

**Hands-On
Learning**

Week 8

**2nd
Grade**

Independent Study Packet



**Educational Activities
to Create, Problem Solve,
Move, and Have Fun**

Table of Contents

This Activity Packet is a collection of open-ended learning challenges that encourage your child to create, build, design, and move. For these activities, you will need materials like paper, tape, markers, and scissors. You will also need other materials, but feel free to substitute with what is around your home.

We recommend allowing your child to choose 2-3 activities per day. Each packet contains a selection of "choice boards," and these can be used over

multiple days. You may also want to review the packet together and make a week long plan using the planner included, or your own.

Brain Breaks can be used throughout the week to support your child in moving their body when they need to take a break from focusing on academic work. The STEM Design Challenge: Brainstorm and Reflection Sheet can be used to help your child dig deeper into the open-ended learning challenges.

Weekly Planner	Page 3
Brain Breaks	Pages 4 - 5
STEM Design Challenge: Brainstorm and Reflection Sheet	Pages 6 - 7
At-Home Activity Choice Board	Page 8
Building Brick Challenge: Build a Boat	Page 9
Dance Party Choice Board	Page 10
Hop in Order	Page 11
Chore Obstacle Course	Pages 12 - 13
Chalk Walk Choice Board	Page 14
Build a Tunnel	Pages 15 - 16
Design Challenge: Gumdrops Structures	Pages 17 - 18
STEM Design Challenge Cards	Pages 19 - 20
Mix Monochromatic Colors	Page 21
Tinfoil Painting	Pages 22 - 23

WEEKLY PLANNER



Name: _____

Month: _____ Days: _____ - _____ Year: _____

MONDAY

Course activities:

To do list:

_____	<input type="checkbox"/>
_____	<input type="checkbox"/>
_____	<input type="checkbox"/>
_____	<input type="checkbox"/>
_____	<input type="checkbox"/>

TUESDAY

Course activities:

To do list:

_____	<input type="checkbox"/>
_____	<input type="checkbox"/>
_____	<input type="checkbox"/>
_____	<input type="checkbox"/>
_____	<input type="checkbox"/>

WEDNESDAY

Course activities:

To do list:

_____	<input type="checkbox"/>
_____	<input type="checkbox"/>
_____	<input type="checkbox"/>
_____	<input type="checkbox"/>
_____	<input type="checkbox"/>

THURSDAY

Course activities:

To do list:

_____	<input type="checkbox"/>
_____	<input type="checkbox"/>
_____	<input type="checkbox"/>
_____	<input type="checkbox"/>
_____	<input type="checkbox"/>

FRIDAY

Course activities:

To do list:

_____	<input type="checkbox"/>
_____	<input type="checkbox"/>
_____	<input type="checkbox"/>
_____	<input type="checkbox"/>
_____	<input type="checkbox"/>

WEEKEND ACTIVITIES:

<input type="checkbox"/>	_____
<input type="checkbox"/>	_____
<input type="checkbox"/>	_____
<input type="checkbox"/>	_____
<input type="checkbox"/>	_____

Brain Breaks

What are brain breaks? Young learners often struggle to stay focused for long periods of time. Brain breaks are short periods of time when we take a step away from the routine work we are doing. They are quick and effective ways to energize and refresh our thinking.

★ Research indicates that brain breaks improve concentration and relieve stress. They increase productivity and provide children with opportunities to develop their social skills and creativity through kinesthetic activities. They also boost brain function! Use these short brain breaks to help refocus before getting back to work.

- 1. Dance Party:** Put on some fun music and dance!
- 2. Keep It Up:** Get a beach ball and keep it from hitting the ground. Add an additional ball to make it even more fun!
- 3. Jump Counting:** Have your child count while jumping with each count. Challenge them by counting by twos, fives, or tens!
- 4. “Head, Shoulders, Knees, and Toes”:** Use a movement song like this one to get your child moving. For added fun, see how fast you can go! This is a great one for young learners.
- 5. Freeze Dance:** Similar to the Dance Party brain break, this one incorporates listening skills. When the music stops, your child must freeze and hold their position until the music begins again.
- 6. Physical Challenges:** Engage your child in the classic challenge of rubbing their belly, and patting their head. Another version to try is to grab your nose with your left hand, and grab your left ear with your right hand.

