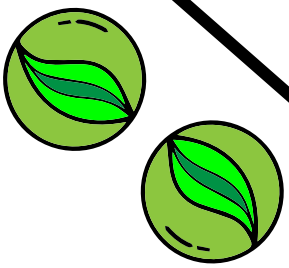
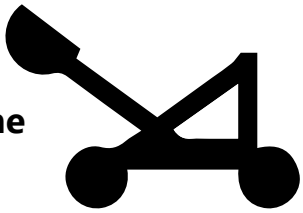
6 STEM TOYS

YOU CAN MAKE WITH YOUR KIDDOS!



CATAPULT

A catapult made out of popsicle sticks is the perfect kids' activity for simple physics!



PENNY SPINNER

A penny spinner is essentially a spinning top, but it's also a neat way to explore STEM as well as keep the kiddos off the screens.

MARBLE MAZE

This DIY marble maze is easy to make, fun for all ages and great for hand eye coordination.

AIR CANNON

Are you ready to play with science and make a homemade science toy that blasts balls of air?

POM POM SHOOTER

Kids of all ages are going to have a literal blast with these homemade pom pom shooters or poppers!

TOY ZIP LINE

Indoors or outdoors, this easy toy zip line is fun for kids. Quick science with tons of hands-on play. All you need is a few things and your favorite super hero! Explore physics through play.

LITTLE BINS FOR LITTLE HANDS

www.littlebinsforlittlehands.com

JR ENGINEERS
CATAPULT

This popsicle stick catapult design is an AWESOME STEM activity for kids of all ages!

SUPPLIES

10 Jumbo craft sticks
3 Rubber bands
Bottle cap and super glue or hot glue
Launch Items

INSTRUCTIONS:

STEP 1: Stack 8 craft sticks on top of one another and secure both ends tightly.

STEP 2: Wedge the 9th stick between the last and next to last stick in a perpendicular fashion.

STEP 3: Finish off with one stick on the top of the stack. Secure the ends of those two sticks with a rubber band as seen below.

STEP 4: Glue on your plastic bottle top if desired and set up the launch items.

STEP 5: Hold down the catapult with one hand while pushing down the top part of the lever with the other hand. Release and watch your items fly.

THE SCIENCE

This catapult is a simple machine. The stack of craft sticks acts as the fulcrum point. If you move the stack farther from where you are pushing down, you get a better launch. If you move it closer, you get a weaker launch.

Other physics concepts at play here are stored energy or potential elastic energy. As you pull back on the popsicle stick, bending it and then release the stick all that potential energy is released into energy in motion producing the projectile motion.

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PENNY SPINNER

You can make these fun paper spinner toys out of simple household materials!

SUPPLIES

Paper plate
Round cup
Pen
Ruler
Markers
Scissors
Penny

INSTRUCTIONS

STEP 1: Draw a circle by tracing around the outside of the cup using the pen. Then cut out the circle.

STEP 2: Use a ruler to find the center of the circle and mark it with a pen.

STEP 3: Place the ruler on the center of the circle and draw a line to create halves.

STEP 4: Then turn the circle and draw another line across the circle to create quarters.

STEP 5: Draw two more lines through the center of each quarter to create eighths.

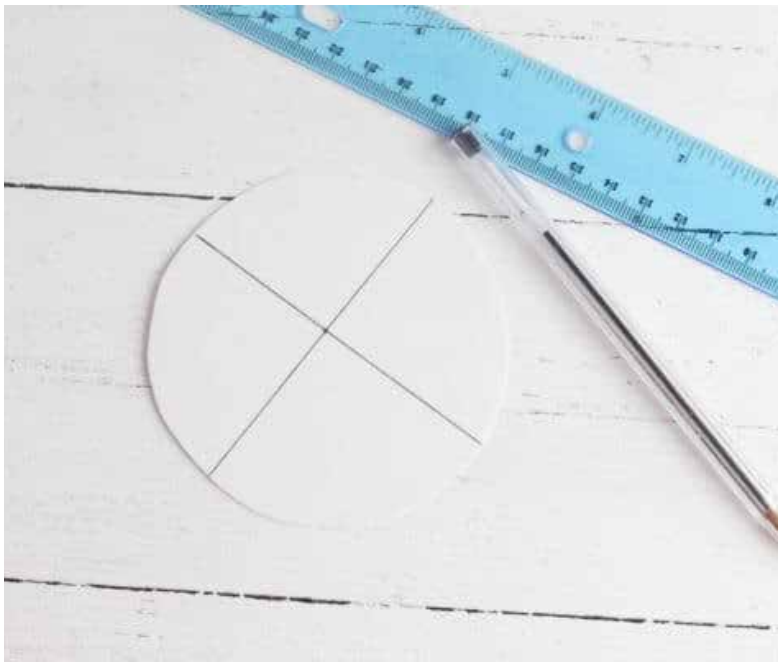
STEP 6: Use the markers to color each eighth or draw patterns in each section.

