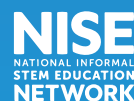




# SCIACT EARLY LEARNING KIT



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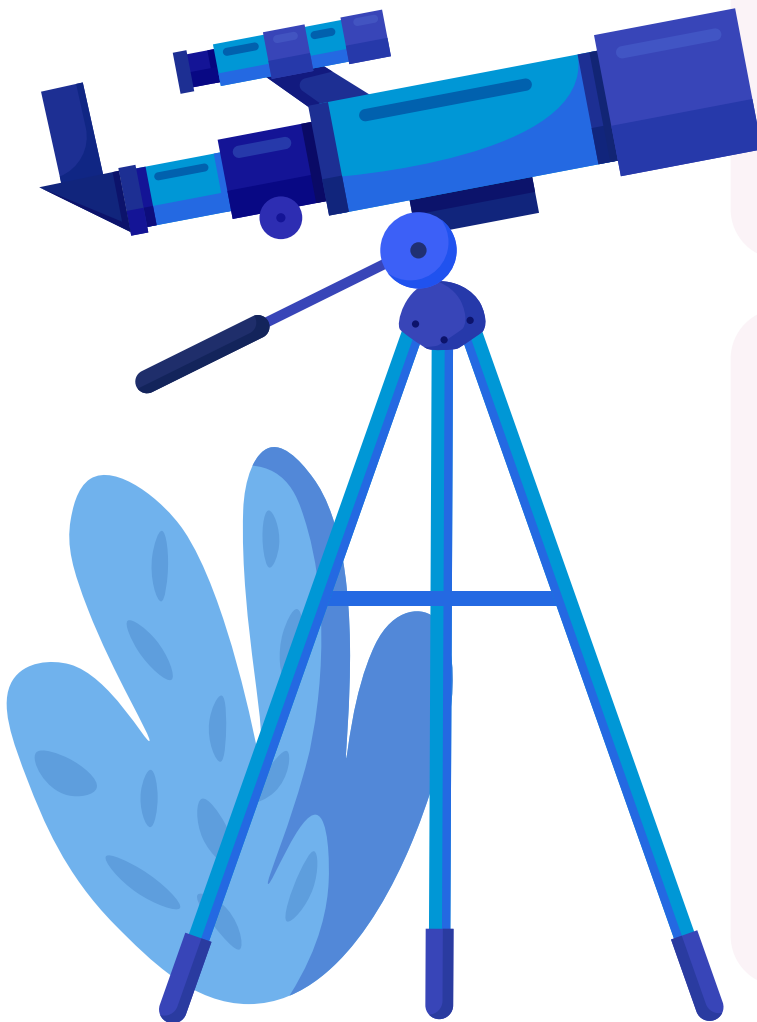
UNIT 1:  
**EXPLORE THE  
MOON**

# EXPLORE THE MOON

A series of activities that encourage a child's imagination and creativity through storytelling and manipulatives about travel to and life on the Moon. We imagine and tell stories—using images, characters, and emotions—to communicate ideas and dreams. Just like everyone, scientists, engineers, and artists use their creativity and imagination to tell stories about future travel to the Moon. This project helps to ignite children's imaginations as to what life might be like when humans return to the Moon to live and to work.

## Learning Objectives

1. **Creative imagination** on life in the future.
2. **Understand** that people can live and work on the Moon.
3. **Use** unstructured play and simple tools to create a story about the Moon.



## VOCABULARY

MOON	ASTRONAUT
ROVER	SOLAR
ENGINEER	PANEL
OXYGEN	GARDEN
ROCKET	EARTH
GRAVITY	TELESCOPE

## MATERIALS

- Space Mission 1 Block Set
- Wooden building blocks
- Moon board
- Dry-erase foam blocks
- Dry-erase markers
- Block cards
- Pencils
- Moon Pictures
- Mission to the Moon take-home picture book:  
The Moon Book

# EXPLORE THE MOON

## BOOK LIST

*Ask for suggestions from partner librarians*

Moon: Peek-Through Picture Book by Britt Teckentrup

Moon! Earth's Best Friend by Stacy McAnulty

Good Night, Baby Moon A Bedtime Book About the Moon by DK

Hello, World, Moon Landing by Jill McDonald

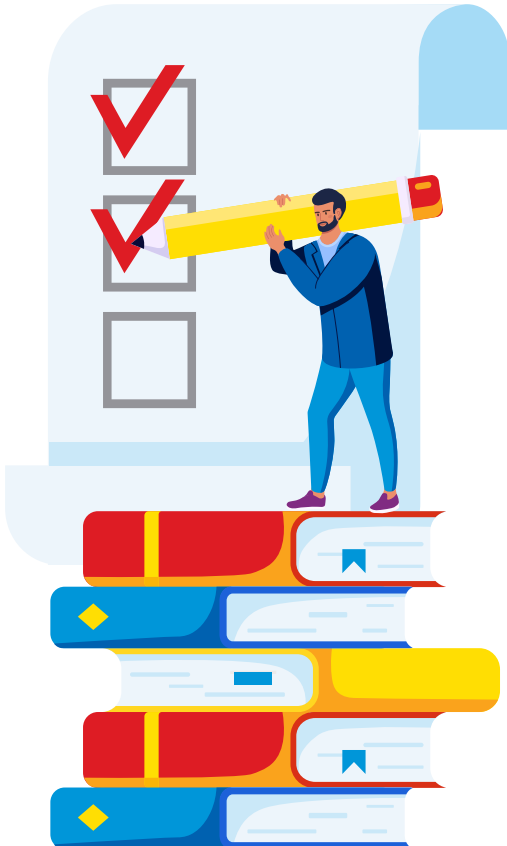
I Took the Moon for a Walk by Carolyn Curtis

Moon's First Friends by Susanna Leonard Hill

Papa, Please Get the Moon for Me by Eric Carle

Lasso the Moon by Trish Holland

Thomas on the Moon by Golden Books



## PREPARATION

- ☐ **Set up a reading circle** with books and pictures of the Moon.
- ☐ **Set up tables** for creative play with story cards, wooden and foam blocks.
- ☐ **Have** dry erase pens, erasers, and pencils in a container on the table.

# EXPLORE THE MOON

## Brain Gym

### WARM UP

These movement exercises will help children with their concentration and focus. You can use this to start your session or as a transition between activities. Gather children in a space large enough for them to move around freely.

### EXPLAIN

**“Welcome young scientists! We are going to learn about the ways scientists use tools today. But first let’s do some dancing! This is called Brain Gym and it has five movements. Ready?”**

### LET’S PUT ON OUR THINKING CAPS!

- **Place** your index finger and thumb on the top of your ear.
- **Massage** the top of your ear and gradually come down the auricle (outer ear).
- **Massage** from the back to the top of your ear.
- **Do** this slowly 5 times.

### BRAIN BUTTONS

- **Place** your left palm on your belly.
- **Place** the thumb and index finger of your right hand an inch below your collarbone. Move the fingers in a circular motion to a count of 5.
- **Switch** hands, placing your right palm on your belly, and your thumb and index finger of your left hand an inch below the collarbone. Massage in a circular motion, counting to 5.



# EXPLORE THE MOON

## CROSS CRAWL

- **Stand** tall with your legs hip-width apart, shoulders rolled back, and chest up. Look ahead.
- **Lift** your right hand above your head. This is your starting position.
- **Lift** your left leg off the floor, and bend your left knee.
- **Bend** simultaneously your right elbow and try to touch the left knee with your right elbow.
- **Get** back to the starting position. Do the same with your left hand and right leg.
- **Repeat** 3 times.



## HOOK UPS

Use this exercise when you need to bring the students' attention back to you during the session.

- **Cross** your right ankle over your left ankle.
- **Extend** your hands in front of you. Cross the right hand over your left hand and link the fingers.
- **Twist** the forearms internally and form a hook. Take six deep breaths.
- **Release** the hook and join your fingertips. Take six deep breaths.
- **Do** this 3-5 times.

"Does everyone feel ready to learn like a Scientist? Let's go!"

Move to the activity location.

## NECK CIRCLES

- **Roll** your shoulders back.
- **Lower** your head and tilt it to the right side.
- **Slowly**, roll your neck from the right to the back, from the back to the left, and then down in the center. This completes one neck circle. Do five circles in each direction.

# EXPLORE THE MOON

## Time to Explore

### MINDSET

This unit complements the Early Exploration Unit in that they are both mainly self-directed by the children with prompts by the facilitator to engage and extend thinking. With that in mind, look around your facility to see if there are any other items that you can use to add to the measuring and comparing experience. Because some items may be heavy for small children, consider setting up your play space on the floor or a low table. And remember your drop cloth! This activity can be messy and sometimes wet.

### SET THE STAGE

1. **Greet** the children and guide them to the activity area.

#### GOOD MORNING/AFTERNOON SCIENTISTS!

Today we are going to explore how scientists think and learn by being curious. But first we have to get our thinking caps on. Is everyone ready to do some Brain Gym? ”

2. **Guide** Brain Gym movements, take your time so that the children can learn how to do the movements correctly. These movements have shown to help with concentration and help when young minds begin to wander.





# EXPLORE THE MOON

## EXPLORE

### 1. Bring participants together for Story Time with The Moon Book

#### a. Show pictures of the Moon from space

##### i. [Full Moon Picture](#) *Print a copy*

- Have one copy per child. They will use this during their art activity.

#### b. Show pictures of the full Moon and saguaro cactus

##### i. [Moon and saguaro cactus](#) *Print a copy*

### 2. Read The Moon Book

### 3. Prompt the children to think: Ask children what it might be like on the Moon, if people lived there.

#### a. Sentence Prompts

- What do you wonder about people living on the Moon? Can you tell me more about that?
- Do you have a favorite part of the book?
- Would you like to live on the Moon? Why or why not?
- What would you take with you if you moved to the Moon?
- What might make it hard to live on the Moon? Can you tell me more about that?

### 4. Transition to Activity Tables

#### a. Go to the table with Moon Board, Cards, and Story Blocks.

#### b. Copies of the black and white Moon for drawing.

#### c. Pencils or crayons to use for the Moon drawing.

- Lead students in the Moon Song, then move to the activity table.

# EXPLORE THE MOON

## EXPLORE CONTINUED

### 5. Invite children into unstructured play with the blocks

**a. Invite children** into the activity, explain that they will now be Moon Scientists and their stories help others learn about the Moon. Encourage them to use their Moon coloring page with the next set of sentence prompts. They will return to the picture during the Wrap Up.

**b. Sample Sentence Prompts** (don't elaborate, these are prompts to get the children's creativity moving) to get them thinking and creating their own stories:

- i. "What do you think the Moon is like?"
- ii. "What do you think you'd find on the Moon?"

**c. Model** how the blocks and cards might be used to help develop the children's stories. Provide at least three variations.

- i. Read a card and think out loud about the prompt. Then use that to make a short story with one or two characters.
- ii. Guide children to create their own stories, with their own characters. Have children select cards and adults read them to them. Once done, prompt with ideas from 7b 1 & 2.

### 6. Let the children play without structure or indication that there is a correct answer.

**a. After 3-5 minutes ask another guiding question:**

- i. What questions do you have about the Moon?
- ii. Now you are a Moon Scientist, use the blocks to tell a story about:
  - Why will you take a trip to the Moon? Are you searching for something? Building something? Collecting information?
  - What tools will you need to explore the Moon?
  - Who are the people in your story?



# EXPLORE THE MOON



## 7. Wrap Up

a. **Space Movement Cube activities and the Moon Song**

b. **Have children bring out their Moon drawings** and make any changes they want after playing with the blocks and cards. Prompt them to make the changes to their pictures.

c. **After the picture wrap up**, prompt with: "Every mission tells a story"

- i. What did you discover about the Moon?
- ii. Do you want to go and work on the Moon? Why or why not?
- iii. (older children): How did you solve problems you encountered?

d. **Close the session** with another round of the Moon Song

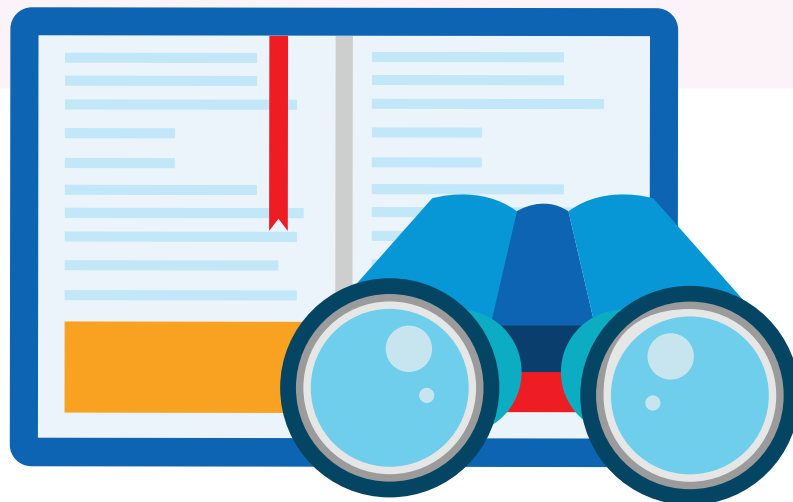
8. **Let the children play without structure or indication that there is a correct answer.**



# EXPLORE THE MOON

## EXTENSION

1. **If you would like to extend the story block activity** or switch it up for children who attend often use the dry-erase foam blocks. These can be used as a nice prop to encourage creative conversation and discussion.
  - a. **What new ideas** do the children have for items they might want to include in their story that they can draw on the cubes?
2. **If your participants show an interest in the Moon book** and you would like to extend the experience, consider reading the excerpts about the Moon from other countries. [Moon Stories from Around the World](#)
  - a. **Hand each child** a copy of the Moon picture and pencils or crayons before you start reading.
  - b. **Have the children draw** the different images mentioned in the stories onto the Moon picture.
3. **For older children** you can add these prompts as guides to their creative thinking. If appropriate, encourage them to act out their thinking using the blocks to set the scenes.
  - What do you think it would feel like to be on the Moon?
  - What can you see? What do you observe on the ground?
  - How could you move/get around on the Moon?
  - How would you live and survive (thrive) on the Moon?
  - What would you need to be happy?



# EXPLORE THE MOON

## Session 2 - Moon Sand Stories

1. Warm up with Space Movement Cube activities and the Moon Song
2. Gather together for Story Time with [Moon Stories from Around the World](#)
3. Reading Circle - Excerpts of Moon Stories
4. Sing the Moon Song and transition to Moon Sand Activity. Have an area covered with a plastic tablecloth set up with Moon Sand Dough and Moon Story blocks.

### MOON SAND STORIES

1. Have Moon Sand Dough and shaping items ready for students (can be stored up to 1 week).
2. Let children mold the dough into moon and star shapes.
3. Have Moon story blocks out for children to use.
4. Prompt them to tell you stories about the Moon like those they heard from other parts of the world. Encourage them to be creative. There are no wrong answers! Use the prompt from the blocks section to encourage the children if they struggle to create stories.
5. Let children take home their Moon Sand with the recipe.
6. Select a Moon activity from NASA Space Place that you want to try.

# EXPLORE THE MOON



## SESSION WRAP UP

1. Space Movement Cube activities and the Moon Song
2. Ask each child to share 1 favorite thing they did during their moon exploration.
3. When each student offers their ideas, give them a sticker or bookmark.
4. Before each child leaves, give them a Family Science Activity kit. Finish with the Moon Song.

### Family Science Activity Kit

Provide each child and parent/guardian with one copy of the [v](#), Movement Cube, and Moon Sand Dough recipe to use at home.

# EXPLORE THE MOON

## FOOD ACTIVITY

### Moon Cake

This no-bake Moon Cake tastes amazing and looks just like the Full Moon!

#### Ingredients

Rice Cakes  
Bananas

Cream Cheese (or Peanut Butter)  
Cheerios

#### Tools

Plastic Knives

Paper plates

Napkins

#### Directions

1. **Wash hands**
2. **Set out** paper plates and knives
3. **Place** rice cake on plate
4. **Spread** cream cheese or peanut butter on rice cake
5. **Peel and dice** banana into small rounds
6. **Place** bananas on rice cake to be like large Moon craters
7. **Place** cheerios on rice cake to be like small Moon craters

#### Other Ideas

1. **Chocolate-flavored Cheerios** for the dark Moon craters
2. **Chocolate sprinkles** for dark parts of the Moon

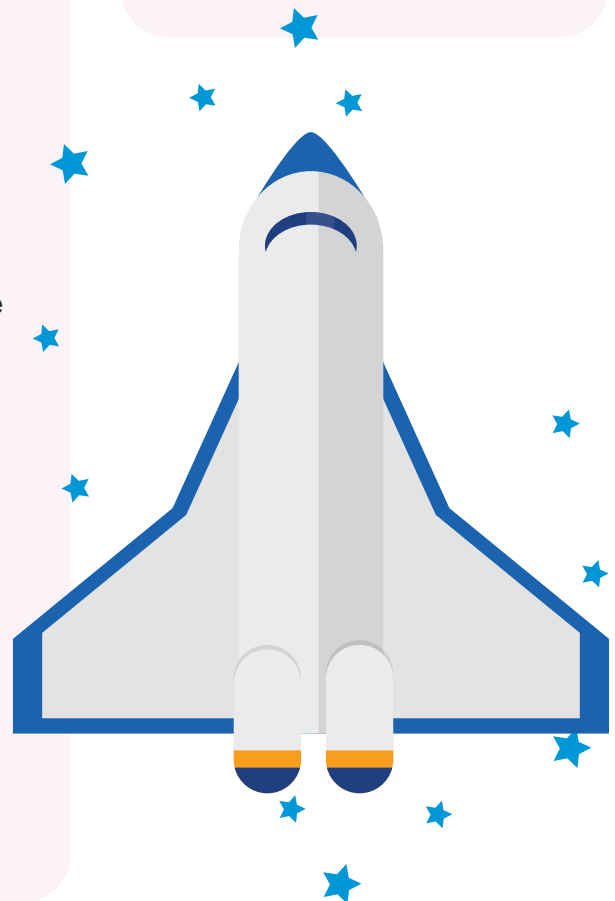
## ART ACTIVITY

### Moon Sand

- 2 cups brown sugar
- 2 cups corn flour (corn starch will also work)
- 10 tablespoons vegetable oil or olive oil

Mix dry ingredients first, then add oil. Dough should hold together without being damp.

