from foil strong enough to hold a toy car?

You will need; Aluminium foil and toy car

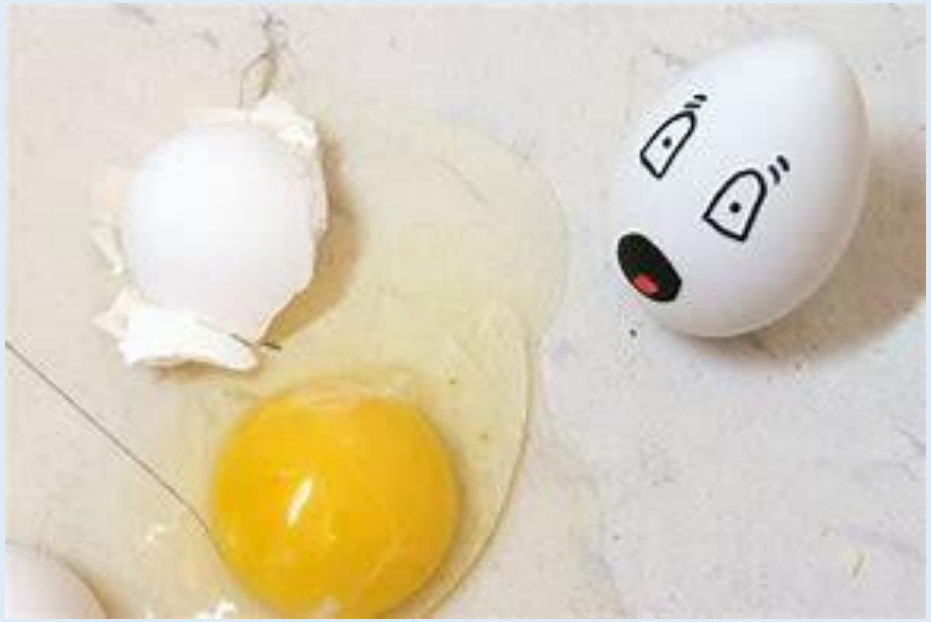
Discuss the texture, fragility and sturdiness of the thin foil.

Discuss words like flexible and rigid, and how we could manipulate the foil to make it sturdier; scrunch, twist and twiddle away to test the strongest form.

Look at pictures of bridges to see how they are built. Use the ideas to plan your own bridge. What features could you include?

Challenge; Does your bridge go over water? Does it have a double level? Does it need to be a certain height/length?

Egg Drop Challenge



Can your child design a container that can hold a raw egg and keep it from breaking when dropped from a high place?

The **egg drop STEM challenge** is a favourite STEM activity. It's simple enough that younger children can participate, but it can easily be modified and made more challenging for older kids.

Challenge

Allow children to only choose 2-3 items from your box of materials.

Try dropping the containers from increasingly higher positions to discover which containers continue to work.

Lego Maze



Set up for this Lego STEM challenge is super simple.
Start with an empty base plate, a tub of Lego and a marble.
Challenge your child to build a path for the marble to travel.
Younger ones may want to start with something simple at first.
Encourage your child to test out the maze as they go. This will allow them to fix any issues before they get too far.
Once your child figures out the best design plan, they can add to the maze.
They may choose to make the maze longer or add a few extra turns to make it more complicated.

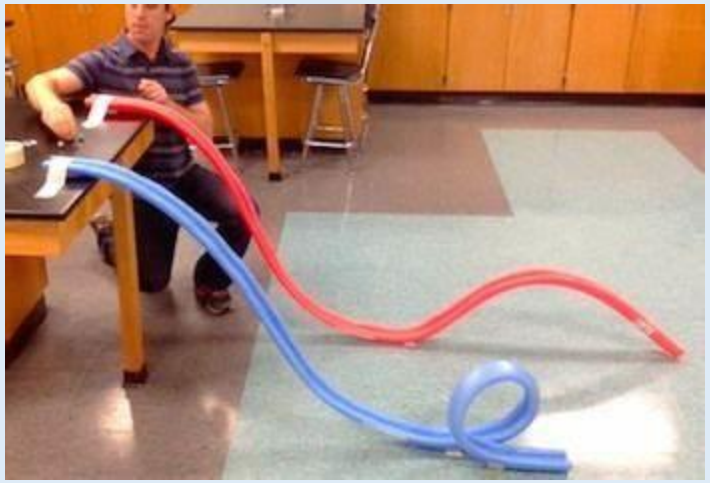
Marble Roller Coaster — Kids of all ages will have fun exploring physics while engineering their very own roller coaster.



