Hands-On Learning

Week 7

2nd Grade

Independent Study Packet

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

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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:

TUESDAY

To do list:

Course activities:

WEDNESDAY

To do list:

Course activities:

THURSDAY

To do list:

Course activities:

FRIDAY

To do list:

Course activities:

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.

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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.

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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.

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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?

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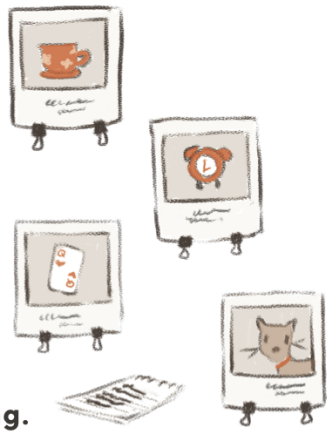
At-Home Activity Choice Board

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!

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Movement Card Game

Our physical health is so important! Staying active not only promotes strong muscles and bones, it also helps with stress reduction, mental health, and even the quality of our sleep! Here is a fun at-home physical activity for the whole family to enjoy! Using simple materials, children will create a movement card game that the family can play together. Geared toward children in preschool through first grade, this activity is a great way to incorporate early reading and math skills while staying active! Your family will love putting their own spin on this fun and easy at-home game all about movement!

What You Need:

- Index cards or enough paper to make 20 small cards (about the size of a playing card)
- Markers

What You Do:

1. Using index cards or 10 small pieces of paper, write one movement on each card (e.g., jumping jacks, spins, hopping on one foot, touching toes, reaching for the sky, etc.).
2. Using 10 more index cards or pieces of paper, write the numbers 1–10 (one number per card).
3. Stack each set of cards (numbers and movements) next to each other facedown.
4. Invite your child to pick a card from each deck, then read the cards aloud.
5. Have all players stand up and complete the movement for the number of times specified (e.g., 8 jumping jacks).
6. Repeat with a new player choosing cards.
7. Play until you have gone through the entire deck at least one time.
8. Variation: Use a timer to see how many repetitions each player can complete in a given amount of time. For example, how many jumping jacks can each player complete in 30 seconds?

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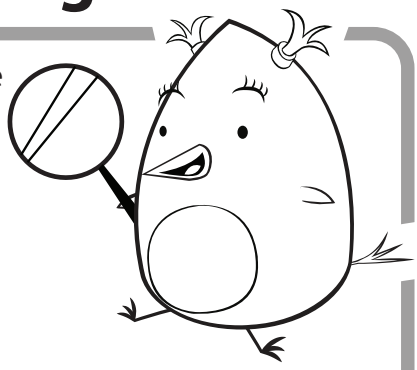
At-Home Scavenger Hunt for Young Learners



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 very soft.
- ☐ Find an animal in a book.
- ☐ Find a pair of matching socks.
- ☐ Find a character eating in a book.
- ☐ Find a container that holds small things.
- ☐ Find an item that you can see yourself in.
- ☐ Find a photo of someone you love.
- ☐ Find someone being helpful in a book.
- ☐ Find two things that are green.
- ☐ Find something that uses electricity.

What is your favorite item from the indoor list? Draw it below.

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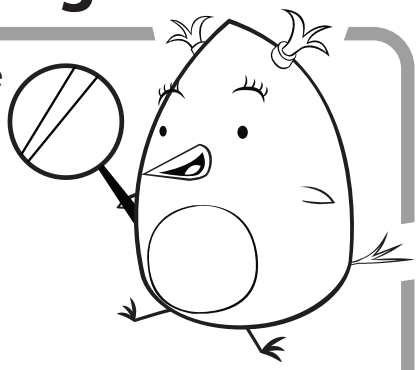
At-Home Scavenger Hunt for Young Learners



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.

Outside

- ☐ Find a stick that is smaller than your hand.
- ☐ Find something that smells good.
- ☐ Find something that is round.
- ☐ Find a stick that is larger than your hand.
- ☐ Find something that needs sunlight to live.
- ☐ Find something that helps people stay safe.
- ☐ Find something that is heavy.
- ☐ Find something orange.
- ☐ Find something that flies.
- ☐ Find something that crawls.

What is your favorite item from the outdoor list? Draw it below.