Store in a sealed container or Ziplock bag for up to 1 week.



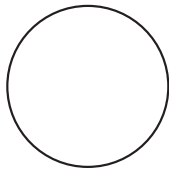
# EXPLORE THE MOON

## FAMILY SCIENCE ACTIVITY Moon Journal

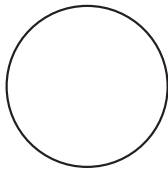
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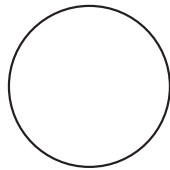
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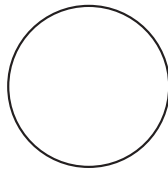
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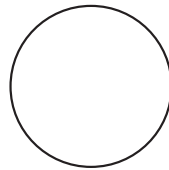
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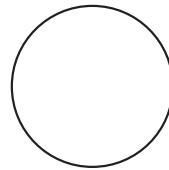
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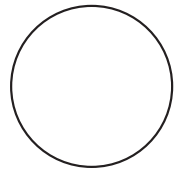
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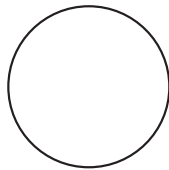
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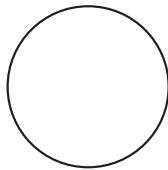
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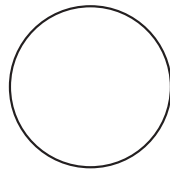
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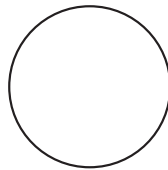
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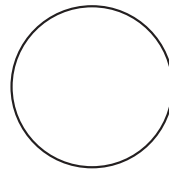
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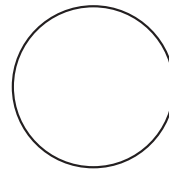
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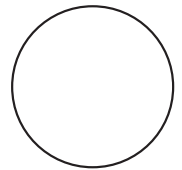
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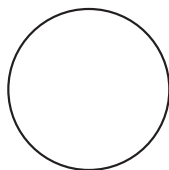
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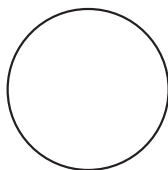
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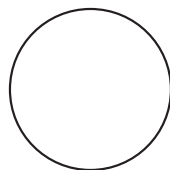
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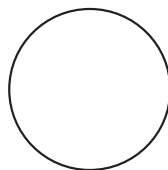
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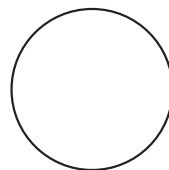
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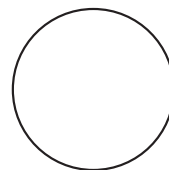
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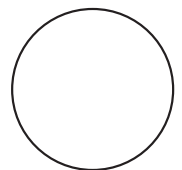
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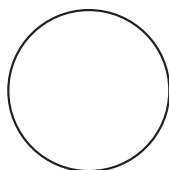
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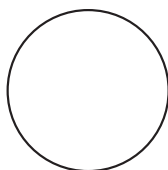
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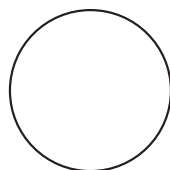
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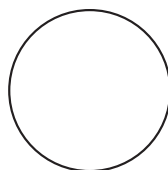
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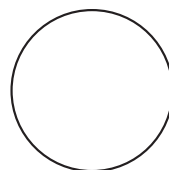
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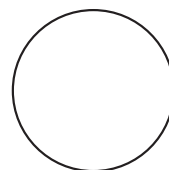
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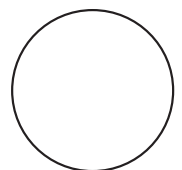
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# EXPLORE THE MOON



## MUSIC AND MOVEMENT ACTIVITY

### Moon Nursery Rhymes

#### I See the Moon

I see the Moon, the Moon sees me,  
Down through the leaves of the old oak tree.  
Please let the light that shines on me,  
Shine on the one I love.

Over the mountains, over the sea,  
Back where my heart is longing to be.  
Please let the light that shines on me,  
Shine on the one I love.

I hear the lark, the lark hears me,  
Singing from the leaves of the old oak tree.  
Oh, let the lark that sings to me,  
Sing to the one I love.

Over the mountains, over the sea,  
Back where my heart is longing to be.  
Oh, let the lark that sings to me,  
Sing to the one I love.

## EXTENSION ACTIVITIES

[Space Place](#)

[Astronomical Society of the Pacific](#)

[Math in the Moon](#)

[50 Moon Crafts and Activities for Kids](#)

[Astronomy for Kids](#)

[Night Sky Network - Moon Activities](#)





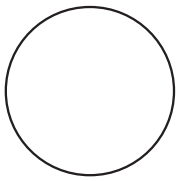
# FAMILY SCIENCE ACTIVITY

## Moon Journal

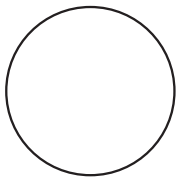
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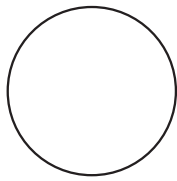
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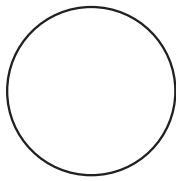
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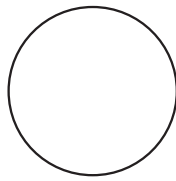
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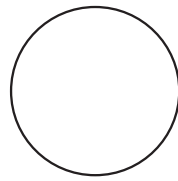
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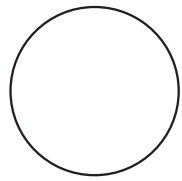
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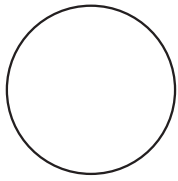
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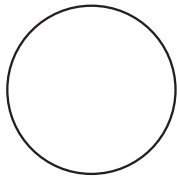
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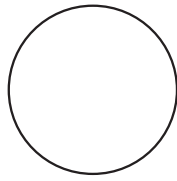
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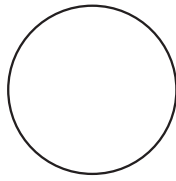
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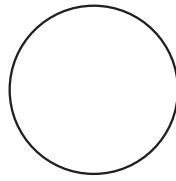
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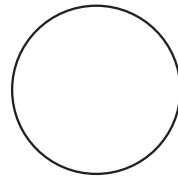
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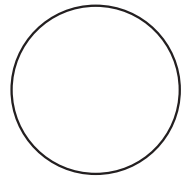
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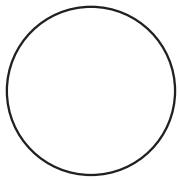
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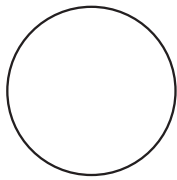
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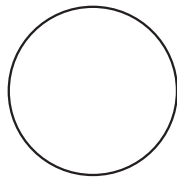
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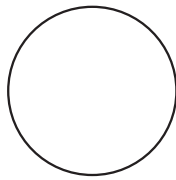
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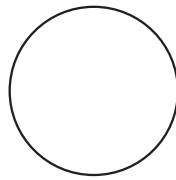
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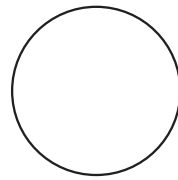
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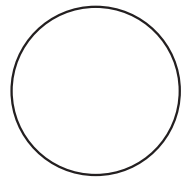
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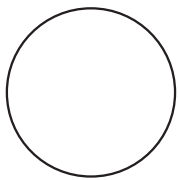
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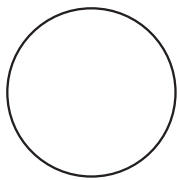
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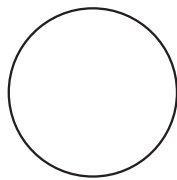
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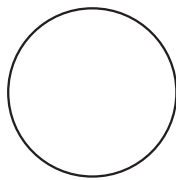
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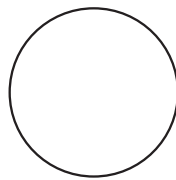
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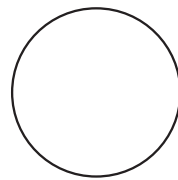
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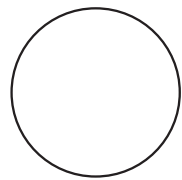
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# UNIT 2: **BEAR SHADOW**



# BEAR SHADOW

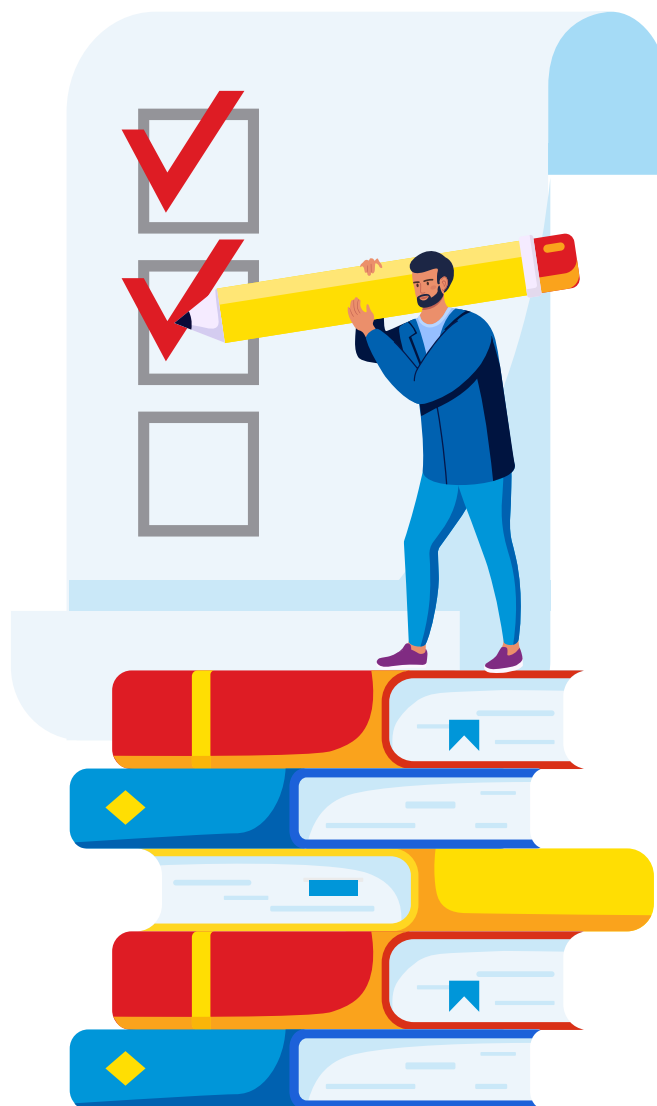
This set is designed primarily for children under the age of 8 and their caregivers. There are also activities included that can be done at home. Library Facilitator will model how shadows form from a light source, an object, and a surface. They will have a table with items to create shadows that their audience can experiment with. After a few minutes of learning through play, the facilitator will bring everyone together for a book circle. The book, Moonbear's Shadow (Frank Asch) is about a little bear exploring his own shadow. Once the story is completed, audience members will be offered an art activity - making bear masks, and an outdoor activity- looking for shadows.

This activity allows children to model the way shadows are created. The question prompts on the challenge cards (see masters in notebook) help children investigate how changing the flashlight's position changes the size, length, and position of shadow. Connecting the activity to shadows created by the sun is suggested. A parallel is suggested to draw attention to shadows outside created by the Sun.

*An extension of this kit is to introduce solar eclipses which occur when the Moon and Sun cast a shadow onto Earth. These can be seen in 2023 and 2024.*

## Learning Objectives

1. **Observe** how a shadow is created when an object blocks light (like from the Sun) from falling on a surface (like the ground or a wall).
2. **Be** able to express that an object's shadow always appears on the opposite side from the light source.
3. **Show** how shadows change when the positions of the light source and the object move around.



# BEAR SHADOW

## MATERIALS

- Flashlight “sun”
- Flashlight batteries
- Toy bear
- Toy tree
- [Landscape mat with pond and fish](#)
- [Challenge cards](#)
- [Moonbear’s Shadow Storybook](#) by Frank Asch
- Paper plates
- Safety scissors
- Crayons
- Ribbon or elastic string for mask
- Craft sticks or straws
- Glue stick
- Brown, white, and black paper
- Tape
- Colored sidewalk chalk
- Straw or raffia
- Oatmeal fruit bars



## VOCABULARY

**SHADOW**

**SUNRISE**

**SUNSET**

**NOON**

**SUN**

**MOON**

**ECLIPSE**

**BEAR**

**Special word:**  
**Zenith (straight up)**

## BOOK LIST

Brown Bear, Brown Bear, What do you see? By Eric Carle

We’re Going on a Bear Hunt by Helen Oxenbury

The Complete Tales of Winnie the Pooh by A. A. Milne

I Love you to the Moon and Back by Amelia Hepworth

Corduroy by Don Freeman

# BEAR SHADOW

## MINDSET

The concepts in this activity are appropriate for all ages. This activity is designed to appeal to preschool-aged visitors, as well as accompanying adults and older children.

1. **Do you want to do this all in one session of 90-120 minutes?**
  - a. If so, have all your supplies set up on separate tables
2. **Do you want to spread the activities over several days with sessions of 45-60 minutes each?**
  - a. **Start** and wrap up with the Bear Goes Over the Mountain Song and Movement
  - b. **Have a reading circle** each day with the Bear Shadow Book
  - c. **Have the Bear Shadow** layout and challenge cards out each day
  - d. **Select one of the activities per day** - bear mask, shadow drawing, shadow puppet show
  - e. **Don't forget snacks!**

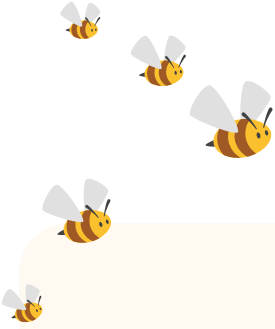
## PREPARATION

- a. **Assemble bear mask materials**  
Have ready in a box
- b. **Print and laminate** Bear Shadow landscape sheet
- c. **Have** set(s) of challenge cards
- d. **Have** toy trees (and other objects you will use to showcase shadows) in a box
- e. **Check** flashlights to ensure batteries are working
- f. **Bring** out Bear Shadow book
- g. **Prepare** a box with oatmeal fruit bars for a snack





# BEAR SHADOW



## EXPLORE

1. **Teach children the Bear Goes Over the Mountain Song and Movement** (see below). **Get everyone loosened up!**
2. **Invite all of the children to a story circle** and read the Bear Shadow book. Use the following conversation prompts to gauge understanding of the concepts within the book.
  - a. **What do you think is causing Bear's shadow?**
  - b. **Why do you think the shadow is moving?**
  - c. **Why do you think Bear can not get rid of his shadow?**
  - d. **What do you think is important about shadows?**
    - i. First clocks were shadow clocks or sundials
    - ii. Shadows from clouds cool the earth, clouds bring rain and snow
    - iii. Some plants grow better in shadows (shade)
    - iv. Eclipses are from shadows of the Earth (lunar eclipse) or the Moon (solar eclipse).
3. **When finished** with the reading circle, guide the children to the Bear Shadow Table and model how to use the flashlights.



# BEAR SHADOW

## EXPLORE CONTINUED

4. **Encourage the children to experiment** with creating shadows using different items. When doing this activity, encourage participants to switch the flashlight on and off, and use it to make a shadow of the toy bear. Then, have them experiment moving the light, the toy bear, and the tree to recreate scenes on the challenge cards:
  - a. **Move the Sun** across the sky, from sunrise to sunset. What happens to Bear's shadow as the Sun moves?
  - b. **Shine the light straight down** on Bear from above his head. Where is his shadow?
  - c. **Try to make Bear's shadow appear** in front of him and behind him.
  - d. **Try to make Bear's shadow longer and shorter.**
  - e. **Bear wants to hide in the shade of the tree. Can you help him?**
  - f. **Try to make Bear's shadow** touch the fish in the pond. (In the story, Bear's shadow scares the big fish away.)
5. **After 3-5 minutes, read or show one of the Challenge Cards and let the children follow the directions.**
6. **Show everyone how to shut off the flashlights and place them on the table.**
7. **Go back to the Bear Shadow Landscape and read at least three more challenge cards.**
  - a. **This activity allows children to model the way the Sun casts shadows outside.** Use the question prompts on the challenge cards to help children investigate how changing the flashlight's position changes the size, length, and position of shadows. As children test different positions of the flashlight, ask them to compare their observations. Encourage them to use their observations to make claims about how to make the shadows longer or shorter (or in front of or behind) the toy bear. Children can make claims either verbally or by demonstrating with their model.

