summer activity guide

Invention & Imagination

ages 5-9

G-san
GEORGIA STATEWIDE AFTERSCHOOL NETWORK

50 STATE AFTERSCHOOL NETWORK

ALACN
Alabama Afterschool Community Network

About the Summer Activity Guides

Summers are for fun and engaged learning. In 2020 as the impact of the pandemic is widely felt, summer opportunities will be different for young people, families, and afterschool and summer program staff. The Summer Activity Guides were developed to help engage youth with supportive adults in a range of places.

The activities and resources in the Summer Activity Guides are intentionally designed to support youth-serving summer programs in driving consistent engagement and providing ongoing opportunities for youth skill-building and emotional well-being. In addition to the activities for youth, supplemental materials will be available to support professional development and enhance family engagement.

The Guides include 150 original activities and challenges organized by four different age groups (5-9) (10-12) (13-15) (16-18). The activities are adaptable for in-person and virtual instruction, or a hybrid of both, as well as sent as take-home packets.

All activities should be safely executed and aligned with state and local health guidelines.

Tinfoil Boats

CHALLENGE DESCRIPTION

In this STEM challenge, youth will try to build a boat that holds 25 pennies out of tin foil. As part of the 'Invention & Imagination' unit, this engineering and physics experiment is designed to introduce youth to the concept of buoyancy. This activity encourages the development of STEM literacy, problem-solving, creativity and critical thinking skills.

SUPPLIES

- Large bowl of water (or a sink or bathtub)
- 40 pennies
- Aluminum foil
- [Optional] Blue or green food coloring
- Tinfoil Boats Handout

STEPS

- Your challenge today is to use aluminum foil to build a boat that can hold 25 pennies without sinking.
- Fill your bowl, sink or bathtub ¾ with water. See Step 1 in the handout. [Optional: Add a few drops of green or blue food coloring to the water.]
- Set out a sheet of aluminum foil. Place 15 pennies on top of the sheet. Ball up the sheet around the pennies.
- Place the balled-up aluminum foil with pennies in the water. What happens? Does it float or sink? It sinks!
- Now, let's build a boat. Cut 2 squares of aluminum foil. Each should be around 8 inches long and 8 inches wide.
- Use 1 square of aluminum foil to build a boat that floats in the water. See Step 2 in the handout. Experiment with different shapes. If it doesn't float the first time, try again with a new sheet of aluminum foil.
- Now set your boat in the water. Why does your boat float? Your boat floats because it is buoyant. Buoyancy is how well something floats in water or in another liquid.
- Slowly add one penny at a time to your boat. See Step 3 in the handout. What do you think will happen? How many pennies can your boat hold before it sinks?
- If your boat sinks, take a new sheet of aluminum foil and try to build a boat that can hold even more pennies.
- Continue to experiment with your boat's design until you've built a boat that can hold 25 pennies without sinking.
- Why did your ball of pennies sink but your boat with pennies did not? The big difference is the size. The ball of foil and pennies is smaller and takes up less room so there is not a lot of force pushing up to keep it floating. The boat takes up more space so it has more force pushing up on it.

ADAPTATIONS

- If you are delivering the challenge virtually, send home a kit with the activity supplies so that youth are all able to participate in the experiment alongside you. If you are not able to send home the supplies, youth can watch the facilitator do the demonstration. Be sure to pause throughout for questions and discussion.
- If you are delivering the challenge digitally or through take-home packets, have youth share photos or videos of their boats to your program platform.
- For virtual and in-person delivery, have images of different items and have kids make predictions (e.g., bucket, other boats, blocks, etc.). Will this float? Why or why not?

EXTENSIONS

- Build boats that float using lots of different materials. Check out the following link for an activity plan: https://www.scholastic.com/teachers/articles/teaching-content/activity-plan-5-6-build-boat-floats/
- To learn more and experiment with buoyancy, try the 'Simple Saltwater Density Experiment' available at: https://littlebinsforlittlehands.com/simple-salt-water-density-science-experiment-saturday-science/

CREDITS: Little Bins for Little Hands' 'Penny Boat Challenge' available at https://littlebinsforlittlehands.com/penny-boat-challenge/

Tinfoil Boats Handout

Step 1: Fill your bowl, sink or bathtub ¾ with water. Set out a sheet of aluminum foil. Place 15 pennies on top of the sheet. Ball up the sheet around the pennies. Place the balled-up aluminum foil with pennies in the water.

Step 2: Use 1 square of aluminum foil to build a boat that floats in the water.

Step 3: Slowly add one penny at a time to your boat. See how many pennies you can add until it sinks.

Build a Catapult

ACTIVITY DESCRIPTION

In this STEM activity, youth will build their own catapult using Popsicle sticks and then use it to fire small objects. As part of the 'Invention & Imagination' unit, this engineering and physics experiment is designed to get youth excited about simple machines. This activity encourages the development of STEM literacy, inquiry, creativity and critical thinking skills.

SUPPLIES

- 10 jumbo Popsicle sticks
- 5 rubber bands
- Plastic spoon
- Marshmallows, small erasers, pom poms or other small objects
- Build a Catapult Handout

STEPS

- Take 8 Popsicle sticks and stack them on top of one another. Wrap a rubber band around each end of your stack. See step 1 on the handout. You may need an adult's help to wrap the rubber band tightly.
- Take another one of your sticks and push it through the stack just below the top stick. See step 2 on the handout. Here is a video of how to do this: https://littlebinsforlittlehands.com/popsicle-stick-catapult-kids-stem-activity/?jwsource=cl
- Flip your stack over so that the Popsicle stick that you just pushed through is on the bottom of the stack.
- Put a second stick on top of your stack and wrap a rubber band around the bottom of the 2 Popsicle sticks. See step 3 on the handout.
- Place your spoon, facing up, on top of the stick that is on top. Wrap a rubber band around the bottom to attach the spoon to the stack and another rubber band around the top. See step 4 on the handout.
- Push the stack of Popsicle sticks towards the ends with the part connected by the rubber bands.
- Your catapult is complete! Now try it out. Hold a marshmallow (or other small object) in the scoop of the spoon. Press down on the spoon and then let go. Watch your marshmallow shoot into the sky!
- Try shooting each of your small objects from your catapult to see which one goes the farthest.

ADAPTATIONS

- If you are delivering the activity virtually, send home a kit with the activity supplies so that youth are all able to participate.

EXTENSIONS

- Use a measuring tape to see which items flew the farthest. Measure and record all of the launches.
- Test out the number of Popsicle sticks used in the stack. What happens if you use 6 or 10 instead of 8?
- Try making different types of catapults. See which one works better. Here's how to make a Lego catapult: https://littlebinsforlittlehands.com/easy-lego-catapult-and-tension-experiment-for-kids/ and here is how to make a catapult with toothpicks: https://littlebinsforlittlehands.com/easy-marshmallow-catapult-activity/

QUESTIONS FOR DISCUSSION

- What type of machine is a catapult? It's a lever. When you pull down on the arm of the lever all of the energy gets stored up and then when you release it, the energy shoots the object into the air.
- What other levers have you seen?
- Which item will go the farthest? Why do you think that item will go the farthest? Come up with a hypothesis (a guess).
- Try firing different objects. Which item worked the best? Did any objects not work at all? Why?

CREDITS: Little Bins for Little Hands' 'Popsicle Stick Catapult' available at https://littlebinsforlittlehands.com/popsicle-stick-catapult-kids-stem-activity/

Build a Catapult Handout

Step 1: Take 8 Popsicle sticks and stack them on top of one another. Wrap a rubber back around each end of your stack.

Step 2: Push one of the sticks through the stack just below the top stick.

Step 3: Put a second stick on top of your stack and wrap a rubber band around the bottom of the 2 Popsicle sticks.

Step 4: Place your spoon, facing up, on top of the stick that is on top. Wrap a rubber band around the bottom to attach the spoon to the stack and another rubber band (or tape) around the top.

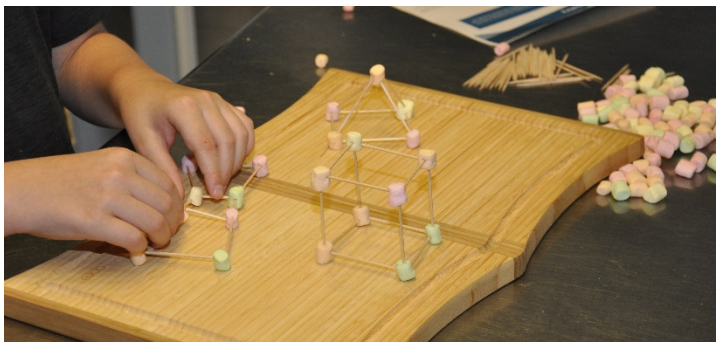
Marshmallow & Toothpick Shapes

ACTIVITY DESCRIPTION

In this STEM activity, youth will build geometric shapes using marshmallows and toothpicks. As part of the 'Invention & Imagination' unit, this hands-on math activity is designed to help youth explore 2-dimensional structures. This activity encourages the development of basic geometry skills, problem-solving skills, and creativity.

SUPPLIES

- 50 toothpicks
- 50 small marshmallows
- Copy of the '2D Geometric Shapes with Marshmallows and Toothpicks' available here: https://members.teachbesideme.com/wp-content/uploads/2017/06/Marshmallows-and-Toothpicks-book.pdf



STEPS

- In this activity you are going to try to build shapes using marshmallows and toothpicks. You will need your marshmallows to do the activity so make sure you don't eat them until the activity is over!
- Set out your marshmallows and toothpicks. Look at the 'Build 2D Geometric Shapes' Activity Cards. Each card shows you how many marshmallows and how many toothpicks you will need to build the shape.
- Find the first card, 'Build a Square'. The card shows that you will need 4 toothpicks and 4 marshmallows to make a square. Use your marshmallows and toothpicks to try to make a square, just like the picture on the card.
- Does your shape look like the picture on the card? After you have finished, set that shape aside and pick up the next card and try to build the shape in the picture.
- See if you can build all 10 shapes on the 2D cards.

ADAPTATIONS

- This activity is best completed over multiple sessions. Youth can build a few shapes in each session. Consider starting with the more simple and familiar shapes first (like a square or triangle).
- If you are delivering the activity virtually, send home a kit with the activity supplies so that youth are all able to participate in the experiment alongside you.

EXTENSIONS

- Build letters and words.
- Build a house, a building in your neighborhood, or a playground.
- Try doing the 'Famous Towers' challenge in this unit by using only marshmallows or toothpicks.
- Try using different materials to build shapes and structures like spaghetti and marshmallows, boxes, index cards or playing cards, etc.

QUESTIONS FOR DISCUSSION

- What was your favorite part of the activity and why?
- What challenged you the most?
- Were there any new shapes that you learned about from this activity?
- What shapes do you see around your home and neighborhood that you could try to build?

CREDITS: Teach Beside Me's 'Building 2D and 3D Geometric Shapes with Marshmallows and Toothpicks' available at https://members.teachbesideme.com/wp-content/uploads/2017/06/Marshmallows-and-Toothpicks-book.pdf

Chromatography

ACTIVITY DESCRIPTION

In this STEM activity, youth will use everyday objects to conduct a simple chemistry experiment. As part of the 'Invention & Imagination' unit, this is designed to introduce youth to the process of chromatography. This activity encourages the development of STEM literacy, inquiry and critical thinking skills.

