Daily Science Project
from the Children's Museum in Easton

Oobleck

Ooey-gooey fun that kids of all ages will have fun mixing up and playing with! It's super simple to make with ingredients you probably already have in your cabinets!

DIRECTIONS:

1. Start with 2 teaspoons of water in a bowl.
2. Add 1 teaspoon of glue.
3. Add 4-5 teaspoons of cornstarch one teaspoon at a time.
4. Mix it well.

Oobleck is ready to use when it is difficult to stir and can be put into a ziploc bag to experiment with more. Though it's difficult to stir when it's ready, it still flows when the baggie is tipped. When placed in your hand, the Oobleck flows (liquid), yet feels dry and can be folded over itself (solid). So is it a liquid or a solid?!

Rock Your Socks! Stuffed Sock Snake

World Down Syndrome Day is observed annually on March 21 to raise public awareness of Down syndrome, a congenital disorder caused by having an extra 21st chromosome. This year's theme is socks, so this is perfect – because we ALL have extra socks with lost mates strewn around the house. And this craft does not require any sewing, so it's perfect for kiddos of all ages!

DIRECTIONS:

1. Stuff an old sock with fiber fill, cotton batting, cotton balls, or other single socks.
2. Tie off the end with a piece of yarn or ribbon.
3. Use old buttons, googly eyes, pom-poms or circles cut from felt to give your snake (or caterpillar) eyes.
4. Use scraps of felt or material cut into shapes to decorate its back. You can use lengths of yarn, ribbon or even elastics to define its body in sections. Use your imagination!

Catapult

A catapult is a device used to hurl an object. It uses a simple machine called a lever (the spoon and craft stick), which is attached to a stationary point called a fulcrum (the cardboard tube), to help move a load (the marshmallow).

Your catapult is powered by the rubber band. When you pull back on the lever, potential energy is stored in the rubber band. When you let go, the potential energy is transferred to the lever and turned into the energy of motion (or kinetic energy), and the marshmallow is flung forward.

DIRECTIONS:

1. Wrap a rubber band around two craft sticks at one end.
2. Slide the plastic cylinder in between two sticks. This is your fulcrum.
3. Place a Styrofoam peanut on the end of your top stick (the side without the band and the stick that is in the air)

4. Your catapult will work best if it is placed on a hard surface. Hold it down using one or two fingers on the rubber band. Use your other hand to pull the top stick down and let your pompom fly!

TRY THIS:
Try launching other safe objects. How about a marshmallow? See which catapult can send the marshmallow the farthest. Use a meter stick to measure the distance, and then record the results. Make a lever and send a ping-pong ball flying high!

Balloon Rocket

It's all about the air...and thrust. As the air rushes out of the balloon, it creates a forward motion called THRUST. Thrust is a pushing force created by energy.
In the balloon experiment, our thrust comes from the energy of the balloon forcing the air out. Different sizes and shapes of balloon will create more or less thrust.
In a real rocket, thrust is created by the force of burning rocket fuel as it blasts from the rocket's engine—as the engines blast down, the rocket goes up!

EXPERIMENT:
1. Tie one end of the string to a chair, door knob, or other support.
2. Put the other end of the string through the paper roll.
3. Pull the string tight and tie it to another support in the room.
4. Blow up the balloon (but don't tie it). Pinch the end of the balloon and tape the balloon to the paper roll. You're ready for launch.
5. Let go and watch the rocket fly!

TRY THIS:
Does the shape of the balloon affect how far (or fast) the rocket travels? Does the length of the straw affect how far (or fast) the rocket travels? Does the type of string affect how far (or fast) the rocket travels? Does the angle of the string affect how far (or fast) the rocket travels?

Puffy Paint

If you've never made puffy paint, it's super easy and such a blast for kids to work with!

DIRECTIONS:
1. In a bowl, mix 1 cup of flour, 3 teaspoons of baking powder and 1 teaspoon of salt. Slowly add water, mixing as you pour, so that you get a batter with a thick consistency.
2. Divide the batter into 3 or 4 smaller bowls. Add your choice of food coloring and mix well.
3. Spoon the colored batter into plastic piping bags or sealable Ziploc bags. Squeeze out excess air and secure with a twist tie or elastic. If you have small squirt bottles, these work great, too.
4. If using a plastic bag, snip a corner so kids can squeeze the batter onto heavy paper, cardboard or even white paper plates.
5. When they are finished, place the masterpiece into the microwave for 30-40 seconds.

HINT: The paint puffs up better in areas where it is thickly applied.

Clean Your Pennies!

Have you ever noticed coins can get pretty dirty, especially pennies? Well here's a quick science activity that "mixes" oohs and ahhs with a little chemical reaction fun!

DIRECTIONS:

1. Pour ½ a cup of white vinegar into a bowl.
2. Add a teaspoon of salt to the vinegar and mix until it's dissolved.
3. Dip a dirty penny ½ way into the mixture and hold it there for ten seconds.
4. Lift up your penny for a clean surprise!

Science Behind the Experiment: When you put a dirty penny into vinegar and salt, the copper oxide and some of the copper dissolve in the water, leaving some of their electrons behind. This means some copper atoms leave the penny and start floating around in the mixture.

Did you know that the date of your penny affects your results?
It could and here's why: If your Lincoln Memorial penny has a date before 1982, it is made of 95% copper. If it is dated 1983 or after, it is made of 97.5% zinc and plated with a thin copper coating. 1983 pennies can be tricky to determine because both copper and zinc center were made during that year. Using this information, test and compare the results of different pennies.

Chromatography

Black ink is black ink, right? Maybe not! Even though the ink from different pens looks the same, it might actually be made of many different dyes. You can separate the dyes in the ink from different pens to make different patterns. Did you know that inks and markers are often combinations of several colored dyes? We can separate these combinations of colors or pigments through a process called chromatography.

Here's the really cool science behind chromatography…When the paper towel is dipped in water, some of the water sticks to the paper towel and gets it wet. There's a force between the water molecules and the molecules in the paper towel. That's called adhesion. The water also sticks to itself. That's called cohesion. Both of these sticky forces - adhesion and cohesion - cause the water to travel up the paper towel, moving against gravity. When the water reaches the ink, it dissolves some of the dyes in the ink, and the dyes travel up the paper towel with the water. That's how you can see all the different colors that make up the ink.

EXPERIMENT:

1. Draw a squiggly line across a strip of paper towel with one of your black pens or markers.
2. Using a dropper, slowly drop drips of water onto the line.
3. Observe what happens and record your results.
4. Let your paper towel dry. Now observe your squiggly line. Compare the results to what it looked like immediately after it became wet.