# BEAR SHADOW



## SESSION WRAP UP

1. **Use The Bear Goes Over the Mountain Song and Movement as a transition.** Have children join you at the Bear Mask making table, move outside for the Shadow Drawing, or other activity of your choice.
2. **Use The Bear Goes Over the Mountain Song and Movement to bring the children back for wrap up or a different activity.**
3. **Have a copy of the Shadow Puppet Show** directions and link for each child to take home.
4. **Clean up and store materials for next time.**

### Optional extensions

If you can take children outside on a sunny day or easily darken the room you're in, you can make a connection between Bear's shadow and the children's own shadows. Reinforce the learning goals in this activity by explaining that the Sun, light bulbs, and flashlights are all examples of sources of light. When an object blocks the path of light, that object can cast a shadow. We can see the shadow on surfaces such as floors or walls. You might also experiment with offering this activity as part of a structured story-time program. You can read *Moonbear's Shadow* by Frank Asch and then offer several extra sets of materials to allow multiple groups of children to experiment with the activity.

# BEAR SHADOW

## SCIENCE ACTIVITY Sidewalk Chalk Drawings

This should be done at two different times of the day. At least two hours apart.

1. **Partner up your participants.**  
One will stand in a small circle (you can put their name in the circle). The other will draw an outline of the shadow.
2. **Switch partners** and switch circles. So you will now have two shadows per team.
3. **Have** the teams color their shadows.
4. **Several hours later**, or the next day, but at a different time — have the children step into their circles and draw a new outline.

### Conversation Prompts:

- Are the shadows the same?
- Why do you think they changed?
- What questions do you have about your shadows?



## ART ACTIVITY Bear Mask

### Materials

Paper plate  
Crayons, markers, or paint  
Scissors  
Glue stick  
Brown, white, and black paper  
Hot glue or tape  
Straw

1. **Cut** the paper plate in half, then color or paint the mask brown. Cut 2 circles out for the eyes. Glue a black 1" circle on the bear's face for the nose.
2. **Cut** two large brown ears and two smaller white ears.
3. **Glue** the white ears onto the brown ears.
4. **Glue** both ears onto the paper plate bear.
5. **Attach** the paper straw to the back of the paper plate with hot glue or tape.

# BEAR SHADOW

## EXPLORE MORE

The next total solar eclipse to be visible in North America happens on April 8, 2024. In the United States, the path of totality—where the entire sun will be blocked—will stretch from Texas to Maine.

You can connect the learning in Bear's Shadow activity to the solar eclipse event, using the Moon's Shadow information sheet. The concepts in this optional connection are most appropriate for slightly older children and adults.

### Solar Eclipses

Using a flashlight for the Sun, and models of the earth and Moon, describe how a solar eclipse occurs (*the Moon passes directly between the Sun and the Earth, blocking the Sun's light and casting a shadow on Earth*).

Solar Eclipses are rare and may not happen for many years. There is a very specific pattern and you can [find solar eclipses](#) for the rest of the 2000's.

### [Links to Moon phases](#)

NASA Solar System Website  
What are Eclipses?

### [Upcoming Solar Eclipses](#)

October 14, 2023: annular eclipse  
April 8, 2024: total eclipse

## MUSIC AND MOVEMENT ACTIVITY

### The Bear Went Over the Mountain

Using the bear masks over their faces, children will sing The Bear Song. Encourage the children to make up movements as they sing the song. For example, mimic a climbing motion when going over the mountain and putting their hands up to their eyes like binoculars when they see what they can see.

The bear went over the mountain,  
The bear went over the mountain,  
The bear went over the mountain,  
To see what he could see.  
And all that he could see,  
And all that he could see,  
Was the other side of the mountain,  
The other side of the mountain,  
The other side of the mountain,  
Was all that he could see.



# BEAR SHADOW

## FOOD ACTIVITY What do Bears Eat?



Bears and people can eat the same things!

- Guided activity for youth to create no-bake oat bars.
- Oats
- Honey or Agave Syrup
- Nuts
- Dry fruit
- Peanut Butter

### Ingredients

*Check for food allergies prior to having children participate in this activity*

- 1 cup creamy peanut butter  
(no sugar added, or sunflower butter for nut free)
- ½ cup honey (or agave syrup\* for vegan)
- ¼ cup dry fruit
- ⅛ cup nuts (if desired)
- 4 cups Old Fashioned rolled oats
- ½ teaspoon [kosher salt](#)
- ½ teaspoon cinnamon

### Instructions

1. **Mix** together all the ingredients in a bowl until it forms a sticky dough. If the mixture is dry and not sticky, add a bit more honey and/or peanut butter; different peanut butter brands perform differently here.
2. **Add** a sheet of parchment paper to a 9 x 9 pan. Place the ingredients in the pan and press it into an even layer. Use a small glass to roll over the top to get it smooth.
3. **Freeze** the bars for 15 minutes. Remove the pan from the freezer and use the parchment to lift it out of the pan. Cut into 16 squares or 32 rectangles. Store refrigerated for up to 2 weeks. You can eat right away, or refrigerate for about 1 hour for a more solid texture.

# BEAR SHADOW

## TAKE HOME ACTIVITY

### Shadow Puppet Show

Science Buddies Activity. Author: Svenja Lohner, PhD

#### Prep Work

- **Place** a table right next to a light-colored wall.
- **Put** the flashlight on a box on a table so it faces the wall. It should be located about 50 cm (about 20 inches) away from the wall.
- **Cut** a circle (about 2-inch diameter) from the card stock.
- **Dim** the lights in the room so it is dark enough to see clear shadows on the wall.

#### Instructions

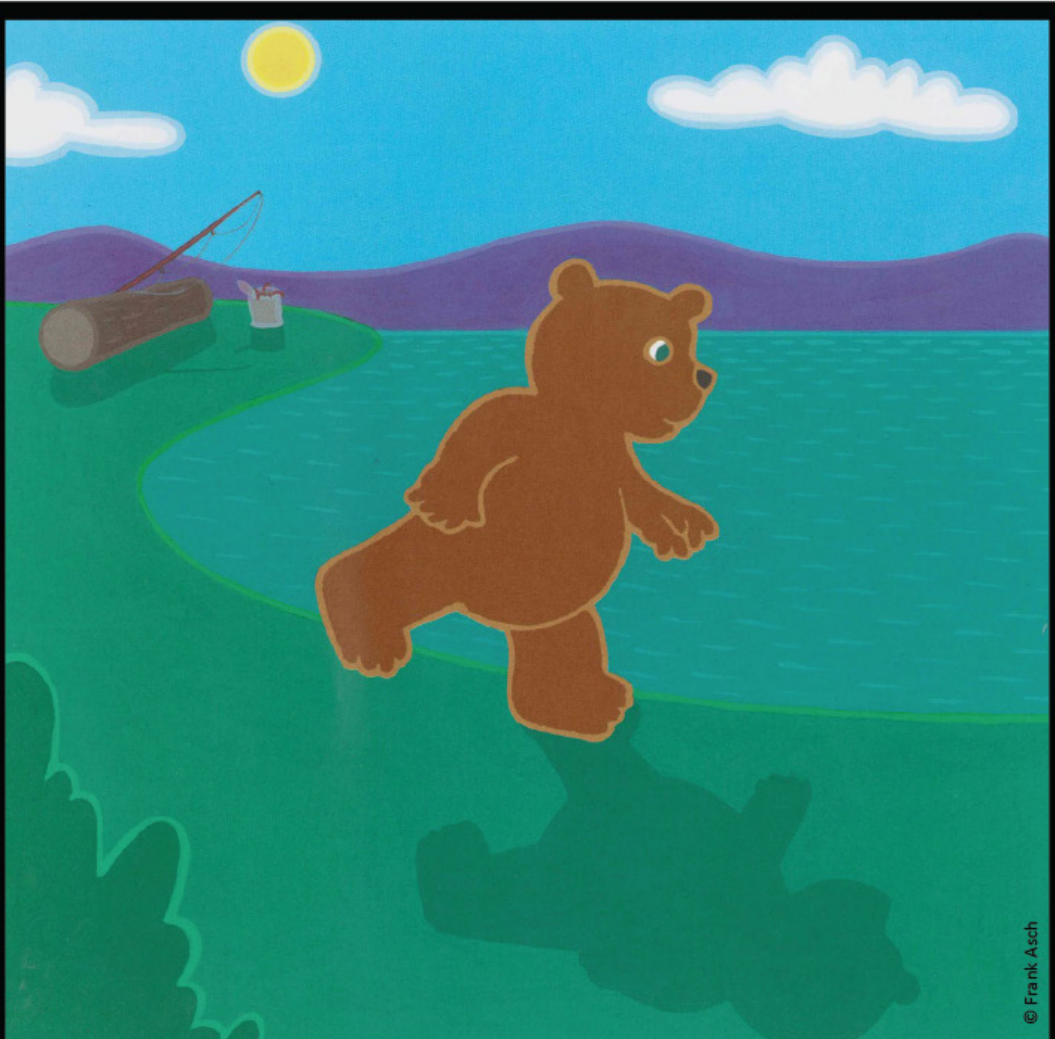
1. **Switch** on the flashlight and point it at the wall. What do you see on the wall once you switch on the light? How does the appearance of the wall change when you switch the light on?
2. **Hold** the card stock circle up halfway between the flashlight and the wall, just outside the light shining on the wall. What do you see on the wall? Does the circle cast a shadow? Why or why not?
3. **Hold** the circle directly in front of the flashlight, halfway to the wall.
  - a. **Cut** a figure or puppet out of the card stock.
  - b. **Tape** a wooden skewer or popsicle stick to the card stock puppet.

What do you see on the wall this time?  
What shape does the shadow have?
4. **Cast** a shadow of the puppet onto the wall. How does the shadow look? How big is it and what shape does it have?
5. **Try** changing the distance between the flashlight and your puppet. Hold the puppet halfway between the flashlight and the wall, then move the flashlight back and forth (farther from and closer to the puppet). What happens to the puppet's shadow as you move the flashlight?
6. **Try** changing the distance between the puppet and the wall. Put the flashlight back in its original position, then move the puppet back and forth (closer to and farther from the wall). How does the shadow change as you move the puppet?
7. **Hold** the puppet halfway between the flashlight and the wall. Try moving the flashlight around and shining it at the puppet from different angles. What happens to the puppet's shadow when you change the angle of the flashlight? How does the shadow change?
8. **Now** that you know how you can change the shape or size of your puppet's shadow, try making long, short, small, and big shadows.

*Turn your knowledge about light and shadow into a shadow play. Make more shadow puppets and tell a story with them! You can also create scenes on the wall by making trees, buildings, or other figures from the card stock.*







**Try to make Bear's  
shadow in front of him.**

**Try to make Bear's  
shadow behind him.**

**When do you see your  
own shadow?**

**Do you see your shadow  
on a cloudy day?**



© Frank Asch

**Try to make  
Bear's shadow long.**

**Try to make  
Bear's shadow short.**

**Where do you see the Sun  
in the sky in the morning?**

**How does your shadow look  
in the morning?**



**Bear's shadow scared the  
big fish away.**

**Try to make Bear's shadow  
touch the fish in the pond.**

**What three things do we need  
to make a shadow?**

- 1. a light**
- 2. an object to block the light**
- 3. a surface for the shadow  
to appear upon**





**What happens to Bear's shadow as the Sun moves?**

**Move the Sun across the sky,  
from sunrise to sunset.**

**What happens to Bear's  
shadow as the Sun moves?**





**Shine the Sun straight down on  
Bear from above his head.**

**Where is his shadow?**

**Where do you see the Sun  
in the sky at lunchtime?**

**How does your shadow  
look at lunchtime?**



**Bear wants to hide in  
the shade of the tree.**

**Can you help him?**

**Tell me about your shadow.**

**Does your shadow always  
look the same?**

**Why do you think your  
shadow changes?**

**UNIT 3:**  
**NEBULA AND**  
**CLOUD ART**

# NEBULA AND CLOUD ART

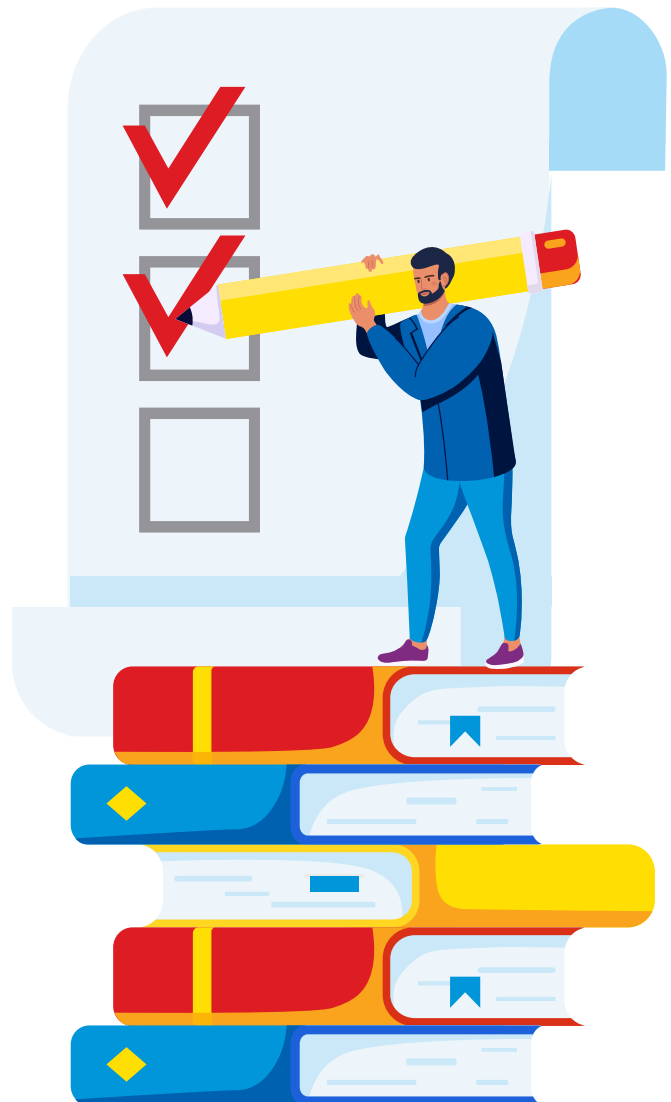
This set of activities is designed primarily for children under the age of 8 and can easily include their caregivers. In this activity, children will look at clouds both on Earth and in Space (nebula). Exploring these will be done through movement, songs, and art to visualize cloud and nebula formation and expansion.

On Earth, clouds are made from a mixture of dust and water vapor. In Space, nebulas are made from gasses formed from elements and molecules blasted out from an exploding star. These gasses form huge clouds of the gasses and dust, creating fantastic forms seen through telescopes around the world.

Children will learn about how nebulas are formed. Because of the unique quantities and locations of the materials and the forces that spread them out, each model nebula will be unique—just like each real nebula! To aid children in understanding that there are clouds in space, Earth type clouds will be explored too. A parallel will be shown between the two.

## Learning Objectives

1. **A nebula** is a large cloud of gas and dust in space that can be created by a dying star.
2. **Nebulas** are responsible for mixing up and spreading out elements in space.
3. **NASA scientists** can use different colors to represent different elements in the nebulas.
4. **Earth clouds are made** from water vapor ( $H^2O$ ), dust and other gases.
5. **Earth clouds are moved** in the atmosphere because of Earth's spin and the warming and cooling of the oceans and land by the Sun (our star).
6. **Earth clouds mix** and churn as they move through the sky.



# NEBULA AND CLOUD ART

## MATERIALS

### Nebula Art

- Neon tempera paints
- Small squeeze bottles (1 for each color)
- Black construction paper circles or squares to fit inside the spinner
- 2 OXO Good Grips salad spinners
- Gel pens
- Optional: paper towels and old newsprint or brown paper table covering to contain mess

### Coffee Filter Nebula

- White, round coffee filters
- Spray bottle for water or disposable cup
- Colored washable markers or colored Sharpies
- Nebula Poster
- Lightweight paper (10-20 pound paper)
- Pencils
- Crayons

### Earth Cloud Poster

- Book: There's No Place like Space! by Tish Rabe

## VOCABULARY

**NEBULA**

**CLOUD**

**STAR**

**MILKY WAY**

**GAS**

**EXPLOSION**

**SUN**

**HOT**

**COLD**

**DUST**

## BOOK LIST

Stars Shining Bright Above You: Explore The Celestial Wonders of The Galaxy  
by Susan M. Straub-Martin

The International Space Station's Eye: Explore the Universe as You've Never Seen It Before by Read With You Center for Excellence in STEAM Education

Hubble's Eyes by Read With You Center for Excellence in STEAM Education

How to Catch a Star by Oliver Jeffers

Ten Little Night Stars by Deb Gruelle

What's Out There?: A Book about Space by Lynn Wilson

# NEBULA AND CLOUD ART

## WARM UP

Bring children together and get them focused on the time with you. Tell them you will explore clouds in space and start by saying, “Space clouds come from stars that have exploded!”