SUPPLIES

- Black washable marker (black Crayola washable or black Expo)
- 1 paper towel
- Scissors
- 5 cups
- Water
- Piece of paper
- Chromatography Handout

STEPS

- Chromatography is a process that scientists use to separate mixtures.
- Cut your paper towel into 5 strips (long pieces). See step 1 in the handout.
- Use your black marker to color the center of each strip of paper towel (about the size of a quarter or 1 inch). See step 2 in the handout.
- Put a small amount of water in the bottom of each of your 5 cups (about 1 inch of water). See step 3 in the handout.
- Fold each of your 5 strips of paper towel in half with the part that you colored at the fold.
- Put 1 piece of paper towel in each cup with the colored center in the water. Let the ends of the strips hang over the sides of the cups. See step 4 in the handout.
- Watch what happens!
- Let the paper towels stay in the cups for a few minutes. Then, take them out and lay them flat on a piece of paper to dry. See step 5 in the handout.
- Look at your paper towels. What colors is black ink made of?

ADAPTATIONS

- If you are delivering this activity digitally, create a log on your program page where youth can post their observations.
- If you are delivering the activity via take-home packets or digitally, encourage parents or caregivers to be involved so that youth can discuss the questions and their observations with someone.

EXTENSIONS

- Try this same experiment with other marker colors or other types of liquid.
- Try this experiment with a permanent marker (like a Sharpie) instead of a washable marker. Once you have colored the paper towel with the marker, add a few drops of rubbing alcohol. Watch what happens.
- Try this same experiment using a coffee filter: https://www.exploratorium.edu/science_explorer/black_magic.html

QUESTIONS FOR DISCUSSION

- What did you think was going to happen when you put the paper towel in the cup of water?
- What happened? The ink from the marker started moving up the paper towel and the colors started to separate into parts. This is called capillary action
- What surprised you?
- What colors is black ink made of? Black ink is made of a lot of different colors. These are called pigments.
- Why do you think the colors separated on the paper towel? The water separated the black ink into its parts (components) by carrying it through the paper towel. This is called chromatography. (For a more in-depth description of chromatography, check out: https://www.explainthatstuff.com/chromatography.html)

CREDITS: Babbledabbledo's 'The Classic Chromatography Experiment' available at https://babbledabbledo.com/how-to-do-the-classic-chromatography-experiment/

Chromatography Handout

Step 1: Cut your paper towel into 5 strips (long pieces).

Step 2: Use your black marker to color the center of each strip of paper towel.

Step 3: Put a small amount of water in the bottom of each of your 5 cups (about 1 inch of water).

Step 4: Put a small amount of water in the bottom of each of your 5 cups (about 1 inch of water).

Step 5: Let the paper towels stay in the cups for a few minutes. Then, take them out and lay them flat on a piece of paper to dry.

Look at your paper towels. What colors is black ink made of?

Tie-Dye T-Shirt

ACTIVITY DESCRIPTION

In this art and STEM activity, youth will create a tie-dye t-shirt using permanent markers and rubbing alcohol. As part of the 'Invention & Imagination' unit, this experiment is designed to introduce youth to soluble science. This activity encourages the development of inquiry, creativity and critical thinking skills.

SUPPLIES

- 1 plain, white cotton t-shirt
- 1 piece of cardboard (about the size of a piece of printer paper)
- Permanent markers (different colors)
- Rubbing alcohol
- Eyedropper/pipette/or recycled condiment bottle

STEPS

- [Note: This activity uses rubbing alcohol, which is can be harmful if ingested. You will need an adult to help.]
- Have you noticed when water drops on paper with words on it, sometimes the ink runs? This is because the ink has combined with the water and as the water moves it carries the ink with it. This is called "solubility". In this activity, we will learn more about solubility by making tie-dye t-shirts.
- To create your tie-dye t-shirt, insert a piece of cardboard into the t-shirt to prevent the colors from bleeding through to the other side.
- Pick the permanent marker colors you want to use.
- Use your markers to draw small simple patterns all over your shirt. For example, to make a flower you can make a large dot in one color and then smaller dots around the large one in a different color. Or you can draw a heart of fireworks shapes.
- Ask an adult to add rubbing alcohol to the eyedropper.
- Slowly drip the rubbing alcohol onto the center of your design.
- Once you have finished designing your t-shirt. Let it dry completely. (Note: Ask an adult to iron your shirt or throw it in the dryer to make sure the design stays put.)

ADAPTATIONS

- If you are delivering the activity virtually, send home a kit with the activity supplies so that youth are all able to participate in the experiment alongside you.
- If you are delivering the activity via take-home packets or digitally, encourage youth to upload photos of their design on your organization's online platform or social media.

EXTENSIONS

- To create other chemical reactions, try the 'Fizzy Dough' or 'Fizzy Painting' activities and extensions.
- If you have an extra t-shirt, try it again. This time draw something new with your permanent markers and/or change how much rubbing alcohol you use.
- Try using a different piece of clothing or cloth, like a mask, sock or kitchen towel.
- Make a shirt for a loved one and invite your whole family to participate.

QUESTIONS FOR DISCUSSION

- What happened to your design when you added 1 drop? What happened when you added more drops?
- When the colors mix together, what happens?
- Do you think water would work as well as rubbing alcohol? Why or why not?

CREDITS: Playdough to Plato's 'Sharpie Tie-Dye Science' available at https://www.playdoughtoplato.com/sharpie-tie-dye-science/

Fizzy Painting

ACTIVITY DESCRIPTION

In this art and STEM activity, youth will create a 'fizzy painting'. As part of the 'Invention & Imagination' unit, this experiment is designed to introduce youth to chemical reactions. This activity encourages the development of inquiry, creativity and critical thinking skills.

SUPPLIES

- Watercolor paper (or use a thick, heavy paper)
- ½ cup of baking soda
- Vinegar (less than ½ cup)
- A squeeze bottle / recycled condiment bottle (ex. an old mustard bottle) / pipette
- Food coloring (multiple colors)
- Fizzy Painting Handout

STEPS

- In this activity, you will create a chemical reaction by making a fizzy painting. A chemical reaction is when two or more ingredients are mixed together and then each ingredient breaks apart into smaller pieces to form something new.
- Find a space where it's okay to get a little messy or somewhere that is easy to clean.
- Sprinkle ½ cup of baking soda on watercolor paper.
- Add 1 tablespoon of vinegar to your squeeze bottle or pipette.
- Add 2–3 drops of food coloring to the squeeze bottle or pipette.
- Use the squeeze bottle or pipettes to drop the colored vinegar onto the watercolor paper.
- Wash out or use a different squeeze bottle or pipette. Add a different color. Repeat until you are finished with your painting.
- Once your paper has dried, scrape off the leftover baking soda.
- You just saw a chemical reaction between baking soda and vinegar. When you added the vinegar, it created the fizzy reaction and formed a gas and a liquid.

ADAPTATIONS

- If you are delivering the activity virtually, send home a kit with the activity supplies so that youth are all able to participate in the experiment alongside you. If you are not able to send home the supplies, youth can watch the facilitator conduct the experiment. Be sure to pause throughout for questions and discussion.
- If you are delivering the activity via take-home packets or digitally, encourage parents or caregivers to be involved so that youth can discuss the questions and their observations with someone.

EXTENSIONS

- Do the experiment over again, but this time change one part (variable) of the experiment. For example, what happens when you add more or less baking soda?
- Try another chemical reaction. Make rainbow lightning art using magnets. Find out how to do it here: https://taminglittlemonsters.com/rainbow-lightning-process-art-for-kids/. Or, try 'Water and Oil Droplet Paintings', like the one found here: https://stayathomeeducator.com/oil-and-water-droplet-painting-process-art-activity/

QUESTIONS FOR DISCUSSION

- What do you think will happen when you add vinegar to the baking soda? What is your hypothesis (guess)?
- What happens to the paper? Why do you think this happened?
- What happened when you mixed the colors?

CREDITS: Taming Little Monsters 'Fizzy Painting' available at https://taminglittlemonsters.com/fizzy-painting-stem-activity-for-kids/

Fizzy Painting Handout

Step 1: Sprinkle ½ cup of baking soda on watercolor paper.

Step 2: Add 1 tablespoon of vinegar to your squeeze bottle or pipette.

Step 3: Add 2 – 3 drops of food coloring to the squeeze bottle or pipette. Use the squeeze bottle or pipettes to drop the colored vinegar onto the watercolor paper.

Step 4: Wash out or use a different squeeze bottle or pipette. Add a different color. Repeat until you are finished with your painting. Once your paper has dried, scrape off the leftover baking soda.

Fizzy Dough

ACTIVITY DESCRIPTION

In this STEM activity, youth will create 'fizzy dough'. As part of the 'Invention & Imagination' unit, this experiment is designed to introduce youth to chemical reactions. This activity encourages the development of STEM literacy, inquiry, creativity and critical thinking skills.

SUPPLIES

- 1 small box of baking soda (approximately 2 cups)
- 1/3 cup white hair conditioner
- 1 cup of Vinegar
- 2-3 squeeze bottles/ recycled condiment bottles/ pipettes
- Food coloring
- Fizzy Dough Handout

STEPS

- A chemical reaction is when two or more ingre dients are mixed together and then each ingredient breaks apart into smaller pieces to form something new. In this activity, you will create a chemical reaction by making fizzy dough.
- To create fizzy dough, add 1 small box of baking soda (2 cups) into a large bowl.
- Add 1/3 cup of conditioner to the bowl of baking soda and stir.
- Mix the dough with your hands until it feels soft and crumbly.
- Put the dough on a plate or small tray. Using your hands, create different shapes with the dough. Or you can use molds or cookie cutters to create the shapes.
- Fill the squeeze bottle or pipette with vinegar. Add 3 drops of food coloring to the bottle. Shake the bottle to mix all the ingredients.
- What do you think will happen when you add vinegar to the dough?
- Squeeze the vinegar onto your dough shapes.
- What happens to the dough?
- Why do you think this happened?
  You just saw a chemical reaction between baking soda and vinegar. When the two came together, they created carbon dioxide, which creates the fizzy bubbles.

ADAPTATIONS

- If you are delivering the activity virtually, send home a kit with the activity supplies so that youth are all able to participate in the experiment alongside you. If you are not able to send home the supplies, youth can watch the facilitator conduct the experiment. Be sure to pause throughout for questions and discussion.
- If you are delivering the activity via take-home packets or digitally, encourage parents or caregivers to be involved so that youth can discuss their observations with someone.

EXTENSIONS

- Do the activity over again, but this time use shampoo instead of conditioner. What do you think will happen?
- Use 3 bottles and add yellow, red and blue food color each. Add each color to your dough, and then mix to form new colors.
- Add vinegar to other dough recipes to see which ones create a chemical reaction.

QUESTIONS FOR DISCUSSION

- What did you think would happen when you add vinegar to the dough? And then, what happened to the dough? Why do you think this happened?
- What other chemical reactions can you think of? Why do some things react but not others?

CREDITS: Babbledabbledo's 'Fizzy Dough' available at https://babbledabbledo.com/how-to-make-fizzy-dough/

Fizzy Dough Handout

Step 1: Add the ingredients. Add 1 small box of baking soda (2 cups) into a large bowl. Add 1/3 cup of conditioner to the bowl of baking soda, and stir. Mix the dough with your hands until it feels soft and crumbly, like snow.

Step 2: Put the dough on a plate or small tray. Using your hands, create different shapes with the dough. Or you can use molds or cookie cutters to create the shapes

Step 3: Fill the squeeze bottle or pipette with vinegar. Add 3 drops of food coloring to the bottle. Shake the bottle to mix all the ingredients. Squeeze the vinegar onto your dough shapes.

Make It Bounce

ACTIVITY DESCRIPTION

In this STEM activity, youth will create bouncy balls. As part of the 'Invention & Imagination' unit, this experiment is designed to introduce youth to polymer science and chemical reactions. This activity encourages the development of STEM literacy, inquiry and critical thinking skills.