Brain Breaks

7. **Race in Place:** Have your child stand up and run in place. On your signal, your child will get back to work.
8. **Simon Says:** Play this oldie but goodie to see how well your child can follow specific directions...but only if Simon Says!
9. **Rock, Paper, Scissors:** Teach your child to play this fun, quick game and see who wins! Best out of three.

For another approach to brain breaks, try these:

- **Drawing or coloring**
- **Mental math:** Give a sequence of instructions for learners to follow while doing math in their head.
- **Invisible pictures:** Have your child draw an invisible picture in the air and try to guess what it is.
- **Story starters:** Begin a story for one minute and let your child finish the story on their own.

STEM Design Challenge

Brainstorm and Reflection Sheet



STEM design challenges are prompts that encourage learners to build something new for a specific reason or purpose. They include ideas from science, technology, engineering, and mathematics.

Directions: Complete this worksheet to help you think about your creation during your design process. Write down information or use check marks to show you have finished the step.

1. Plan: Sketch or write about what you will create.	What is the challenge?	
	Materials:	Ideas:
	Blueprint: Sketch what your creation will look like.	
2. Create: Build your creation based on your plan.		
3. Play: Try out your creation. Swap with another person so they can try it too. Ask them what they would change to make your creation better.		

STEM Design Challenge

Brainstorm and Reflection Sheet



4. **Adjust:** Make changes to your creation if you need to.

What changes did you make? Why?

5. **Share:** Show off your creation! Draw a picture of your finished design.

... and Reflect: Jot down notes about what you will share.

What worked for you? What was a challenge you had during your design process? What did you learn? How did you make changes based on what you learned?

At-Home Activity Choice Board

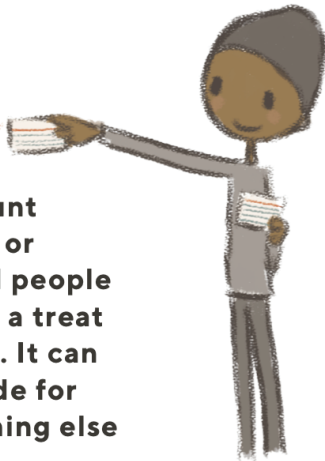
Directions: Choose one or more activities to complete at home.



Take a walk around the block and imagine what is a bird's view of your neighborhood. Look on Google Maps in Satellite mode to envision the bird's view. Then draw a map of your neighborhood, from a bird's perspective.



Create an indoor competition. How many events will you have? What tools do you need? How long will it last? Establish the rules and expectations of the competition, gather the supplies, and set-up the fun. Take pictures or a video to capture the competition!



Design a scavenger hunt where you use riddles or rhyming words to lead people to the next clue. Have a treat at the end of the hunt. It can be something you made for the players, or something else they would enjoy.



Make a game to play with other family members with objects you have around the house. Write down the directions for the game, and be sure to include how to win!



Make a travel brochure for an imaginary city. What will people want to see or do? It can be realistic or a fantasy place you would like to visit.

Draw a chalk game board outside. It can be as simple or as complicated as you can imagine. How many players will you have, and what are some tricks to win faster?



Building Brick Challenge: Build a Boat



Develop your child's mathematical and engineering skills with this fun building brick challenge.

In this activity, your learner will be challenged to create a boat out of building bricks. They can even test out their design to see if it floats! This activity is a great way to “seas” the day by encouraging creativity and problem-solving skills in your child.

What You Need:

- Building bricks of any size and shape

What You Do:

1. Ask your learner, “Can you build a boat out of building bricks?”
2. Encourage your child to make a **plan**. Ask, “How many bricks do you think you will need?” or “Do you want to draw a picture of your boat first?”
3. Give your child time to **create** their design. Ask, “Do you need help?” (They should ultimately be doing most of the building.)
4. Have designers **play** with their new design. Ask, “Do you think your boat will float in water?” Have them test their boat in the water.
5. After testing out the design, ask your learner what ways they can **adjust** their design. For example, “Is there anything you want to change about the boat?” or “What do you think you can do to make it float?”
6. Challenge designers to **share** their new designs. They can record a video, or write a few sentences about the design and include a drawing or picture of it. Prompt them to include details about the boat and any challenges they had while building it.

Amplify this challenge! Choose one or more of the following questions to add a new level of difficulty to the challenge:

- Can you make your boat float? (If it didn't float before)
- Can you make your boat float with three toys in it?
- Can you time how long your boat stays afloat?