TRY THIS: Try it out with different types of pens. Does a scented marker make a different pattern than a non-scented marker? What happens if you use a dry erase marker or a sharpie? What about a gel pen or ball point pen? Explore and have fun!

Hands, Feet, Oh My!

Non-standard units of measure are used to introduce young children to the concept of measuring without them having to read. The idea is to focus the child on the concept of longer, shorter, heavier, and lighter before they move onto the next step of measuring using standard units. In this activity we are using paper clips, but you can use LEGO bricks or pennies, too. Just make sure whatever unit you pick is a consistent size.

DIRECTIONS:
1. Trace your child's open hand on a piece of paper.
2. Ask your child to predict how many paper clips long they think their hand print is, then have them measure and record the number.
3. Ask and have them predict the width of their hand print and record the number.
4. Trace and measure a sibling's hand or an adult's hand and compare the results.

TIP: Have children estimate and measure with different units. Compare the measurements and discuss why they are different.

TRY THIS: Trace a child's full body onto a large piece of paper (or outline their full body in chalk outside on a paved surface if the weather allows). Demonstrate how to measure different body parts with the paper clips and write down the numbers. Children can work in pairs to help each other measure body parts and record results. Who has the tallest outline? Whose foot was less than 8 paper clips long?

Roll a Rainbow

This is a fun little experiment to teach kids about colors and color mixing. Best of all, there's no mess – provided the bag is sealed tightly!

DIRECTIONS:
1. Cut a piece of paper so that it will easily fit inside a sealable plastic bag. Remove it from the bag to start.
2. Squirt dabs of tempera or acrylic paint at one end of a piece of paper. Then carefully slip it inside the plastic bag (an adult's job) so the paint is at the bottom end of the bag. Make sure you release some of the extra air and seal it.
3. Using a rolling pin, dowel, or even their fingers, have them push or roll the paint the length of the paper, ideally in a fluid motion.
4. The paper can be removed from the bag and placed somewhere to dry.

TRY THIS: You can teach kids about primary and secondary colors. Squirt dabs of red, yellow and blue close to one another so they overlap and make orange, green and purple. Or use warm colors (reds, oranges, pinks and yellows) to create a sunset picture. Cool colors (blues, greens, purples) will look like an ocean.

Build a Bridge

Every day we pass bridges, whether it's a foot bridge, a highway overpass, a span over water, or a viaduct over a valley. We pass on these structures without even thinking of the engineering genius that went into their design and construction, let alone the science behind their strength. Beam, truss,

arch, suspension: each type of bridge varies in design, distance, and their ability to negotiate the forces of tension and compression. Depending on the purpose of the bridge, how much weight it will need to hold, and how far it will need to traverse, engineers can figure out which bridge is the right bridge.
A bridge uses tension and compression to balance itself and keep it standing. These two opposing forces work together to create equilibrium in a bridge's structure. A bridge will buckle if compression, the force pushing down on it, becomes too much; it will snap if tension, the force pulling on it, is too great.

EXPERIMENT:
1. Using two cups as its foundation, construct a bridge of paper. The paper can be folded but it can't be secured by tape, elastics, etc.
2. Now it's time to test your building skills! Your challenge is to reach 30 points without the bridge collapsing. How do you reach points? With coins!
3. Give yourself 3 points for every quarter on your bridge (not over the cups, though).
Give yourself 2 points for every nickel on your bridge (not over the cups).
Give yourself 1 point for every penny on your bridge (not over the cups).

TRY THIS: Construct another bridge and test your designs with objects around your home...How many Legos can your bridge hold? How many matchbox cars?

Float My Boat

Build a tin foil boat and test out your design by seeing how many pennies the boat can hold without sinking.

DIRECTIONS:
1. Get your supplies. You will need some 6-inch squares of tin foil, a handful of pennies, and a container or dish pan half-filled with water.
2. Construct your boat by bending and folding the tinfoil. Predict how many pennies you think your original design can hold without sinking.
3. Put your boat in the container of water and add pennies one by one until the boat sinks. Take the boat out of the water and count how many pennies the boat was holding. Remember not to include the penny that sank the boat!
4. Think you can make improvements? Construct more boats and try out different designs. Learn what works and what doesn't work after each attempt. Consider factors such as the height and thickness of the sides of the boat, the size of the bottom of the boat, and where you place the pennies within the boat.

THINGS TO CONSIDER: When a boat floats, it must push water aside to make room for itself. The water also pushes back on the sides and bottom of the boat; this force is called buoyancy. Buoyancy is what keeps the boat floating. The more water the boat pushes aside due to size and shape, the more force the water uses to push back and support the boat in the water. For this reason, the size and shape of your tin foil boat design determines how many pennies the boat can hold without sinking.

TRY THIS: See how many pennies an even bigger tin foil boat can hold. What happens if you use 12-inch squares of tinfoil to design your boat instead of 6-inch squares? See if the water affects your

results. Try floating your boat in "saltwater" (similar to ocean water) by adding salt to your container of water.

Drops on a Penny

Have you ever noticed on a rainy day how water forms droplets on a window? Why does it do that instead of spreading out evenly over the whole surface? It all has to do with something called surface tension. Try this activity to learn more!

DIRECTIONS:
1. Using a dropper, carefully begin placing a drop of water in the center of a penny, counting as you go.
2. You will begin seeing a dome shape forming in the puddle of drops.
3. Stop when the puddle spills over the edge of the coin.

TRY THIS: Repeat the experiment using different types of liquids such as cooking oil, water with dish detergent added, and liquid sunscreen. Surface tension prevents the water molecules from falling out and spilling. You can keep adding water drops until the surface tension is not strong enough to counter the gravitational pull on the water. The size of the drops will vary with different liquids, so the surface tension of each liquid is different. That means the number of drops you can fit on a coin without spilling is different, too!

Melted Crazy Crayons

There comes a point when crayons become a bit too stubby to really work well. If this is the case in your house, here is a fun solution that the kids will enjoy helping you with.

DIRECTIONS:
1. Gather up all stubby crayons and remove the wrappers. Cut longer crayons into chunks.
2. Place the chunks into cupcake pans. Mix up the colors so you have a nice variety.
3. Place the sheet into a 250 degree oven. Turn on the oven light so kids can watch the crayons melt.
4. After they have melted, carefully remove them from the oven and let them cool off and solidify. Once they have hardened, pop them out of the trays and let the kids try out their crazy color crayons!

TRY THIS: Another thing to do with crayon shavings is melt them between two pieces of wax paper with an iron set at a low temperature. Sprinkle the shavings in the center of a piece of wax paper and cover it with the other piece. Gently press the iron to melt the shavings and working from the center, carefully coax the colors out to the sides of the wax paper. Let the paper cool before cutting it into shapes.