SUPPLIES

- 2 tablespoons of white glue
- 2 tablespoons of warm water
- 2 teaspoons of cornstarch
- 1 teaspoon of Borax
- Food coloring
- 2 cups, 2 spoons, and measuring spoons

STEPS

- [Note: This activity uses Borax, which is an eye irritant. You will need an adult to help.]
- In this activity, we are going to make our own polymer. "Polymers" are big molecules made of smaller molecules that are stuck together like blocks. (Think of a chain of paper clips.) A molecule is the smallest material that can exist. Paper, plastic and gum are all polymers.
- To make our polymer, first, get out 2 cups.
- In your first cup, mix 1 teaspoon of Borax with 2 tablespoons of warm water. Stir until the Borax is part of the water (dissolved). (Note: wash your hands after using Borax)
- In your second cup, mix 2 tablespoons of white glue with 2 teaspoons of cornstarch. Add 2 -3 drops of food coloring and stir together.
- Add your mixture from the first cup (dissolved Borax) to the second cup (glue/cornstarch). Stir together.
- Once the mixture becomes impossible to stir, take it out of the cup and mix it together with your hands (like a pizza dough). After mixing, roll it between your palms to make a ball. Make sure to keep pushing hard. (Note: this will be messy, and that's the fun part!)
- Now your ball should be ready to bounce.

ADAPTATIONS

- If you are delivering the activity virtually, send home a kit with the activity supplies so that youth are all able to participate in the experiment alongside you.
- If you are delivering the activity via take-home packets or digitally, encourage parents or caregivers to be involved so that youth can discuss the questions and their observations with someone.

EXTENSIONS

- Polymers can also be used in baking, like bread! Try to make your own magic dough: https://www.scientificamerican.com/article/make-your-own-magic-dough/
- Try a different experiment using a different kind of polymer – a gummy bear! In this experiment you will see what happens to gummy bears when you mix it with water. Here is the activity: https://www.pslc.ws/macrog/kidsmac/activity/bear.htm

QUESTIONS FOR DISCUSSION

- What did you think would happen when you mixed your first cup with your second cup?
- Why do you think the ball bounces? (The ball bounces because the polymer chain changes shape when it hits the floor, which makes it bouncy)
- Does it bounce better on carpets or hard surfaces?
- What other polymers can you think of that are bouncy and stretchy? What do they have in common?

CREDITS: Babbledabbledo's 'DIY Bouncy Balls' available at https://babbledabbledo.com/simple-science-experiment-diy-bouncy-balls/

Lava Lamps

ACTIVITY DESCRIPTION

In this STEM activity, youth will create a layered 'lava lamp'. As part of the 'Invention & Imagination' unit, this experiment is designed to introduce youth to the density of liquids. This activity encourages the development of STEM literacy, inquiry, creativity and critical thinking skills.

SUPPLIES

- Large jar or bottle (e.g., soda bottle)
- Cookie sheet
- ¼ cup of corn syrup
- ½ cup of water
- Food coloring
- ½ cup of oil
- Measuring cups
- 1 Alka Seltzer tablet
- [Optional] Scientific Method sheet to record the steps and observations of the experiment: https://docs.google.com/file/d/0Bxq0hYp2IyG1QWVzQTIycG1KbGs/edit?pli=1

STEPS

- [Note: this activity includes an Alka Seltzer tablet and is best done with adult supervision and support.]
- Set your cookie sheet out on a table and place your jar in the middle of it. This will help with anything that may spill.
- Measure about ¼ cup of corn syrup and pour it into the jar.
- Measure about ½ cup of water and add it to your jar.
- Add 3 drops of food coloring.
- Measure ¼ cup of oil and add it to the jar. If your jar is not very full, you can add another ¼ cup of oil. Leave a little room at the top of your jar.
- Add 1 Alka Seltzer tab to your jar. Watch what happens! It creates bubbles like a lava lamp.
- Put the top back on your jar.

ADAPTATIONS

- If you are delivering the activity virtually, send home a kit with the activity supplies so that youth are all able to participate in the experiment alongside you.
- If you are delivering the activity via take-home packets or digitally, encourage parents or caregivers to be involved so that youth can discuss the questions and their observations with someone.

EXTENSIONS

- Use different liquids to make another jar. Try using honey, light corn syrup, dish soap, olive oil, rubbing alcohol and water. Which liquids are denser and go to the bottom of the jar?
- Try making a rainbow density jar. Check out the following link for a step-by-step: https://www.playdoughtoplato.com/rainbow-jar/

QUESTIONS FOR DISCUSSION

- What do you think will happen when you add the different liquids to the jar?
- What happens when you add each of the liquids to your jar? They separate and become layered in the jar.
- Why do you think the liquids are separating and becoming layered? The liquids separate because they have different weights. Density describes how heavy a liquid is.
- What other liquids might have different densities?
- What happened when you added the Alka Seltzer tablet? Why do you think that happened? When you added the tablet, it started dissolving and creating a gas.

CREDITS: Babbledabbledo's 'How to Do the Classic Layered Liquids Science Project available at https://babbledabbledo.com/science-for-kids-layered-liquids/

Lemon Volcano

ACTIVITY DESCRIPTION

In this STEM activity, youth will use a lemon to make a volcano that erupts. As part of the 'Invention & Imagination' unit, this chemistry experiment is designed to build wonder and excitement while introducing youth to a chemical reaction that creates carbon dioxide. This activity encourages the development of STEM literacy, inquiry, creativity, and critical thinking skills.

SUPPLIES

- 2 lemons cut in half
- ½ cup baking soda
- Food coloring
- Dawn dish soap
- Plate or tray
- Small cup
- Spoon
- Lemon Volcano Handout

STEPS

- [Note for adults: Cut both lemons in half.]
- Squeeze 2 of your lemon halves into a small cup so that you have extra lemon juice.
- Place half a lemon on a plate or a tray. This will prevent a mess when the volcano erupts.
- Use the handle of your spoon to poke holes in the different sections of the lemon. See step 1 on the handout.
- Put a few drops of food coloring around the different sections of the lemon. You can use just one color or different colors. See step 2 on the handout.
- Pour some Dawn dish soap over the top of the lemon. See step 3 on the handout.
- Use a spoon to sprinkle baking soda over the top of the lemon. See step 4 on the handout. Save a little bit of your baking soda to add later. You can also use the handle to push some of the baking soda into sections of the lemon to help your eruption along.
- It will take a few minutes for the reaction to begin and your volcano to start to erupt.
- As it begins to erupt, you can use the handle of your spoon to push more of the baking soda into the lemon.
- After the first eruption has stopped, you can add more baking soda and pour your extra lemon juice on top to continue the reaction.

ADAPTATIONS

- If you are delivering the activity virtually, send home a kit with the activity supplies so that youth are all able to participate in the experiment alongside you. If you are not able to send home the supplies, youth can watch the facilitator do the demonstration. Be sure to pause throughout for questions and discussion.

EXTENSIONS

- Try doing the same experiment with other citrus fruits like limes, oranges, and grapefruits. Which fruit has the biggest eruption?
- Try doing the same experiment with other materials. What happens if you use white vinegar instead of detergent, generic brands of dish soap instead of Dawn?
- Check out the short film 'Working as a Volcanologist': https://www.youtube.com/watch?v=ADnh2FcZwLg

QUESTIONS FOR DISCUSSION

- What do you think will happen when you add the dish soap and baking soda to the lemon? Come up with a hypothesis (a guess).
- What happened when you added the baking soda to your lemon?
- What surprised you?
- What makes the lemon volcano erupt? The citric acid from the lemon juice reacts with the baking soda and creates carbon dioxide, which is a gas. The bubbling and fizzing that you see is the carbon dioxide.
- What did you like about the activity?
- What challenged you?
- What do you want to learn more about?

CREDITS: Little Bins for Little Hands' 'Erupting Lemon Volcano' available at https://littlebinsforlittlehands.com/erupting-lemon-volcano-chemistry/

Lemon Volcano Handout

Step 1: Use the handle of your spoon to poke holes in the different sections of the lemon.

Step 2: Put a few drops of food coloring around the different sections of the lemon. You can use just one color or different colors.

Step 3: Pour some Dawn dish soap over the top of the lemon.

Step 4: Use a spoon to sprinkle baking soda over the top of the lemon.

The 50 State Afterschool Network

The Summer Activity Guide has been developed for the 50 State Afterschool Network with leadership from the Georgia Statewide Afterschool Network to engage and support children and youth nationwide.

In each state, the afterschool network is broadening opportunities for youth. Seeking equitable outcomes for underserved children to succeed in school and future jobs, a statewide afterschool network brings together cross-sector leaders with a common vision and coordinated strategy to advance quality afterschool and summer learning programs

Alabama Afterschool Community Network
Alaska Afterschool Network
Arizona Center for Afterschool Excellence
Arkansas Out of School Network
California AfterSchool Network
Colorado Afterschool Partnership
Connecticut After School Network
Delaware Afterschool Network
Florida Afterschool Network
Georgia Statewide Afterschool Network
Hawai'i Afterschool Alliance
Idaho Afterschool Network
Afterschool for Children and Teens Now (ACT Now) Coalition (IL)
Indiana Afterschool Network
Iowa Afterschool Alliance
Kansas Enrichment Network
Kentucky Out-of-School Alliance
Louisiana Center for Afterschool Learning
Maine Afterschool Network
Maryland Out of School Time Network
Massachusetts Afterschool Partnership
Michigan After-School Partnership
Ignite Afterschool (MN)
Missouri AfterSchool Network
Mississippi Statewide Afterschool Network
Montana Afterschool Alliance
Beyond School Bells (NE)
Nevada Afterschool Network
New Hampshire Afterschool Network
New Jersey School- Age Care Coalition
NMOST (New Mexico Out of School Time) Network
New York State Network for Youth Success
North Carolina Center for Afterschool Programs
North Dakota Afterschool Network
Ohio Afterschool Network
Oklahoma Partnership for Expanded Learning Opportunities
OregonASK
Pennsylvania Statewide Afterschool/Youth Development Network
Rhode Island Afterschool Network
South Carolina Afterschool Alliance
South Dakota Afterschool Network
Tennessee Afterschool Network
Texas Partnership for Out of School Time
Utah Afterschool Network
Vermont Afterschool, Inc.
Virginia Partnership for Out-of-School Time
Washington Expanded Learning Opportunities Network
West Virginia Statewide Afterschool Network
Wisconsin Afterschool Network
Wyoming Afterschool Alliance

summer activity guide

Invention & Imagination

ages 10–12

G·san
GEORGIA STATEWIDE AFTERSCHOOL NETWORK

50 STATE AFTERSCHOOL NETWORK

ALACN
Alabama Afterschool Community Network

About the Summer Activity Guides

Summers are for fun and engaged learning. In 2020 as the impact of the pandemic is widely felt, summer opportunities will be different for young people, families, and afterschool and summer program staff. The Summer Activity Guides were developed to help engage youth with supportive adults in a range of places.

The activities and resources in the Summer Activity Guides are intentionally designed to support youth-serving summer programs in driving consistent engagement and providing ongoing opportunities for youth skill-building and emotional well-being. In addition to the activities for youth, supplemental materials will be available to support professional development and enhance family engagement.

The Guides include 150 original activities and challenges organized by four different age groups (5-9) (10-12) (13-15) (16-18). The activities are adaptable for in-person and virtual instruction, or a hybrid of both, as well as sent as take-home packets.

All activities should be safely executed and aligned with state and local health guidelines.

Marshmallow & Toothpick Geometry

ACTIVITY DESCRIPTION

In this STEM activity, youth will build geometric shapes using toothpicks and marshmallows. As part of the 'Invention & Imagination' unit, this hands-on math activity is designed to help youth explore 3-dimensional structures. This activity encourages the development of basic geometry skills, problem-solving skills, and creativity.