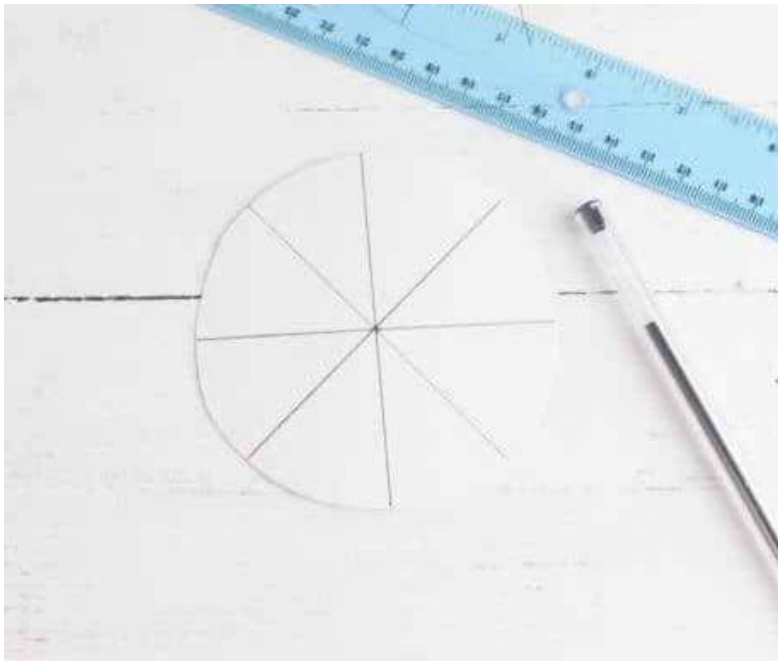
STEP 7: Cut a slit in the center of the circle slightly smaller than a penny. Push the penny through the slit.

STEP 8: Holding the penny between your fingers, spin the penny spinner on a flat surface.

HOW DOES A PENNY SPINNER SPIN?

The simplest answer is that something in motion including spinning will stay spinning unless a force is acted upon it. Although the penny spinner doesn't spin on a tiny point it still shares similar qualities with a traditional top in that it uses something called the conservation of angular momentum to keep spinning.





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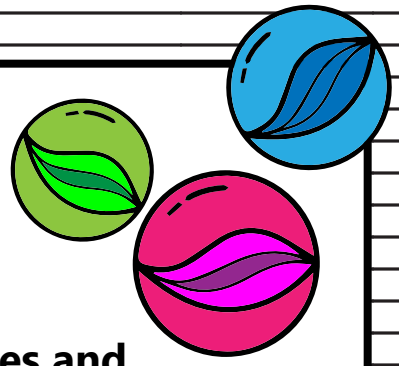
MARBLE MAZE



This DIY marble maze is easy to make, fun for all ages and great for hand eye coordination!