TIP: It is best to put paper towels underneath the wax paper or use an old ironing board cover to do this project as melted wax can easily make a mess. Also, be sure to thoroughly clean the bottom of the iron for any lingering wax.

Butter Maker

You need only a few supplies from your kitchen and kiddos with strong arms to enjoy this old-fashioned activity. Make it a family affair and let everyone take a turn shaking!

EXPERIMENT:
1. Pour cold heavy whipping cream into a mason jar with a lid. Make sure you fill the jar only halfway so there's plenty of room to shake the cream.
2. Drop a few clean marbles into the jar. If you don't have any marbles, don't worry. This activity can be done strictly with arm power (although it will take a bit longer).
3. Secure the lid and begin shaking. This step may take upwards of 15 minutes depending on how pasteurized the cream is, the number of marbles, and arm strength. This is a good time to get more helpers involved!
4. About halfway through the process, you'll hear a difference in the shaking sound. Open the lid to see how the butter is beginning to form. The buttermilk will have begun to separate. Add a pinch of salt, secure the lid, and continue shaking.
5. Once you feel as though a solid mass has formed in the jar, open the lid and use a strainer to separate the butter from the buttermilk. The butter can be transferred to a container and stored up to 3 days in the refrigerator – if it will even last that long!
HINT: Bake some muffins so you can enjoy this tasty treat right away!

Paper Sculpture
Play and make sculpture at the same time! Using strips of paper, kids are encouraged to fold, bend, twist and curl them into amazing architectural delights.

DIRECTIONS:
1. Cut a bunch of colored paper into strips with varying lengths and widths.
2. Begin by creating a shape with a strip and gluing it to a piece of cardboard.
3. Working from that piece, begin building out and up with your sculpture. Try to do something different to each strip of paper: fold, bend, twist, curl, loop – what other ways can you manipulate it?

Cotton Ball Launchers
Your goal in this engineering challenge is to construct a launcher using a cup and a balloon to hurl a cotton ball super far!

EXPERIMENT:
1. Cut out the bottom of a plastic cup.
2. Cut off the bottom of a latex balloon (about 1/8" of a 12" balloon. Smaller balloons can work as long as it works with step #3).
3. Place the balloon over the cut end of the cup and tape the sides securely.
4. Place a cotton ball inside the cup. Pull the neck of the balloon back and release!
TRY THIS: Set up cups, bowls, vases, etc. as targets, each marked with a different point value. You can challenge children to reach a goal number. For example, "Let's see who can reach 10 points!" The children will be adding up the points they reach so you're also incorporating a little math!

Recyclable Planters
This activity combines a whole lot of learning all rolled into one: recycling, gardening, composting and plant anatomy. Get a jump on spring by growing new plants to fill your yard and garden with great flavors and bright colors.

DIRECTIONS:
1. You'll need newspaper, a cylinder (water bottle or aluminum can), potting soil and seeds (pea or bean seeds are wonderful because they sprout quickly!).
2. Lay the newspaper on a hard surface. Fold and wrap it tightly around the cylinder. Tape the edge and slide the cylinder out.
3. Fill the newspaper pot about ¾ high with potting soil. Make a couple small holes with a fingertip and drop a seed in each. Cover the holes with a layer of soil.
4. Place the pot in a sunny location with a plate underneath to catch any water or soil that may leak out.
5. Water the pot every 2-3 days, keeping the soil moist to encourage seed germination.
6. Once the seeds sprout and get strong enough you can see roots coming out of the pot base, transfer it directly into the ground. The pot will eventually break down and become compost! *It is best to plant outside only after the last frost – usually early May in the northeast.

TRY THIS: Make a bunch of pots filled with a variety of seeds. Be sure to mark what is planted in each by writing the name on a craft stick and popping it in the soil. They can be placed on a baking tray – with sides – and placed near a window. Keep a journal of the sprouts, indicating when they are being watered, how much sunlight they are exposed to, which pot germinated first. As the plants grow, kids can measure the heights and draw pictures of what they notice.

Basic Printmaking

Making prints is a delightful activity because it is so easy to make little changes that extend a child's engagement. Part of the fun is the mystery of not knowing exactly how a print will turn out. No two are ever the same!

DIRECTIONS:
1. Clean a Styrofoam tray and cut away any surrounding edge it may have. Use a pencil to score lines in the tray. Press down hard enough so that there is a clear distinction in heights. These prints will be mirror images of what is drawn, so if you are including letters, be sure to draw them backwards and from right to left!
2. Use a paintbrush or roller to spread paint over the tray.
3. Carefully flip the tray onto a piece of paper, pressing all over the back to ensure you get the best print possible. Lift the tray straight up. Voila!

TRY THIS: You can cut your own foam shapes from Styrofoam and glue them onto another tray as another option. You could also look around the house for other objects with interesting textures: bubble wrap, a sponge, corrugated board, a patch of screen, spare keys, a bunch of elastics, and a few buttons. The possibilities are endless!

Cup Tower

Today's challenge is simple. Create the world's tallest cup tower in 30 minutes. Ready? Go!

Although this seems easy, it's really not. Lots of things can go wrong, but this is what makes this STEAM activity so great. STEAM challenges give every child the opportunity to be a successful contributor in the problem-solving process; it's an empowering way of teaching. Whether working solo or with siblings, Cup Tower can occupy a lot of time and can be adapted in different ways!

EXPERIMENT:
1. Using a bunch of paper or plastic cups, try to build the tallest tower you can. Think about the foundation and how it will have to be designed to support the weight of the upper layers. Have a step stool at the ready—it may be needed!

TRY THIS: Tape off a section of hard flooring as the work area. You could also use a hula hoop. If more than one child is participating, turn it into a competitive build-off where design flair – not necessarily height – is a key factor.

Recycled Bird Feeder

These are super easy for kids of all ages and abilities to create, and you shouldn't feel limited to using a paper towel tube. Be creative and see what else you can use as a base for the feeder – and share your photos with us!

YOU'LL NEED: Paper towel tube, birdseed, peanut butter or shortening, a plate, a dull knife, and some yarn.

DIRECTIONS:
1. Spread bird seed onto a paper plate and set it aside.
2. Cut a piece of yarn about 18" long, for each bird feeder and set aside.
3. Use a knife to spread peanut butter (or shortening) on the outside of a paper tube.
4. Roll the paper tube onto the bird seed, pressing gently so the seed sticks to the peanut butter or shortening.
5. Feed the yarn through the tube and tie a knot at the end. Hang it from a branch in a nearby tree for the birds to enjoy.