SUPPLIES

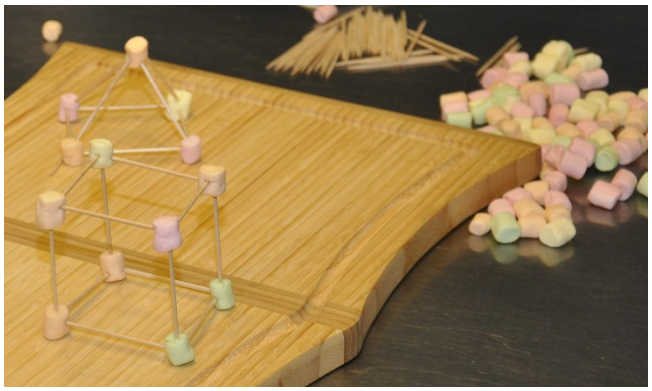
- 150 toothpicks
- 100 small marshmallows
- Copy of the '3D Geometric Shapes with Marshmallows and Toothpicks' available here: https://members.teachbesideme.com/wp-content/uploads/2017/06/Marshmallows-and-Toothpicks-book.pdf

STEPS

- Today you are going to try to build 3-dimensional shapes using marshmallows and toothpicks. A 3-dimensional shape is an object that has length, width and height. For some examples of 3-dimensional shapes, see: https://www.math-salamanders.com/image-files/3d-geometric-shapes-assorted-col.gif
- Set out your marshmallows and toothpicks. Look at the 'Build 3D Geometric Shapes' Activity Cards. Each card shows you how many marshmallows and how many toothpicks you will need to build the shape.
- Find the first card, 'Build a Tetrahedron'. The card shows that you will need 4 marshmallows and 6 toothpicks to make a tetrahedron. Use your marshmallows and toothpicks to try to make a square, just like the picture on the card.
- *Does your shape look like the picture on the card?* After you have finished, set that shape aside and pick up the next card and try to build the shape in the picture.
- See if you can build all 12 shapes on the 3D cards.

ADAPTATIONS

- If you are delivering the activity virtually, send home a kit with the activity supplies so that youth are all able to participate in the experiment alongside you.
- If you are delivering the activity digitally, have youth share photos of their shapes on your program platform or page.



EXTENSIONS

- Try building a shape or a structure that can hold weight. What shape can hold the most weight?
- Try building the tallest structure you can. How tall can you make it without it tipping over?
- Try doing the 'Famous Towers' challenge in this unit by using only marshmallows or toothpicks.

QUESTIONS FOR DISCUSSION

- What was your favorite part of the activity and why?
- What challenged you the most?
- What shapes were new to you?
- [Pick a few of the shapes and discuss:] What real-life buildings or structures have you seen that are this shape? Why do you think that they are this shape?
- What other shapes, that were not on the cards, could you build?

CREDITS: Teach Beside Me's 'Building 2D and 3D Geometric Shapes with Marshmallows and Toothpicks' available at https://members.teachbesideme.com/wp-

Famous Towers

CHALLENGE DESCRIPTION

In this STEM challenge, youth will use household items to create five famous towers. As part of the 'Invention & Imagination' unit, this challenge is designed to introduce youth to structural engineering. This activity encourages the development of STEM literacy, problem solving, and critical thinking

SUPPLIES

- You can use a lot of different types of items for this challenge. Here are some ideas:
  - Popsicle sticks or toothpicks
  - Straws
  - Spaghetti (dry)
  - Cups
  - Newspaper or Cardboard
  - Marshmallows
  - Legos or other blocks
  - String or tape
- Famous Towers Handout

STEPS

- A tower is a building that is taller than its length and width. You have probably built towers before, but have you ever wondered why some towers are stronger or taller than others?
- In this challenge, you will create 5 towers that are different shapes and use different materials. Each day you will create a tower that looks like a famous tower from the list below, or you may pick your own famous tower. Check out the Handout for photos of each.
  - **Day 1: CN Tower –** The CN Tower is located in Toronto, Canada. It is 1,815 feet tall and was the tallest building in the world for 30 years.
  - **Day 2: Eiffel Tower** – The Eiffel Tower is located in Paris, France. It is 984 feet tall and more than 200 million people have visited this tower.
  - **Day 3: Burj Khalifa** – The Burj Khalifa is located in Dubai, United Arab Emirates. It is the tallest building in the world (2,717 feet)
  - **Day 4: The Minaret of Samarra** – A minaret is a tower. The Spiral Minaret is located in Samarra, Iraq. It is shaped like a cone and has a spiral ramp.
  - **Day 5: Leaning Tower of Pisa** – The Pisa Tower is located in Pisa, Italy. After it was built, it began to sink because of poor construction.
- For each tower, copy the design of the tower as best you can.
- After you build the tower, ask yourself: what part of the design made your tower stronger?

ADAPTATIONS

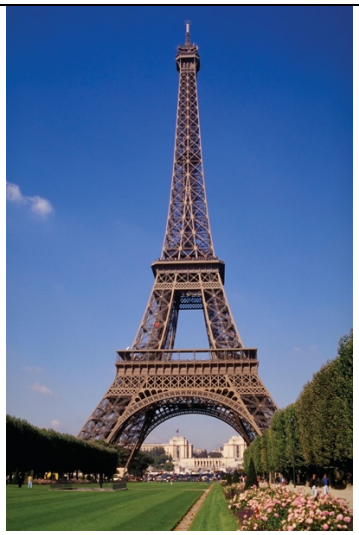
- If you are delivering the activity virtually, send home a kit with the challenge supplies so that youth are all able to participate (e.g., popsicle sticks, straws, spaghetti, cups, cardboard, marshmallows, string or tape.) Have youth share out examples of their towers.
- If you are delivering the activity via take-home packets or digitally, encourage youth to upload photos of their towers.

EXTENSIONS

- Test each tower to see which one will knock over when you blow it or push it lightly. What can you do to make it stronger?
- Design your own tower. Try to build a stronger or taller tower using what you learned from the challenge. Draw the tower on a piece of paper before building it – just like real engineers do!
- If you have a deck of cards at home, try to build a house of cards (https://www.flickr.com/photos/63417360@N02/7933021762)

Famous Towers Handout

Instructions: Each day create a tower that looks like a famous tower from the list below, or you may pick your own famous tower.

Day 1: CN Tower	Day 2: Eifel Tower	Day 3: Burj Khalifa
		
Day 4: The Minaret of Samarra	**Day 5: Leaning Tower of Pisa**	**Create Your Own Tower**
		

Build a Catapult

ACTIVITY DESCRIPTION

In this STEM activity, youth will build their own catapult using Popsicle sticks and use it to fire small objects. As part of the 'Invention & Imagination' unit, this engineering and physics experiment is designed to get youth excited about simple machines and introduce them to a law of motion. This activity encourages the development of STEM literacy, inquiry, creativity and critical thinking skills.

SUPPLIES

- 10 jumbo Popsicle sticks
- 5 rubber bands
- Plastic spoon
- Marshmallows, erasers, pom poms or other small objects
- Build a Catapult Handout
- [Optional] Catapult Log Handout
- [Optional] Measuring tape

STEPS

- Take 8 Popsicle sticks and stack them on top of one another. Wrap a rubber band around each end of your stack. See step 1 on the handout.
- Take another one of your sticks and push it through the stack just below the top stick. See step 2 on the handout. Here is a video of how to do this: https://littlebinsforlittlehands.com/popsicle-stick-catapult-kids-stem-activity/?jwsource=cl
- Flip your stack over so that the Popsicle stick that you just pushed through is on the bottom of the stack.
- Put a second stick on top of your stack and wrap a rubber band around the bottom of the 2 Popsicle sticks. See step 3 on the handout.
- Place your spoon, facing up, on top of the stick that is on top. Wrap a rubber band around the bottom to attach the spoon to the stack and another rubber band around the top. See step 4 on the handout.
- Push the stack of Popsicle sticks towards the ends connected by the rubber bands.
- Your catapult is complete! Now try it out. Hold a marshmallow (or other small object) in the scoop of the spoon. Press down on the spoon and then let go. Watch your marshmallow shoot into the sky!
- Try shooting each of your small objects from your catapult to see which one goes the farthest. Use the Catapult Log Handout to record the distances.

ADAPTATIONS

- If you are delivering the activity virtually, send home a kit with the activity supplies so that youth are all able to participate in the experiment alongside you.

EXTENSIONS

- Use a measuring tape to see which items flew the farthest. Measure and record the launches in a log.
- Try designing a different catapult using the same materials.
- Test out the number of Popsicle sticks used in the stack, what happens if you use 6 or 10 instead of 8?
- Try making 2-3 different catapults out of different materials. See which one works better. Here's how to make a Lego catapult: https://littlebinsforlittlehands.com/easy-lego-catapult-and-tension-experiment-for-kids/ and here is how to make a catapult with toothpicks https://littlebinsforlittlehands.com/easy-marshmallow-catapult-activity/

QUESTIONS FOR DISCUSSION

- A catapult is a simple machine. What type of machine is it? It's a lever.
- What other examples of levers can you think of?
- How does a lever work? When you pull down on the arm of the lever, all of the energy gets stored up and then when you release it, the energy that has been stored up shoots the object into the air. This is called Newton's Law of Motion.
- Which item will go the farthest? Why do you think that item will go the farthest? Come up with a hypothesis (a guess).
- Try firing different objects. Which item worked the best? Did any objects not work at all? Why?

CREDITS: Little Bins for Little Hands' 'Popsicle Stick Catapult' available at https://littlebinsforlittlehands.com/popsicle-stick-catapult-kids-stem-activity/

Build a Catapult Handout

Step 1: Take 8 Popsicle sticks and stack them on top of one another. Wrap a rubber back around each end of your stack.

Step 2: Push one of the sticks with notches through the stack just below the top stick.

Step 3: Put a second stick on top of your stack and wrap a rubber band around the bottom of the 2 Popsicle sticks.

Step 4: Place your spoon, facing up, on top of the stick that is on top. Wrap a rubber band around the bottom to attach the spoon to the stack and another rubber band around the top.

Catapult Log Handout

Instructions: Try shooting each of your small objects from your catapult to see which one goes the farthest. Measure and record the distance that each object travelled using the below log.

Catapult test #	Distance travelled (in inches)
1	
2	
3	
4	
5	
6	
7	
8	

Fizzy Painting

ACTIVITY DESCRIPTION

In this art and STEM activity, youth will create a 'fizzy painting'. As part of the 'Invention & Imagination' unit, this experiment is designed to introduce youth to chemical reactions. This activity encourages the development of inquiry, creativity and critical thinking skills.