SUPPLIES

Template
Paper plate
Marble
Colored paper
Scissors
Scotch tape

INSTRUCTIONS

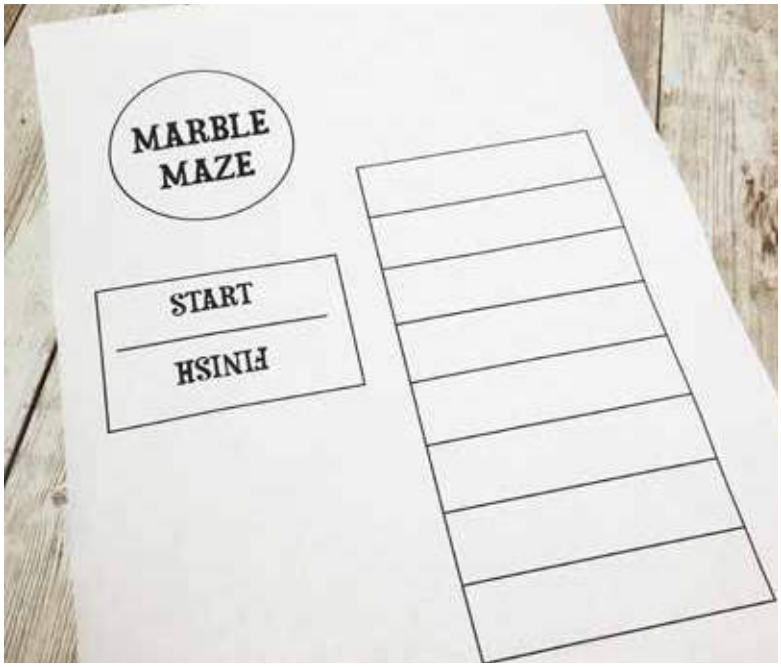
STEP 1: Print template and cut out the parts.
(You can use colored paper if you like.
STEP 2: Place the paper strips into the shape of an asterisk in the center of the paper plate.
STEP 3: Tape down the outer edges of each paper strip.
STEP 4: Make an arch with each strip and tape the other end down.
STEP 5: Tape the center circle and Start/Finish line.
STEP 6: Place a marble at the 'start' line and try to get it through each arch and back to the 'finish' line.

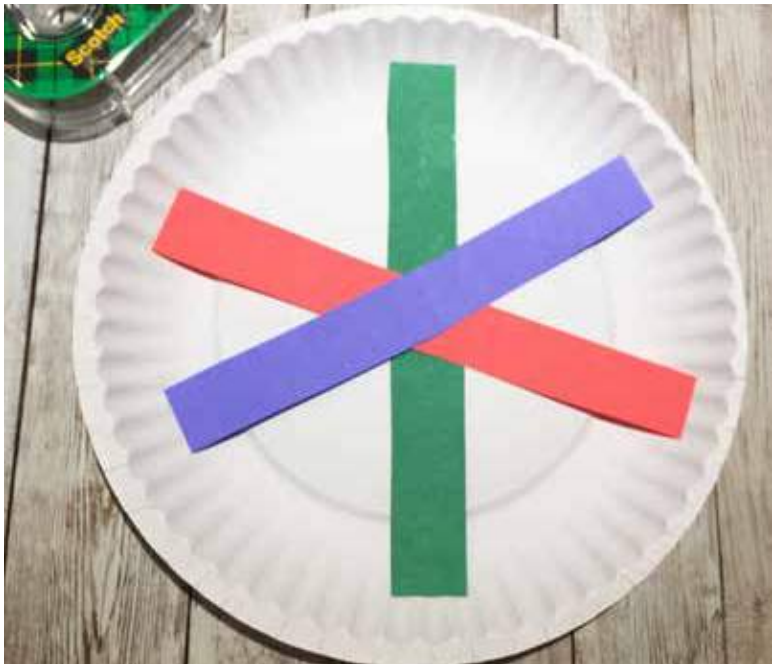
HAND EYE COORDINATION

It seems simple, but hand-eye coordination involves many body systems. It involves knowing where the body is in space and how it is moving, with visual processing. Hand-eye coordination is important in everyday tasks such as grasping objects, handwriting, playing games, eating, cooking, and even doing one's hair. As with other body skills, hand-eye coordination can be practiced and improved upon. Most people think of hand-eye coordination as the ability to catch a ball or throw with accuracy. However, hand-eye coordination is much more and is used in everyday tasks. Simply put, it is the ability of the body to coordinate hand movement based on information from the eyes.

MARBLE MAZE

START
FINISH


MARBLE
MAZE
START
FINISH


Scotch

MARBLE
MAZE
FINISH
START

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VORTEX CANNON

Are you ready to play with science and make a homemade science toy that blasts balls of air?

SUPPLIES

Plastic Bottle
Balloon
Scissors
Paint or Stickers

INSTRUCTIONS:

STEP 1: Cut off the ends of the bottle and the narrow end of the balloon.

