

**Hands-On
Learning**

Week 7

**5th
Grade**

Independent Study Packet



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



Education.com

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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.

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WEEKLY PLANNER



Name: _____

Month: _____ Days: _____ - _____ Year: _____

☐ MONDAY

To do list:

Course activities:

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☐ TUESDAY

To do list:

Course activities:

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☐ WEDNESDAY

To do list:

Course activities:

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☐ THURSDAY

To do list:

Course activities:

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☐ FRIDAY

To do list:

Course activities:

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WEEKEND ACTIVITIES:

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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.		

Name _____

Date _____

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?

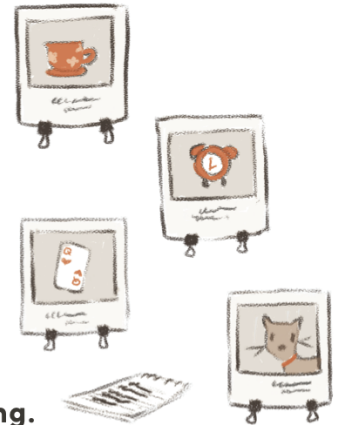
At-Home Activity Choice Board

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



Select a book that everyone in your home is familiar with. Assign everyone a character. Decide that any arguments that day must take place in character.

Take pictures of at least four random objects around the house. Then create a story which includes these objects, either as characters or important objects, in the story. You can write the story down, or narrate it, creating a video or audio recording.



Improvise a story with another person. You start the story, and another person adds onto the story. Take turns until all storytellers agree on the ending. If you cannot agree, flip a coin to decide who gets to end the story. If the other person is long-distance, send emails back and forth or use a shared document for the story.



Challenge family members to construct a building that can fit into a small box while you create your own building. Then join all the buildings to create a town. As you assemble the town, ask yourself questions like, "Where do people live and what do they do? What is the environment like? How are these people connected?"

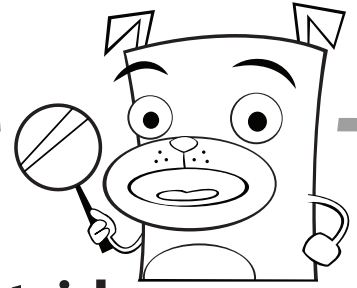


Find two plants in your home, preferably in different rooms, and imagine they are penpals. Write letters from one to another throughout the day, and read them to them.

Choose a time of day that is called Bad Mood O'Clock. It is when everyone is usually in a low mood. When Bad Mood O'Clock strikes, start a dance party or work out together to work the mood away!



At-Home Scavenger Hunt



Directions: Explore your home and the area around your home to find the items listed below. Once you find the item, write a check mark next to it.

Inside

- ☐ Find something made of metal.
- ☐ Find a fiction book.
- ☐ Find a tool that helps you pick things up.
- ☐ Find an item that is a need rather than a want.
- ☐ Find an object that makes your life easier.
- ☐ Find something on which you can write.
- ☐ Find a photo of someone you love.
- ☐ Find a nonfiction book.
- ☐ Find an item that holds meaning for you.
- ☐ Find something that uses electricity.

Outside

- ☐ Find something that makes a noise.
- ☐ Find something shiny.
- ☐ Find something made of a natural resource.
- ☐ Find an item that is natural and green.
- ☐ Find something to recycle.
- ☐ Find something that uses photosynthesis.
- ☐ Find an item that does not need sunlight.
- ☐ Find something that is living.
- ☐ Find something that is nonliving.
- ☐ Find an item that is helpful to humans.

Which item on the inside list was most difficult to find? Why do you think that is?

What item on either list was most interesting to find? Why? Record your answer and sketch an illustration of the item on the back of this sheet or another piece of paper.

Dance Battle



Encourage the brain-body connection in your child with movement games. This activity will decide who's got the better moves, throughout the ages of music! In addition to providing an opportunity for movement, this can be a great way to connect with your child and show them how dance and music have evolved over time.

What You Need:

- Open space
- Music and speakers

What You Do:

1. Find an open space, outdoors or indoors, with nothing around that can be knocked over once your dance battle kicks off.
2. Show your child some popular dance songs and videos of dances from different time periods; Elvis to disco, 80s pop to the Macarena! Talk to them all about how you danced at their age, as a teenager, young adult, etc.
3. Now play the music and see who's got the better moves!
4. Here are some enrichment prompts to ask your child that will take your dance battle to the next level:
 - Some dances are more directional and some allow for more freestyling; which do you like more?
 - What kind of music do you like dancing to most?
 - Can you make up your own dance?
 - When will current popular music become the next "oldies"?