Dance Party Choice Board

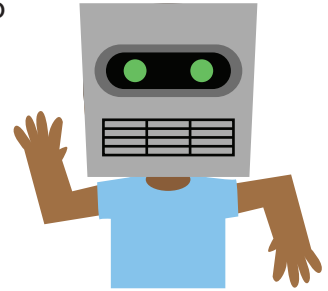
Directions: Choose a song and use one of the following to get your body moving!



Join the ballet: Dress up in your fanciest clothes and become a ballerina on the stage.



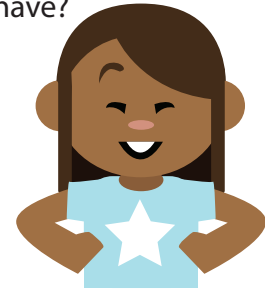
Robot dance: Turn into a mechanical robot and see who can do the most realistic robot moves!



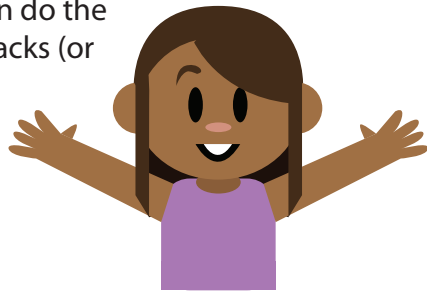
Spotlight dance: Grab a flashlight and take turns dancing in the spotlight.



Dance like a superhero: What kind of superpowers do you have? Incorporate your superpower into your dancing.



Jump to the beat: Put on some upbeat music and see who can do the most jumping jacks (or jumps) for the duration of the song. The winner chooses the next move!



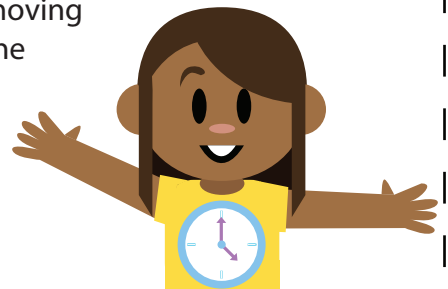
Scarf or ribbon dance: Grab some scarves, ribbons, or long pieces of fabric and dance to the music using your materials as a prop.



Animal dance: Turn on some lively instrumental music and turn into your favorite animal on the dance floor!



Slow motion dance: Dance as slowly as you can while still moving your body for the entire song.



Hop in Order



Physical activity comes in many shapes and forms, and often in the entertaining form of games! Physical activity strengthens muscles, bones, and joints, while also supporting mental health, sleep, and other aspects of life. Here is a fun at-home physical activity that encourages movement while also working on literacy or math skills! In this activity geared towards children from preschool through second grade, children will hop in order of game cards of your own making—be it alphabetical order, numerical order, sentence order, skip-counting, story sequence, and more. The variations are endless, and children will enjoy the combination of movement and learning!

What You Need:

- Index cards or blank paper cut down to card size
- Markers

What You Do:

1. Get out 5–10 index cards (or small pieces of paper), and write either letters of the alphabet (lowercase or uppercase), numbers (e.g., between 0-20, 100-150, etc.), or sight words on each card.
2. Choose a spot—either inside or outside—where there is enough space to move around without knocking anything over.
3. Place the cards on the ground in order (such as alphabetical or numerical) and far enough apart to encourage mid-size jumps.
4. Invite your child to start at the beginning and hop to the end in the given order or sequence, reading each card aloud. For older kids, you can give them math problems for them to solve (e.g., have them hop to the sum of $5 + 5$) or practice reading skills by laying out words that create complete sentences.

Get creative and use different areas around your home and incorporate different movements for subsequent rounds (e.g., tiny hops, jumping on one foot, walking backward). Invite your child to take part in the planning for siblings or other family members, and consider playing as a family!

Chore Obstacle Course



Staying at home doesn't have to stop your children from being active! This chore obstacle course will keep your child entertained and engaged, while also helping them improve their efficiency at everyday tasks. They might even get a taste for helping out around the house! This obstacle course is easily adaptable and can be repeated as many times as you need help around the house! For an added challenge, assign time reductions/increases based on the quality of work. For example, if the laundry is folded well, let your child subtract 10 seconds from their final time. Designed for second and third graders, this activity puts a fun twist on everyday tasks while keeping children active, productive, and engaged.