TIPS: Encourage your little ones to become naturalists! Have them take photos and make drawings of some of the birds that come into your yard to feed. It is fun and educational to see which birds are most attracted to your seed. Cardinals, sparrows, chickadees, nuthatches, juncos, goldfinches and sparrows are some common visitors in the northeast.

Cloud in a Jar

These rainy April days are a perfect time to introduce kids to the concept of weather, and this simple experiment makes it easy for them to understand. No galoshes required!

YOU'LL NEED: A wide mouth jar, shaving cream, food coloring, a small cup, and a dropper

DIRECTIONS:
1. In a small cup, mix the food coloring with some water.
2. Fill a wide mouth jar water until it is about 3/4 full.
3. Right before the kids are ready to do the experiment, spray a bunch of shaving cream in the jar until it is just a small bit above the rim. This will be the cloud.

4. Ask the kids to pick up some colored water with a dropper and squirt it on top of the shaving cream cloud. Repeat this step one or two more times, but pay close attention to what is happening below the cloud.
5. The colored water will begin to seep down through the shaving cream and into the water below – just like rain!

THE SCIENCE BEHIND IT: The shaving cream represents the clouds and the water represents the air. The colored water represents rain. As the colored water saturates the "cloud", it gets heavy and eventually is so heavy that it can no longer hold the water. It "rains" down into the jar – through the "air." It is just like when real rain falls through the air.

Design a Town

This is a wonderful open-ended project that can span days and can be used as a foundation for imaginative play even longer. The idea is to get the kids thinking and talking about communities – what buildings, businesses, workers and inhabitants does each town or city need? Or is their Utopia a giant amusement park with the world's tallest roller coaster? Or a sanctuary where prehistoric creatures live in relative harmony with My Little Ponies?

DIRECTIONS:
1. Start collecting various boxes, assorted packaging cartons (make sure they are clean) and paper bags.
2. Set out tape, markers, crayons, scissors, glue sticks, newspapers and construction papers for kids to use in their building exercise.
3. Use a large piece of cardboard or tape off an area in the playroom that designates the size of the town. Draw or use tape to indicate a few basic roads to get your child's imagination going...

Floating Egg

Here's a quick, easy science experiment you can do with items you likely have on hand!

DIRECTIONS:
1. Fill a tall drinking glass ¾ full of tap water.
2. Carefully place the egg into the water...and watch it sink.
3. Now fill another tall glass ¾ full of tap water and add 3 tablespoons of salt to it. Stir well.
4. Carefully place another egg into the salt water...and watch it float!

THE SCIENCE BEHIND IT: The egg will sink in regular tap water because the density of the water is less than the density of the egg itself. Adding salt to the water increases its density, making it denser than the egg. As a result, the egg will float in the salt water.

TRY THIS: Are there other liquids you can add to make the egg sink or float? What else can you dissolve in water that will make an egg float?

Bouncing Egg

This is a super cool experiment to conduct over a couple days! This experiment will show the results of a chemical experiment when a raw egg sits in vinegar for a few days. You'll need: 3 glasses, vinegar in each class, 3 eggs (or just one works, too!), food coloring

Instructions:
1. Put the eggs in vinegar.
2.Let the eggs sit in the vinegar for at least 72 hours.
3.Add a different color food coloring to each of the glasses with vinegar.
4.After 72 hours, dump out the vinegar and rinse the eggs in tap water.
5.See if the eggs bounce!

Science Behind It: Vinegar is acidic and the shell of an egg contains calcium carbonate. A reaction occurs when you expose calcium carbonate to an acid. The thin membrane on the egg remains after you rinse the vinegar off giving it an interesting texture. After the 72 hours, the egg will bounce! Try it out!

Surface Tension Art

This is a fun way to learn about surface tension incorporating arts and crafts, science - it's a little bit of everything! You'll need: flat container with water, chalk, paper (to fit inside container), something to scrape the chalk with

Instructions:
1.Scrape the chalk so that the flakes rest on top of the water.
2.Quickly drop the piece of paper on the water and then peel it back up. The speckles of the chalk will stick to the paper. Wait until you see what it looks like when it dries!

This activity shows how water tension works. Putting the paper on top of the water breaks the tension, so you can't put another piece of paper on it. You have to start over with some fresh water to complete the activity again.

Spin Art

An adult needs to do some preliminary gluing, but then it’s time to turn the kids loose! This activity has a tendency to get a bit messy from all the excitement, so it’s best to put down a paint tarp to catch paint splatter. You’ll need: An old CD, a marble, marker top, glue gun, squeezable paint, a large container or box, a paint tarp

DIRECTIONS:
1. Hot glue a marble to a CD at the center hole (an adult’s job).
2. Flip the CD over and hot glue a marker cap to the CD (an adult’s job). Let both sides dry.
3. Place a large container on the floor. A plastic bin or cardboard box both work well.
4. Begin to spin one of the tops in the container.
5. As it is spinning, squeeze paint on the top and watch the color spin and fly outward.
6. Continue adding different colors and watch the patterns of splattered paint emerge as well as the path the tops take in the container.

TIPS: Try spin art with a sibling. Have one person spin the tops and the other squeeze the paint. Keep paper towels handy to wipe off the marker cap handle if it gets slippery with paint. Or you can hot glue a marker through the hole in the CD. As the top spins, the marker tip will draw its path!

THE SCIENCE BEHIND IT: Did you know this project combines science, technology and art? Betcha didn't know how much you were actually learning while you were playing! When an object spins, there is a force that pushes away from the center called centrifugal force. When you drop paint on the spinning top, it lands on the CD and flies outward away from the center. That's the science portion. Technology is when you apply science to make a tool or device to help you do something. By making your own top, you just created a painting tool! This painting tool lets you distribute paint in all directions from a center point. And finally, action painting is a style of art that focuses on applying paint to a canvas but not worrying about the final picture. All that matters is making marks that are the result of real movement.

Build a Scale

You'll need: a cardboard tube (toilet paper roll or paper towel roll both work), some coins, rubber band, tape, a ruler or paint mixer, items to weigh

Instructions:
1. Tape down the cardboard tube to the table/flat surface.
2. Place the rubber band on the ruler and bring the rubber band through to the other side of the ruler by tucking it under the cardboard tube. Place the ruler through the other side of the rubber band. It will look like an airplane when you are finished this step.
3. Adjust the placement of the rubber band on the ruler to make the scale level.
4. Place your items to weigh (coins or heavier items) on the scale to test items to make the scale level and see what items are heavier or lighter.