How Does a Marble Roller Coaster Work?

Just like the cars on a real roller coaster, the marble has potential energy when it is at the top of the hill. The energy becomes kinetic energy when the marble rolls down the hill. As it rolls, it gains speed and momentum. This enables the marble to continue rolling when it comes to the smaller hills.

If the marble has enough momentum when it gets to a loop it will continue to travel, and centripetal force will keep the marble rolling forward through the circular path.



Challenge

Make your track even longer by adding additional pool noodles. Can you make a curve? Can you get the marble to go through 2 loops?

Use other materials, such as cardboard boxes, to add other elements to your coaster. Try making a tunnel or using the boxes to help make hills.

Experiment with changing the height of your first hill. Try making it taller or shorter. How does it affect the coaster?

Coffee Filter Parachute — Find out how to make a toy parachute from a coffee filter in this quick and simple challenge.



Materials needed: paper coffee filter, string, scissors, crayons or markers, clear tape (optional), small toy figure (such as an army man, toy block person, or plastic animal)

Have your child stand on a chair and drop a small toy. What happens?

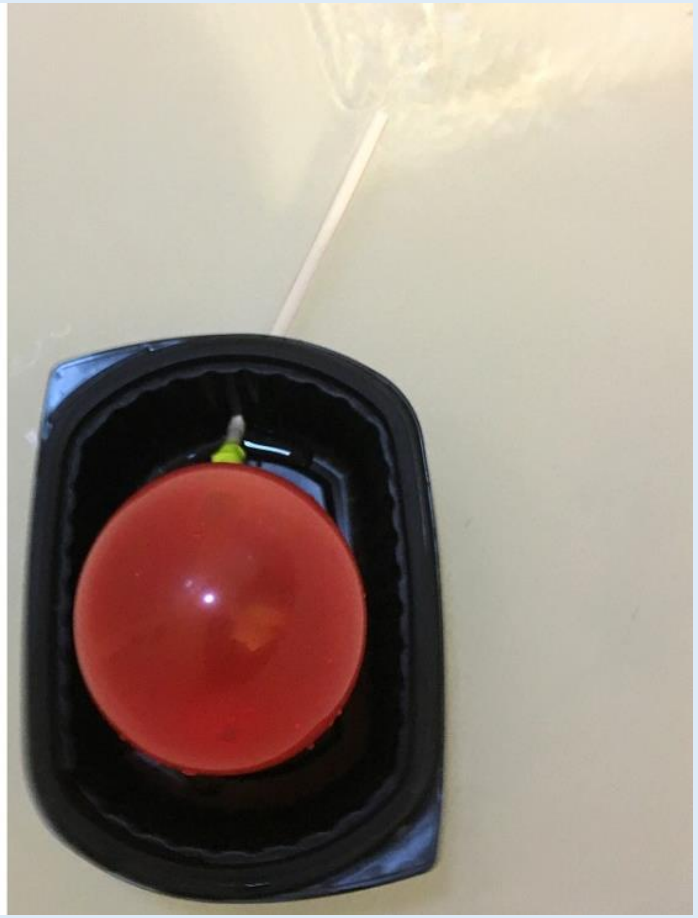
- Try making a smaller parachute. Use a cupcake liner or cutting a smaller circle out of a coffee filter to make it.
- What happens if you use longer strings? Try doubling the length of the strings you use and see what happens.

Balloon-Powered Boat — This super simple STEM idea is perfect when you are stuck indoors — and it makes bath time more fun!

Materials:
Disposable Plastic Container, Bendable Plastic Drinking Straw, Balloon, Tape, Scissors, Bathtub or Large Plastic Container