What You Need:

- Different chores that require different rooms, such as washing dishes, doing laundry, folding clothes, cleaning up their room, etc.
- Some disposable water bottles or recyclables and a trash can/recycling bin
- Pen and paper
- Painter's tape or something to mark spots on the floor
- Stopwatch

What You Do:

1. Come up with a list of chores for your child to complete. There should be one chore per room, so that your child has to move from room to room. These chores can be both ones your child is familiar with, and ones they've never done before.
2. Designate a start point, end point, and the path in between. Ensure there is some clear open space between the rooms for your child to do physical activities in. Also, make sure the path is not around sharp edges or anything that could be a hazard if your child falls or runs into something. If necessary, make a "no running between stations" rule!
3. Walk your child through each chore station and physical activity station (you can mark the stations with painter's tape if you like). The actual chores and physical activities can be changed to fit you and your child best! You can use the suggestions here or come up with your own.
4. Here is a sample chore obstacle course to get your started:
 - Start in your child's room. Begin the timer. Have your child start with 20 jumping jacks.

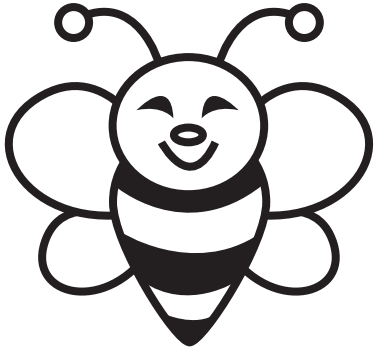
Chore Obstacle Course



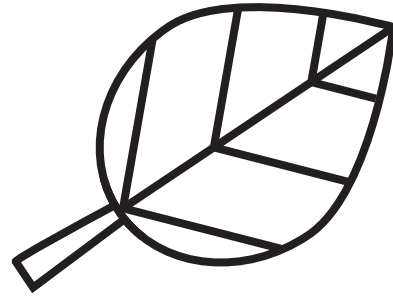
- Then they will grab their hamper, go to the laundry room, put their dirty clothes in the laundry machine, and start the washer. Then they will move to an open space and balance on each leg for 15 seconds. They can't leave that room until they do 15 seconds on each leg!
 - Next, have them go to the kitchen and put away the dishes from the dishwasher. They will then move to an open space and complete 10 push-ups!
 - Then, have them hop on one leg to another room to fold laundry. If they put their other foot down on their way there, they have to go back to the kitchen and start their hopping again! Once they've folded the laundry, they will do 10 sit-ups!
 - Last, have them hop on the other leg back to the kitchen, and take out the trash! Once the trash can lids close, stop the timer.
5. Record the time it took them to complete the chore obstacle course. See if your child can improve on their time each time they do the course!

Chalk Walk Choice Board

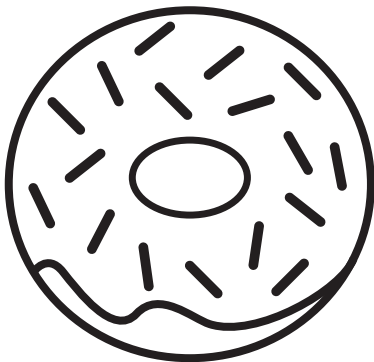
Directions: Take a walk around the neighborhood. Choose one of these encouraging drawing options and draw it on the sidewalk in your neighborhood. Color in the affirmations on the choice board when you finish drawing them.



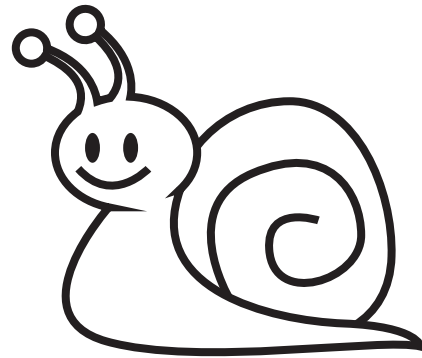
Bee Kind



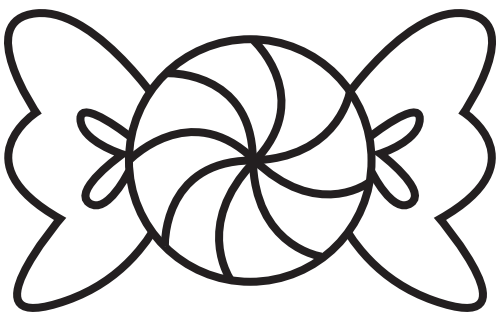
We be-leaf in you!