SUPPLIES

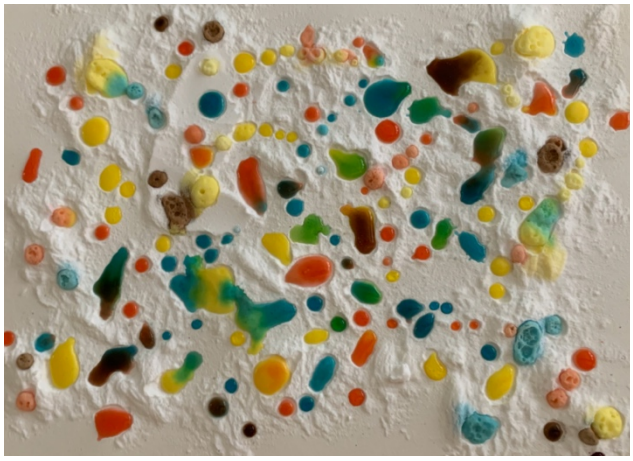
- Watercolor paper (or use a thick, heavy paper)
- ½ cup of baking soda
- Vinegar (less than ½ cup)
- A squeeze bottle / recycled condiment bottle (ex. an old mustard bottle) / pipette
- Food coloring (multiple colors)

STEPS

- In this activity, you will create a chemical reaction by making a fizzy painting. A chemical reaction is when two or more ingredients are mixed together and then each ingredient breaks apart into smaller pieces to form something new.
- Find a space where it's okay to get a little messy or somewhere that is easy to clean.
- Sprinkle ½ cup of baking soda on watercolor paper.
- Add 1 tablespoon of vinegar to your squeeze bottle or pipette.
- Add 2 – 3 drops of food coloring to the squeeze bottle or pipette.
- Use the squeeze bottle or pipettes to drop the colored vinegar onto the watercolor paper.
- Wash out or use a different squeeze bottle or pipette. Add a different color. Repeat until you are finished with your painting.
- Once your paper has dried, scrape off the leftover baking soda.
- You just saw a chemical reaction between baking soda and vinegar. When you added the vinegar, it created the fizzy reaction and formed a gas and a liquid.

ADAPTATIONS

- If you are delivering the activity virtually, send home a kit with the activity supplies so that youth are all able to participate in the experiment alongside you. If you are not able to send home the supplies, youth can watch the facilitator do the demonstration. Be sure to pause throughout for questions and discussion.
- If you are delivering the activity via take-home packets or digitally, encourage parents or caregivers to be involved so that youth can discuss the questions and their observations with someone.



EXTENSIONS

- Do the experiment over again, but this time change one part (variable) of the experiment. For example, what happens when you add more or less baking soda?
- Try another chemical reaction. Make rainbow lightning art using magnets. Find out how to do it here: https://taminglittlemonsters.com/rainbow-lightning-process-art-for-kids/. Or, try 'Water and Oil Droplet Paintings', like the one found here: https://stayathomeeducator.com/oil-and-water-droplet-painting-process-art-activity/

QUESTIONS FOR DISCUSSION

- What do you think will happen when you add vinegar to the baking soda? What is your hypothesis (guess)?
- What happens to the paper? Why do you think this happened?
- What happened when you mixed the colors?

CREDITS: Taming Little Monsters', 'Fizzy Painting' available at https://taminglittlemonsters.com/fizzy-painting-stem-activity-for-kids/

Chromatography

ACTIVITY DESCRIPTION

In this STEM activity, youth will use everyday objects to conduct a simple chemistry experiment. As part of the 'Invention & Imagination' unit, this activity is designed to introduce youth to the process of chromatography. This activity encourages the development of STEM literacy, inquiry and critical thinking skills.

SUPPLIES

- Black washable marker (black Crayola washable or black Expo)
- 1 paper towel
- Scissors
- 5 cups
- Water
- Piece of paper
- Chromatography Handout

STEPS

- Chromatography is the process that scientists use to separate mixtures by letting them slowly move past each other.
- Cut your paper towel into 5 strips (long pieces). See step 1 in the handout.
- Use your black marker to color the center of each strip of paper towel (about the size of a quarter or 1 inch). See step 2 in the handout.
- Put a small amount of water in the bottom of each of your 5 cups (about 1 inch of water). See step 3 in the handout.
- Fold each of your 5 strips of paper towel in half with the part that you colored at the fold.
- Put 1 piece of paper towel in each cup with the colored center in the water. Let the ends of the strips hang over the sides of the cups. See step 4 in the handout.
- Watch what happens!
- Let the paper towels stay in the cups for a few minutes. Then, take them out and lay them flat on a piece of paper to dry. See step 5 in the handout.
- Look at your paper towels. What colors is black ink made of?

CREDITS: Babbledabbledo's 'The Classic Chromatography Experiment' available at https://babbledabbledo.com/how-to-do-the-classic-chromatography-experiment/

ADAPTATIONS

- If you are delivering this activity digitally, create a log on your program page where youth can post their observations.
- If you are delivering the activity via take-home packets or digitally, encourage parents or caregivers to be involved so that youth can discuss the questions and their observations with someone.

EXTENSIONS

- Try this same experiment with other marker colors or other types of liquid.
- Try this experiment with a permanent marker (like a Sharpie) instead of a washable marker. Once you have colored the paper towel with the marker, add a few drops of rubbing alcohol. Watch what happens.
- Try this same experiment using a coffee filter: https://www.exploratorium.edu/science_explorer/black_magic.html

QUESTIONS FOR DISCUSSION

- What did you think was going to happen when you put the paper towel in the cup of water?
- What happened?
- What surprised you?
- Why do you think that the water separated the colors on the paper towel?
- How could this process be useful?

Chromatography Handout

Step 1: Cut your paper towel into 5 strips (long pieces).

Step 2: Use your black marker to color the center of each strip of paper towel.

Step 3: Put a small amount of water in the bottom of each of your 5 cups (about 1 inch of water).

Step 4: Put a small amount of water in the bottom of each of your 5 cups (about 1 inch of water).

Step 5: Let the paper towels stay in the cups for a few minutes. Then, take them out and lay them flat on a piece of paper to dry.

Look at your paper towels. What colors is black ink made of?

Tie-Dye T-Shirt

ACTIVITY DESCRIPTION

In this STEM and art activity, youth will create a tie-dye t-shirt using permanent markers and rubbing alcohol. As part of the 'Invention & Imagination' unit, this experiment is designed to introduce youth to soluble science. This activity encourages the development of inquiry, creativity and critical thinking skills.

SUPPLIES

- 1 plain, white cotton t-shirt
- 1 piece of cardboard (about the size of a piece of printer paper)
- Permanent markers (different colors)
- Rubbing alcohol
- Eyedropper / pipette / or recycled condiment bottle

STEPS

- [Note: This activity uses rubbing alcohol, which is can be harmful if ingested. You will need an adult to help.]
- Have you noticed when water drops on paper with words on it, sometimes the ink runs? This is because the ink has combined with the water, and as the water moves it carries the ink with it. This is called "solubility". In this activity, we will learn more about solubility by making tie-dye t-shirts.
- To create your tie-dye t-shirt, insert a piece of cardboard into the t-shirt to prevent the colors from bleeding through to the other side.
- Pick the permanent marker colors you want to use.
- Use your markers to draw small simple patterns all over your shirt. For example, to make a flower you can make a large dot in one color and then smaller dots around the large one in a different color. Or you can draw a heart of fireworks shapes.
- Ask an adult to add rubbing alcohol to the eyedropper.
- Slowly drip the rubbing alcohol onto the center of your design.
- Once you have finished designing your t-shirt. Let it dry completely. (Note: Ask an adult to iron your shirt or throw it in the dryer to make sure the design stays put.)

ADAPTATIONS

- If you are delivering the activity virtually, send home a kit with the activity supplies so that youth are all able to participate in the experiment alongside you.
- If you are delivering the activity via take-home packets or digitally, encourage youth to upload photos of their design on your organization's online platform or social media.

EXTENSIONS

- To create other chemical reactions, try the 'Fizzy Dough' or 'Fizzy Painting' activities and extensions.
- If you have an extra t-shirt, try it again. This time draw something new with your permanent markers and/or change how much rubbing alcohol you use.
- Try using a different piece of clothing or cloth, like a mask, sock or kitchen towel.
- Make a shirt for a loved one and invite your whole family to participate.

QUESTIONS FOR DISCUSSION

- How far did the color spread when you dropped alcohol on it? What did that mean for your design?
- What happened to your design when you added 1 drop? What happened when you added more drops?
- When the colors mix together, what happens?
- Do you think water would work as well as rubbing alcohol? Why or why not? (Probably not, water does not create the same chemical reaction with permanent markers as alcohol does.)

CREDITS: Playdough to Plato's 'Sharpie Tie-Dye Science' available at: https://www.playdoughtoplato.com/sharpie-tie-dye-science/

Make It Bounce

ACTIVITY DESCRIPTION

In this STEM activity, youth will create bouncy balls. As part of the 'Invention & Imagination' unit, this experiment is designed to introduce youth to polymer science and chemical reactions. This activity encourages the development of STEM literacy, inquiry and critical thinking skills.

SUPPLIES

- 2 tablespoons of white glue
- 2 tablespoons of warm water
- 2 teaspoons of cornstarch
- 1 teaspoon of Borax
- Food coloring
- 2 cups, 2 spoons, and measuring spoons

STEPS

- [Note: This activity uses Borax, which is an eye irritant. You will need an adult to help.]
- In this activity, we are going to make our own polymer. Polymers are big molecules made of smaller molecules that are stuck together like blocks. (Think of a chain of paper clips.) A molecule is the smallest material that can exist. Paper, plastic and gum are all polymers.
- To make a polymer, first, get out 2 cups.
- In your first cup, mix 1 teaspoon of Borax with 2 tablespoons of warm water. Stir until the Borax is part of the water (dissolved). (Note: wash your hands after using Borax)
- In your second cup, mix 2 tablespoons of white glue with 2 teaspoons of cornstarch. Add 2 -3 drops of food coloring and stir together.
- Add your mixture from the first cup (dissolved Borax) to the second cup (glue/cornstarch). Stir together.
- Once the mixture becomes impossible to stir, take it out of the cup and mix it together with your hands (like a pizza dough). After mixing, roll it between your palms to make a ball. Make sure to keep pushing hard. (Note: this will be messy, and that's the fun part!)
- Now your ball should be ready to bounce.

ADAPTATIONS

- If you are delivering the activity virtually, send home a kit with the activity supplies so that youth are all able to participate in the experiment alongside you.
- If you are delivering the activity via take-home packets or digitally, encourage parents or caregivers to be involved so that youth can discuss the questions and their observations with someone.

EXTENSIONS

- Try the activity again using more or less of one ingredient. For example, add more glue to see if your ball is bouncier.
- Try a different experiment using a different kind of polymer – a gummy bear! In this experiment you will see what happens to gummy bears when you mix it with water. Here is the activity: https://www.pslc.ws/macrog/kidsmac/activity/bear.htm

QUESTIONS FOR DISCUSSION

- What did you think would happen when you mixed your first cup with your second cup?
- Why do you think the ball bounces? (The ball bounces because the polymer chain changes shape when it hits the floor, which makes it bouncy.)
- Does it bounce better on carpets or hard surfaces?
- What other polymers can you think of that are bouncy and stretchy? What do they have in common?

CREDITS: Babbledabbledo's 'DIY Bouncy Balls' available at https://babbledabbledo.com/simple-science-experiment-diy-bouncy-balls/

Lava Lamps

ACTIVITY DESCRIPTION

In this STEM activity, youth will create a layered 'lava lamp'. As part of the 'Invention & Imagination' unit, this experiment is designed to introduce youth to the density of liquids. This activity encourages the development of STEM literacy, inquiry, creativity and critical thinking skills.

SUPPLIES

- Large jar or bottle (e.g., soda bottle)
- Cookie sheet
- ¼ cup of corn syrup
- ½ cup of water
- Food coloring
- ½ cup of oil
- Measuring cups
- 1 Alka Seltzer tablet
- [Optional] Scientific Method sheet to record the steps and observations of the experiment: https://docs.google.com/file/d/0Bxq0hYp2IyG1QWVzQTIycG1KbGs/edit?pli=1

STEPS

- [Note: this activity includes an Alka Seltzer tablet and is best done with adult supervision and support.]
- Set your cookie sheet out on a table and place your jar in the middle of it. This will help with anything that may spill.
- Measure about ¼ cup of corn syrup and pour it into the jar.
- Measure about ½ cup of water and add it to your jar.
- Add 3 drops of food coloring.
- Measure ¼ cup of oil and add it to the jar. If your jar is not very full, you can add another ¼ cup of oil. Leave a little room at the top of your jar.
- Add 1 Alka Seltzer tab to your jar. Watch what happens! It creates bubbles like a lava lamp.
- Put the top back on your jar.