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Building Brick Challenge: Build a Tall Tower

What do you think the tallest building in the world is? The Empire State Building? Big Ben? Nope, it's the Burj Khalifa located in Dubai! It soars over 2,716 feet into the sky.

In this activity, your child will be challenged to build a tall tower of their own out of building bricks! The instructions include question prompts to guide students through the design challenge, and encourages them to adapt their designs until they are satisfied with the final product.

What You Need:

- Building bricks of any size and shape

What You Do:

1. Ask your learner, "Can you build a tall tower?"
2. Encourage your child to make a **plan**. Ask, "How many bricks do you think you will need?" or " Are you going to build a foundation?"
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, "What kind of building is this?" or " Who lives in this tower?"
5. After testing out the design, ask your learner about ways they can **adjust** their design. For example:
   - Is there anything you want to change about the tower?
   - How can you make the tower stronger?
   - Do you need other tools or objects to make the tower taller?
   - Do you think the tower will stay up if the wind blows, or during a storm or earthquake?
6. Challenge designers to share their new designs. They can record a video, or draw a picture of the design and add a few sentences describing it. Ask some prompting questions, such as:
   - What did you enjoy the most about building the tower?
   - What would be the purpose of the tower?
   - Where would this tower be the most useful?
   - Where would this tower be the least useful?

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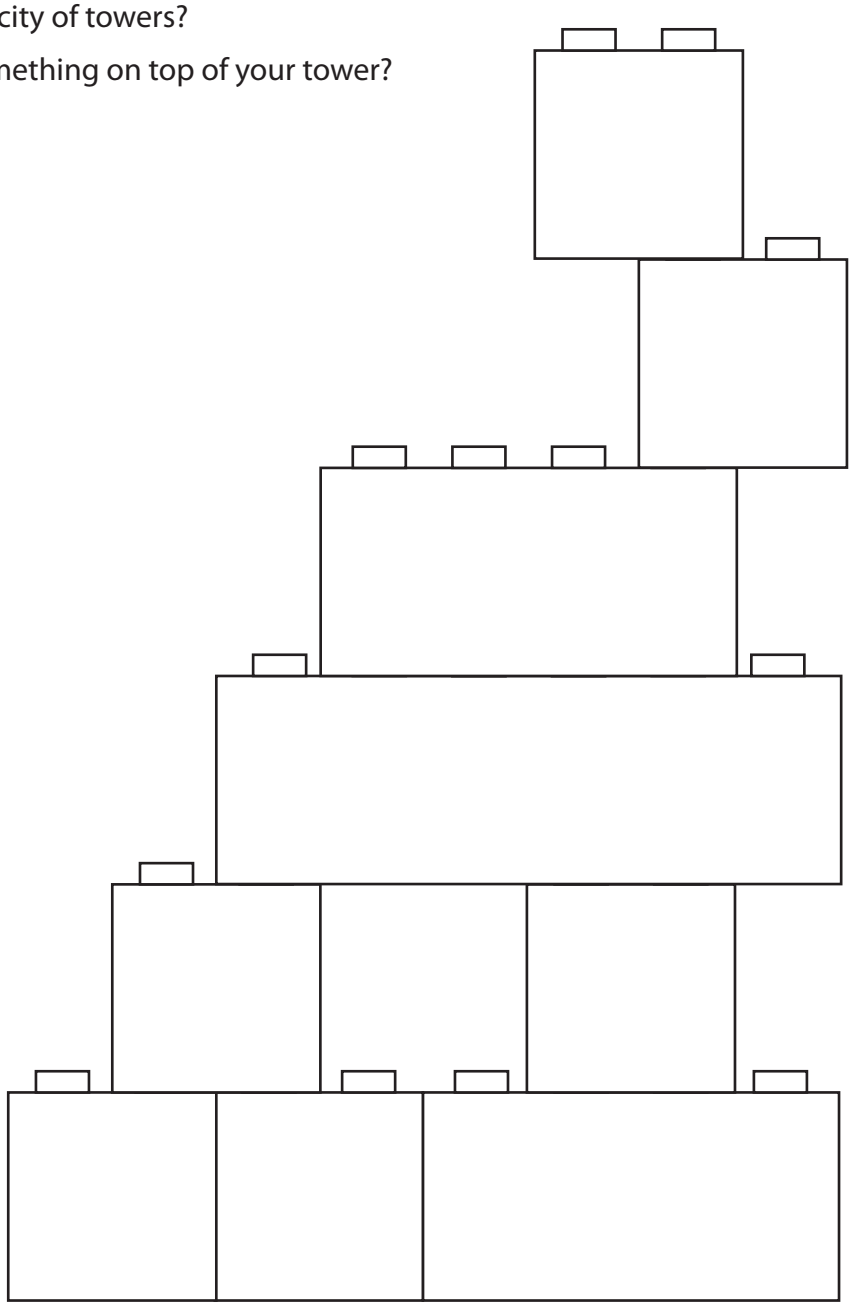
Building Brick Challenge: Build a Tall Tower