Dance Ideas:

- Ballroom dancing: Throw it way back to classical music. Try the waltz!
- Line dancing: Try the "Macarena".
- Disco: Try "Y.M.C.A."
- Elvis Presley: Try to get your knees moving like "The King"!
- Newer dances: Try "the floss".

Design and Build a City



If you travel through any city, you're sure to notice the hustle and bustle. Cities are full of activity with people entering buildings, stores, parks, museums, and theaters. Children will be traveling to school or playdates, and there are sure to be some construction projects underway. Challenge your learner to design and build a city of their own in this creative engineering activity. Geared toward third, fourth, and fifth graders, this activity allows budding city planners the flexibility to create whatever they desire with gentle prompting questions that will guide them in their design process.

What You Need:

- Various materials around the house, like:
 - Empty cereal boxes or small boxes
 - Tape
 - Paper
 - Any other artistic materials to decorate the city (optional)
- Space to spread out the city

What You Do:

1. Ask your child, "Can you build a city?" Discuss the design, purpose, and outlines of typical cities. Tell your learner their challenge is to create a city worth living in and define what that means to them.
2. Encourage your child to make a plan. Help inspire their thinking by asking:
 - What are some things you like in your town and neighborhood that you would like to include in your design?
 - What are some buildings, services, recreational places, or activities you would like to include in your community?
 - What is the geographical terrain of the city?
 - Is there freshwater located in or near the city?
3. Let your child take their time as they create their own city. Have your child use their chosen resources to build components of their city. They may take a few days, depending on how detailed they would like to be with their buildings, signs, streets, etc.
4. Tell your budding city planner to play with their new design. They can pretend to be a student in the city traveling to school. Ask, "What are some things you would see on the way to school? What would the traffic be like? Would you use public transportation?"

Design and Build a City



5. After testing out the design, ask your learner to think about ways they can adjust their design. For example, "What do you think will make your community even better? How would you help people feel welcome and safe?"
6. Challenge designers to share and describe their new designs. Some presentation options include recording a video or writing a blog about their design. Make sure they include pictures! As your learner creates their presentation, ask them some of the following questions:
 - What do you want people to understand about your city?
 - Why would people like to live in the city?
 - Which part of your city are you most excited about or makes you the proudest?

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

- Can you create different communities within the city?
- Can you make the community look similar to one you have visited in the past?
- How is your community different from one located in another country?
- How would moving buildings around change the feel or purpose of the community?
- Can you adjust your city so that electricity is powered by renewable energy?
- Can you make a big tourist attraction in your city to promote tourism and strengthen the economy?

The opportunities for learning are endless with this fun and engaging design experience. This is a project that can take a day or weeks.

Building Brick Challenge: Build the Eiffel Tower



The Eiffel Tower in France was built in 1887. What was supposed to be a temporary structure has become one of Paris' most famous tourist attractions and landmarks. Learners can build their own version today! In this activity, children will work on their mathematics and engineering skills as they attempt to recreate the Eiffel Tower out of building blocks.

What You Need:

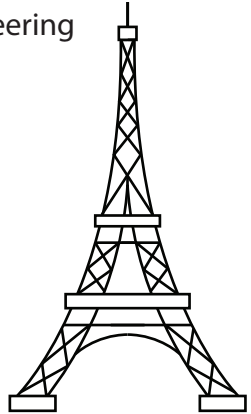
- Building bricks of any size and shape

What You Do:

1. Ask your learner, "Can you build the Eiffel Tower?"
2. Encourage your child to make a **plan**. Ask, "How many bricks do you think you will need?" or "Do you want to look at a picture of the Eiffel Tower while you build?"
3. Give your child time to **create** their design. Ask your child if they need help, but they should be allowed to do most of the building.
4. Have designers **play** with their new design. Ask, "What might someone who is in front of the Eiffel Tower be thinking?"
5. After testing out the design, ask your learner what ways they can **adjust** their design. For example:
 - Do you want to make the size of the tower larger or smaller?
 - Do you want to look at the picture of the Eiffel Tower again and change your design?
6. Challenge designers to **share** their new designs. They can record a video or write an essay describing how they built their tower and how it compares to the Eiffel Tower. Ask some prompting questions, like:
 - What did you enjoy the most about this activity?
 - Did you find it challenging to recreate the Eiffel Tower?