Use: Twinkle Twinkle Little Star as the warm-up and during program transitions.

## MINDSET

1. **One result of this activity** is that every paint nebula is unique in shape, similar to nebulas observed in space! This means that some nebulas may have the paint spread more evenly, resulting in rings, while some may have the paint concentrated on one side.
2. **In order to make a slightly more symmetrical nebula**, the facilitator can pick up the salad spinner basket after the participant adds their drops of paint to the middle of the paper and gently tilt the basket in a circular motion in order to start spreading the paint evenly around the center.
3. **Another technique** that may help is to take out the spinner basket and set it on a flat surface while the drops of paint are added.
4. **Regardless of technique**, if there is more paint on one side of the paper than the other, the paint will often unevenly spread toward the heavier edge when the salad spinner is in motion.





# NEBULA AND CLOUD ART

## PREPARATION

1. **Mix 3 parts paint and 1 part water in each small squeeze bottle and shake well for vibrant colors.** Consider having 4 or more colors available in separate small squeeze bottles to offer enough color choices for visitors.
  - a. **This will create a paint nebula that dries with vibrant colors.** If too much water is used in the mixture, or if the water and paint are not mixed together well, the construction paper may wrinkle and curl when drying.
2. **Although not much force is needed** to operate the spinner, please consider a stable table or surface when facilitating the activity. Make sure to cover the table in old newsprint or brown paper to prevent paint getting on the surface.
3. **Have paper towels on hand for periodic cleanups.** You will need to wipe excess paint from the bottom of the spinner if too much collects after a lot of use.
4. **Set up a drying area to leave the recently-completed nebula spin art.** Have each child (or facilitator) write their names or initials on their creations (possibly on the back) using the gel pens.
5. **Have your book and reading circle area ready.**
6. **Make arrangements with parents or guardians to carry the damp art items.**

## PREPARATION

### Nebula Poster Tracing Activity

1. **Have copies of Nebula Poster out**
2. **Have lightweight paper and pencils**
3. **Have some small rulers, protractors, or sample shapes with names (for reference)**

# NEBULA AND CLOUD ART

## PREPARATION

### Nebula Tye Dye with Coffee Filters

1. **Fold a plain white coffee filter into fourths**
2. **Set up a drying station with scrap newspaper or paper towels for the Nebula Tye Dye.** These take several hours overnight to dry.
3. **Fill the coffee filters with dots, dashes, any kinds of marks using markers** - colored dry erase, Sharpies, and Crayola Washable Markers are perfect for this.
4. **Make marks slowly, so the ink really has time to sink into the four layers of the filter.**
  - a. **It is totally acceptable** to leave plenty of white space between marks.
5. **The next step will fill it all in!** Encourage your kids to experiment with the primary colors but don't restrict them to only using those.
6. **Lay colored and folded coffee filters on the drying station.**
7. **Allow kids to spray their coffee filters with water.** Really spray them as the water needs to soak through all the layers so the color soaks through all the layers.
  - a. **You can also do it Chromatography style** by dipping the tip of the coffee filter cone in water and letting the water creep upward by capillary action. This does take a bit longer. *Only insert about ½ inch of the coffee filter into the water, then hold it for 1-2 minutes while the water seeps into the fibers.*
8. **White space is quickly filled in, colors swim together and new colors and shapes are made!**
9. **Now you've got these wet little wads of awesome color.** Let them dry for at least an hour, preferably for around 12 hours. It's tempting to unfold them right away. But when they're wet the coffee filters are super fragile and all that color swimming around needs to settle down before you unfold them.

# NEBULA AND CLOUD ART



## EXPLORE

1. **Guide children to the reading circle.** Lead the group in a Space Song - Twinkle Twinkle Little Star. Once finished with one or two rounds, say: "We are going to explore stars and clouds of dust in space. First, let's see what Dr. Seuss says about space."
2. **Read, There's No Place Like Space! By Tish Rabe**
  - a. **Prompt children for understanding with the following:**
    - i. How many planets are in our solar system?
    - ii. What do you think planets are made of?
    - iii. What is something you remember about Venus, Jupiter, Saturn...?
    - iv. Can you create a simple way to remember the names of the planets?
    - v. Where does the light from the Moon come from?
    - vi. What star do we see every day?
    - vii. What do you think stars are made of?
    - viii. Do you think planets and stars are born?
3. **Follow the book with another round of Twinkle Twinkle Little Star** and then guide the participants to the activities.
4. **At the activity table tell them that you are going to explore clouds in space, the place that stars and planets are born.** Space clouds are called nebula (Show nebula poster and talk about colors and shapes). They are created from exploding stars. To remember the stars that give us such beautiful space clouds everyone is going to sing - Twinkle Twinkle Little Stars! (teach the song if needed, or have a child who knows the song lead it).
5. **Tell the children that "they are going to be like the stars in the sky and create their own nebula!"**

# NEBULA AND CLOUD ART

## EXPLORE CONTINUED

6. **Split your group into three and assign them to an activity table.**  
Assure them that they will get a chance to try all of the activities.
7. **Model how to drip the paint on the black paper, then spin it** to create a sample. Have children make their own spin art.
8. **As the children pick out their paint, try saying:** “Nebulas are made of different elements (represented by the colored paint that you see here). What colors do you want your nebula to have?”
9. **Facilitate a conversation about how the colors (elements) mixed together** as a result of the nebula’s formation. For example, try asking:
  - a. **“What happened to the colors, or elements, you put onto your paper?”**
  - b. **“How would you describe the pattern of your nebula?”**
10. **For younger visitors, walk them through observations**
  - a. **“Do you see how the color spreads out from the center?”**
  - b. **“Do you notice how the colors mixed together (point to where paints overlap)?”**
11. **Point out how the many colors change on the paper:**
  - a. **Blending or interesting shapes that form while spinning.**
  - b. **Whether the paint spread outward in a mostly circular way,** resembling a round nebula, or if the paint spread is more random like a uniquely shaped nebula.
  - c. **Share that, “Some nebulas are named after animals or shapes they resemble.”**
    - i. For example, there’s the Butterfly Nebula and the Cat’s Eye Nebula.”
    - ii. **“What shapes do you see in your nebula?” or “What name would you give your nebula?”**
12. **Lay the spin up art on sheets of newspaper, paper towels, or a drying table.**

# NEBULA AND CLOUD ART

## STATION 2 Poster Tracing

1. **Show children how to trace the shapes of the nebula** from the poster. Then they can color them however they like. Each color is an “element.”
2. **Have different shapes with their names available for children to use as reference**
3. **Once these are completed, bring everyone together** with their poster tracing. Have the children work in groups of two or three and show each other the different shapes and describe what they see and why they chose their colors.



# NEBULA AND CLOUD ART

## STATION 3 Tye Dye Coffee Filters

This can be a bit messy with markers and spray bottles. But FUN!

1. **Every child gets a coffee filter.** Show them how to fold the filters into quarters.
2. **Let them use their thumbs to create creases.**
3. **Show examples of different ways to color the filters** and let the children experiment.
4. **Facilitator may have to prompt children to add more colors and shapes.**
5. **When ready, set the filters on a tray** (early exploration activity), and spray with water until saturated.
6. **Place the filters on the drying station.**

## OPTIONAL EXTENSION Nebula Dance

This should be done at two different times of the day.  
At least 2 hours apart.

1. **Have the children gather** together and hand them scarves or ribbons.
2. **We are going to do a dance** and pretend we are nebula flying through space! Each of you is an element. Think out the nebula art that you created, and let's see if we can create more art!
3. **Bring this to a close with Twinkle Twinkle.**

If you incorporate food into your program — try  
String Cheese Rockets.

## EXTENSION ART ACTIVITY Nebula Sensory Slime

This [slime recipe](#) can help children understand how gasses mix and move through space. This is a dark colored slime with glitter to model an active nebula.

# NEBULA AND CLOUD ART

## EXTENSION ACTIVITY

### Nebula Poster & Cloud Poster

#### How many Shapes?

Split the children into two groups - Nebula and Cloud. Have them do this activity. If there is time, let them switch to the other poster.

Children are given lightweight paper to trace the outer shape of the nebulas or clouds on the poster. Then they can color their shapes. When they are done with their drawing, have them identify how many different shapes they can see. Encourage them to look at the whole and at different parts.

Have them use different colors to outline the shapes. Suggest they move the drawings around so they can see them from different angles. Do they see more shapes? What are they?

#### If they do both:

How are earth clouds and space clouds/nebula the same? Different?

Make sure the children sign their names and date their pictures. If they are pre-literate, the facilitator can write names and dates.



## FOOD ACTIVITY

### Galaxy Popcorn

*Recipe can be sent home with caregiver to make there.*

#### String Cheese Rocket

Give each child a string cheese and invite them to peel or "string" only one end of the cheese and flare the pieces out to look like a rocketship.

# NEBULA AND CLOUD ART

## TAKE HOME SCIENCE ACTIVITIES

### Earth Cloud Poster Activity

With copies of this poster, have children gather in a circle outside where they can see the sky. Make sure to tell them, "No looking at the Sun!" See how many types of clouds they can see. Have them call out shapes they see. After three or four minutes have them face into the circle. Do a telephone activity, with the clouds they see as the characters of their story. Do as many rounds as you can, encouraging the children to be creative with what they already know about clouds: they are made of water vapor, dust and gasses, moving around because of the heating of the sun and oceans.



## MUSIC AND MOVEMENT ACTIVITY

### Twinkle, Twinkle Little Star Song and Dance Movement

#### Ribbon/Scarf Dance

Each child gets a colorful ribbon or scarf. They are told that the closest window is their Sun that has just exploded and they are the gasses flowing into space. Let them weave together moving the scarves up, down, and around. They can make clicking, crackling, or popping noises to mimic hot gasses cooling off. They should start at the window or "sun" and move away until they reach another wall or the facilitator says STOP.

You can explain that when a sun explodes it pushes the gasses into space and they speed away but also mix and create amazing-colored structures called nebula.





# NEBULA AND CLOUD ART

## TAKE HOME SCIENCE ACTIVITIES

### Cloud in a Bottle (NASA JPL)

*This activity is demonstration and observation only.*

#### Preparation

**Cut** a 2 liter bottle about 25% below the top. This creates a funnel. Keep the bottle cap attached.

#### Directions

1. **Boil** 1.5 cups of water in the microwave or electric kettle.
2. **Fill** the funnel with ice.
3. **Pour** water into the lower section of the 2 liter bottle.
4. **Light** a stick of incense and put some smoke into the lower section.
5. **Place** the ice funnel, small part facing into the bottle.
  - Watch the interaction of the warm and cold air.
  - Ask children what they observe.

**Ask children if air can be seen? Clouds on earth are made of gasses just like clouds in space.**

**Let's do an experiment and see if we can see how clouds are formed!**

#### Conversation starters:

**"Are clouds hot or cold?"**

**"What do you think earth clouds are made from?"**

**"What do you think space clouds are made from?"**

**"Do clouds move? Why do you think that?"**

## EXTENSION ART ACTIVITY

### Nebula Sensory Slime

Did you know that our universe is stretching out in all directions? It's true! Ever since the universe began about 13.8 billion years ago, it's been stretching out and expanding. In the activity, you'll make your own stretchy universe slime.

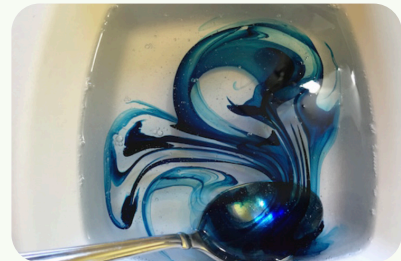
### What You Need

Clear school glue  
1 teaspoon of borax  
Water  
Red and blue food coloring

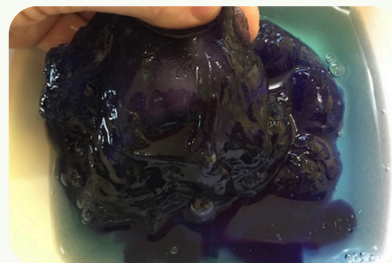
Two bowls  
Measuring cups:  $\frac{1}{2}$  cup and 1 cup  
Glitter  
Wax paper

### Instructions

- 1. In one bowl, mix**  $\frac{1}{2}$  cup of glue with  $\frac{1}{2}$  cup of water. Stir it together; it will mix nicely.  
*Note: You may also use white school glue, but your universe slime will be lightly colored and opaque.*
- 2. Add food coloring to the glue** and water mixture. We used 6 drops of blue and 3 drops of red to get a nice, dark purple color.
- 3. In the other bowl, mix** 1 teaspoon of borax with 1 cup of lukewarm water.
- 4. Stir until the borax is dissolved.** This takes a while, so you have to be patient. If you skip this step, your slime will not come together very well.
- 5. Stir, stir, stir,** until you don't feel the crunch of the solid bits of borax on the bottom. The water will start to look a little cloudy.



6. **Add the purple glue mixture** to your borax water, stirring slowly as you pour it.
7. **You'll see the slime start to form.** Stir as much as you can. Use your hands to get in there and work it around.
8. **Take your glob of slime** out of the bowl and put it on your wax paper. It's okay if there is some water left behind.
9. **It's time to add some glitter galaxies!**  
Flatten out your slime and spread glitter over the top. You can use any color or combination of colors, but lighter ones will work best because they will stand out against the dark purple.
10. **Fold your slime in half** to seal in the glitter. Then press it out and fold it over again.
11. **Keep pressing and folding** and watch as the glitter spreads throughout your slime.
12. **Play with your handheld universe and watch it stretch and expand!**



Find this activity online and learn more by visiting [NASA Space Place](#)

## FOOD ACTIVITY

### Galaxy Popcorn

PREP TIME: 15 minutes | TOTAL TIME: 15 minutes

#### Ingredients

- 10 cups popped popcorn
- 10 oz black candy melts
- 1.75 oz Sixlets, blue
- 2 cups mini marshmallows
- 1 tbsp Wilton Silver Stars
- 1 tbsp nonpareils, blue
- 1 tbsp jimmies, white
- 1 tbsp Choco Maker Shimmer Rock Candy



#### Instructions

1. **Line a baking sheet** with parchment paper and set aside.
2. **Add popcorn** to a large mixing bowl.
3. **Microwave candy melts** according to package directions and pour over popcorn.
4. **Stir well** to evenly coat popcorn.
5. **Spread mixture** onto prepared baking sheet and immediately top with sprinkles, stars, candies, and jimmies. Let cool to harden completely or pop into the fridge to speed up the process.
6. **Once the popcorn is hard, break apart** popcorn into smaller pieces and stir in marshmallows and Sixlets.
7. **Store** in an airtight container or resealable bag.

UNIT 4:  
**MEASURE UP**  
*THINK LIKE A SCIENTIST*

This session helps young children learn about measurement and tools. This is an important part of being a scientist – asking questions and measuring. Using structured play, children will learn about measurement, comparison and contrast, density, distance, and shapes. This unit is mainly self guided with thinking and doing prompts provided by the facilitator, and is developmentally appropriate for early learners. Rather than emphasizing content, this unit highlights science process skills: what “doing” science can look like at a young age. Extensions that bring in place-based or locally relevant items into this unit are easy to incorporate and will help children extend their thinking beyond the provided materials.

## Learning Objectives

1. **Develop** an understanding of measurement and measuring using tools, and counting – all are important skills for doing science with concentration and help when young minds begin to wander.
2. **Investigate** through play foundational science concepts like distance, mass, and volume
3. **Become** aware that Scientists develop and use measuring tools to gather information about the physical world, including faraway objects in space

### VOCABULARY

MEASURE	SQUARE
INVESTIGATE	CUBE
VOLUME	CIRCLE
MASS	CYLINDER
DISTANCE	BUCKET
TOOL	COMPARE
BALANCE	QUESTION

### MATERIALS

- Large plastic bin
- Large baking tray
- Small tarp/drop cloth
- Play sand
- 10-foot tape measure
- Blocks
- ½ cup measuring cups (2, of different styles)
- 2 cup (1 pint) liquid measuring cup
- Plastic balance scale
- Book: How Long or How Wide?: A Measuring Guide (Math Is CATegorical<sup>®</sup>) by Brian Cleary

## BOOK LIST

I Use Science Tools by Kelli Hicks

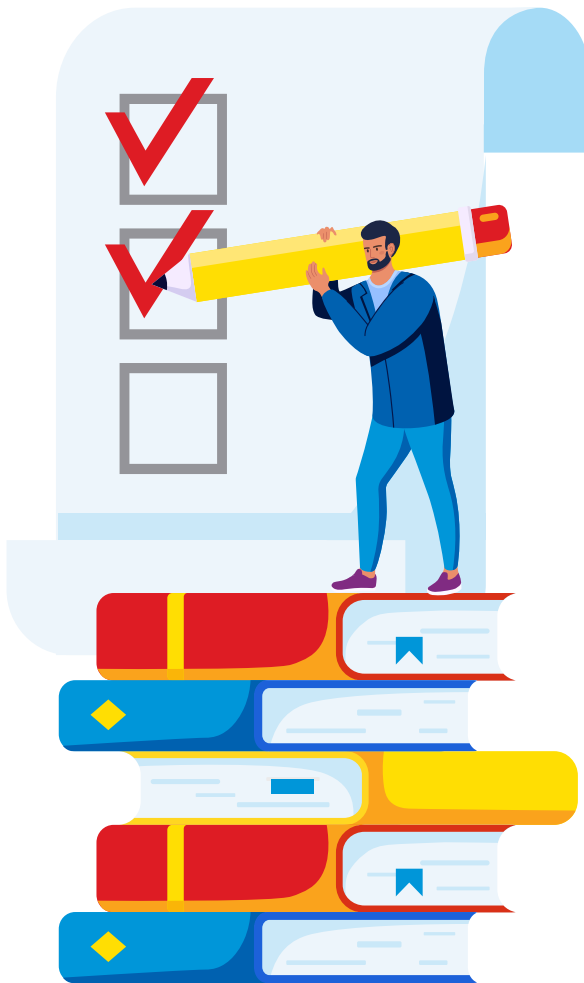
How Long?: Wacky Ways to Compare Length by Jessica Gunderson

How Tall?: Wacky Ways to Compare Height by Mark Andrew Weakland

How Heavy?: Wacky Ways to Compare Weight by Mark Andrew Weakland

Me and the Measure of Things by Joan Sweeney

Brain Gym Exercises by StyleCraze



## Preparation

- ☐ **Place** the protective tarp on the floor or a low table, with the large plastic bin on top.
- ☐ **Pour** the sand (or alternate material) into the bin. You may choose to facilitate this activity at an existing sandbox or sand table if you have one available.
- ☐ **Spread** out the blocks, measuring cups, and liquid measure on top of the sand in the bin.
- ☐ **Place** the plastic balance scale on the baking tray next to the bin.
- ☐ **Hold** on to the tape measure and any additional, optional measuring tools (stopwatch, thermometer) to introduce as appropriate.