ADAPTATIONS

- If you are delivering the activity virtually, send home a kit with the activity supplies so that youth are all able to participate in the experiment alongside you.

EXTENSIONS

- Use different liquids to make another jar. Try using honey, light corn syrup, dish soap, olive oil, rubbing alcohol and water. Which liquids are denser and go to the bottom of the jar and which are less dense and stay near the top of the jar?
- Try making a rainbow density jar. Check out the following link for a step-by-step: https://www.playdoughtoplato.com/rainbow-jar/

QUESTIONS FOR DISCUSSION

- What do you think will happen when you add the different liquids to the jar? What is your hypothesis (guess)?
- What happens when you add liquids to your jar? They are separating and becoming layered in the jar.
- Why do you think the liquids are separating and becoming layered? The liquids separate because they have different weights. Density describes how heavy a liquid is.
- What other liquids might have different densities?
- What happened when you added the Alka Seltzer tablet? Why do you think that happened? When you added the tablet, it started dissolving and creating a gas.

CREDITS: Babbledabbledo's 'How to Do the Classic Layered Liquids Science Project' available at https://babbledabbledo.com/science-for-kids-layered-liquids/

Cloud in a Jar

ACTIVITY DESCRIPTION

In this STEM activity, youth will create a cloud in a jar. As part of the 'Invention & Imagination' unit, this experiment is designed to introduce youth to the science of weather and condensation. This activity encourages the development of STEM literacy, inquiry and critical thinking skills.

SUPPLIES

- A jar with a lid
- 1/3 measuring cup
- 1/3 cup of hot water (from the tap)
- Ice (5 – 7 cubes of ice, or enough to fill the lid of a jar)
- Hairspray
- Cloud in a Jar Handout

STEPS

- Have you ever looked up in the sky and wondered how clouds form? Clouds form when water in the air condenses. Condensation is the process of a gas changing into a liquid. In this activity, you will make your own cloud using a jar.
- Add 1/3 cup of hot water from the sink into the jar with a lid. Swirl it around in the jar to warm up the sides.
- Turn the lid upside down and place it on top of the jar.
- Add 5-7 ice cubes onto the lid and allow the ice to rest on the top of the jar for 20 seconds.
- Remove the lid, quickly spray a small amount of hairspray into the jar, and then replace the lid with the ice still on top.
- When you see a good amount of condensation (gas changing into a liquid) in the jar, remove the lid.
- When you added the warm water to the jar, some of it turned into vapor. Then, the vapor rose to the top of the jar, and it came into contact with the cold air from the ice cubes. When the vapor cooled, it also condensed. The cloud formed when you gave the condensation something to hold on to: hairspray! In nature, water vapor condenses with dust, air pollution, pollen, or other small particles in the air.

ADAPTATIONS

- If you are delivering the activity virtually, send home a kit with the activity supplies so that youth are all able to participate in the experiment alongside you. If you are not able to send home the supplies, youth can watch the facilitator conduct the experiment. Be sure to pause throughout for questions and discussion.
- If you are delivering the activity via take-home packets or digitally, encourage parents or caregivers to be involved so that youth can discuss the questions and their observations with someone.

EXTENSIONS

- Do the experiment over again, but this time change one part of the experiment. For example, what happens when you add more or less water, or use a smaller or bigger jar?
- Create a raincloud in a jar. Follow the instructions here: https://www.giftofcuriosity.com/make-a-rain-cloud-in-a-jar/

QUESTIONS FOR DISCUSSION

- Why do you think you added warm water then cold ice to the top of the jar?
- What happened inside the jar when the lid was on? (The water vapor rose to the top of the jar.)
- What happened when you removed the lid? Why do you think this happened? (The water condensed with hairspray and formed a cloud.)
- Where else have you seen condensation before (ex. bathroom mirror after a shower)?

CREDITS: Gift of Curiosity's 'Weather Science' available at https://www.giftofcuriosity.com/weather-science-how-to-make-a-cloud-in-a-jar/

Cloud in a Jar Handout

Step 1: Add 1/3 cup of hot water into the jar with a lid. Swirl it around in the jar to warm up the sides. Turn the lid upside down and place it on top of the jar. Add 5-7 ice cubes onto the lid and allow the ice to rest on the top of the jar for 20 seconds.

Step 2: Remove the lid, quickly spray a small amount of hairspray into the jar, and then replace the lid with the ice still on top.

Step 3: When you see a good amount of condensation (gas changing into a liquid) in the jar, remove the lid.

Lemon Volcano

ACTIVITY DESCRIPTION

In this STEM activity, youth will use a lemon to make a volcano that erupts. As part of the 'Invention & Imagination' unit, this chemistry experiment is designed to build wonder and excitement while introducing youth to a chemical reaction that creates carbon dioxide. This activity encourages the development of STEM literacy, inquiry, creativity, and critical thinking skills.

SUPPLIES

- 2 lemons cut in half
- ½ cup baking soda
- Food coloring
- Dawn dish soap
- Plate or tray
- Small cup
- Spoon
- Lemon Volcano Handout

STEPS

- [Note for adults: Cut both lemons in half.]
- Squeeze 2 of your lemon halves into a small cup so that you have extra lemon juice.
- Place half a lemon on a plate or a tray. This will prevent a mess when the volcano erupts.
- Use the handle of your spoon to poke holes in the different sections of the lemon. See step 1 on the handout.
- Put a few drops of food coloring around the different sections of the lemon. You can use just one color or different colors. See step 2 on the handout.
- Pour some Dawn dish soap over the top of the lemon. See step 3 on the handout.
- Use a spoon to sprinkle baking soda over the top of the lemon. See step 4 on the handout. Save a little bit of your baking soda to add later. You can also use the handle to push some of the baking soda into sections of the lemon to help your eruption along.
- It will take a few minutes for the reaction to begin and your volcano to start to erupt.
- As it begins to erupt, you can use the handle of your spoon to push more the baking soda into the lemon more.
- After the first eruption has stopped, you can add more baking soda and pour your extra lemon juice on top to continue the reaction.

CREDITS: Little Bins for Little Hands' 'Erupting Lemon Volcano' available at https://littlebinsforlittlehands.com/erupting-lemon-volcano-chemistry/

ADAPTATIONS

- If you are delivering the activity virtually, send home a kit with the activity supplies so that youth are all able to participate in the experiment alongside you. If you are not able to send home the supplies, youth can watch the facilitator do the demonstration. Be sure to pause throughout for questions and discussion.

EXTENSIONS

- Try doing the same experiment with other citrus fruits like limes, oranges, and grapefruits. Which fruit has the biggest eruption?
- Work in groups to research the causes, composition, types of volcanoes and the impact of their eruptions. Then build a volcano with your group.
- For a number of lessons on volcanos, check out: https://www.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.lp_volcanoes/volcanoes/
- Check out the short film 'Working as a Volcanologist': https://www.youtube.com/watch?v=ADnh2FcZwLg
-

QUESTIONS FOR DISCUSSION

- What do you think will happen when you add the dish soap and baking soda to the lemon? Come up with a hypothesis (a guess).
- What happened when you added the baking soda to your lemon? Why do you think that happened?
- What surprised you?
- What made the lemon volcano erupt? The citric acid from the lemon juice reacts with the baking soda and creates carbon dioxide, which is a gas. The bubbling and fizzing that you see is the carbon dioxide.
- What did you like about the activity?
- What challenged you?
- What do you want to learn more about?

Lemon Volcano Handout

Step 1: Use the handle of your spoon to poke holes in the different sections of the lemon.

Step 2: Put a few drops of food coloring around the different sections of the lemon. You can use just one color or different colors.

Step 3: Pour some Dawn dish soap over the top of the lemon.

Step 4: Use a spoon to sprinkle baking soda over the top of the lemon.

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Georgia Statewide Afterschool Network
Hawai'i Afterschool Alliance
Idaho Afterschool Network
Afterschool for Children and Teens Now (ACT Now) Coalition (IL)
Indiana Afterschool Network
Iowa Afterschool Alliance
Kansas Enrichment Network
Kentucky Out-of-School Alliance
Louisiana Center for Afterschool Learning
Maine Afterschool Network
Maryland Out of School Time Network
Massachusetts Afterschool Partnership
Michigan After-School Partnership
Ignite Afterschool (MN)
Missouri AfterSchool Network
Mississippi Statewide Afterschool Network
Montana Afterschool Alliance
Beyond School Bells (NE)
Nevada Afterschool Network
New Hampshire Afterschool Network
New Jersey School- Age Care Coalition
NMOST (New Mexico Out of School Time) Network
New York State Network for Youth Success
North Carolina Center for Afterschool Programs
North Dakota Afterschool Network
Ohio Afterschool Network
Oklahoma Partnership for Expanded Learning Opportunities
OregonASK
Pennsylvania Statewide Afterschool/Youth Development Network
Rhode Island Afterschool Network
South Carolina Afterschool Alliance
South Dakota Afterschool Network
Tennessee Afterschool Network
Texas Partnership for Out of School Time
Utah Afterschool Network
Vermont Afterschool, Inc.
Virginia Partnership for Out-of-School Time
Washington Expanded Learning Opportunities Network
West Virginia Statewide Afterschool Network
Wisconsin Afterschool Network
Wyoming Afterschool Alliance

summer activity guide

Passion & Purpose

ages 13–15

G·san
GEORGIA STATEWIDE AFTERSCHOOL NETWORK

50 STATE AFTERSCHOOL NETWORK

ALACN
Alabama Afterschool Community Network

About the Summer Activity Guides

Summers are for fun and engaged learning. In 2020 as the impact of the pandemic is widely felt, summer opportunities will be different for young people, families, and afterschool and summer program staff. The Summer Activity Guides were developed to help engage youth with supportive adults in a range of places.

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The Guides include 150 original activities and challenges organized by four different age groups (5-9) (10-12) (13-15) (16-18). The activities are adaptable for in-person and virtual instruction, or a hybrid of both, as well as sent as take-home packets.

All activities should be safely executed and aligned with state and local health guidelines.

Telling My Story

ACTIVITY DESCRIPTION

In this art activity, teens will take pictures in and around their community to highlight different strengths and/or problems they see. As part of the 'Passion & Purpose' unit, this activity is designed to allow teens to express themselves and get engaged in their communities. This activity supports the development of creativity, social-awareness, perspective-taking, reflection, and problem-solving.

SUPPLIES

- Camera or phone/tablet with a camera
- Computer and/or printer
- Paper
- Pen/pencil

STEPS

- The goal of this project is to find out what you would like changed in your community to make it a better place.
- Choose an issue in your community to focus on – health, the environment, social justice, etc.
- Take pictures around your community that highlight both the strengths and challenges around your chosen issue.
- When taking pictures remember:
  - No trespassing, respect privacy, and get permission (if taking pictures of people)
- Once you are done taking pictures, select 3-4 photographs that you think really capture the strengths and/or challenges in your community.
- For each photograph, answer the following questions on a separate sheet of paper:
  - What do you see in this picture?
  - What is really happening in this picture?
  - How does this relate to your life?
  - Why does this strength or problem exist?
  - What can you do about this?
- Once you have answered these questions for each of your photos, put the photos and your answers to the questions into a PowerPoint or booklet to make them easy to share with peers.

ADAPTATIONS

- If teens do not have access to a camera, they can do this activity by walking around their community and writing down what they observe related to their chosen issue.