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

- Can your tower withstand weather, like rain or wind?
- Can you replicate the latticework on the Eiffel Tower? This lattice ironwork makes the tower strong while staying lighter than a solid tower.



Design Challenge: Making a Solar Oven



In this fun activity, your child will create their very own solar oven to bake cookies or s'mores!

We have given instructions which you can use to guide your child through the design thinking process. Since this is a design challenge, your child can be entirely creative with how they choose to make their oven using typical household items. However, we have also given a step-by-step procedure for making a solar oven in case your child is struggling to come up with ideas. Feel free to rely entirely on your child's creativity, take some inspiration from our procedure, or follow our procedure exactly. Be sure to engage your child by asking them questions that have them think critically about the design process.

What You Need:

- Cardboard pizza box
- Box cutter or scissors
- Aluminum foil
- Plastic wrap
- Black construction paper
- Ruler
- Cooking ingredients of your choice (Some options are s'mores or nachos; avoid cooking raw meat or raw eggs using your solar oven.)
- Any other household items
- Pen and paper for taking notes

What You Do:

1. First, explain to your child their task in this activity. Explain to them that their job is to create a solar oven out of a cardboard pizza box in order to cook the food of their choice.
2. Ask your child what they would like to cook in their solar oven. Prepare the ingredients.
 - a. Some ideas are s'mores, nachos, and cookies (if possible, use edible cookie dough in case the oven doesn't work very well).
3. Ask your child the following questions so that they begin thinking critically about the design process:
 - a. What does your oven need in order to cook the food? (Answer: heat)
 - b. What are some of the best objects or colors that absorb heat? (Answer: The color black is good at absorbing heat.)
4. Show your child the materials they have, but don't have them start building just yet. Instead, ask them to **brainstorm** how they will use these materials in order to create a solar oven. Have them write out or draw their ideas on a piece of paper.
5. After your child has finished brainstorming, ask them to choose the design they think will work best. Remind them of the purpose of their oven: to cook the food of their choice.

Design Challenge: Making a Solar Oven



- a. 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. Once your child has decided on a design, they can start **building**. Be sure to supervise and help out as needed.
7. After your child is done building, it's time to **test** it out! The best time to use your solar oven is between 11 a.m. and 2 p.m. when the sun's rays are strongest. Make sure to set the food on a dish so you don't make a mess inside the oven.
8. Depending on the food your child has decided to make, the cooking process will vary.
 - a. To make a solar s'more: Place one or two marshmallows on top of a graham cracker. Put two to three squares of chocolate on top of the marshmallow. Wait until the chocolate and marshmallow are done cooking to top them with the second graham cracker.
 - i. Ask your child why it might be a good idea to have the chocolate on top. (Answer: Dark colors, like brown or black, are best at absorbing heat. If the chocolate is on top, it will absorb heat into the entire s'more.)
 - b. To make nachos: Place grated cheese on top of tortilla chips and wait for the sun to melt the cheese.
9. Wait for your child's oven to cook the food. (Timing will vary depending on the oven and food choice.) Be sure to frequently check back on the oven and observe whether the food is gradually cooking.
 - a. If your child's oven eventually cooks the food, congratulate your child on their success!
 - b. If your child's oven doesn't work, help them find out what went wrong. You could ask them if they think there was a mistake with the way they constructed the oven or if they forgot to add a necessary material. Then, encourage your child to go back and repeat this process until they make an oven that works.

Here is a procedure for creating a solar oven in case your child is struggling to come up with designs:

1. Take an empty pizza box and clean out any stray bits of cheese, sauce, or crumbs.
2. Using a ruler and pencil, draw a square that is one inch from the edges of the top of the box.