## Brain Gym

### WARM UP

These movement exercises will help children with their concentration and focus. You can use this to start your session or as a transition between activities. Gather children in a space large enough for them to move around freely.

### EXPLAIN

**“Welcome young scientists! We are going to learn about the ways scientists use tools today. But first let’s do some dancing! This is called Brain Gym and it has five movements. Ready?”**

### LET’S PUT ON OUR THINKING CAPS!

- **Place** your index finger and thumb on the top of your ear.
- **Massage** the top of your ear and gradually come down the auricle (outer ear).
- **Massage** from the back to the top of your ear.
- **Do** this slowly 5 times.

### BRAIN BUTTONS

- **Place** your left palm on your belly.
- **Place** the thumb and index finger of your right hand an inch below your collarbone. Move the fingers in a circular motion to a count of 5.
- **Switch** hands, placing your right palm on your belly, and your thumb and index finger of your left hand an inch below the collarbone. Massage in a circular motion, counting to 5.





## CROSS CRAWL

- **Stand** tall with your legs hip-width apart, shoulders rolled back, and chest up. Look ahead.
- **Lift** your right hand above your head. This is your starting position.
- **Lift** your left leg off the floor, and bend your left knee.
- **Bend** simultaneously your right elbow and try to touch the left knee with your right elbow.
- **Get** back to the starting position. Do the same with your left hand and right leg.
- **Repeat** 3 times.



## HOOKE UPS

Use this exercise when you need to bring the students' attention back to you during the session.

- **Cross** your right ankle over your left ankle.
- **Extend** your hands in front of you. Cross the right hand over your left hand and link the fingers.
- **Twist** the forearms internally and form a hook. Take six deep breaths.
- **Release** the hook and join your fingertips. Take six deep breaths.
- **Do** this 3-5 times.

"Does everyone feel ready to learn like a Scientist? Let's go!"

Move to the activity location.

## NECK CIRCLES

- **Roll** your shoulders back.
- **Lower** your head and tilt it to the right side.
- **Slowly**, roll your neck from the right to the back, from the back to the left, and then down in the center. This completes one neck circle. Do five circles in each direction.

## Time to Explore

### MINDSET

This unit complements the Early Exploration Unit in that they are both mainly self directed by the children with prompts by the facilitator to engage and extend thinking. With that in mind, look around your facility to see if there are any other items that you can use to add to the measuring and comparing experience. Because some items may be heavy for small children, consider setting up your play space on the floor or a low table. And remember your drop cloth! This activity can be messy and sometimes wet.

### SET THE STAGE

1. **Greet** the children and guide them to the activity area.

#### GOOD MORNING/AFTERNOON SCIENTISTS!

Today we are going to explore how scientists think and learn by being curious. But first we have to get our thinking caps on. Is everyone ready to do some Brain Gym? ”

2. **Guide** Brain Gym movements, take your time so that the children can learn how to do the movements correctly. These movements have shown to help with concentration and help when young minds begin to wander.



## EXPLORE

### 1. “Okay everyone – are you ready to get your hands dirty and explore? Let’s start with a Reading and Scientist Circle.”

#### a. Read book: How Long or How Wide?: A Measuring Guide

##### i. Reading Prompts

- What does distance mean?
- How can we measure distance?
- What tools can you use to measure how long something is?
- What tools can you use to measure how far away something is?
- What tools can you use to measure how much something weighs?

### 2. Everyone sit around, I’ll start then each of you can add a question.

#### a. Ask a question that the children can test with the materials available. Help the children who get stuck with a question by asking for clarification. Try not to give them the question. Examples:

- i. How much sand can fit into my hand? Is it the same amount that can fit in yours?
- ii. If I have the same amount of water and sand will they weigh the same?
- iii. How high can you jump?
- iv. Are my shoes the same size as yours?

#### b. In the circle ask the children to come up with a question. If some are shy or don’t want to participate, encourage but don’t push. Engage them to help them feel comfortable to ask at a different time. If there are multiple facilitators, have one take notes of the questions to use as prompts.

### 3. “Let’s find some answers to our questions!” Model how to explore with the materials available to find answers to their questions. Take one of the children’s questions and use that to start. Make sure to use the child’s name when identifying the question.

#### a. Sand in the hand – Use measuring cups and/or the scales to compare the amount of sand that one’s hand can hold. Make sure to ask the children to pay attention to who has the most and the least sand in their hand.

#### b. How high can you jump – Use the measuring tape and a wall to test how high children can jump, or use the tape along the floor to measure how far they can jump.

## EXPLORE CONTINUED

4. **Allow children to self-direct their exploration** while narrating their actions in a way that highlights their use of tools, introduces vocabulary around measurement, and poses new challenges. For example: “You’re filling the liquid measure with scoops of sand to see how much it can hold. That’s an interesting investigation. Do you think all of that sand can fit on one side of the scale?”
  - a. **You do not need to cover all** of these different areas of measurement over the course of one session. Instead, follow the child’s lead, providing support and building on the early learner’s natural inquiries throughout the activity. If things get repetitive, you can try redirecting toward a different type of measurement, but don’t worry if that doesn’t catch the participant’s interest. Repetition helps to cement understandings of cause and effect, and lays the foundation for replicability, another important science process skill.
5. **Questions and prompts** you can ask children about various measurements.
  - a. **Prompts**
    - i. How do you know...?
    - ii. Can you tell me more about that?
    - iii. What can we use to measure ...?
      - How can we compare the heights of two block towers?
      - How much water/milk do we need so everyone has a cup full?
  - b. **Volume** – When the child is moving sand into, out of, and among containers:
    - i. Which holds more sand? The liquid measure or the cup?
    - ii. How many ( $\frac{1}{2}$  cup) scoops does it take to fill the liquid measure?
    - iii. Do you think you can hold all the sand from the  $\frac{1}{2}$  cup scoop in your hands? Make your hands into a cup, and have someone else pour the sand in. What happens to the sand that doesn’t fit?
    - iv. Can you find two containers or scoops that look different but hold the same amount (volume) of sand?



## c. Mass (measure of how much material is in a given object) –

When the child is putting objects into the balance scale:

- i. Put a handful of sand into one side of the scale. What happens? How many blocks does it take to balance out? Have different people add a handful of sand – are the same number of blocks needed?
- ii. Which feels harder (heavier) to lift up: a  $\frac{1}{2}$  cup of sand or the liquid measure full of sand?
- iii. Fill the liquid measure with sand and dump it into one side of the scale. What happens? Now, fill the liquid measure with blocks and dump those into the other side of the scale. Which side is heavier?
- iv. Fill both  $\frac{1}{2}$  cup measures with sand, and empty one onto each side of the scale. What happens?

## d. Distance/Length – Introduce this new form of measurement, using the same materials, as time allows:

- i. Have children do the Jumping Game to start with this measurement.
  - A simple, yet effective, game to promote gross motor skills and measuring. Tape out 5-6 lines on the floor about a foot apart. Invite participants to take turns jumping as far as they can. Then, challenge them to try jumping even further next time and compare distances.
- ii. Draw a line in the sand. How many blocks can you line up next to it from end to end?
- iii. How many blocks long is your shoe? How about other people's shoes?
- iv. What other distance can you measure? How far away is it in blocks, inches, foot lengths, etc.?
- v. How tall are you – measure your height with the tape measure, and lock the tape measure at that length. Now: Can you find something else in the room that is the same length as you? Why do you think people are different heights?
- vi. Use different comparison items to measure length and distance – shoes, arms spread apart, measure tape, books, etc.



## EXPLORE CONTINUED

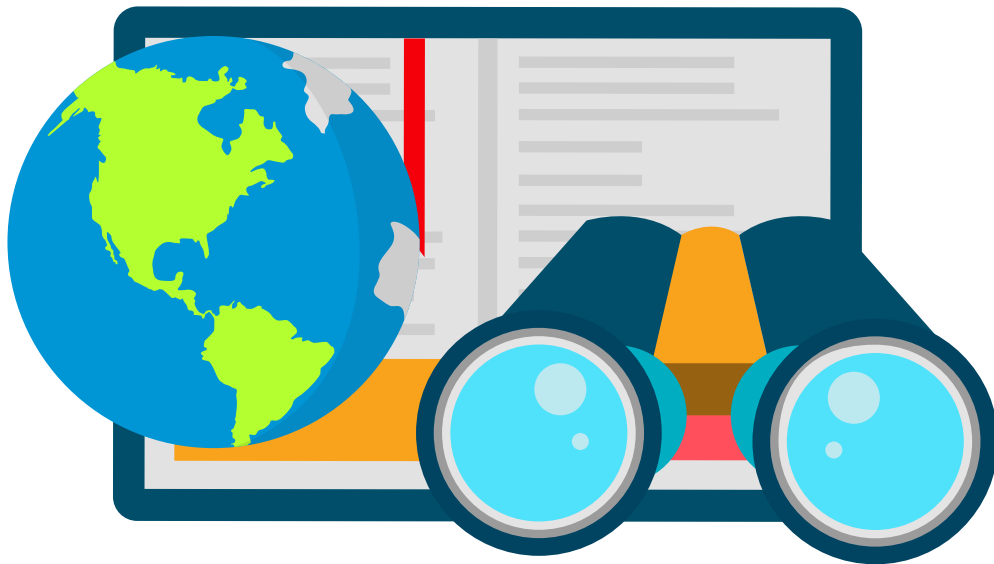
### 6. For older children, consider adding more abstract types of measurement.

#### a. Timers

- i. Stopwatch & Sand Timer – compare timers. How are they the same? How are they different?
- ii. Sand Timer – build challenge. How tall can you build a block/Lego/keva plank tower in 30 seconds?
- iii. Stopwatch: How long does it take to fill the liquid measure with scoops of sand?

#### b. Thermometer

- i. Digital kitchen thermometer: Insert the thermometer into a mound of sand to take its temperature.
  - How can you make the sand warmer? How might you make it colder?
- ii. Digital kitchen thermometer: Insert the thermometer into a measuring cup of water to take its temperature.
  - How can you make the sand warmer or colder?
- iii. Digital kitchen thermometer – find the temperature of your hand, room air, a book, the sidewalk, etc. Which is warmer? Cooler?





## SESSION WRAP UP

1. **Five minutes before the session ends, gather children together in their Scientist Circle.**
  - a. **Ask each of the children** to think of something they learned today. Give them about 15 seconds to think. Then have them share this with a shoulder buddy (someone sitting close to them).
  - b. **Allow 3 to 5 students to share** what they learned with the group, taking note of any misconceptions as well as surprise learnings.
  - c. **Lead the group** in the Brain Gym movements to bring the session to a close. "Does everyone remember how we started our activities today? With Brain Gym! Let's do these Thinking Helper movements again."

Throughout the lesson, provide specific praise to students based on your observations of how they work with the tools provided and/or the target vocabulary they use during the session.

## EXTENSIONS TO THIS UNIT

1. This Art session can have a Brain Gym lead in and/or exit.
2. If you have additional time, older students, or need more variety, consider an art extension using sand and tempera paint.
  - a. Consider how each item can be used in the extension activities using the tools in the kit or additional measuring tools that are available.
  - b. **Art Option 1:** Mix a small amount of sand with liquid tempera paint in a small disposable bowl to add texture. Offer a free style painting activity with 2-3 colors and paper.
  - c. **Art Option 2:** Add a small amount of liquid tempera paint to a bowl of sand. Mix well so that the paint coats all of the grains. Children can use brushes, sponges, or Ziplock bags with a corner cut out as their 'brush'. Offer paper and let the children experiment.
    - i. An extension to this is the addition of White Glue to the sand and paint mixture. The glue helps keep the sand in place and dries clear.
3. **Additional Measurement Suggestions**
  - a. **Weight or mass** of the sand
  - b. **Liquid measure** of the paint and glue
  - c. **Length** of the paper
  - d. **How long** it takes for the paint to dry

## MUSIC & MOVEMENT ACTIVITY

### Jumping Game

A simple, yet effective, game to promote gross motor skills and measuring. Tape out 5-6 lines on the floor about a foot apart. Invite participants to take turns jumping as far as they can. Then, challenge them to try jumping even further next time and compare distances. Children can practice measuring with conventional measuring tools (tape measures) and non-conventional measuring tools (string, hands, pennies, Legos, etc).



## TAKE HOME SCIENCE ACTIVITY

### Tin Foil Boats

#### Materials

Tin foil	Water	Pennies or
Bowl	Scissors	marbles

#### Directions

1. **Cut** a piece of tin foil 5 x 6 inches.
2. **Fold** up the sides of the boat so it will hold a cargo of pennies and not sink.
3. **Place** the boat in the bowl of water. Begin adding pennies for the boat's cargo.
4. **See** how many pennies your boat can carry before it sinks.
5. **Have** some friends over and try this experiment with them. See which one of you can create the boat that will carry the greatest amount of cargo.
6. **Be sure** to dry the pennies before you begin adding them as cargo because remember water has weight!
7. **Have** the person who created the boat begin adding pennies to their boat while another person counts the number of pennies as they are added to the boat.
8. **Try** different ways to distribute the weight of the pennies on your boat so you can carry the maximum number.

## FOOD ACTIVITY

### Trail mix

Continue with the theme of measuring by inviting participants to make their own trail mix. Provide a variety of dry ingredients and measuring cups. Let them measure each ingredient into their own bowl and mix.

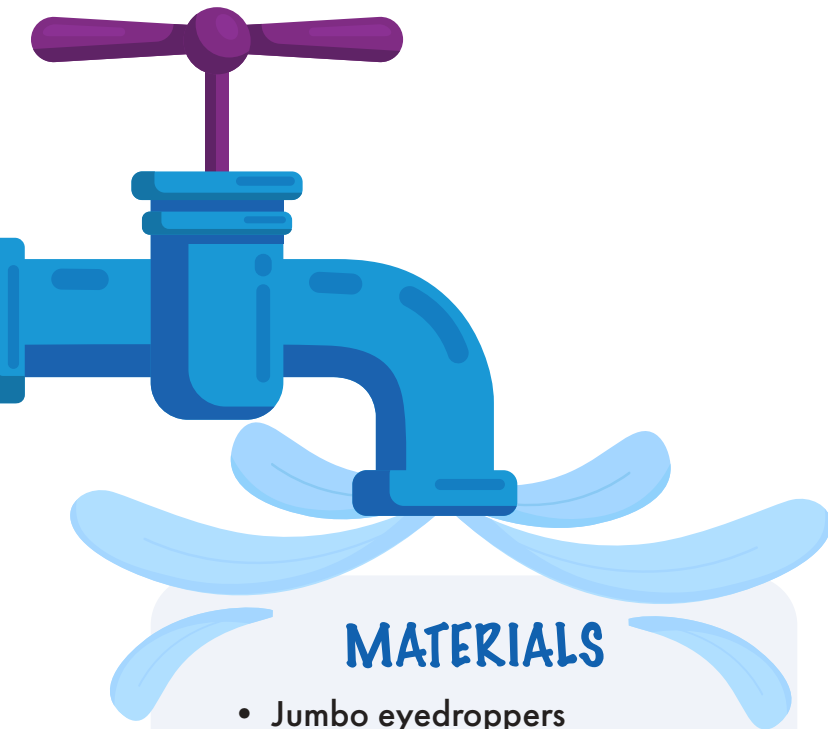
- Peanuts and other types of nuts
- Raisins
- Sunflower seeds
- M&M's or chocolate chips
- Bowls
- Measuring cups
- Small spoons for mixing



**UNIT 5:**  
**EARLY**  
**EXPLORATION**  
**WITH WATER**

# EARLY EXPLORATION WITH WATER

This unit is focused on simple play and exploration activities that can help young children develop fundamental science process skills. This unit helps early learners develop the types of skills that scientists use every day. Participants will learn through play and exploration using water. The activities give children an opportunity to practice scientific ways of thinking that are developmentally appropriate for early learners. Rather than emphasizing content, the activity highlights science process skills or what doing science can look and feel like at a young age.