Questions to Ask: How many coins do you think it will take for the scale to balance? Or how much money in coins do you think it will take for your scale to balance?

Try it Out: Just like a seesaw, the placement of the items affects how the scale balances. What happens if you put heavier items farther away from the fulcrum (the center of the scale) and lighter items closer to the middle? How about the opposite?

Jellybean Engineering

Building structures with marshmallows is a classic engineering project, but there are countless ways to adapt it to what you have on hand. This time around we are using jellybeans with the toothpicks. You can choose to lead your children in an activity or let them freely explore!

YOU'LL NEED: Jelly beans, toothpicks, flat working surface

DIRECTIONS:
1. Gently poke a jelly bean with a toothpick.
2. Connect jelly beans together with other toothpicks to create your own design.

TIPS: Encourage children to use their imagination to design a cool structure! Or, give them a goal. For example: Design a free-standing structure that is at least three levels (toothpicks) tall but only one level wide.

Build a Hand Crank

Simple machines are used to reduce effort (force), making a task easier to complete. Think of our bucket on the Museum's boat raised by a pulley! Simple machines can easily be built from lots of materials, including recyclables. Using recyclables for STEAM projects is an awesome way to reuse and re-purpose common household items, so go through your bins!

YOU'LL NEED: 2 cardboard tubes, a thick piece of cardboard, a ribbon spool, a straw or a pencil, some yarn or string, tape, scissors, and something that can be used as a bucket (plastic fruit cups or yogurt containers work well).

DIRECTIONS:
1. Securely tape two cardboard tubes onto a piece of cardboard. They should be about 4 inches from one another.
2. Make two notches at the top of each cardboard tube just large enough for a straw or pencil to rest in and be able to spin.
3. Place the spool on the straw or pencil. If you can't find some sort of spool, you can simply secure your yarn or string directly to the straw or pencil with a piece of tape. If you are using a spool, make sure you secure it to the straw or pencil with tape. Hint: If you have access to another straw, slip one inside the other and use the bendy part as a handle!
4. Tie your bucket to the end of the piece of yarn or string.
5. Go ahead and start testing out your simple machine. What can you pull up with it? How many Matchbox cars can be lifted? How many Legos?

THE LEARNING BEHIND IT: Simple machines are devices with just a few or no moving parts that are used to modify motion and force in order to perform work. The same physical principles and mechanical advantages of simple machines used by ancient engineers to build pyramids are used by today's engineers to construct modern structures such as houses, bridges and skyscrapers. Simple machines allow engineers to solve everyday challenges. Other simple machines are the inclined plane, lever, wedge, wheel and axle, and screw.

Color Eruptions

This activity shows a chemical reaction! You'll need: 3 different cups of vinegar each with a different food coloring, baking soda on a plate, a dropper

Instructions:
1.Put some baking soda on a plate
2.Use your droppers to place different colors of vinegar onto the baking soda to see little chemical reactions
3.Make some beautiful artwork from this chemistry experiment!

Science Behind It: Vinegar is an acid and baking soda is an alkalide. These form a chemical reaction when they are combined. Use this activity to create secondary colors or an awesome piece of artwork as your drop the vinegar into the baking soda!

Paddle Boat Design

STEM activities for kids that involve water, like this DIY plastic paddle boat, are always a hit. After learning how to build a paddle boat, have the kids testing it out in a dish pan or sink filled with water. Or coax them to experiment with their paddle boat in a bathtub. It's a win-win for grown ups!

YOU'LL NEED: A plastic bottle, 2 wooden chopsticks, a plastic milk jug, scissors, duct tape, a medium-sized thick rubber band, a ruler, and a pencil.

DIRECTIONS:

1. Cut 4 rectangular pieces from the plastic jug. Each rectangle should be 2 by 3 inches. Use the pencil and ruler to measure/draw out the shapes and then carefully cut them out.
2. Fold each rectangle in half. Align the pieces in a cross shape and then tape the sides together one at a time.
3. Now attach the chopsticks to the opposite sides of the water bottle. Using the duct tape, attach them about ¾ of the way down the side. You will have 3 or 4 inches of the chopstick hanging off the back of the bottle. Wrap the entire boat with a piece of duct tape to keep everything in place.
4. Attach the rubber band to the chopsticks. It should fit perfectly. You don't want it to be stretched out.
5. Finally slide two blades of the paddle through the rubber band. Now it's ready to test in water!

LEARNING TIPS: Experiment with the boat's paddle. If you wind it forward does it cause the boat to move forward in the water? Does winding it backward make it move backward? What happens if you move the rubber band closer to the boat? If you wind the rubber band multiple times, does it make a difference in the length of time the boat moves through the water?

Shadow Puppets

This is a super fun and simple activity to do at home!

Instructions:

1.Find a blank wall or section of a wall in your home
2.Turn off the lights in the room and cast a light only on that wall.
3.Place your hands in front of the light to create shadows on the wall! Make animals, conduct skits, or make objects with your hands!

Cloud Dough

This silky smooth play dough can be made in just a few minutes with stuff you already have in your house–hair conditioner and cornstarch! You'll need cornstarch, hair conditioner, a large mixing bowl and food coloring (optional).

DIRECTIONS:

1. Pour 2 cups of cornstarch into the mixing bowl.
2. Add 1 cup of inexpensive hair conditioner and begin mixing with your hands. You will notice how the ingredients come together nicely and become pliable and very smooth.

3. Divide the dough if you want to color it with food coloring. 4. Store the dough in a plastic bag or air tight container. It should last a couple of days. If it starts to dry out, add a small dollop of conditioner until you reach the right consistency.

LEARNING TIPS: Super soft cloud dough is designed for its sensory experience, as an alternative to other play doughs that quickly become flaky and dry out. While your child creates and manipulates the dough, they are developing eye-hand coordination while improving strength and dexterity in their little hands and fingers. This fine motor skill development is a great head start for later skills like holding a pencil and using scissors!

Bubble Snakes

The best part is this is easy peasy to make and uses things that you have around the house. Perfect! YOU'LL NEED: An empty water bottle, duct tape or an elastic band, an old sock, scissors, dish soap and a dish pan or other shallow container.

DIRECTIONS:
1. Cut the bottom off of a water bottle.
2. Slide the sock over the bottle. You can use duct tape or an elastic band to hold it in place. 3. Pour some dish soap into a shallow container and mix in a bit of water.
4. Dip the sock covered end into the soap mix and then gently begin blowing and blowing and blowing! You'll be amazed at the length of the snake!