Design Challenge: Making a Solar Oven



3. Use a box cutter or knife to cut out three of the four sides of the square, leaving the crease-side of the box attached.
4. Make a crease along the uncut side of the square to create a flap that stands up.
5. Cut a piece of aluminum foil that is large enough to cover the inner side of the cardboard flap.
6. Wrap the foil tightly and secure with tape.
 - a. Ask your child what they think the purpose of the foil is. (Answer: Aluminum foil reflects sunlight and brings heat into the oven.)
7. Line the bottom of the pizza box with black construction paper.
 - a. Ask your child why they think black paper is useful and if white paper would work as well. Why or why not? (Answer: The color black absorbs sunlight best, and therefore black paper absorbs the sun's heat. White paper would not work well because it would reflect a lot of sunlight instead of absorbing it.)
8. Cut two pieces of plastic wrap that are the same size as the top of the pizza box.
9. Use tape to secure the plastic wrap to the inside edges of the square window you cut into the box. You are creating an airtight window.
 - a. Ask your child why they think it's important to create an airtight oven. (Answer: Your oven should be airtight in order to prevent any of the sun's heat from escaping it.)
10. Roll up some newspaper pages into tubes to stuff into the sides of the box. Make sure you are still able to close the lid of the pizza box.
 - a. Ask your child what they think the purpose of the newspaper is. (Answer: Newspaper insulates the oven and prevents heat loss.)
11. Finally, it's time to test out your oven by cooking something!

Design Challenge: Marble Labyrinths



In this activity your child will create a marble maze out of large straws and other materials. This challenge allows for open exploration time with the materials and then provides challenges for your child to complete based on how they respond to being able to first create a maze without restrictions. This activity gives your child room to try a challenge multiple times and many different ways, and gives your child the opportunity to solve a problem creatively.

What You Need:

- 1-2 marbles
- Large milkshake straws
- Any other recycled materials that your child would like to use in their maze
 - Bottle caps
 - Popsicle sticks
 - Cardboard
 - Construction paper
 - Paper towel rolls
- Box lid (a shoebox works well; collect a few of these to make multiple mazes)
- Scissors
- Tape or glue
- Pen and paper for brainstorming and notetaking

What You Do:

1. To begin, talk to your child about what makes a maze fun or challenging and how they can create their own. Ask your child if they have played games with mazes or seen mazes before.
 - What made the mazes difficult or easy?
 - What made the mazes fun?
 - Did the mazes use one kind of material or shape or multiple kinds of materials or shapes?
2. After discussing with your child, show them all of the items they will use to create their mazes and allow them to explore the materials.
 - Ask your child to create a maze for a marble to go through. If your child needs help cutting more straws, assist them with this step. However, try to let your child play with creating different mazes on their own.
 - Remind your child that they can use any of the materials available to make their maze.
3. Once your child has had sufficient time to make a first maze, have your child test it. Instruct your child to place a marble at their maze's entrance and have them solve their maze. Ask your child what they noticed while making and solving their maze.
 - What made the maze easy or difficult to solve?

Design Challenge: Marble Labyrinths



- How did the marbles interact with the different materials?
- How long did solving the maze take?
- What were the steps used in designing their first maze?
- How could using the design process help create more complex or well thought out mazes?

4. Now, introduce the design challenge to your child. Tell them that they will use what they've already learned by making their first maze to solve different maze challenges. Give your child a challenge to start. Challenges could include:

- Make a maze using three different kinds of materials.
- Make a maze using only four straws.
- Make a maze that looks like a smiley face, heart, or other shape.
- Make a maze that uses only straws or another type of material.
- Make a maze that takes a friend or family member over 30 seconds to solve.
- Make a maze in under one minute.
- Use every material on the table to make a maze.
- Make a maze that has pieces cut out of the base box lid, which make the maze more difficult to solve. (You might have to assist your child with cutting the lid).
- Make a maze with no sides to keep the marble inside of the maze. (You might have to assist your child with cutting cardboard or their box lid).

5. Ask your child to brainstorm different ways to create a maze for one of the challenges. Have your child draw or write their ideas on a piece of paper. Your child could also lay pieces in their maze box without taping or glueing anything down.

6. After your child has several ideas, ask them to choose the design that they think will work best.

Remind your child of the goal of the maze: to complete the challenge assigned to them.

- This is an important step of the design thinking process, because it teaches your child to prioritize the functionality of their prototype (design) over their personal preferences. This also prevents them from getting too emotionally attached to one design.

7. Now, it's time for your child to build their maze! Give your child space to experiment, but step in to help if necessary. Allow your child's ideas to evolve as they try out different ways of making their maze and encourage your child to write down what works and what doesn't work.