CREDITS

- Activity inspiration from photovoice.org

EXTENSIONS

- Share your photos and reflections with your friends or family members. What discussions do your photos spark? What can you all do together to positively impact your community?
- In addition to taking pictures, interview people from your community about the issues you notice. What are their insights?

QUESTIONS FOR DISCUSSION

- What did you learn about yourself and your community from this activity?
- What issue did you choose to focus on for your photos? Why?
- What is something you love about your community? Why?
- How do others view your community? Are their assumptions accurate? What can you do to change the way people view your community?
- Think about other communities you know and visit. What are similarities and differences to your community?

Kindness Counts

CHALLENGE DESCRIPTION

In this service-learning challenge, teens will complete various acts of kindness in their homes or communities. As part of the 'Passion & Purpose' unit, this challenge is designed to help teens feel empowered to create change in their community by building on the issues they highlighted in the "Telling My Story" activity. This challenge supports the development of empathy, respect for others, social awareness, and creativity.

SUPPLIES

- Items will vary based on what activities teens decide to do for their acts of kindness.

STEPS

- We can connect people and improve our communities through simple, kind gestures.
- Recall the issue(s) that you uncovered in the "Telling My Story" activity. Try to come up with small acts of kindness that you can do in and around your community to address these issues.
- For example, if your issue was the environment, your acts of kindness could be planting a tree in your neighborhood, picking up garbage on the side of the road, reducing the amount of plastic your family uses, or starting a community garden.
    - For more idea inspiration visit www.randomactsofkindness.org/kindness-ideas
- Sticking to your issue, create a list of at least 5 different acts of kindness you can do in your home or community to address this problem.
    - Keep your resources in mind – if necessary, make your ideas low-budget.
- Over the next 2-3 weeks, aim to implement all 5 of these acts of kindness from your list in your home or community.
    - If your activities require ongoing maintenance (like a community garden), make sure you have a plan to follow up.
    - Enlist the help of others when needed.

ADAPTATIONS

- If facilitating in-person, teens can work in large or small groups to come up with acts of kindness and create a plan to implement these acts together.
- If facilitating virtually, make sure teens have a time to come together to share their acts of kindness with their peers.

EXTENSIONS

- Enlist your friends or family members to do these acts of kindness with you.
- Take a picture of each of your 5 acts of kindness. Use these pictures as a photo journal, post them on social media, or share them with friends and family to inspire everyone to be more kind!
- Enjoying these acts of kindness? Extend this challenge by coming up with even more ideas for acts to do around your community over the next several weeks.

CREDITS

- Activity inspiration from randomactsofkindness.org; image from pressfoto.com

What's My Purpose?

ACTIVITY DESCRIPTION

In this social-emotional learning (SEL) activity, teens will complete a worksheet to help them discover their purpose in life. As part of the 'Passion & Purpose' unit, this activity builds on the 'Telling My Story' activity and is designed to help teens reflect upon their interests, discover their strengths, and understand how their passions can influence their plans for the future. This activity supports the development of self-awareness, goal setting, and reflection.

SUPPLIES

- 'What's My Purpose?' worksheet
- Pen/pencil

STEPS

- Discovering your strengths and passions can help you form a sense of identity, plan for the future, and understand your purpose in life.
- Make sure you have your photos and reflections from the 'Telling My Story' activity available.
    - Remind yourself of the community need you identified in that activity (the environment, health, etc.)
- Using the attached 'What's My Purpose?' worksheet, answer the first 10 questions fully.
- After you have answered the first 10 questions, complete the worksheet by reviewing your answers to those questions to help you with the last page of the worksheet.
    - "What are my strengths/skills?"
    - "What are my passions/interests?"
    - "What is a need in my community?"
- Answering these final questions will lead you to discovering your purpose.
- It's okay to still be unsure of your passions or purpose by the end of this activity.

ADAPTATIONS

- If facilitating virtually or in-person, create time for teens to share their passions, strengths, and purpose with their peers. Facilitate discussion between those with similar and/or different responses.
- If facilitating digitally or using take-home packets, encourage teens to share with their friends or family.

CREDITS

- Image from katemangostar

EXTENSIONS

- Compare your strengths, passions, and purpose results from this worksheet to your results from the 'My Personality' activity in Unit 1. What similarities are there? What differences? How can your personality type help you achieve your purpose?

QUESTIONS FOR DISCUSSION

- What did you learn about yourself from this activity?
- Were you surprised by anything you learned from this activity?
- How can you use your strengths and passions to improve your community?
- What pressure do you feel to discover your passions and purpose?
- How can you manage your own expectations, and the expectations of others, when it comes to finding your purpose?

Worksheet: What's My Purpose?

Answer the following questions to identify your strengths and passions

1. **I lose track of time when I am…**

_____

_____

_____

2. **If I knew I couldn't fail, I would…**

_____

_____

_____

3. **I am great at…**

_____

_____

_____

4. **Things that come naturally or easy to me are…**

_____

_____

_____

5. **I feel good about myself when I am…**

_____

_____

_____

Worksheet: What's My Purpose?

6. **Topics I enjoy learning about include…**

_____

_____

_____

7. **My favorite things to do in my free time are…**

_____

_____

_____

8. **If I could have any job or career it would be…**

_____

_____

_____

9. **I would regret not being able to do these things during my lifetime…**

_____

_____

_____

10. **People who inspire me are…**

_____

_____

_____

Worksheet: What's My Purpose?

- **Based on my responses to the 10 questions above, what are my top 3 strengths and/or skills?**

  1. _____
  2. _____
  3. _____

- **Based on my responses to the 10 questions above, what am I passionate about?**

  _____

  _____

- **Based on the "Telling My Story" activity, what is a need in my community?**

  _____

  _____

- **Use the Venn Diagram below. Taking your strengths, passions, and a need in your community into account, what do you think your purpose is?**

  _____

  _____

My Voice Matters

ACTIVITY DESCRIPTION

In this service-learning activity, teens will research an issue that they are passionate about and develop a plan to address that issue. As part of the 'Passion & Purpose' unit, this activity builds on the 'What's My Purpose?' activity and is designed to help teens understand the causes of various societal issues and empower them to create change in their communities. This activity supports the development of problem-solving skills and ethical responsibility.

SUPPLIES

- 'Service-learning Plan' worksheet
- Pen/pencil
- Access to the internet

STEPS

- Refer to your 'What's My Purpose?' worksheet from the 'What's My Purpose?' activity.
- From that worksheet, identify which issue you said you are passionate about.
    - This issue could be the environment, health, social justice, education, etc.
- For this activity, you will research that issue further. You can use the internet for your research, or talk to people who are experts on your chosen issue.
- Answer the first 7 questions on the attached 'Service-learning Plan' worksheet.
- Once you have answered the 7 questions, go to the next page of the worksheet and develop the plan for your chosen service-learning project based on your research.
    - Your project could be a fundraiser, supply drive, awareness building campaign, volunteering with another organization, or anything else of your choosing.
- After you have completed the entire worksheet, share what you learned about your issue and the plan for your service-learning project with your peers.

ADAPTATIONS

- If teens are having a hard time coming up with a project idea, allow them to work with a peer.
- If facilitating in-person, teens can do a group service-learning project. Ensure all teens have a say in the chosen topic, research, and planning.

CREDITS

- Image from freepik.com

EXTENSIONS

- In the next activity in this unit you will be putting your service-learning project into action!
- Enlist your friends and family to assist with your service-learning project. They could serve as volunteers, help spread the word, secure supplies, etc.

QUESTIONS FOR DISCUSSION

- What did you learn about your chosen issue?
- Were you surprised by anything you learned about your issue?
- Have you ever led or participated in a service-learning project before? How was that experience?
- How do you feel about leading a service-learning project?
- How can you use your strengths to make sure your service-learning project is successful?

Worksheet: Service-learning Plan

Answer the following questions about your selected issue

1. **What is the issue you will be researching?**

_____

2. **What is the history of this issue?**

_____

_____

_____

_____

_____

_____

3. **How does this issue impact you or your community specifically?**

_____

_____

_____

_____

_____

_____

4. **What will it take to solve this issue?**

_____

_____

_____

_____

_____

_____

Worksheet: Service-learning Plan

5. **What is already being done to address this issue, if anything?**

6. **What reputable organizations are doing work to address this issue?**

7. **What can you do to address this issue in your community? What can you do to address this issue on a national level?**

Worksheet: Service-learning Plan

Complete the following worksheet to create a plan for your service-learning project

What issue is your service-learning project going to address?

_____

What is the goal of your service-learning project? What do you hope to achieve?

_____

_____

Provide an overview of your service-learning project:

_____

_____

How will you know if your service-learning project has been successful?

_____

_____

What is the date and time that your project will take place? Will it be an ongoing project?

_____

What materials, supplies, or equipment will you need for your project? Where will you get those items?

_____

_____

Who do you need permission or approval from to implement this project?

_____

What local or national organizations can you partner with to help with your project?

_____

_____

How will you advertise your project?

_____

_____

How will you find volunteers for your project, if needed?

_____

_____

I Can Make a Difference

ACTIVITY DESCRIPTION

In this service-learning activity, teens put their service-learning project into action. As part of the 'Passion & Purpose' unit, this activity builds on the 'My Voice Matters' activity and is designed to provide teens with a hands-on learning experience and a chance to get engaged in their community. This activity supports the development of perspective-taking, respect for others, social engagement, and reflection.

SUPPLIES

- 'Service-learning Plan' worksheet from the 'My Voice Matters' activity
- Any materials needed for your service-learning project

STEPS

- Make sure you have your completed 'Service-learning Plan' worksheet from the 'My Voice Matters' activity.
- Reference the last page of the worksheet where you developed the plan for your service-learning project.
- Make sure all plans you laid out in your 'Service-learning Plan' worksheet are in place for your project and you have any necessary supplies.
- Time to do you service-learning project!
  - Your project may be a one-time event or an ongoing project.
- Be sure to document your service-learning project through pictures or video so you can share your experience with others.
  - If you are volunteering with an organization, they may not allow pictures or videos. Make sure to check their policies.
- Share your service-learning experience with your peers.

ADAPTATIONS

- If teens are unable to physically volunteer somewhere, they can still make a difference through various online methods such as hosting an online fundraiser, starting an online petition, or starting an awareness-building campaign on social media.

CREDITS

- Image from freepik.com

EXTENSIONS

- Celebrate your hard work! If there were other volunteers at your project, celebrate with them as well.
- Create a video or PowerPoint presentation to summarize your service-learning project. You can use this to share with others and encourage them to volunteer in the future.

QUESTIONS FOR DISCUSSION

- What was it like to volunteer for a cause that is important to you?
- Did anything about your service-learning experience surprise you?
- What did you learn anything about yourself through this experience?
- Do you think your service-learning project was a success? Why or why not?
- How can you continue working to address your selected issue?
- How will you let others know about your selected issue? How can you engage others in this cause?

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summer activity guide

Invention & Imagination

ages 16–18

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GEORGIA STATEWIDE AFTERSCHOOL NETWORK

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Wildlife Journal

CHALLENGE DESCRIPTION

In this STEAM challenge, teens will keep an illustration journal of various wildlife they see in and around their community. As part of the 'Invention & Imagination' unit, this challenge is designed to help teens learn about the different types of animals that live in their community. This challenge supports the development of creativity, critical thinking, and problem-solving skills.