LEARNING TIPS: Please remind your kids to blow air out not suck air in. If your child sucks in, they will be eating bubbles – yuck! You can turn up the fun by dotting the bottom of the sock with different shades of food coloring. Then dip the sock into the dish soap mix and as the bubbles are blown, a rainbow snake emerges!

Paper Airplanes with Targets

Folding paper airplanes is a quintessential kids' activity, but here we are adding the additional challenge of accuracy with respect to distance. Game on! You'll need: Lots of sheets of paper, a target such as a hula hoop, a laundry basket or a masked off area. Use your own airplane design or find some online: www.bestpaperairplanes.com.

DIRECTIONS:
1. Make all of the paper airplanes you plan on testing. It might be helpful to mark each one for identification later.
2. In an open area with plenty of room to fly (perhaps outside if it's a nice day), hang the hula hoop or establish the target area. Determine and set your launch spot. It should be about 20' from the target.
3. Throw each of the planes 10 times and record your results. How many times did the planes hit the mark?
4. Try using different throwing techniques during each round of trials to figure out which way works best for accuracy. For example, does throwing it fast work better than throwing it slow? What happens if you throw the plane at an angle?

LEARNING TIPS: There are numerous ways of folding paper airplanes. Each design is unique and alters the plane's flight. Some are made for distance, others for flight time, and some for accuracy. How do the results for each plane compare? Why do you think the best planes performed as well as they did? Can you create your own paper airplane design that is better than the planes that you used in the experiment? What if you were allowed to have attachments on the planes? What would work best to improve the results of any of the planes?

Turkey Gobblers

Traditionally this has been a fun Thanksgiving craft, but you can get creative and adapt it to the season. For example, you could use a green cup and it can become a bullfrog croaking in the springtime sun. Use a white cup and turn it into a wailing ghost during Halloween. Be imaginative! You'll need a heavy duty paper or plastic cup, construction paper, wiggly eyes, glue, scissors, monofilament, and a sponge.

DIRECTIONS:
1. Poke 2 small holes in the bottom of the cup (an adult's job) with scissors or an awl.
2. Cut a length of filament about 18" long. Feed one end through the holes and tie a knot, leaving as small a tail as possible on one side. You can add a piece of tape inside the cup to secure the knot.
3. Cut a sponge in thirds. At the other end of the monofilament, pull it as hard as possible as you tie the knot at the center of the sponge. It will be pinched in the middle but that's fine.
4. Flip the cup over and begin decorating it. If you are making a turkey, you might want to use colorful feathers for the tail. If it's going to be a frog, maybe using a couple green pom-poms will work as enlarged eye casings. If it's going to be a ghost, drape the cup with a piece of tissue paper or a paper towel and glue it in place.
5. When you are done decorating, lightly dampen the sponge, fold it in half and pinch it at the top of the monofilament. Squeeze the sponge tightly as you pull it down the length of the filament. It will make a gobbling sound!

THE SCIENCE BEHIND IT: Friction produces the sounds you hear. Experiment with the pull speed and technique to get the sound you like. What happens when you pull the sponge down with a short, jerky motion?

Dancing Raisins

Kids (and let's face it, adults too!) get a huge kick out of this experiment. It's really cool to see the bubbles attach to the raisins and lift them up. Pro tip: stream music from your phone so that EVERYONE can dance along with the raisins!

YOU'LL NEED just 2 things: club soda or any clear soda (Sprite/7-Up), some fresh raisins

DIRECTIONS:
1. Fill a clear glass with soda.
2. Drop a few raisins into the glass. Make sure you separate the raisins. If they are stuck together this experiment won't work.

3. Patiently wait and see what happens. It may take a minute or two to get them to dance!

THE SCIENCE BEHIND IT: When you first drop the raisins in the soda, they sink to the bottom of the glass because they are more dense than the soda. But the carbonated soda releases carbon dioxide bubbles and these bubbles love to attach to the rough surface of the raisins. They act like tiny floatation devices that lift the raisin to the surface of the water. This is due to an increase in buoyancy. Once the carbon dioxide bubbles reach the surface of the soda they pop and the gas is released into the air. This makes the raisin lose buoyancy and fall back down to the bottom of the glass. This continues until all of the carbon dioxide has escaped and the soda is flat.

EXTEND THE LEARNING: Try this activity using different kinds of soda and see which one works best. Alternatively, try adding different things to the soda. Some popular options are pieces of uncooked pasta, corn kernels, and lentils.

Ziploc Seedlings

A sprout emerges from a seed. It's an exciting process that usually happens in the ground and out of sight – until now. Today we'll show you how to plant a bean in a clear plastic bag so you can observe how roots form and leaves emerge before your very eyes!

YOU'LL NEED: A small plastic storage bag with a zipper top, a dried uncooked bean or pea or other seed, paper towels, and water.

DIRECTIONS: For this experiment, choose a window where the seeds will get plenty of light, but won't be blasted by intense sun all day. If your windows are freezing cold, tape the bag to a clear glass or vase in a sunny spot indoors, rather than a window.

1. Have your child cut a paper towel in half and fold it a few times so it can fit into the zipper storage bag.
2. Soak the paper towel in water and slide it into the bag. Smooth it so that it's relatively flat inside the bag.
3. Let your child position two beans or seeds about a half inch from the bottom of each bag, on one side of the paper towel. Don't worry if they don't stay in place, but if necessary, stuff a little piece of paper towel into the bottom of the bag so that the seeds aren't sitting in water.
4. Seal the bag part way, leaving an opening near the top so the growing plants can get some air.
5. Tape the bag in a window with the beans facing indoors, so that your child can watch them as they grow. Be sure to periodically moisten the paper towel to keep an ideal growing environment for the seeds.

THE SCIENCE BEHIND IT: Dried beans and peas are seeds that contain dormant (sleeping) baby plants. These tiny plants need signals to make them "wake up" and emerge from the seed: light, air and water. Temperature can also play a role, which is why you don't want to put your seed against a freezing cold window. Germination is the name for the processes the plant goes through in order to sprout from the seed and form leaves. When a plant first sprouts, it gets nutrients from the seed. You can see the seed shrinking as the plant grows. As the plant develops, it depends on its roots and leaves to collect the energy it needs. Once it reaches a certain size and uses up the nutrients in the seed, your window sprout can be transplanted into soil outside.

Dish Soap Putty

This is a super simple but super cool chemistry activity! You'll need: 2 tablespoons of corn starch, 1 and 1/2 tablespoons of dish soap

Instructions:

1. Pour 2 tablespoons of corn starch into a bowl.
2. Add 1 and 1/2 tablespoons of dish soap.
3. Mix it up until it reaches the putty consistent you like and then play with it!