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

- Can you count the number of bricks you used?
- Is there another way you can measure the height of the tower?
- Can you build a tower as tall as you are?
- Can you build a city of towers?
- Can you rest something on top of your tower?



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Design Your Own Planet

Imagination is a spark needed to make the best inventions or art. In this activity, Design Your Own Planet, learners will imagine a new planet in the solar system. What will it look like? What are the inhabitants like? Children can let their imaginations run wild and include as much scientific thinking as they desire with this design challenge. While you are leading your child through the activity, allow them to work independently. Geared toward children from preschool through second grade, this fun activity will intertwine arts with science, and get your child's creative juices flowing.

What You Need:

- Internet access
- Craft materials around the house. Some ideas are:
  - Paper
  - Tape
  - Glue
  - Balloons
  - Paint
  - Paintbrushes
  - Construction paper

What You Do:

1. Do a search online for pictures of Earth from outer space and show them to your child. Talk to your child about what Earth looks like, and discuss different environments, such as rainforest or deserts.
2. Now show them online photos of other planets and explain that there are other planets in our solar system. Ask your learner, "Can you design and make your own planet?"
3. Encourage your child to make a **plan**. Ask your learner, "What will your planet look like? What animals will live on the planet? What is the name of your planet? What materials do you need to make your vision come true?"
4. Give your child some craft materials and have them **create** their design. Allow them to work independently, but be available with ideas and suggestions if they ask for help. As your child creates their planet, ask them, "Is this what you imagined? What other materials do you need for your planet?"
5. Tell your little designer to **play** with their new planet. Have them imagine landing on their planet in a spaceship. What would they do? What would they see?
6. After imagining their journey through their planet, ask your child what ways they can **adjust** their design. For example, ask questions like, "What do you want to change about your planet? What do you wish your planet had?"

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Design Your Own Planet

7. Have your creator make any changes they find necessary.
8. Challenge designers to **share** their planet. They can record a video or draw their design on paper. They can mention what the planet looks like, what the temperature and environment is like, and what animals live on the planet.

Amplify this challenge! If your child enjoyed this challenge, take them one step further. Ask them one or more of these questions:

- Can you create different ecosystems or environments on your planet?
- Can you imagine other creatures living on the planet that do not exist on Earth? Do they breathe? What do they do?

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Design Challenge: Building a Bridge

This challenge is a great introduction to design thinking because it will capture your child's interest in a way that is fun and empowering. The task at hand is to design a bridge that is made out of marshmallows and toothpicks, focusing on its functionality. The bridge must be six inches long and able to hold four medium-sized paperback books.

We have laid out step-by-step instructions that are useful to follow as a guideline of the design thinking framework, but feel free to go beyond what we have written out. Your job is to help your child through the design thinking process by teaching them the importance of empathy, brainstorming, and prototyping. Each step in the design thinking process is essential, so make sure to complete each step in the instructions.

What You Need:

- Marshmallows
- Toothpicks
- Four medium-sized paperback books
- Tape measure or ruler
- Pen and paper for note-taking

What You Do:

1. Explain the prompt to your child by telling them that they have been asked to design a bridge that is six inches long and can hold four medium-sized paperback books.
   a. Allow your child to play with a ruler so they can visualize six inches, and allow them to hold the four books so that they can have a better idea of how strong their bridge should be.
2. Next, ask your child to **define** a bridge and its purpose. If you'd like, feel free to look at pictures of bridges online so that your child can see a variety of designs. Remind your child that they should remember the purpose of a bridge when they start to make theirs. Some questions you can ask your child include:
   a. What is the purpose of a bridge? (Potential answer: A bridge is a structure that connects two pieces of land across water. A bridge must be able to carry cars and other objects on it, and it must be able to stand on its own over a body of water.)