STEP 2: Decorate the bottle if desired! (Optional)

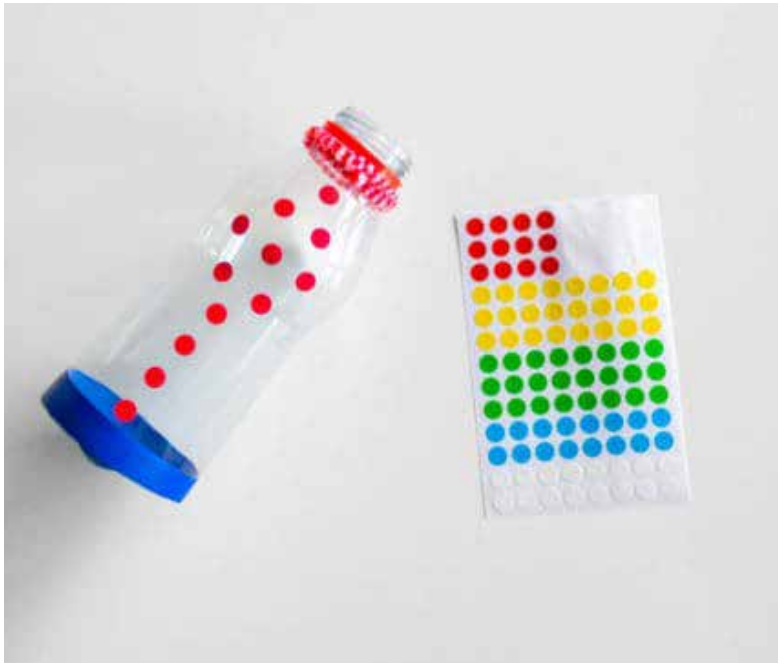
STEP 3: Then you will want to stretch the balloon over the end of the bottle.

STEP 4: By using the end of the bottle with the balloon, to essentially suck air back, you can then aim and shoot that air out the front of the bottle. You can even knock over dominoes with that force of air! Amazing! Simply stretch out the end of the balloon and let it go.

THE SCIENCE

Why does the air move? Generally, it's because of air pressure caused by temperature changes and moves from high pressure to low pressure. This is when we see storms pop up, but we can also see it on an ordinary day too with a soft breeze.

Although the temperature is a big part of the pressure change, you can also make that pressure change yourself with this cool air cannon project! The air blaster creates a burst of air that shoots out of the hole. Although you can't see it, the air actually forms a donut shape. The difference in air pressure from the fast-moving air through the opening creates the spinning vortex that is stable enough to travel through the air and knock over a domino!



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POM POM SHOOTER

Kids of all ages are going to have a literal blast with these homemade pom pom shooters or poppers!

SUPPLIES

Paper Cups or toilet paper rolls
Balloons, 12”
Pom Poms
Duct Tape
Construction paper
Scissors
Ruler
Craft Knife/scissors

INSTRUCTIONS

STEP 1: If you are using a paper or plastic cup, have an adult cut the bottom out of the paper cup with a craft knife or scissors. If you are using a toilet paper roll, you are all set with step one.

STEP 2: Decorate your cup or tube with paper, stickers, tape, etc.

STEP 3: Trim the very top off the balloon with scissors. Knot the end of the balloon. Gather the cut balloon and stretch it over one end of the cup, centering the knot over the opening. Do the same if you are using a cup!

STEP 4: Next, you want to secure the balloon piece on to paper cup with duct tape.

STEP 5: Time for the fun! Load the pom pom shooter with pom-poms, pull back on the knotted end and then let go to launch the pom poms!

THE SCIENCE

The first law of motion states that an object will remain at rest until a force is placed on it. The pom-pom isn’t launching buy itself, so we need to create a force! That force is the balloon. The second law of motion says that a mass (like the pom-pom, marshmallow, or styrofoam ball) will accelerate when a force is placed on it. Now, the third law of motion tells us that for every action there is an equal and opposite reaction, the force created by the stretched balloon pushes the object away.

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TOY ZIP LINE

All you need is a few things and your favorite super hero! Explore physics through play.

SUPPLIES

Clothes line
Clothes pins
Zip ties
Pulley
Toys

INSTRUCTIONS

STEP 1: Attach your clothes line to two points. A slight downhill angle will work best.

STEP 2: Attach your simple pulley system to your clothes line.

STEP 3: Now zip tie your toy (action figure).

STEP 4: Release and watch it go!

THE SCIENCE

Zip lines work with gravity. The slope needs to descend and gravity will help you out. You can't zip your toy zip line up! Test out different angles. What happens if your slope is higher, lower, or the same. Friction also comes into play because of the pulley. One surface moving over another is going to create friction which will help the zip line accelerate. You can also talk about energy, potential energy at the top when you are holding the pulley and ready to release and kinetic energy when batman is in motion.

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