This is a no fail recipe! If it's too dry, just add a little more dish soap, and if it's too wet, add a little more corn starch.

Baking Soda Balloon

As soon as the chemical reaction begins, the balloon will start to inflate. The more vinegar and baking soda you use, the bigger your balloon will get! You'll need an empty plastic water or soda bottle, a balloon, a funnel, baking soda, and vinegar.

DIRECTIONS:

1. Stretch the opening of the balloon over the end of the funnel. Pour about 1/3 cup of baking soda into the funnel and gently swish it around a bit until it all falls through the funnel and into the balloon. Hang onto the balloon opening so it doesn't fall off the funnel.
2. Rinse all the baking soda off the funnel (or you'll get fizzing), and then use the funnel to pour about 1 cup of vinegar into a soda or water bottle. If you are using a soda bottle, pour enough vinegar so that it's about 1/3 full; if you are using a smaller water bottle, pour enough so that it's about half full.
3. Gently stretch the opening of the balloon over the opening of the bottle. Make sure the balloon is draping down at the side to keep the baking soda from falling in.
4. Now lift the balloon so that it is completely upright allowing all of the baking soda to fall into the vinegar. (Although the balloon might seem to be pretty snug on the bottle opening, it is still recommended that you pinch it the whole time. The last thing you want is for it to pop off!)
5. Watch the magic happen right before your eyes!

THE SCIENCE BEHIND IT: So how does it work? Vinegar and baking soda, when mixed together, make an acid-base reaction. The reaction creates carbon dioxide gas that bubbles up from the mixture. The gas expands up and out of the bottle and causes the balloon to inflate. Carbon dioxide is heavier than air, so when you drop the balloon, you'll notice that it falls to the ground faster than a regular balloon filled with air!

Vibrating Gongs

Vibrations or sound waves, make up the sound we hear. Sound waves can travel through solids, liquids and gases as vibrations. We'll be making sound waves with this experiment and comparing their vibrations around you. YOU'LL NEED: metal coat hanger, yarn/twine

DIRECTIONS:

1. Cut two pieces of yarn, both one foot long.
2. Tie the strings to the bottom of the hanger and slide one to the left side and to the right.
3. Wrap the free end of the left yarn around your left index finger.
4. Wrap the free end of the right yard around your right index finger.
5. Hold both wrapped fingers to your ears with the upside-down hanger dangling below your neck.
6. Gently tap the neck of the hanger on a hard surface.

Did you hear the sound waves? Did you feel the vibrations? Try other surfaces. Here are some suggestions: Wall, table, chair, curtain, pillow, tree, coat, someone's leg (with permission of course). Compare the results. Which surfaces make the loudest sound? Quietest? Which surfaces don't work well? Depending on the surface, the vibrations will be absorbed. So, testing your "gong" on a blanket should have quieter results than if you tested it on a fence.

Hang Time

In this science experiment, kids make paper helicopters and explore the principles of flight.
YOU'LL NEED: THIS PRINTABLE, scissors, a paper clip, and a fan (optional).

DIRECTIONS:
1. Print out the pdf and construct the helicopters according to the instructions.
2. Slide a paper clip onto the bottom of each helicopter.
3. Kids can practice throwing their helicopter up into the air and letting it spin down. It spins because of the wing shape and the pressure of the air as it falls.
4. Once they have done this for a few minutes, put out a fan and turn it on, with the column of blowing air aimed directly at the ceiling. Start out on the lowest setting. Hold the helicopter above the center of the fan like a flower (the handle is the stem, the helicopter blades are the petals) and drop it straight down. Be sure to emphasize that the kids should not throw them, but simply drop them.

THE SCIENCE BEHIND IT: Wind speed and wing shape affect how a helicopter flies. For objects to fly, they must overcome the forces of gravity and drag with the forces of lift and thrust. **Gravity** is an invisible force that keeps us from floating into space and keeps the Earth rotating around the Sun. On Earth, gravity pulls everything downward. The only way helicopters and airplanes can fly is if the upward force of lift is greater than the downward force of gravity. **Drag** is a force that slows things down – like when you try to walk through deep water. When things fly on Earth, drag is caused by air in our atmosphere pushing against the object. **Lift** occurs when air moves quickly over an object, lowering the air pressure on top of the object. This concept is called Bernoulli's Principle, after Daniel Bernoulli, who first discovered that as the speed of air increases, pressure decreases. **Thrust** is the force that pushes an object in the direction that it is flying. In a helicopter, the tail rotor creates thrust to keep the helicopter moving. In the case of this experiment, thrust is created by kids throwing the helicopter, or by the fan blowing upward.

LEARNING EXTENSIONS: Nature uses a similar helicopter design and wind to help maple seeds fly through the air. This helps the seeds move further away from the tree that produced them. Can you think why this would be helpful?

Slime Drawings

Every kid loves to draw, and with this activity, you can really change things up. Instead of paper, use slime as the canvas and watch as their creations come to life with movement!
YOU'LL NEED: White glue and liquid starch to make the slime; magic markers or Sharpies for drawing.

SLIME DIRECTIONS:
1. Pour 1/4 cup of white glue into a large bowl.
2. Add 1/8 cup of liquid starch combine until it is thick and slimy.
3. Knead the slime with your hands. Add another 1/8 cup of liquid starch to the slime and knead thoroughly. Make sure there is no unmixed glue hiding in the center of the slime ball.
4. If the slime is too sticky, add more starch, a little at a time. You want to knead the slime until it is not sticky anymore. The slime can be stored in an airtight container or plastic bag for up to a month.

Grab some markers and let the stretchy fun begin! You can use magic markers or Sharpies. The slime will not damage the tips.

THE SCIENCE BEHIND IT: Slime is a non-Newtonian fluid. Non-Newtonian fluids like Oobleck, quick sand, and silly putty change state based upon the pressure that is applied to it. By pulling slowly (or by allowing gravity to take over), the slime stretches and elongates. Otherwise, it snaps and breaks.

LEARNING EXTENSIONS: How can you incorporate the fluidity into the art? Use movement to tell a more visual story and add another dimension to your art!

Lava Lamps
This is always a hit. So grab a few household supplies and give this lava lamp science activity a try! Your kids will love exploring colored water and oil, but a surprise ingredient will make this science activity even more exciting! YOU'LL NEED: Clean plastic water bottle, oil (vegetable, baby, etc), food coloring, and an antacid tablet (the fizzy kind you drop in water).