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Design Challenge: Building a Bridge

b. What, specifically is the purpose of your bridge? (Answer: To be six inches long and hold four books.)

3. Allow your child to **ideate**. Give them a pen and a piece of paper, and ask them to brainstorm various designs of bridges they can make using toothpicks and marshmallows.
   a. If your child has a difficult time drawing or writing their ideas, feel free to talk it through with them while you write their ideas down on paper.
4. After your child has finished brainstorming, tell them to choose the design they think would be best. Refer back to their answers from step 2, and ask them to prioritize the purpose of the bridge when choosing which one to make.
   a. This is an important step of the design thinking process because it teaches your child to prioritize the functionality of their design over their personal preferences. This also prevents them from getting too emotionally attached in case their design doesn't work.
5. Now, for the fun part: **prototyping**, or building! Give your child the marshmallows and toothpicks, and let them begin making their bridge.
   a. Allow your child to work independently as much as possible, but be sure to help out wherever is needed.
6. Finally, it's time to **test** your child's prototype. Ask your child the following questions while they test out their bridge:
   a. Does the bridge you created stand on its own without falling?
   b. Does the bridge measure six inches in length?
   c. Can the bridge hold four books without toppling?
7. If your child's bridge is unsuccessful in any way, make sure that they aren't discouraged. Frame their failure as an opportunity to try again, and help identify what parts of their design they need to improve. Take your child back to the start of the design thinking process, and repeat these steps until they have created a bridge they are proud of!

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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
  - Construction paper
  - Popsicle sticks
  - Paper towel rolls
  - Cardboard
- 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?

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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!

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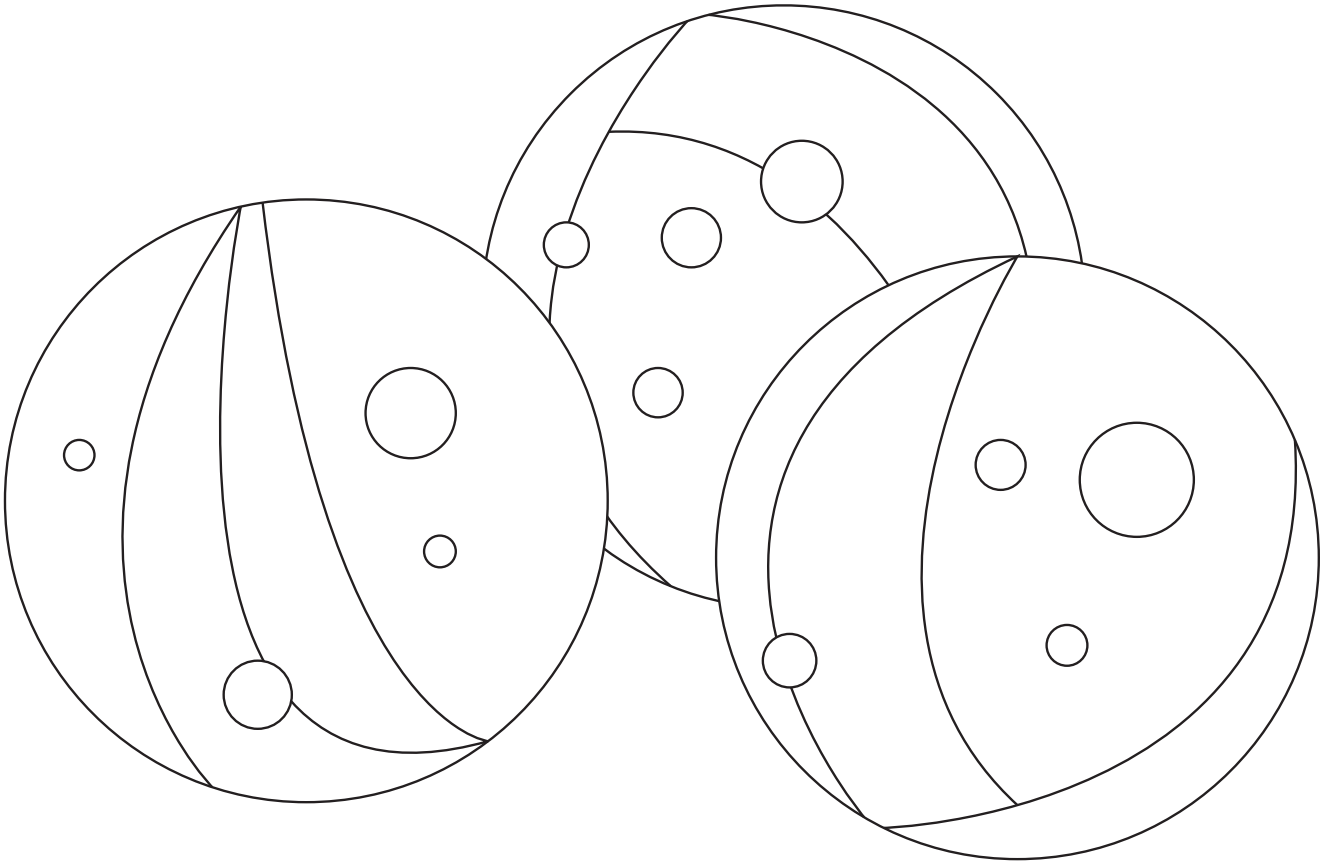
Design Challenge: Marble Labyrinths