Instructions

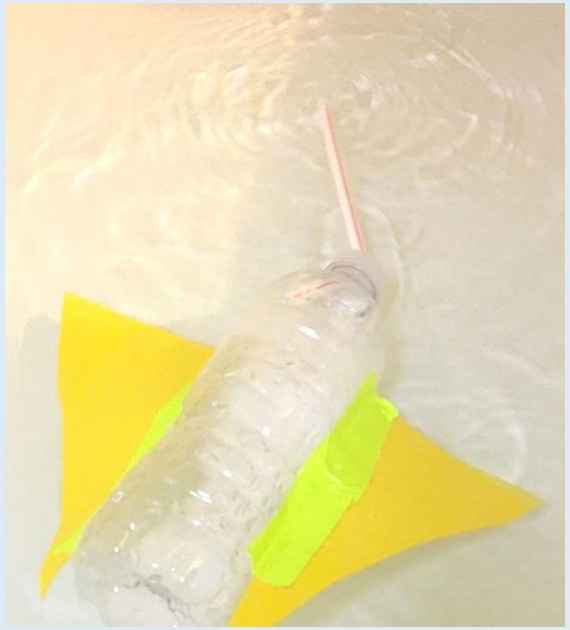
~Start by using the tip of your scissors to make a small hole in one end of your plastic container. It should be centered along the bottom edge. Try to make the hole close to the width of your drinking straw.
~Thread the short end of your straw through the hole you made so that the short end rests inside the container. Stretch your balloon and blow it up a few times. This will help make it easier to blow up once your boat is finished.
~ Slide the neck of the balloon onto the short end of your straw. Then wrap a piece of tape tightly around the balloon's neck and secure it to the straw.
~ Decorate your boat if desired.
~ You can use permanent markers, stickers, or colorful duct tape to decorate the plastic container. Be careful not to accidentally tape the balloon to the boat!
~ Now it's time to test out your boat.
~ Fill the bathtub or a large shallow plastic container with 6 inches of water.
~ Blow through the free end of your straw and fill up your balloon with air.
~ Pinch the neck of your balloon to keep the air from escaping. Set your boat in the water. Make sure the straw is bent down so the free end of the straw is just below the water's surface.
~ Let go of your balloon and watch as your boat moves across the water.



Challenge

- Does the length of the straw affect the boat? Try cutting the straw shorter.
- How does the amount of air in the balloon affect the boat's journey? Blow the balloon up as much as possible. Then try filling it only half way.

Rocket Bottle Boat — Your child will love using baking soda and vinegar in this simple boat STEM.



Materials Needed:
Clean, Dry Disposable Water Bottle with Lid, Bendable Plastic Drinking Straw, Vinegar, Baking Soda, Small Sharp Knife, Measuring Cup, Tablespoon, Tape, Bathtub or Large Plastic Container with Water

~Use the tip of a sharp knife to cut a small X in the center of your water bottle's lid. This step should be done by an adult, or under close adult supervision.
~Thread the short end of your bendable straw through the lid so that the shorter end will be inside the bottle when the lid is put back on. You may need to use the tip of a pen to help widen the hole a bit more so you can wiggle the straw in.
~You want the straw to fit snugly, without gaps for air to escape through. If there are any gaps, use a small amount of duct tape to cover them.
~Next, cut 2 triangles from craft foam. If you want, you can decorate them with permanent markers. These will become the fins for your rocket.
Tape the fins to the sides of your bottle so they are opposite of each other.
~ Fill a bath tub (or large plastic container) with 4-6 inches of water.
~ Pour 1/4 cup of vinegar into the plastic bottle.
~Now for the tricky part. Tilt your bottle so the vinegar stays at the bottom and you can scrape a tablespoon of baking soda into the top of the bottle without it falling into the vinegar.
~Keeping the bottle tilted, screw the lid back on. Make sure the lid is on tight so no air can escape.
~Give the bottle a quick shake and place it in the water so the end of the straw is just below the water's surface.

Challenge
•Try changing the amount of vinegar you use. Does it affect how far the boat moves?
•What if you change the amount of baking soda?
•Try making a bottle rocket and seeing how high it will fly into the air.

Pendulum Painting — This easy STEM activity is the perfect mix of engineering and art.





Materials

- Cups, paint, string, paper, pole.

Method

~ Make two holes in the top of the plastic cup and thread the string through them. Tie them around a pole balanced like a bridge.

~ Make a small hole in the bottom of the cup and seal it up with some tape until you are ready to swing!

~ Add the paint to the cup, any colours, but make sure they are slightly watery so that they run smoothly out of the hole.

~Put the paper under the cup, remove the tape and gently swing the cup. What patterns does it create as it moves?

Challenge

Change the length of your string. Does it affect the pendulum motion? Is the design different?

What if you swing faster? Slower?

There are so many more to explore. Just type in STEM activity into your search engine and see what amazing activities you could complete!

Enjoy!