DIRECTIONS:
1. Pour water into the bottle until it's about 1/4 full.
2. Fill the rest of the bottle with oil allowing for some empty space at the top.
3. Wait for the water and oil to separate. You need to have two distinct layers, so make sure little hands don't shake the mixture!
4. Once the layers have formed, add a dozen or so drops of food coloring to the bottle. Observe how the food coloring falls through the oil and mixes with the water.
5. Break the antacid tablet into smaller pieces and drop one of them into the bottle. You'll notice it begins to fizz causing the colored blobs start to float and dance around! When the blobs stop moving, add another piece of the antacid tablet and enjoy the dance again. As difficult as it is, try not to let kiddos shake the bottle because you'll end up with a very muddy mix.

THE SCIENCE BEHIND IT: The oil floats on top of the water because it is less dense and lighter than water. The food coloring has the same density as the water so it sinks through the oil and mixes with the water. When you add the tablet it sinks to the bottom then starts to dissolve. As it dissolves it makes gas called carbon dioxide. This gas is lighter than water so it floats to the top. The air bubbles bring some colored water with them to the top. When the air comes out of the colored water blob, the

water gets heavy again and sinks. It does this over and over again until the tablet is completely dissolved.

LEARNING EXTENSIONS: What happens if you put the cap on after dropping in the fizzy tablet? What happens if you drop a whole tablet in the bottle? Try sprinkling some salt into your lava lamp instead of the tablet. What happens?

Magnetic Art

We love this process art experience because it mixes in a bit of science. Kids love the unpredictability of it and that's another reason why it's a fave. Each painting is unique and you can easily change up the variables to keep their attention and keep them learning. YOU'LL NEED: A large magnet or magnet wand, various metal objects (like ball bearings, springs, and screws), various non-metal objects (like marbles, Legos, and plastic caps), paper, a plastic tray with sides or a cardboard box lid, paint, paint cups or an egg carton, and spoons.

DIRECTIONS:
1. Pour the paints in containers that are deep enough to dip in each of the objects.
2. Place the paper inside the tray or box lid. Cut the paper if necessary.
3. Dip a metal piece in paint and drop it into the tray. Then take the magnet and move it around under the tray.
4. Here's where the science part comes into play. Dip a non-metal piece in paint and drop it into the tray. What happens when the magnet is underneath?

THE SCIENCE BEHIND IT: Playing with magnets is one of the first bits of science most children discover. That's because magnets are easy to use, safe, and fun. They're also quite surprising. Remember the force when you held two magnets close and felt them either attract (pull toward one another) or repel (push away from one another)? One of the most amazing things about magnets is the way they can attract other magnets or other magnetic materials invisibly, through what we call a magnetic field. This project demonstrates that quite nicely.

LEARNING EXTENSIONS: Experiment with more metal and non-metal objects and encourage your child to try moving the magnet in different directions. Do the screws move differently from the ball bearings? What track pattern does the spring leave?

Pom Pom Races

On the surface, this activity seems almost too simple to hold a kid's attention. But we assure you that is not the case! Kids will get hooked, and besides, you can easily make it more competitive or challenging if the need arises. YOU'LL NEED: Tape in different colors (masking or washi tapes work well), pom poms, straws, ample play space.

DIRECTIONS:
1. Tape fun lines on the floor, each in a different color/pattern: straight, zigzag and wavy.

2. Place a pom pom at the start of each line and ask the child to blow through the straw to move the pom pom along the line. The straight line will be relatively easy, but the wavy and zigzag will require some skill! They may need to change their positioning or the length of their breaths to stay on the line.
3. Challenge siblings to a pom pom race and time them to see how quickly they can get to the finish line.

THE LEARNING BEHIND IT: This challenge helps to develop a child's motor planning and breath control.
LEARNING EXTENSIONS: Older kids might respond to a penalty. Sometimes, having something happen when they don't quite finish the challenge motivates them to keep going or try harder. Maybe they have to start over at the beginning of the line each time their pom pom goes off. With younger kids, turn the game into one of balance and ask them to walk on the different shaped lines. Can they tiptoe on each of the lines? How about walk backwards? Involve their favorite toys in the play. Ask them to drive trucks or "walk" stuffed animals along the lines.

Homemade Suet

Suet is a high-calorie bird food best reserved for winter months or the cool, early days of spring. As the weather warms the suet could melt, so it's best to place it outside during a stretch of cooler days. YOU'LL NEED: Lard or bacon fat, peanut butter, rolled oats, cornmeal, birdseed, flour, mixing bowl, paper cups, a mesh vegetable bag, and some twine or string.

DIRECTIONS:
1. Melt ½ cup of bacon fat and ½ cup of peanut butter in a microwave.
2. Add 1 cup rolled oats, 1 cup cornmeal, 1 cup birdseed and ½ cup flour then mix well.
3. Spoon the mix into paper cups and place in the freezer.
4. Once they have solidified, take the cups out of the freezer and tear away the outside paper. Drop the suet cakes into the mesh bag. Use twine to secure the top of the bag and hang it outside from a tree branch. Observe which birds stop by to nibble!
Optional: a simpler version of this project can be made with peanut butter or lard mixed with birdseed.
LEARNING EXTENSIONS: Keep a notepad of the various birds that the suet attracts. You may observe chickadees, finches, wrens, woodpeckers, blue jays, cardinals and nuthatches. How does each of them feed? What calls do they make to alert others of the treat? You may also get a bunch of squirrels visiting the suet cakes, too. They tend to be very aggressive going after food!

Shadow Drawings

Looking to ensure that your kids spend their time outdoors this summer instead of parked in front of various screens? This shadow drawing project is a great way to keep your kids busy outside. YOU'LL NEED: Paper, pencils, colored pencils or markers, figurines, and a sunny day.

DIRECTIONS:
1. Set up the figurines at the edge of the paper. Make sure they are in the sun and casting a shadow onto the paper so your kids can trace the outline.
2. Once the objects are traced, they can have fun coloring them!

THE LEARNING BEHIND IT: Any object that can block the light so no light can pass through is called an opaque object. Your body is an example of an opaque object. The size of the shadow

depends on the angle at which the light is falling on the object. Your shadow keeps changing throughout the day. It is longest in the early morning and the late afternoon. At noon, when the sun is directly overhead, there is little or no shadow at all. That's because the position of the sun changes throughout the day. As the sun moves, so do the angles of its rays. A long time ago people observed and tracked the length of shadows throughout the day to keep time. The world's earliest clock was the sun!

LEARNING EXTENSIONS: Use this technique to create an entire page of shadow drawings! Imagine a grouping of dinosaurs thundering across the paper, or poseable figures doing back bends and high kicks. Here's another fun idea. Have someone stand on pavement in the sun to cast a shadow and let someone else trace them with chalk. Then draw in silly faces and add clothes to complete the portraits!