## MATERIALS

- Jumbo eyedroppers
- Spray bottles
- Sponges
- Aluminum foil
- Felt squares
- Toy brick baseplates
- Small plastic petri dishes
- Plastic trays
- Color-changing bath tablets to color water
- Waste/dump bucket
- Microfiber towels
- Book: Water Rolls, Water Rises: El Agua Rueda, El Agua Sube by Pat Mora, illustrated by Meilo So

## Learning Objectives

1. **Exploring** materials, using tools, and making observations are important skills for doing science.
2. **Very young children (ages 0–4) use science process skills** (like exploring, categorizing, measuring, observing, predicting, problem-solving, and using tools) to learn about the world around them.
3. **Practicing science process** skills early and often is important for children’s brain development.

## VOCABULARY

<b>SINK</b>	<b>SMELLING</b>
<b>FLOAT</b>	<b>HEARING</b>
<b>PREDICT</b>	<b>ROUGH</b>
<b>OBSERVE</b>	<b>SMOOTH</b>
<b>SEEING</b>	<b>DAMP</b>
<b>TOUCHING</b>	

# EARLY EXPLORATION WITH WATER

## BOOK LIST

I Use Science Tools by Kelli Hicks

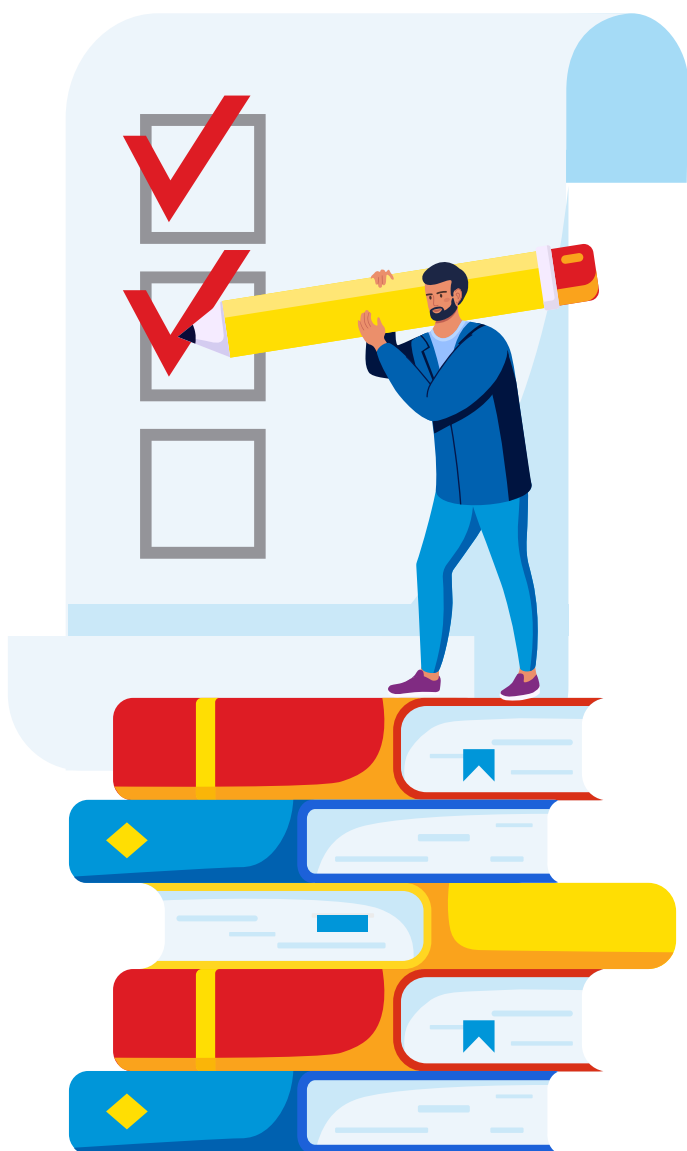
What is a Scientist? by Barbara Lehn

Floating and Sinking by Amy S. Hansen

Cece Loves Science by Kimberly Derting

Ada Twist, Scientist by Andrea Beaty

Brain Gym Exercises by StyleCraze



## Preparation

- ☐ **Cut aluminum foil** into squares. These can be used multiple times.
- ☐ **Cut felt** into smaller squares. These can be used multiple times.
- ☐ **Cut kitchen sponges** in half, so that they fit into petri dishes.
- ☐ **Add** color-changing bath tablets to water.
- ☐ **Fill** dropper and spray bottles with colored water.
- ☐ **Place** surfaces (aluminum foil, felt, brick baseplates) onto plastic trays to reduce mess.

# EARLY EXPLORATION WITH WATER

## Brain Gym

### WARM UP

These movement exercises will help children with their concentration and focus. You can use this to start your session or as a transition between activities. Gather children in a space large enough for them to move around freely.

### EXPLAIN

**“Welcome young scientists! We are going to learn about the ways scientists use tools today. But first let’s do some dancing! This is called Brain Gym and it has five movements. Ready?”**

### LET’S PUT ON OUR THINKING CAPS!

- **Place** your index finger and thumb on the top of your ear.
- **Massage** the top of your ear and gradually come down the auricle (outer ear).
- **Massage** from the back to the top of your ear.
- **Do** this slowly 5 times.

### BRAIN BUTTONS

- **Place** your left palm on your belly.
- **Place** the thumb and index finger of your right hand an inch below your collarbone. Move the fingers in a circular motion to a count of 5.
- **Switch** hands, placing your right palm on your belly, and your thumb and index finger of your left hand an inch below the collarbone. Massage in a circular motion, counting to 5.



# EARLY EXPLORATION WITH WATER

## CROSS CRAWL

- **Stand** tall with your legs hip-width apart, shoulders rolled back, and chest up. Look ahead.
- **Lift** your right hand above your head. This is your starting position.
- **Lift** your left leg off the floor, and bend your left knee.
- **Bend** simultaneously your right elbow and try to touch the left knee with your right elbow.
- **Get** back to the starting position. Do the same with your left hand and right leg.
- **Repeat** 3 times.



## HOOK UPS

Use this exercise when you need to bring the students' attention back to you during the session.

- **Cross** your right ankle over your left ankle.
- **Extend** your hands in front of you. Cross the right hand over your left hand and link the fingers.
- **Twist** the forearms internally and form a hook. Take six deep breaths.
- **Release** the hook and join your fingertips. Take six deep breaths.
- **Do** this 3-5 times.

"Does everyone feel ready to learn like a Scientist? Let's go!"

Move to the activity location.

## NECK CIRCLES

- **Roll** your shoulders back.
- **Lower** your head and tilt it to the right side.
- **Slowly**, roll your neck from the right to the back, from the back to the left, and then down in the center. This completes one neck circle. Do five circles in each direction.

# EARLY EXPLORATION WITH WATER

## Ready, Set, Go

### SET UP

1. **Cut** aluminum foil into squares. These can be used multiple times.
2. **Cut** felt into smaller squares. These can be used multiple times.
3. **Cut** kitchen sponges in half, so they fit into petri dishes.
4. **Add** color-changing bath tablets to water.
5. **Fill** droppers and spray bottles with colored water.
6. **Place** surfaces (aluminum foil, felt, brick baseplates) onto plastic trays to reduce mess.
7. **Place** the water and water tools out of sight to encourage an initial focus on the other materials prior to the session.

### MINDSET

Each child is learning at their own pace. Some kids might want to just repeat the same portion of the activity over and over again. This is okay! Repetition is the foundation of replicability, and no matter what, they are exploring the properties of water, becoming acquainted with the materials on the table, and practicing parts of the scientific process. Just keep asking questions and providing narration! While the children are exploring, make sure to ask for comparisons between different materials to prompt exploration, observation, and categorization. This activity can get messy. Have the towels and dump bucket on hand to wipe down surfaces between participants. Color tablets added to water are washable, so don't worry if they get onto clothing or tabletops

# EARLY EXPLORATION WITH WATER

## SET THE STAGE

1. **Greet** the children and guide them to the activity area.

### ☾☾ GOOD MORNING/AFTERNOON SCIENTISTS!

Today we are going to explore how scientists think and learn by being curious. But first we have to get our thinking caps on. Is everyone ready to do some Brain Gym? ☾☾

2. **Guide** Brain Gym movements, take your time so that the children can learn how to do the movements correctly. These movements have shown to help with concentration and help when young minds begin to wander.



3. **Reading Circle:** Water Rolls, Water Rises: El Agua Rueda, El Agua Sube
  - a. **"Okay Scientists - We are going to explore water today. But first, let's sit down and read a book called: Water Rolls Water Rises: El Agua Rueda, El Agua Sube. Then we are going to have a Scientist Circle!**
  - b. **Facilitator reads the book.** While reading, the facilitator should pause periodically and ask questions to gauge the children's understanding.
    - i. Prompts during reading
      - Where do you think river water ends up?
      - Give examples of different ways we encounter water (for facilitator - snow, fog, rivers, muddy paths, reservoir, mud, bathtub, planters, garden...)
      - What is your favorite place with water?
      - What games have you played with water?
      - Why do you think water is important?
      - Extension for older children - What shape does water take?



# EARLY EXPLORATION WITH WATER

## 4. After reading the book, introduce the Scientist Circle.

**a. After reading the book,** prompt children to think about what they already know about water.

- i. Take 2-3 minutes to have children share what they know about water. If there are any glaring misconceptions, make note to cover those during the activities.
- ii. Next, ask the children if they have any questions about water. Examples of questions they may have are: Why is water wet? Why is water sometimes a liquid and sometimes a solid?" Take 2 minutes and have children share what questions they have.
- iii. Let children know that almost all science starts with a question.

**b. "Here are some questions I was thinking about:"**

- i. Considering the materials available, ask a question that the children can test with the materials available. Help the children who get stuck with a question by asking for clarification. Try not to provide them with the question.
- ii. If some are shy or don't want to participate, encourage but don't push. Engage them to help them feel comfortable to ask at a different time. If there are multiple facilitators, have one take notes of the questions to use as prompts.

**c. "You thought of some great questions. Now it is time to explore. Is everyone ready to explore with water?"**



# EARLY EXPLORATION WITH WATER

## EXPLORE

- 1. Set up centers with different materials** so that the children can move around to experience different items. Add the water tools after the children have completed one round of touch, see, and listen (using their senses) to experience the different surfaces.
  - a. Guide children** to the drop cloth with the materials that are on tables appropriate for the children's height.
  - b. Throughout the session you should encourage children** to use sight and touch to gather sensory input. They will observe the items (felt, foil, blocks, etc) twice, once while they are dry (no water) and another time after the water is introduced.
    - i. Begin with open-ended questions like "How does [the felt/foil/brick/sand] feel?"
    - ii. "What do you notice about [the felt/foil/brick/sand]?"
      - If children have trouble answering, offer examples of specific, descriptive language to help them compare and categorize the materials. For example: "Does it feel soft or hard?"  
Or: "Which is shinier, the felt or the aluminum foil?"
- 2. Introduce water and hand out measuring tools** after participants have had a chance to explore the material's surfaces. Then, encourage participants to use sight and touch to gather information about how the materials changed once water was added.
  - a. If needed, demonstrate how to use the tools.**
    - i. Model how to pull at the bottom of the spray bottle "trigger" for more leverage.
    - ii. Experiment with adjusting the nozzle to see what happens. Help children aim the spray.
    - iii. If needed, demonstrate how to use the eye droppers, and talk participants through what you are doing. You can even try picking up water from the soaking-wet felt!
    - iv. Sponges can be used to absorb water that has been sprayed onto surfaces and into petri dishes. They can also be used to squeeze water back out onto surfaces.

# EARLY EXPLORATION WITH WATER

## EXPLORE CONTINUED

**b. Pose guiding questions** as the children start their explorations using water.

- i. Does [the felt/foil/brick/sand] feel/look different now? Describe how it is different.
- ii. Did the color change? How do you think that happened?
- iii. What do you think will happen if we spray water onto [the brick baseplate]?
- iv. I see that you're pouring that water very carefully. Do you think that will make a difference with the [felt/foil/brick]?
- v. How is water different on different surfaces? Use your resources to provide different surfaces for the children to test.
  - "What do you think happens if you drop water on top of an aluminum foil mountain?"
  - "What do you think will happen if you drop water onto the felt? Where will the water go?"
  - "What do you think will happen if we drop water on a rock from outside? How about a piece of paper?"
  - "What do you think will happen if you drop water in sand?"

**c. During the session continuously ask open-ended questions** and make connections between the materials on the table and familiar landscape or water cycle components.

- i. Examples include petri dishes become lakes or ponds, the aluminum foil becomes a mountain range, the spray from the bottle is rain, the sand makes dirt/landscapes, etc.

**3. Make sure to provide opportunities for kids** who can't yet verbally articulate their thoughts to show you what they are thinking by pointing to or manipulating the materials in front of them.

**a. For example,** if you ask, "Where do you think the water will go when I pour it on top of this mountain?" provide different options a child can point to.

- i. "You're squeezing the sponge to make it rain! That is amazing!"
  - Talk about rain. Where does it come from? Where does it go? Does it disappear in the soil like it does in the sponge? Where does it pool up to make puddles, like in the petri dish or on the brick baseplate?
- ii. Encourage real-life connections to harness prior knowledge, make science feel accessible, and reinforce the message that science questioning, curiosity, and exploration occurs anytime, anywhere.

# EARLY EXPLORATION WITH WATER



## SESSION WRAP UP

1. **Five minutes before the session ends, gather children together in their Scientist Circle.**
  - a. **Praise each of the students** for their scientific thinking, observations, etc. and ask them which activity they enjoyed the most. Take note of this for future programming.
  - b. **Lead the group in the Brain Gym movements** to bring the session to a close. "Does everyone remember how we started our activities today? With Brain Gym! Let's do these Thinking Helper movements again."

# EARLY EXPLORATION WITH WATER

## EXTENSIONS TO THIS UNIT

1. **This Art session can have a Brain Gym lead in and/or exit.**
2. **If you have additional time**, consider continuing the theme of exploration. This can be especially helpful with older students, if there is a need for more variety.
3. **This activity focuses on open ended opportunities** for children to explore a variety of textures, patterns, and designs.
  - a. **Provide objects** that can be used with water soluble tempera paint by the children to create their own masterpiece.
    - i. Suggested materials: Leaves, sticks, and other natural objects; Bubble wrap; Cotton Balls; Sponges; paint sponges and brushes; Legos, hands, etc.
    - ii. Add sand to the samples of the paint and explore variations in surfaces.
4. **Suggest using paint** with the objects to make prints on paper, or have them try mixing colors to create new colors.
5. **Ask each child to create a story** around their creation and have them share it with the group.

## FOOD ACTIVITY

### Play with your Food!

Provide a variety of healthy snacks and a paper plate. Invite the participants to create shapes and other objects with their food items. Can they make a sun? A flower? A happy face?

### Suggested food items:

Pretzel sticks  
Carrot and celery sticks  
Grapes

Round and square crackers  
Apple slices

Did you know that it is actually good for children to play with their food? Read [this article](#) to understand why. It also provides other ideas for playing with food.

# EARLY EXPLORATION WITH WATER

## HOME SCIENCE ACTIVITY

### Sink or Float

This sink or float experiment is a simple physics experiment that will encourage your child to make predictions and observations about buoyancy and density. Through their observations, they'll learn that buoyant objects float and dense objects sink, and if they want to be true little scientists, they can record their predictions and results.

### Materials

#### Items that Sink

Metal utensils

Coins

Stones

Toy car/truck

Keys

Glass gemstones or marbles  
(not suitable for toddlers)

#### Items that Float

Duplo/Lego

Stick or popsicle stick

Corks

Bathtub toys

Foam shapes

Crayon

Rubber ball

A container to do the experiment in i.e.  
plastic tub, basin, pot, bucket etc.

Optional: food coloring  
to color the water

## HOME SCIENCE ACTIVITY 2

### Dancing Raisins

### Materials

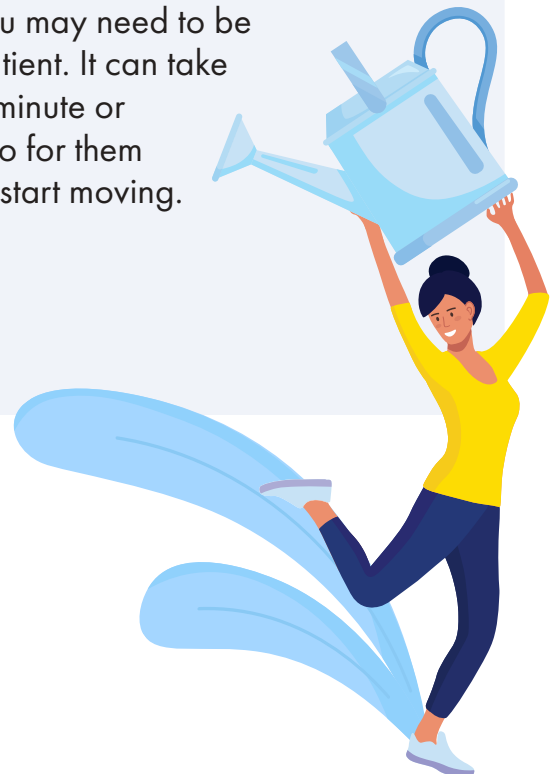
Club Soda or another clear soda  
(7-Up, Sprite, etc.) (Unopened is best)

Raisins (fresh works best)

**Tip:** You will want to separate the raisins first. If they are stuck together they won't dance. Small/medium raisins work better as well.