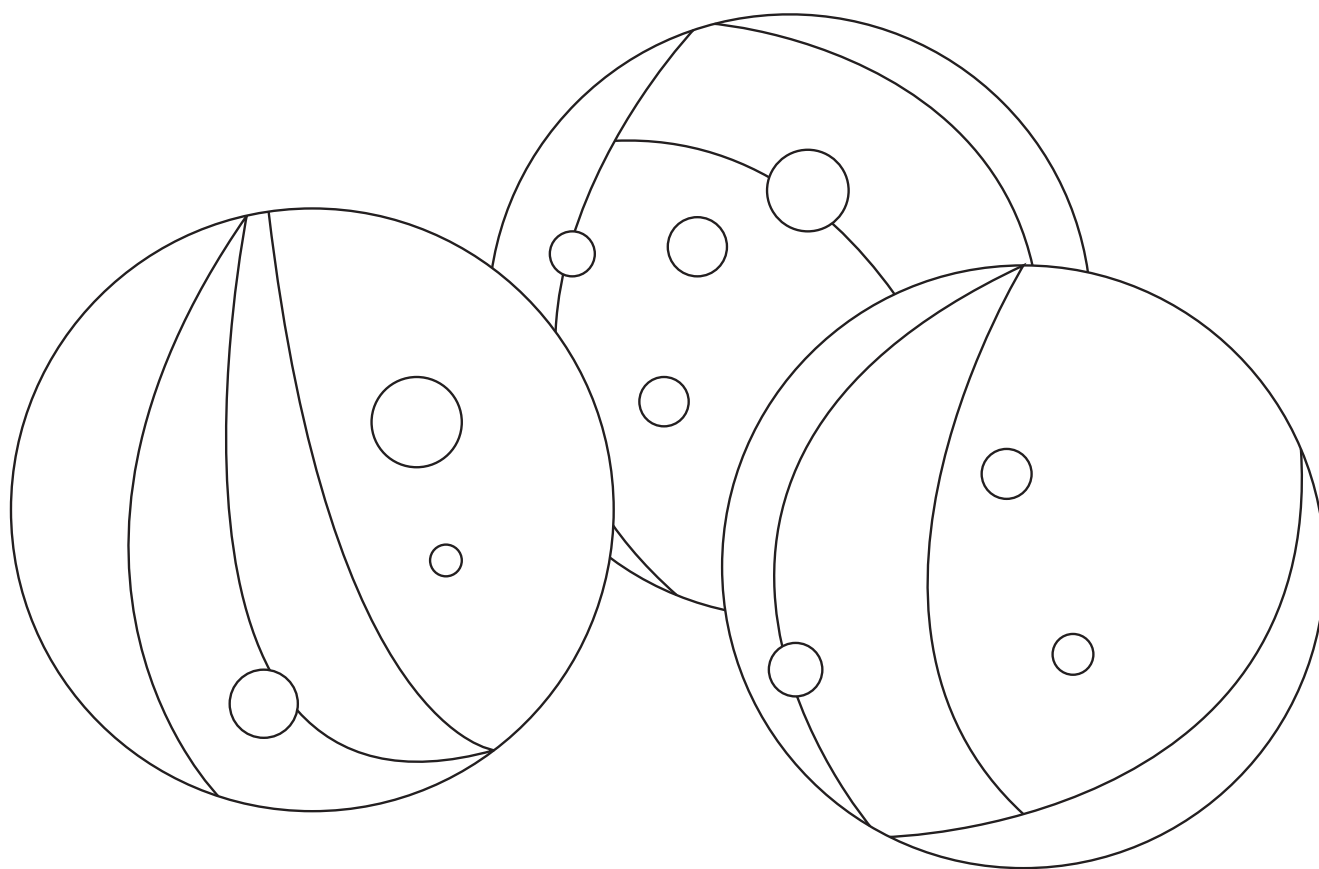
8. After your child has finished their maze, have them test it.

- If your child's maze has successfully completed the challenge, congratulate them on their work!

Design Challenge: Marble Labyrinths



- If your child's maze does not complete the challenge, ask them what they think went wrong. Discuss what worked and didn't work in the building process and ask your child to go back to the brainstorming stage and try out a different design.
9. Once your child has successfully completed a challenge, give them another one to complete or allow them to make up their own challenges, restrictions, and requirements for their mazes.