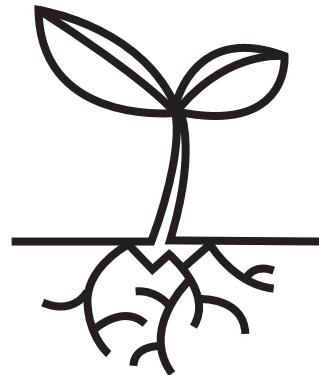
Donut give up!



You snailed it.



Daily Encourage-Mint



We're rooting for you!

Build a Tunnel



If your child has ever ridden in the subway or metro, or gone on a long road trip, they have probably traveled through a tunnel. Tunnels are located underground and sometimes even underwater. Some tunnels are dug just to help transportation vehicles, but other tunnels have laboratories, or are created to observe underwater animals at aquariums.

Tunnels are dug underground for various reasons. Thousands of years ago, people dug tunnels to take out minerals from the ground. Farmers also made tunnels for irrigation, and before we had toilets, people made sewage channels to dispose of waste.

In this science and engineering activity, challenge your child to design and build a tunnel of their own. During their planning process, ask them to decide on a purpose for their tunnel and how it will help make people's lives easier. Encourage your budding engineer to imagine the location of their tunnel and how it can be helpful to people, as well as aesthetically pleasing.

What You Need:

- Access to the internet
- Variety of household materials, such as:
 - Play dough
 - PVC pipes
 - Toilet paper or paper towel rolls
 - Paper
 - Tape
 - Glue
 - Paint

What You Do:

1. Review the information from the introduction to this activity with your child.
2. Conduct a search online for additional facts and examples of tunnels.
3. Show pictures of various tunnels from around the world. Ask your learner if they can think of any tunnels they have seen before (such as at the playground or on road trips).
4. After a conversation about the purpose of tunnels and where they are located, ask your learner, "Can you build your own tunnel?"
5. Encourage your child to make a plan, thinking about materials they will use and what their tunnel may look like. They can even draw a picture of their proposed tunnel. To encourage thinking, ask your learner:

Build a Tunnel



- What will your tunnel look like?
 - What materials will you use to make your tunnel?
 - How much space will you need?
 - What is the purpose of your tunnel?
6. Give materials to your child, or let them choose what they will need for their tunnel.
 7. Make sure you're available for questions or assistance while your child creates their design, but have them build the tunnel on their own. Encourage your child to refer back to their plan.
 8. When they're ready, tell your learner to play with their new tunnel. It's important to remind them about the purpose they set for their tunnel. Ask your child:
 - Is your tunnel strong?
 - Is it able to do what you wanted it to do?
 - Can you think of things to make your tunnel better?
 9. After testing out the design, ask your learner to think of ways they can adjust their design. For example, ask, "What changes can you make to the tunnel? What do you need in order to make adjustments to your tunnel?"
 10. Allow time for your child to share their new designs. They can record a video explaining the tunnel and its purpose, or they can write an informational, how-to explanation about their tunnel. Make sure they take pictures to include in their writing.

Amplify this challenge! Choose one or more of the following questions to add a new level of difficulty to the challenge:

- Can you develop the landscape around the tunnel? People create tunnels usually through mountains, large hills, or underwater.
- Can you make your tunnel longer? The largest undersea tunnel in the world is 31.4 miles long with 23.5 miles underwater.
- Can you make your tunnel stronger to withstand the elements and storms?
- Can you create a tunnel using a different method? Research the different methods for creating a tunnel and try to make a new tunnel with a different method. Compare the new tunnel to your first tunnel. Which tunnel serves its purpose best? Why do you think that is?

Design Challenge: Gumdrops Structures



In this activity, your child will use gumdrops (or a material such as clay or play dough) and toothpicks to build structures that complete various design challenges. Your child will be given free building time as well to explore the materials before beginning the challenge. They will then be asked to build off of what they've already created in order to complete the activity.