SUPPLIES

- A journal, notebook, or loose-leaf paper
- Pen or pencil
- Markers, colored pencils, or crayons

STEPS

- Nature is all around us! Have you ever stopped to look at the different animals that live in your neighborhood?
- In this challenge you will keep a wildlife illustration journal where you will draw pictures of the different animals you see around your community. This can include different types of birds, insects, squirrels, or anything else you come across.
- Take about 30 minutes to walk around your community with your journal and a pen or pencil.
- Whenever you see a new animal, draw a picture of it in your journal and write down any identifying characteristics (size, color, shape, what it was doing or eating, etc.)
    - If you'd like, you can also add color to your illustrations for more detail
- After you have finished your walk, try to identify the animals you found using the following website: https://www.backyardnature.net/i-ident.htm
- Once you've identified the animals, answer the following questions in your journal:
    - What is this animal called?
    - What does this animal eat?
    - What is unique about this animal?
- Continue your wildlife journal walks every day for at least a week (feel free to extend this over a couple of weeks if you'd like!)

CREDITS

- Image from katemangostar

ADAPTATIONS

- Teens can also take pictures of the various animals they find and create a digital journal using a Word document.
- If facilitating in-person, teens can work together by walking in the community and researching the animals as a group.
- If teens cannot go outside, they can research animals that are native to their area to complete this challenge.

EXTENSIONS

- You can extend this challenge by going to a different community to see how the animals differ in that area.
- Explore how the animal species you observed impact your community. Are they carnivorous, pollinators, etc.?
- Don't have a journal or notebook? Make your own! Staple or tie together loose-leaf paper and create a cover for your journal that you can decorate.
- This challenge can also be done with plants! Keep an illustration journal of the different animals you see around your community, such as trees, flowers, etc.

Melted Crayon Art

ACTIVITY DESCRIPTION

In this art activity, teens will create an abstract art design by melting crayons. As part of the 'Invention & Imagination' unit, this activity supports the development of creativity, self-expression, problem solving, and creative inquiry.

SUPPLIES

- Crayons
- Canvas or cardstock
- Pencil sharpener, food grater, or knife
- Wax paper
- An iron or hairdryer

STEPS

- In this activity you will create melted crayon art in the design of your choosing.
- Take out your crayons and select the colors you would like to use. You can use the whole rainbow or go with a specific palette (such as only blues and purples).
- Use a pencil sharpener, grater, or similar to create piles of colorful crayon shavings.
- On your canvas or paper, lay out your design using the crayon shavings. You can create patterns, shapes, designs, or make it random!
- Cover your design with wax paper – this stops the pieces from moving around or flying off the canvas.
- Use your iron or hairdryer to melt the crayon shavings. Keep melting until you have your desired design.
    - Be careful, this can get hot and wax can splatter!
- Let the wax dry for at least 20 minutes to ensure it is completely cooled and hardened.
- Remove the wax paper and admire your finished work of art.

ADAPTATIONS

- If facilitating virtually or digitally, create a crayon art to show teens as an example.
- If facilitating virtually, create a time for teens to share their crayon art creations with one another.

EXTENSIONS

- Melt your crayons on black or colored cardstock, rather than white, for a different effect.
- Draw images underneath or on top of your melted crayons to add to the design. You can cut out images from magazines and glue them to your canvas before melting your crayons.
- There is a whole world of crayon-related art you can try! Some examples include creating candles out of melted crayons, crayon jewelry, crayon ornaments, etc.
    - Check out this site for more inspiration: https://heatherednest.com/melted-crayon-art-craft-ideas/

QUESTIONS FOR DISCUSSION

- What did you learn from this activity?
- What was the inspiration for your design? Was it hard to create? Why or why not?
- Did you make any mistakes? How did you fix those mistakes?

Build Your Own Speakers

ACTIVITY DESCRIPTION

In this STEM activity, teens will build a speaker for their cellphone or MP3 player using household objects. As part of the 'Invention & Imagination' unit, this activity supports the development of analyzing situations, solving problems, creativity, design thinking, and critical thinking.

SUPPLIES

- An empty paper towel roll
- A paper or plastic cup
- Scissors
- Cellphone or MP3 player
- Markers or colorful tape (optional)

STEPS

- In this activity, you will build your own speakers to use with your cellphone or MP3 player.
- Trace the open end of your paper towel roll onto the side of your cup, towards the bottom of the cup.
- Cut a hole the exact size of the circle you traced, so the paper towel roll fits snugly into the hole.
- Cut a square slit the width of your cellphone or MP3 player along the other edge of the paper towel roll that is not inserted in the cup.
- Stick the speaker end of your cellphone or MP3 player into the slit in the paper towel roll.
- Play some music and hear your speakers in action!
- So, how does this work? When you place your phone speaker into the paper towel roll, the roll feeds sound into the cup. This directs the sound out at a smaller angle than it would have come out without the speaker. Sound directed into a smaller angle sounds louder.
    - For example, think of how your voice sounds louder when you speak into a megaphone or a rolled-up piece of paper – this is the same concept!

ADAPTATIONS

- If facilitating virtually, create a space for teens to show off their speakers and try them out with their peers.

EXTENSIONS

- Decorate the empty paper towel roll and cup with a fun or colorful design to personalize your speakers.
- Experiment with creating speakers that have cups on both ends of the paper towel roll, and prop your cellphone upright in the middle of the roll. Is the sound louder?
- Look up ways to make a DIY tripod or selfie-stick for your cellphone.
- Explore how your cellphone or computer speakers work.

QUESTIONS FOR DISCUSSION

- What did you learn from this activity? Did anything surprise you?
- What modifications could you make to these speakers to improve how they work?
- Would the sound be different if you used a shorter tube like a toilet paper roll instead of a paper towel roll? Why or why not?
- Would the sound be different if you used glass or wooden bowls instead of paper cups? Why or why not?

CREDITS

- Activity inspiration from https://www.thecrafttrain.com/diy-iphone-speaker/

Wind-Powered Vehicle

ACTIVITY DESCRIPTION

In this STEM activity, teens will use design and create a wind-powered vehicle using household objects. As part of the 'Invention & Imagination' unit, this activity supports the development of analyzing situations, solving problems, creativity, design thinking, and critical thinking.

SUPPLIES

- Any materials found around the home, such as tape, paper, pens, string, glue, clips, scissors, rubber bands, cardboard, popsicle sticks, skewers, straws, etc.
- Fan or hairdryer (optional)

STEPS

- In this activity, you will design and create a wind-powered vehicle that can move on its own.
- Collect all the materials that you will need to build your vehicle.
- Design and build a vehicle that is powered by only the wind.
    - Your vehicle can be any size or shape, as long as it has 4 wheels and can move without be touched, pushed, or rolled downhill.
- Once your vehicle is ready, place it on a flat, smooth surface and see how far it travels.
    - To create "wind" you can blow on your vehicle, or use a fan or hairdryer.
    - If your wind-powered vehicle does not move, reassess your design and make any necessary modifications to ensure it works.
- Take a photo or video of your vehicle in action to share with others!

ADAPTATIONS

- If facilitating virtually, create a time for teens to share their vehicle designs with one another and show off how their vehicle moves.
- If teens need inspiration, have them look up videos of other wind-powered vehicles.

EXTENSIONS

- Decorate your vehicle with a fun design.
- Create a vehicle using another form of sustainable energy, such as solar power.
- Research famous alternative energy scientists or companies famous for using alternative energy, such as Gerald Pearson, Lewis Howard Latimer, or Tesla. What were their inventions? How have they influenced today's society?

QUESTIONS FOR DISCUSSION

- What did you learn from this activity? What was challenging about it?
- What did your vehicle look like? What were the main features of your design?
- Was your overall vehicle design successful? What worked? What didn't work?
- Would it have been helpful to have different materials? If so, what?
- How did the design of your vehicle compare to your peers' vehicles? What were the differences/similarities?

CREDITS

- Image from CT After School Network STEM Mini-Conference

Design for My Community

ACTIVITY DESCRIPTION

In this STEM activity, teens will create an invention that helps to solve a problem they have identified in their community. This activity also builds on themes discussed in the 'Passion & Purpose' unit. As part of the 'Invention & Imagination' unit, this activity supports the development of analyzing situations, solving problems, perspective taking, and creativity.

SUPPLIES

- Any materials found around the home, such as tape, paper, pens, string, glue, clips, scissors, rubber bands, garbage bags, etc.

STEPS

- In this activity, you will think of a challenge or issue in your community. Think back to the community issue you identified in the 'Passion & Purpose' unit.
- Once you have your issue in mind, think of an invention that could help fix that problem. For example:
  - If you notice an issue with the environment, you could design something to keep your community clean such as a recycling center or robot trash collector.
  - If you notice an issue with accessibility for individuals with disabilities, you could design ramps to help people with wheelchairs navigate your community, or a system to communicate with people with vision or hearing impairments.
- Once you have decided upon your invention, write down what specific qualities the invention should have and what it should be able to do.
- Collect materials from around your home and build a prototype of your invention.
- Test your invention. Does it work how you wanted? Make any necessary improvements or changes.

ADAPTATIONS

- If teens do not have the necessary materials to build a prototype, they can draw a detailed image of their invention with a description or labeled parts instead.

CREDITS

- Image from unsplash

EXTENSIONS

- Create a 'pitch' for your invention. Come up with a 2-minute presentation about what issue your invention addresses, how it works, and why it will make a difference. Record your pitch or present it for your peers.
- What are the next steps you would need to take in order to get this invention funded and developed? Create a plan to make this creation a reality.

QUESTIONS FOR DISCUSSION

- What did you learn from this activity? Did anything surprise you?
- What was the community issue you were trying to address? How did you come up with the idea for your invention?
- Was your invention successful? Why or why not?
- How can you continue working to address your selected community issue?
- Have you ever considered a career as an engineer or designer? Why or why not?

The 50 State Afterschool Network

The Summer Activity Guide has been developed for the 50 State Afterschool Network with leadership from the Georgia Statewide Afterschool Network to engage and support children and youth nationwide.

In each state, the afterschool network is broadening opportunities for youth. Seeking equitable outcomes for underserved children to succeed in school and future jobs, a statewide afterschool network brings together cross-sector leaders with a common vision and coordinated strategy to advance quality afterschool and summer learning programs

Alabama Afterschool Community Network
Alaska Afterschool Network
Arizona Center for Afterschool Excellence
Arkansas Out of School Network
California AfterSchool Network
Colorado Afterschool Partnership
Connecticut After School Network
Delaware Afterschool Network
Florida Afterschool Network
Georgia Statewide Afterschool Network
Hawai'i Afterschool Alliance
Idaho Afterschool Network
Afterschool for Children and Teens Now (ACT Now) Coalition (IL)
Indiana Afterschool Network
Iowa Afterschool Alliance
Kansas Enrichment Network
Kentucky Out-of-School Alliance
Louisiana Center for Afterschool Learning
Maine Afterschool Network
Maryland Out of School Time Network
Massachusetts Afterschool Partnership
Michigan After-School Partnership
Ignite Afterschool (MN)
Missouri AfterSchool Network
Mississippi Statewide Afterschool Network
Montana Afterschool Alliance
Beyond School Bells (NE)
Nevada Afterschool Network
New Hampshire Afterschool Network
New Jersey School- Age Care Coalition
NMOST (New Mexico Out of School Time) Network
New York State Network for Youth Success
North Carolina Center for Afterschool Programs
North Dakota Afterschool Network
Ohio Afterschool Network
Oklahoma Partnership for Expanded Learning Opportunities
OregonASK
Pennsylvania Statewide Afterschool/Youth Development Network
Rhode Island Afterschool Network
South Carolina Afterschool Alliance
South Dakota Afterschool Network
Tennessee Afterschool Network
Texas Partnership for Out of School Time
Utah Afterschool Network
Vermont Afterschool, Inc.
Virginia Partnership for Out-of-School Time
Washington Expanded Learning Opportunities Network
West Virginia Statewide Afterschool Network
Wisconsin Afterschool Network
Wyoming Afterschool Alliance