### Instructions

1. **Fill** a glass with soda.
2. **Drop** raisins into the glass.  
What happens? Do they sink or float?
3. **Observe** what happens.  
You may need to be patient. It can take a minute or two for them to start moving.



## FOOD ACTIVITY

### Article from UDA Creative Arts Preschool

#### **PLAYING WITH YOUR FOOD IS A GOOD THING! THE BENEFITS OF PLAYING WITH FOOD FOR PRESCHOOLERS**

“Don’t play with your food! It’s bad manners!”

We’ve had this concept drilled into us from the time we were small, and chances are that we’re drilling it into our children too. And while we don’t think every meal should be a handsy free-for-all, there are plenty of reasons why playing with food could be a beneficial bonus in your preschooler’s life.

##### **Using More Senses Helps Kids Learn Better**

The more senses that are involved in an activity, the more your child is going to learn — and retain. Playing with food allows your child to see, smell, feel, hear (what does it sound like when you squish a pea or snap a pretzel?), and even taste. This sensory experience helps with language development, problem solving skills, concentration, and comfort in trying new things.

##### **Playing with Food Decreases Food Battles**

We often get into battles of wills at the dinner table. “Eat three more bites, and you can have dessert/go play with your friend/watch a show.” But kids know you can’t actually force them to eat, and so it’s common for them to choose a meal as a time to exert their independence.

Playing with their food removes the battle and gives children a sense of control. It helps them develop curiosity about the food and approach it on their own terms.

Give your child more opportunities to play with new foods, and you may see less resistance during meals.

##### **Playing with Food Helps with Food Aversions**

If you have a picky eater, you know how tough it is to get them to try anything new. Letting children play with food lets them experience the food through different senses. They’ll feel the textures with their hands instead of their tongues, which is much more approachable. They may take the time to smell the food or inspect it visually.

And when playing is allowed, pressure is off. This gets your child comfortable with the food so that when it’s presented as a consumable part of a meal, they may be more willing to try it.





### **Kids Learn Through Play**

Kids learn about their world through play. They learn cause and effect, bravery, language development, and so much more. When a child is allowed to play with a food, they'll learn more about that food. They might ask curious questions, or become fascinated by the food's details. Again, this will help them get more comfortable with unfamiliar foods.

Let your child guide goldfish crackers on a swim through a new soup. Use bell peppers or apples as sponges for paint. Set broccoli up as a forest for your child's small animal toys.

### **But Isn't It Wasteful to Play with Food?**

"You'll finish your dinner because there are starving children in \_\_\_\_\_ (fill in the blank)."

Many of us heard this when we were growing up, and it's a fair point. How can we play with food, when children around the world don't have enough to eat on a daily basis?

Katie from *Preschool Inspirations* offers some grounding perspective. She points out that in the United States, we are surrounded by wealth and abundance. Taking showers, driving cars, shopping in a supermarket, and more are all privileges we freely enjoy. And while we know these privileges aren't available to everyone, we still don't deprive ourselves of them.

This doesn't mean we should use our resources wastefully with no regard to anybody else. But perhaps it's a good idea to focus our efforts on making a difference, like donating generously to someone in need.

Katie also suggests that when playing with food, to use foods that are expired, food that would have been thrown away (maybe you spilled a bag of pretzels or maybe the apple is too bruised), and foods that benefit nature — like birdseed projects done outdoors.





## How to Play with Food

- Let your child cook with you. Try your best not to stress out over messes; this is part of the sensory process.
- Choose fun ways to present food from time to time. Put chicken on kabob sticks, arrange fruit in rainbow order, cut food into different shapes, let your children build their own tacos, etc.
- Use food as the subject of an art project. While you prepare dinner, leave an extra cucumber or broccoli stem on the counter and ask your child to draw or paint it. Tell your child to give it arms and legs, change its color, or even come up with a story about their drawing.
- Have a fun taste test. Choose different food items you know your child likes, and take turns being blindfolded while feeding each other bites of the food. Everyone will have fun as you guess what you're tasting.
- Pick your favorites. Buy several types of one kind of food — apples are a good idea. Taste each variety, and vote on your favorites.
- Before a bite, ask your child what that food will sound like when it's chewed. Will it be crunchy, soundless, squishy? Similarly, ask your child to describe its appearance or smell.
- Make food into a math problem. Ask your child to count their grapes on their plate. Then ask them how many will be remaining if they eat one. What about two?
- Have your child help you make dinner more colorful. What foods can you add to your chicken dinner to make your plates more like the rainbow?
- String cereal on yarn.
- Use apples, bell peppers, or potatoes as painting stamps.
- Use food as checker pieces.
- Make faces with different food items.
- Play with pretend food. Invent the wackiest recipes you can.



*At UDA Creative Arts Preschool, we eat healthy snacks every day and give the children opportunities to play with their food, prepare their own food, and try new foods. To learn more about UDA Creative Arts Preschool in Draper, Utah, contact us online or give us a call at (801) 523-5930*

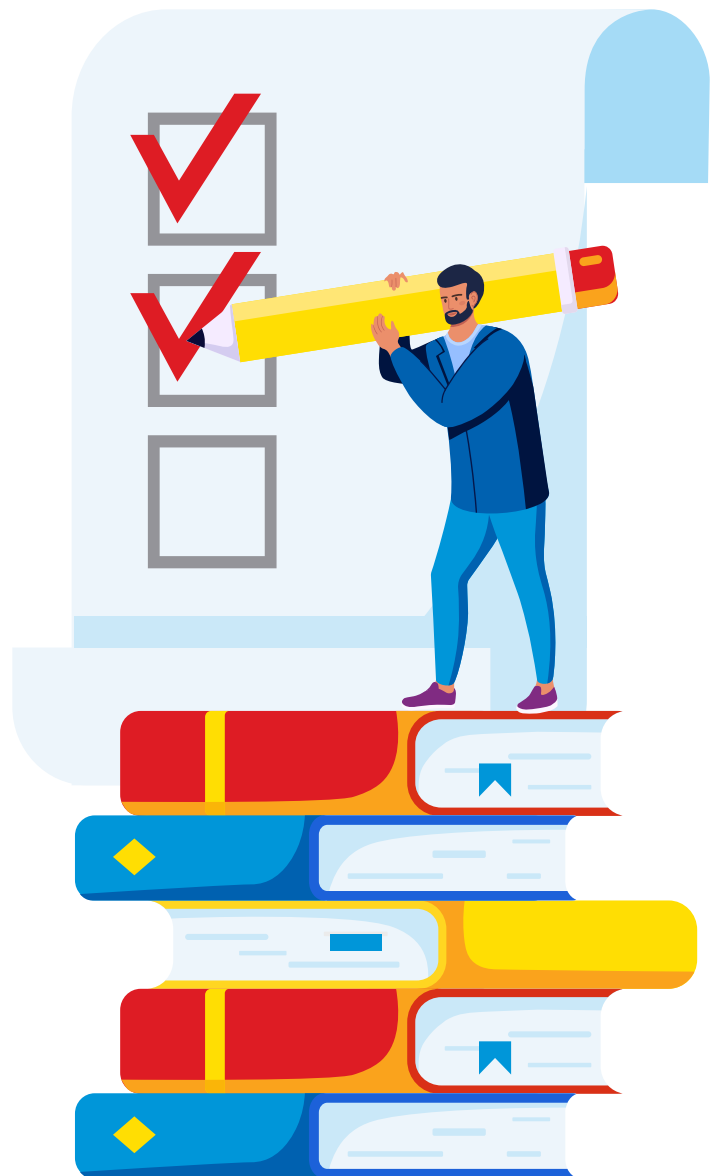
**UNIT 6:**  
**HIDE AND SEEK**  
**MOON**

# HIDE AND SEEK MOON

This series helps to guide early learners' understanding about the Moon with hands-on activities, a reading circle, and Oreos! An introduction to the tools used to understand the Moon is done with the Hide and Seek Moon activity. This will start with simple binoculars and a Hidden Objects Moon poster that lets young participants discover how some tools can make distant objects appear closer and brighter. This will segue to a reading circle with a Peruvian Tale of the Moon with Moon Rope storybook. It shares a story of one of the ways people have made meaning out of the shapes they see on the Moon. An additional hands-on activity is included to reinforce the truth behind Moon phases, as well as an Art project about the Moon. Food (Oreos!) and two take-home (or additional program activities) that help learners reinforce their understanding of Moon phases are also included.

## Learning Objectives

1. **See how certain** tools help scientists study objects that are very far away.
2. **Binoculars** make distant objects appear closer and brighter.
3. **Moon Phases** appear from the shadow of the Earth blocking the sunlight.
4. **The Moon** rotates on a 29-day cycle, that is why we see the same side all the time.
5. **There are many stories** about the Moon from countries around the world.
6. **Oreos** are awesome.



# HIDE AND SEEK MOON

## VOCABULARY

**MOON**

**TELESCOPE**

**BINOCULARS**

**OBSERVATION**

**CRATER**

**PHASE**

**WAXING**

**GIBBOUS**

**WANING**

## MATERIALS

- [Moon poster](#) with icons (3 ft. x 3 ft.)
- Poster-hanging adhesive strips
- Binocular invitation sheet
- 2–3 (or more) pairs of child-friendly binoculars
- Moon worksheet (for each participant)
- Markers
- [Moon Rope](#) storybook by Lois Ehlert, translated by Amy Prince
- 8"×11" paper sheets (x7)
- Balloon
- Disposable bowls
- 8 oz. glue
- Battery-operated tea lights
- One or more "Moon" balls: 1-2" smooth, white balls such as ping-pong balls or polystyrene
- Dylite (not Styrofoam)
- Skewers or toothpicks (one for each Moon ball)
- Earth globe or inflatable Earth ball, preferably about four times the diameter of the Moon ball
- Small stickers
- Oreo cookies
- Popsicle sticks
- Paper plates
- Optional: pin or sharp nail for poking holes

## BOOK LIST

I Am the Moon: A Book About the Moon for Kids by Rebecca McDonald

Moon's First Friends by Susanna Leonard Hill

Luna Muna by Kelli Gerardi

Rocket Girl by Didi Dragon

The Man in the Moon by Nikki Moten

# HIDE AND SEEK MOON

## WARM UP

This movement exercise will help the children start conceptualizing New, Waxing, Full, and Waning Moon phases. You can use this to start your session or as a transition.

Gather the children in a space large enough for them to move around freely. Explain:



**WE ARE GOING TO LEARN ABOUT THE MOON TODAY.  
BUT FIRST LET'S DO THE MOON DANCE!**

This has four parts, just like the four phases of the Moon. Ready?



### **New Moon** **10 - 15 seconds**

Let the children swing around in place without touching each other.  
"At the New Moon there is no light, it is inside the shadow of the Earth"

### **Waxing Moon** **15 - 30 seconds**

"The new Moon moves slowly out of the shadow and is called Waxing (have children repeat the phrase) or growing. Everyone slowly move together and make a half circle."  
*Facilitator will have to help children to make the half circle - it does not have to be neat.  
Children should be guided to hold hands.*

### **Full Moon** **15 - 30 seconds**

Have the children expand their half circle to a full circle. And Dance!  
"When the Moon leaves the Earth's shadow, it is bright and round.  
This is the Full Moon." (have children repeat the phrase)

### **Waning Moon**

Have children go back to a half circle, but  
facing in the opposite direction from the Waxing.  
"But the Moon keeps moving and soon goes back into the Earth's shadow.  
The Waning Moon (have children repeat the phrase) follows the full Moon."

### **New Moon**

Have the students drop their hands and move randomly to do their New Moon dances.  
"The Moon keeps going into the shadow until it becomes dark and starts  
all over again"

# HIDE AND SEEK MOON

## MINDSET

This program is best when conceptualized as a multiple day program. Consider these activities for a themed series or integrated into a family astronomy event.

## SET UP

### DAY 1

#### Hide and Seek Moon Activity

1. **Assess your options** for hanging the Moon poster. Hang the poster 6–8 feet away from the table you'll use for the activity.
2. **Layout binoculars.**
3. **Set up a table**, use painters tape, or two yard sticks end to end, to indicate 6 feet from the poster.
4. **Moon worksheet & drawing tools**
5. **Moon Rope storybook**

#### Moon Phase Experiment

- Pack of Ping Pong balls (for the Moon)
- Skewers or toothpicks
- Earth Globe or Inflatable ball of the Earth (at least 4x bigger than the ping pong balls)
- Pin or nail for poking holes
- Colored markers if wanted



### DAY 2

#### Paper Mache Moon Light

- Package of round balloons
- Newspaper, paper bags, or used copy paper
- White glue and water mixture (3 to 1)
- Table covering
- Small bowls

#### Moon Crater Model

- Modeling clay or play dough
- Plastic or aluminum tray, at least 8" x 10"
- Paper towel
- Rubber band or tape (to secure the paper towel to the flashlight)
- Moon model: ping-pong ball or smooth polystyrene ball mounted on a toothpick or skewer

# HIDE AND SEEK MOON

## EXPLORE: DAY 1

### 1. Have area prepared for dancing, reading circle, and activity.

- a. **Have the Moon poster** with animal icons hanging, ready for the activity following the reading circle. Set up a table or indicators of 6 feet from the poster to show children where to stand when doing observations.
- b. **Have Moon worksheet** ready and on the table with the binoculars. Have writing materials and or crayons for the children to use.

### 2. Greet children and bring them to the designated learning area.

Facilitator introduces themselves and briefly talks about what they will be doing:

- a. **"Hi my name is Ms./Mr. \_\_\_\_\_ today we are going to learn about the Moon! Can anyone tell me what they know about the Moon?"**

Take about 2-3 minutes to have children call out what they know. If there are any glaring misconceptions, make note to cover those during the activities.

- b. **"We are going to start with the Moon Dance! Come on and let's have fun!"** Lead one or two rounds of the Moon Dance, having the children repeat the phases as you progress.

### 3. Reading Circle - Moon Rope Storybook

- a. **"Do you know that people all over the world see the Moon? Let's read a story from Peru in South America about the Moon"**

- b. **Bring the children to the reading circle space and read the book.**

- c. **To ensure children are paying attention** every other page do an 'I Spy' of an object on the activity table and the poster.

- d. **Conversation prompts as the story is read:**

- i. Who is Mr. Fox? What does he want to do?
- ii. What made Mr. Mole want to visit the Moon?
- iii. Do you think a grass rope is strong enough to take people to the Moon? Why or why not?
- iv. How did Mr. Fox and Mr. Mole travel to the Moon? Do you think that is how people travel to the Moon?
- v. What do you think you'd find if you visit the Moon?

- e. **When the story ends,** ask the children what they liked about the book.

# HIDE AND SEEK MOON



## 4. Transition to Activity

**a. Ask the children** if they would like to use scientist tools and explore like real scientists.

**b. Have everyone stand up.**

- i. "Before we become scientists, let's sing a Moon Song!" Teach the children the Hey Diddle Diddle song. Encourage them to sing and then come up with a cat, dog, cow, spoon dance!
- ii. Dance the children to the Moon Viewing Area.

## 5. At the Moon Viewing Area/tables and show them the binoculars.

Describe these as scientist tools that allow you to see things up close that are far away. Some children, especially those at the younger ages, may have trouble with the binoculars. Be ready to help them use the correct side, and on how to focus. Let children build their confidence, so if a bit more time is needed to practice with the tool, let that happen.

**a. Hold up the binoculars** and say the word several times, having the children repeat it. Talk about how they are a tool that lets you see things that are far away.

- i. Tools like these are used by scientists.
- ii. Call the children Little Scientists.

**b. Take 3-4 minutes** to let them explore and look around, play 'I Spy' with objects dealing with science or astronomy in the area. Ask what they are seeing.

**c. Prompts**

- i. "What other things might you want to look for with your binoculars?"
- ii. "What about when you're outside?"
- iii. "Binoculars are a tool that help people see things that they can't see well with only their eyes."



# HIDE AND SEEK MOON

## EXPLORE: DAY 1 CONTINUED

### 6. Guide the children to the Moon Poster Viewing area:

- a. **Have the children stay at least 6 feet from the poster.** They can be in a line or a circle, or scattered in the reading area.
  - i. "Now my scientists let's use our binoculars and practice with our Moon Poster"
  - ii. "If we want to see the objects on the Moon poster, we can look through the binoculars and point the big part toward the Moon. Everyone try that. What do you see?"
  - iii. "What is the difference between looking at the poster with just your eyes and with the binoculars?"

### 7. After about 5-6 minutes of observing the Moon Poster, have children sit around a table with crayons and a blackline master of a Moon shape.

- a. **Some very young children may find it easier to explore** and then talk about their observations rather than using the worksheet. If that is the age group, have them sit in a Full Moon circle and do a Telephone Game where the children take turns sharing what they saw on the poster.