What You Need:

- Gumdrops (or any other soft candy like jelly beans or fruit snacks, play dough, modeling clay, etc.)
- Toothpicks
- Book, full water bottle, or other item (to be used as a test weight)
- Ruler or tape measure
- Pen and paper for brainstorming and note-taking

What You Do:

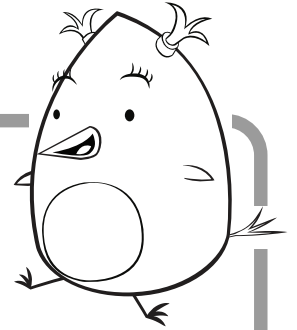
1. Give your child 10 gumdrops (or handful of clay or play dough formed into small balls) and 20 toothpicks to start. Allow them to explore the materials by asking your child to build whatever they would like.
2. After allowing your child to build freely for a while, ask them to take some notes on their creation. Ask your child to write down the height, width, and appearance of their structure. Then, ask your child how much weight they think their structure can hold. Test their idea by placing something heavy such as a book or full water bottle on their design.
3. Now, read the following story to your child.
 - Birdee would like a new play structure and she needs your help to make one! She loves colorful, sweet-smelling gumdrop candies, so that's what she would like you to use. She knows that a play structure just built out of gumdrops would not be very stable, so she thinks toothpicks are a good material to help support the structure. Help Birdee to build a fun and stable play structure using gumdrops and toothpicks.
4. Ask your child to brainstorm ways in which they could change their current creation or build something new entirely for Birdee. For example, ask your child to build a structure that can hold a few books, or a structure that is taller than two feet.
5. After your child has finished brainstorming their design, ask them to choose one of their ideas to build. Make sure to remind your child of the overall goal of their design.

Design Challenge: Gumdrops Structures



- This is an important step of the design thinking process because it teaches your child to prioritize the functionality of their design over personal preferences, and it prevents them from getting too emotionally attached to one design.
6. Now it is time for your child to actually build their design! Give your child room to test and create on their own, but help out if they need assistance.
 7. Once your child has finished building, help them to test their creation.
 - If their design completes the challenge, congratulate them on their success.
 - If your child's design does not successfully complete their challenge, ask them what they think went wrong. Have your child go back to the original brainstorming and prototyping stages. Ask your child to redesign their structure and continue brainstorming and prototyping until their design is successful.
 8. To finish the activity, ask your child a few final questions.
 - What did they learn during the initial exploration of the materials?
 - What different types of structures worked or did not work in each challenge?
 - What was the most challenging part of the activity? What was the most fun part?

STEM Design Challenge Cards



STEM design challenges are prompts that ask learners to build something new for a specific reason or purpose.

Directions: Print these cards double-sided and cut them out. Then choose a design challenge to complete.



How can I build an unsinkable boat with only two materials?

How can I invent a new sport with kitchen tools?

How can I make something useful with a cereal box?

How can I build a piece of furniture with up to five pieces?

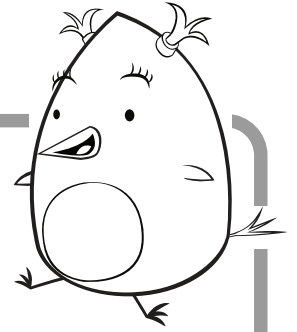
How can I create a sculpture that makes music in the wind?

How can I design shoes inspired by nature?

How can I make a tool to help me _____?
(Fill in the blank!)

How can I solve a problem using just the materials on this table?
(Choose 5-8 materials from your home.)

STEM Design Challenge Cards



(Backside of the cards)

Directions: Use these inquiry-based questions to help you think through all adjustments and conclusions you make about your design.



Challenge: New Sport

- What is the purpose of the game?
- How would someone win?
- Justify why you would have certain rules.
- Can you think of another way to make the game more challenging?

Challenge: Unsinkable Boat

- What is the size of the boat? What things would fit in the boat?
- Can the boat float for 10, 30, and 60 minutes?
- How much weight can the boat maintain?
- Can you think of other materials you could use to make a new boat?

Challenge: New Furniture

- What is the purpose of the furniture?
- Can the new piece of furniture support your weight?
- What is the maximum amount of weight this piece of furniture can hold? How do you know? How could you measure the max weight?
- Can you use a different material to make the furniture stronger?

Challenge: Purposeful Cereal Box

- What is the purpose of your design?
- How does the size of your chosen cereal box limit what you can create?
- How does your design help someone?
- What materials did you use in addition to the cereal box?
- What materials would you like to add and why?