Make a Family Encyclopedia!



Help your learners affirm their place in the family, and in the march of recent history, with this fun family album project. Catalogue each family member's favorite things, birthdays, hobbies etc. By making a handmade family encyclopedia, your child will really get to know everyone in the family and they'll practice their writing abilities, which will help them develop valuable literacy skills. This also makes a great gift for a family member!

What You Need:

- Family member questionnaire
- Pens and markers
- 9" x 12" construction paper in rainbow colors
- Hole punch
- Ribbons, stickers, glitter
- Stamps and envelopes (or email)

What You Do:

1. Start by helping your child make a list of family members, either close by or far away, to include in the "Family Encyclopedia." Keep the list handy at home so that when answers come back, you can check them off your list.
2. Come up with a list of questions that your child wants to ask family members. There should be different questions for grown-ups and kids to reflect life experiences.
3. Help your child draft a letter of introduction to the project with a questionnaire page, asking each person to fill it out, glue on a photo, and send it back. (Give a deadline. It makes a huge difference to get the questionnaire back in a timely manner.)
4. While you're waiting to hear back from everyone, have your child create a decorative cover using the 9" x 12" construction paper. Cover both the front and back of a piece of cardboard with construction paper and then decorate the cover using markers and any other special craft supplies your child likes, such as glitter, paint, or stickers. Your child can also do the same for a back cover as well, to sandwich the pages in between.
5. You'll also want to help your child make a "table of contents" for the book. You can make one or two pages for this. The first page can be a "family tree" showing who is descended from whom, and/or a list of each person's name with the page number that person's "biography" is on.
6. When the questionnaires come back, use a glue stick to attach each completed questionnaire onto a different piece of plain construction paper (without cardboard this time). If your family is large, you'll

Make a Family Encyclopedia!



want to use both sides of each piece of paper. If not, you may only need to work with one side at a time.

7. Fasten your book together by making 4–5 holes along the side with a hole punch, and then use ribbon to make a loop with a decorative bow through each one. You'll have a stunning, one-of-a-kind family encyclopedia.

Note: These directions layout an old-fashioned, handmade book, but you can also “go digital” and support technology skill goals in your child’s classroom as well. Don’t worry, you don’t need an expensive service. Instead, use email to send the questionnaire, and request that relatives send their replies through the internet with digital photographs included, if possible. Your child may also want to use computer graphics to layout an attractive cover. However you decide to do this project, you and your child will have a blast enjoying the many responses to the questionnaire, and savoring the joys of seeing your family, page by page.

Make Marbleized Paper!



Swirling colors, bright patterns, and unexpected results are what you get when you marbleize paper. This art form is old and steeped in tradition (you may have seen marbleized endpapers in very old books). Making marbleized paper, however, is a bit messy and should be done outside if at all possible. If you can't do it outside, make sure you do it in a room where the floor and work surface is covered. The beautiful result of this project is well worth the extra effort!

What You Need:

- Paper cups
- Craft sticks
- Food coloring
- Cooking oil
- Flat tray – aluminum roasting pan or clean kitty litter box
- Small eye droppers or squeeze bottles
- Plastic forks
- Rubber gloves
- Old t-shirt or smock
- White paper and or envelopes

What You Do:

1. Fill several paper cups about 1/3 full with cooking oil and add several drops of food coloring. Stir them thoroughly with a craft stick.
2. Fill your tray with about 1 inch of water. With your dropper, add a few drops of color to your water.
3. Gently swirl the color around until you like the pattern. Make sure you do not mix the color into the water, you want it to sit on the surface.
4. When you have a pattern that you like, carefully place your paper so it lies on top of the water without any air bubbles under it.
5. Lift the paper off immediately and let it drip for a minute.
6. Hang the paper on a clothes line, a drying rack, or a flat surface to dry.
7. Gently stir the surface of the paint in the tray, or add some new colors and swirl them. Practice patterns like circles, hearts and squiggles. Don't worry about mistakes because it will all be beautiful!

Did You Know?

Marbleized paper started over 700 years ago in Turkey. They used it in government papers to keep people from forging documents. A good question to consider is why the oil doesn't mix with the water and why it floats. Oil is a different substance and has a different molecular charge than water, and therefore it cannot dissolve into the water. Oil is less dense than water, so it floats to the top.