- 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.



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Write Secret Messages

Your child will feel like a secret agent when you teach them this cool art trick. Write your learner an "invisible" message with white crayon, then watch their amazement as they paint over what looks like a blank piece of paper and see a picture emerging. Then let your child have their own turn at making a secret picture! This creative art project will tap into children's creativity, is a great way to inspire games of playing "secret agent," and can be a challenging exercise in handwriting and spatial awareness.

What You Need:

- White construction paper
- White wax crayons
- Newspaper
- Water soluble paint (tempera paint or watercolor paint)

What You Do:

1. Draw a simple image on the white construction paper with the white crayon and write a few simple words.
2. Tell your child that the "blank" piece of paper is magic!
3. Lay down some newspaper in the painting area, and ask them to paint over the paper with their favorite color. Can they see the image? What is it? Can they identify any letters?
4. To commend their excellent detective work, let your child in on the secret and ask them to create their own "magic drawings."
5. See if your young detective can guess how the "magic" works. Explain how the waxy crayon puts a "paint-proof" layer of wax on the paper. So when the paint is applied, the areas that have been drawn on are blank!

Variations:

- This is a great way to exchange "secret" drawings and notes with friends who are in the know!
- Let your child make a secret birthday card for a friend. Deliver the card with instructions on how to reveal the hidden message!
- Play an invisible alphabet game with your child! Draw a letter of the alphabet with the white crayon on the white paper and see if your child can guess the letter you have written. Were they right? All they have to do is paint over the letter to see! If your child can read, you can play this game using words instead of letters.

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Relief Sculpture Art

Are your children fascinated by griffins, dragons, unicorns, basilisks, and other medieval mythical beasts? Explore these cool creatures through sculpture by making your own bas relief beast out of modeling clay and paint. For children who love all things fantasy, this is the perfect art project, sure to spark their imaginations and get their creativity going. After creating your new art piece, jump into imaginative play by creating a story to go along with your new mythical beast relief!

Bas relief, or low relief, is a classic art form in which the image is upraised against a flat plane and has an overall shallow depth. Coins are an example of bas relief.

What You Need:

- Cardboard reused from an empty cereal or cracker box
- Modeling clay
- Craft sticks
- Glue
- Pencil
- Tempera paint
- Paint brush

What You Do:

1. Start by researching mythical creatures of the Middle Ages. Help your child choose one to use for this project or invent one of their own.
2. Have your child draw the basic shape of their creature on the cardboard with a pencil. Don't worry about adding too much detail since the drawing will be covered with clay.
3. Now begin building up the relief sculpture. Have your child tear off small amounts of clay and mold them into the body parts of their creature (head, body, tail, legs, etc.), then press and flatten them onto the cardboard. If the clay doesn't stick, try dabbing a small amount of glue under it. Help your learner experiment with texture and pattern by layering the clay pieces to create a three-dimensional look.
4. Carve out facial features and other details to the creature using craft sticks or clay tools.
5. Now add some color. Have your child paint their mythical beast with the tempera paint in any color palette they like; encourage them to be creative! Don't forget to paint the cardboard background, too.
6. Once your artist is done painting, set the sculpture aside to dry.

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