Challenge: New Shoes

- What is the purpose of the shoes?
- When would someone use these shoes?
- How could you use these shoes in various environments?
- Are the shoes appropriate for exercise or the beach?

Challenge: Sculpture

- What materials did you use?
- Does the sculpture stand up on its own?
- How tall is the sculpture?
- How does it play music? When or how long does the music play?
- Can the sculpture withstand outside weather?

Challenge: Solve a Problem

- What problem do you want to solve?
- What's your plan to solve the problem?
- Can this tool solve more than one problem?
- What materials do you wish you had to make your invention better?

Challenge: Helpful Tool

- What does your tool help you do?
- How does the size affect its usefulness?
- Why create this tool instead of using something that already exists?
- Can you use this tool in more than one way?
- Is this tool child-friendly or does it require adult supervision?

Mix Monochromatic Colors!



This is a great activity to give your child a hands-on lesson all about secondary colors, which are created when two primary colors are mixed together. After learning or reviewing some color-based vocabulary, young artists will choose a secondary color to explore and create a monochromatic color chart of all the many shades of their chosen color. Mixing their own palette of colors and making each one a different tint or shade is a bit like a puzzle—it's a fun challenge that will help children understand how many colors they can get from just a few tubes of paint.

What You Need:

- White watercolor paper cut into a square
- Ruler
- Pencil
- Primary color tempera paint (red, yellow, blue)
- Black tempera paint
- White tempera paint
- Paint brushes
- Water cup
- Mixing palette
- Rags

What You Do:

1. Discuss with your child the difference between **tint** and **shade**, and define the word **monochromatic**.
 - A tint is when white is added to a color.
 - A shade is when black is added to a color.
 - Monochromatic refers to all the hues (tints and shades) of one color.
2. Have your child use a pencil and ruler to grid the white paper into at least 20 squares.
3. Have them decide on a secondary color to work with (green, orange, or purple), and choose the correct primary colors to make their secondary color. Here is where your learner can start experimenting!
 - blue + yellow = green
 - yellow + red = orange
 - blue + red = purple
4. Have your child squeeze out their chosen primary colors onto a mixing palette, and also squeeze out black and white paint in separate areas on the same palette.

Tackle a Tinfoil Painting



Etching dates back to the 5th century, made famous by artists like Albrecht Durer. Also called intaglio, etching on metal is typically done by covering a metal plate with a waxy coating and then carving a picture into the plate. The plate is then dipped in a special acid called mordant, eating away at the metal that's not protected by the wax and creating indentations that allow the metal plate to be inked and printed. Instead of bringing hazardous chemicals into your home, your child can explore this ancient art technique with the help of some tinfoil, black paint, and the end of a paintbrush!

What You Need:

- Tinfoil
- Dishwashing detergent
- Scissors
- Large paintbrush
- Tape
- Toothpicks, paintbrushes, and craft sticks for making marks
- Cardboard
- Piece of colorful construction paper
- Black tempera paint

What You Do:

1. Do some quick research to learn more about etching with an internet search of Albrecht Durer or intaglio printmaking.
2. Invite your child to cut a 6" x 6" piece of tinfoil using a ruler and scissors. They can use some small pieces of rolled tape placed on the back corners to secure the tinfoil to a piece of cardboard.
3. Have them get out the black tempera paint and a brush. Before they get painting, squeeze a drop or two of dishwashing detergent onto their tinfoil.
4. Encourage your child to use a big brush to evenly distribute the black paint mixed together with the dishwashing detergent all over the tinfoil.
5. While they're waiting for the paint to dry, have them brainstorm ideas for their artwork and create a sketch to use when etching. While they're drawing out their ideas, discuss how they can use cross-hatching to create shading and depth within their etching! Cross-hatching is using lines drawn closely together in one direction and then layered with another set on top to create changes in tones. Have them practice using a pencil.
6. It's etching time! Offer your child several mark-making implements of various sizes, such as toothpicks, the ends of paintbrushes, or tongue depressors.

Tackle a Tinfoil Painting



7. Have your child "scratch" their design into the dried paint, using the different-sized implements to create lines in various sizes.
8. Once your child has finished, they can carefully remove the tinfoil from the cardboard and mount it on a colorful piece of construction paper!