- b. **Guide the children** to think about the Moon and the many objects they saw through their binoculars.

- i. Have them draw a picture that tells their own story of things on the Moon  
*Make sure to write the children's names and the date on the page.*

### 8. If you are doing a one-day program, this concludes the activities.

- a. **Consider sending home** one of the Take Home Activities and the Oreo activity.

### 9. If you have a multi-day program, continue to the next section.

Prepare parents that Day 2's activity will include paper mache and that their children should wear "art activity" clothes.

# HIDE AND SEEK MOON

## EXPLORE: DAY 2

### 1. Have area prepared for dancing, reading circle, and activity.

#### a. Have the paper mache materials ready for the activity following the reading circle.

- i. Prepare paper mache paste by mixing 2 parts white glue + 1 part water or mix 1 part flour + 1 part water. Use the mixing stick to combine into a liquid paste. Have this in a quart jar with a lid. When ready to do the activity the paste can be poured into paper bowls or plates. The paste should be made as close to the activity time as possible to avoid setting.
- ii. Have as many balloons pre-blown up as possible. Set each into its own small bowl. The balloons do not have to be large.
- iii. Tear the paper sheets into 2-inch strips or squares. You can do this prior to the session or let the child do the tearing. The pieces don't have to be in perfect shapes.

### 2. Welcome

#### a. Greet children and bring them to the designated learning area.

Facilitator introduces themselves and briefly talks about what they will be doing.

#### b. "Hi my name is Ms./Mr. \_\_\_\_\_ today we are going to keep learning about the Moon! Can anyone tell me what they know/remember about the Moon?"

Take about 2-3 minutes to have children call out what they know. If there are any glaring misconceptions, make note to cover those during the activities.

#### c. "We are going to start with the Moon Dance! Come on and let's have fun!"

Lead one or two rounds of the Moon Dance, having the children repeat the phases as you progress.



# HIDE AND SEEK MOON

## EXPLORE: DAY 2 CONTINUED

### 3. Reading Circle - Moon Rope Storybook

- a. **"Do you know that people all over the world see the Moon? We are going to read the Moon Rope Storybook again. Listen closely and see if you hear something new."**
- b. **Bring the children** to the reading circle space and read the book.
- c. **To ensure children are paying attention** every other page do an 'I Spy' of an object on the activity table and the poster.
- d. **Conversation prompts as the story is read:**
  - i. Do you think a grass rope is strong enough to take people to the Moon?
  - ii. What do you think you'd find if you visit the Moon?
- e. **When the story ends**, ask the children what they liked about the book.

### 4. Transition to Activity

- a. **Ask the children** if they would like to have a Moon night-light that they make.
- b. **Have everyone stand up.**
  - i. "Before we become scientists, let's sing a Moon Song!" Teach the children the High Diddle Diddle song. Encourage them to sing and then come up with a cat, dog, cow, spoon dance!
  - ii. Dance the children to the Moon Viewing Area.

### 5. **Dance everyone over to the tables with the paper mache Moon building materials.** Have a set of models at different stages of completion so the children can see what the different parts look like.

- a. **If children are tearing the strips**, show them how and about how big the pieces should be. You will need a lot of paper.
- b. **Bring out the balloons and bowls, and the paste and dipping plates.**
- c. **Have a set of pre-made models that show the following steps.**
  - i. Dip paper strips into the paste. Run the strips between your fingers to squeeze excess paste from the strips. The strips need to only be damp not real wet.
  - ii. Place the dipped strips of paper on the balloon and smooth them out. Cover the whole balloon in one layer of paper by overlapping the strips slightly.

# HIDE AND SEEK MOON

**d. Let this first layer dry** for about 30 minutes, then apply a second layer by repeating steps 3 to 5. Let this second layer dry overnight.

**e. Send home with the following directions:**

- i. The next day an adult can pop the balloon from the bottom and remove the plastic. They may need to reshape the “Moon” back to its circular/oval shape by pushing it out from the inside.
- ii. Put the battery-operated tea light on the table and place the paper mache Moon over it. Now you have your very own Moon nightlight!

**6. While the paper mache is drying,** guide the children into a Science Activity.

**a. Many scientists create models** to see things up close that are far away. So let's look at our Moon poster and create a model of craters!

**b. Set Up**

- i. Cover the front of the flashlight with the paper towel and secure it in place with a rubber band or tape. (This diffuses the light of the flashlight.)

**c. Spread the dough in the tray to cover the bottom.** Use your fingers to create a Moonscape with craters, mountain ridges or other features. Use the poster of the Moon's surface for inspiration.

**d. Conversation prompts:**

- i. The Moon has different phases. When do you think would be the best time to see those features on the Moon?
- ii. Give one participant the flashlight and invite them to shine it straight down on the dough Moonscape from above. They should move the flashlight up or down as needed until the light covers the dough tray. Explain that the flashlight represents the sun.
- iii. What features can you see on the Moonscape?
- iv. Now ask the flashlight holder to move the flashlight slowly down to one side so it shines across the Moonscape from the side.
- v. What do you notice about the features on the Moonscape?
- vi. Can you see details that you couldn't see before? Why do you think that is?
- vii. Point out that shadows show more details than direct light. Encourage participants to experiment with moving the flashlight back and forth over the models to different positions.
- viii. Where do you see shadows on the Moonscape now?

**7. When the session is complete,** have another Take-Home Activity for the parents, a short how-to guide for making the paper mache and consider sending home one of the Take-Home Activities and the Oreo activity.

# HIDE AND SEEK MOON

## ACTIVITY EXTENSIONS FOR OLDER CHILDREN

This activity is designed to appeal to preschool-aged participants, as well as accompanying adults and older children, but the concepts in this activity are appropriate for all ages. When facilitating this activity for children older than preschool age, you may offer them an extra challenge.

Encourage participants to draw in some detail of what they see on the printed poster of the Moon.

While one child uses the binoculars to find hidden images on the Moon, they might describe to a partner where and what those images are, then encourage the partner to try to mark down the correct location on the printed image of the Moon, without looking through the binoculars themselves.



# HIDE AND SEEK MOON

## ART ACTIVITY Paper Mache Moon Light

Kids are fascinated by the Moon! Make a Moon craft out of layers of paper mache and the greatest thing is that it turns into a homemade NIGHTLIGHT. Kids will enjoy their very own Moon lighting up their room.

### Supplies

8"×11" paper sheets (x7)	1 8 oz. glue
1 balloon	1 mixing stick
2 disposable bowls	1 battery operated tea light

### Instructions

- 1. Make the paper mache paste by mixing 2 parts glue + 1 part water.** Use the mixing stick to combine into a liquid paste.
- 2. Blow up the balloon to the desired size of the "Moon".** Use one bowl to hold up your balloon.
- 3. Tear the paper sheets into 2-inch strips or squares.** (Let your child be carefree about tearing paper. It doesn't have to be in perfect shapes.)
- 4. Dip paper strips into the paste.** Run the strips between your fingers to squeeze excess paste from the strips.
- 5. Place the dipped strips of paper on the balloon and smooth them out.** Cover the whole balloon in one layer of paper by overlapping the strips slightly.
- 6. Let this first layer dry overnight.** Then, apply a second layer by repeating steps 3 to 5. Let this second layer dry overnight.
- 7. Once the paper is completely dry, pop the balloon from the bottom.** You may need to reshape your "Moon" back to its circular/oval shape by pushing it out from the inside.
- 8. Put the battery-operated tea light on the table and place the paper mache Moon over it.** Now you have your very own Moon nightlight!

**Tip:** an alternative paper mache paste recipe: Mix 1 part flour + 1 part water.

# HIDE AND SEEK MOON

## SCIENCE ACTIVITY

### Does the Moon Rotate?

#### Big Ideas

The Moon rotates in the same amount of time it takes to complete one orbit of Earth. People on the Moon would experience day and night, but they would be much longer than on Earth.

#### Audience

Families

Students, 2nd grade and older

#### What You Need

*Note: Do this activity outside while the sun is shining.  
The best times are late afternoon (within two hours of sunset)  
or early morning (within two hours of sunrise).*

One or more "Moon" balls: 1-2"  
smooth, white balls such as ping-pong  
balls or polystyrene

Earth globe or inflatable Earth ball,  
preferably about four times the diameter  
of the Moon ball

Dylite (not Styrofoam)

Small stickers

Skewers or toothpicks  
(one for each Moon ball)

Optional: Pin or sharp nail for poking  
holes

#### Set Up

1. **Stick** a skewer or toothpick into each Moon ball. If you are using a ping-pong ball, you will need to poke a hole in the ball first with a sharp pin or nail.
2. **Place** a sticker on the Earth model over the place where you live.
3. **Place** a sticker on one side of the Moon ball.

# HIDE AND SEEK MOON

## What To Do

- 1. Ask participants to think about day and night on Earth:**
  - a. What are daytime and nighttime like on Earth?**
  - b. What do you know?**
- 2. Demonstrate how day and night are caused by the Earth's rotation.**

Ask one participant to hold the Earth globe above their head so the sunlight shines on it. Invite others to notice what parts of the globe are in sunlight or shadow.

  - a. Where is it light on the globe, and where is it dark?**
  - b. Imagine you are standing where the sticker is.** Is it daytime or nighttime there?
  - c. How could we make that sticker go from day to night (or night to day)?**
- 3. Ask the person holding the Earth to turn slowly in a circle counterclockwise.** Invite others to notice how the sticker moves from light to dark as the Earth rotates.
- 4. Now ask participants to think about the Moon:**
  - a. Do you think there is day and night on the Moon?**
  - b. What makes you think that?**
- 5. Ask another participant to hold up the Moon model using the stick.** Point out that the Moon orbits around the Earth. Ask the Moon holder to demonstrate by walking in a circle around the Earth holder.
- 6. Explain that the face of the Moon always looks the same to us on Earth because the same side of the Moon is always facing Earth.** Ask the Moon holder to orbit the Earth again, this time keeping the sticker pointed toward the Earth. Invite others to notice what parts of the Moon are in sunlight or shadow as it orbits. Where is it light on the Moon, and where is it dark? If you were standing on the Moon where the sticker is, would it be daytime or nighttime now?



# HIDE AND SEEK MOON

## What To Do CONTINUED

7. **Ask the Moon holder to turn the Moon model so the sticker faces away from the Earth and orbit again.**
  - a. **If you were standing where the sticker is now,** would you have day and night?
  - b. **If you lived there,** would you ever be able to see the Earth?
8. **Discuss what the model shows about day and night on the Moon:**
  - a. **Does the Moon rotate?** Is there day and night on the Moon?
  - b. **The Moon takes about 27 Earth days to make one orbit.** What does that tell us about how long day and night are on the Moon?

## Tips & Tricks

If you aren't able to do this outdoors, you can approximate it indoors in a darkened room using a bright, directional light source such as a powerful flashlight or floodlight in place of the sun.

Test your set-up in advance to make sure it shows the lit and shadowed sides of the Earth and Moon clearly.

With a large group, you could engage more participants by giving each person a Moon model and having them all orbit the Earth model, noticing changes on their own Moon models as they go.



# HIDE AND SEEK MOON

## What To Know

The Earth completes one rotation every 24 hours (one day), and it completes one orbit around the sun about every 365 days (one year). The Moon completes one rotation in the same amount of time that it completes one orbit around the Earth—about 27 Earth days. In other words, the Moon’s “day” and its “year” are the same length!

Astronauts living and working on the Moon would have daytime and nighttime, but not the same way we think of them on Earth. Each day or night on the Moon lasts for about 14 Earth days, so they would have two weeks of daylight, followed by two weeks of darkness!

There is no “dark side” of the Moon! There is a side of the Moon that never faces the Earth, but it isn’t always dark. Because the Moon rotates, that side sees the sun’s light for half of its orbit around the Earth, just like the other side.

*SOURCE: Night Sky Network, Does the Moon Rotate? | Courtesy of: Nisenet*

## MUSIC AND MOVEMENT ACTIVITY

### Hey Diddle Diddle



Hey diddle diddle, the cat and the fiddle  
The cow jumped over the Moon  
The little dog laughed to see such fun  
And the dish ran away with the spoon!

Hey diddle diddle, the cat and the fiddle  
The cow jumped over the Moon  
The little dog laughed to see such fun  
And the dish ran away with the spoon!



# HIDE AND SEEK MOON

## FOOD ACTIVITY

### You Will Need

8 Oreo Cookies

A popsicle stick or other tool for scraping the frosting

### What to Do

1. **Slowly twist an Oreo open** to leave as much frosting on one side of the cookie as possible. If it doesn't work, eat the cookie and try again!
2. **Use the popsicle stick or scraper** to create the phases of the Moon out of the frosting.
3. **Arrange the phases of the Moon in order.**

### Procedure

1. **Prepare materials for your class.** This activity is most successful when students can work alone or in pairs. Each student or pair will need 8 cookies and one scraper (per person)
2. **Prompt students to think about each kind of Moon** they have seen (full Moon, half Moon, crescent Moon, new Moon, gibbous Moon)
3. **As the students come up with their responses,** have them scrape the frosting off of the cookies to create the different phases of the Moon

**Once they have created each phase,** have students arrange their cookies in order. Since the phases occur in cycles, it is a good idea to have them arrange the pattern in a circle.

- a. **For an optional addition:** add an object to represent Earth in the middle of the phase circle and a sun on the outside of the circle to identify the light source.

# HIDE AND SEEK MOON

## TAKE HOME SCIENCE ACTIVITIES

### Lunar Phase Viewer

*Goal: Build an easy device that illustrates the phases of the Moon.*

*Age: 6 and up | Adult supervision/intervention required when cutting*

*Skills: Crafts, observation*

#### Materials

A cardboard box

A pen

Cutting device

Glue

A button or a coin

#### Prerequisites

Awareness of the phases of the Moon

#### Introduction

This little device will display the phases of the Moon beautifully. Note: This does not explain the origin of the phases of the Moon. The phases of the Moon are not due to something hiding part of the Moon, nor is it due to the shadow of the Earth. The phases of the Moon are simply due to the fact that we only see the part of the Moon that is illuminated by the sun.

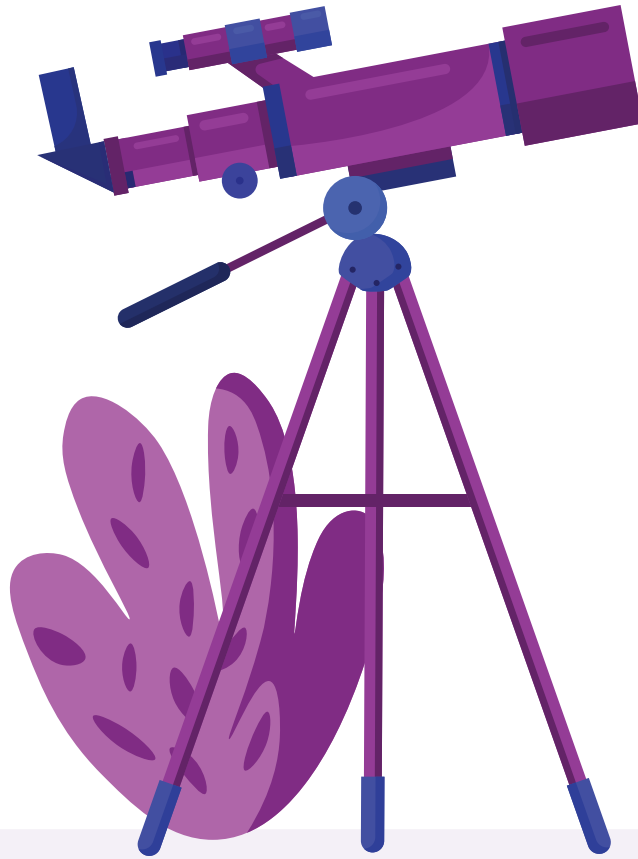
#### Construction

- 1. Draw a circle in one corner of the lid of the box.** Use the round button or the coin as a guide.
- 2. Cut the circle on the box neatly using the cutting device.**
- 3. Remove the circle from the box and keep it safe.**
- 4. Cut out two rectangular strips of cardboard.** Stick the two strips of cardboard to the cut out circle to make a stand for the circle.
- 5. Stick the standing cardboard circle inside the cardboard box opposite the hole in the lid.** Keep a gap of approximately 2 cm between the lid with the hole and the stand.
- 6. Mark 15 dots with an interval of about 1.5cm between each dot.** Make holes on the marked dots with the pen.
- 7. Close the cardboard box and look through the holes.**

Extension: The round hole can be decorated with translucent paper to depict the light and dark patches on the Moon. You can also decorate the opening to depict other planets and Moons. This reinforces the message that all planets and Moons are not sources of light but reflect the light from the sun or the star they are orbiting around. Therefore all planets and Moons have phases if seen from the right place.

Source: Mr. Mani, UNawe India – AID India

# HIDE AND SEEK MOON



## TAKE-HOME SCIENCE ACTIVITIES

### Paper Plate Moon Phases

In this activity, students color and cut cheap paper plates to form a handy reminder of the phases of the Moon.

#### Materials

3½ paper plates per student  
Markers  
Crayons or paints  
Pencils

Rulers  
Hole punch  
Scissors  
Small paper fasteners

#### Learning Objectives

In this activity, students will learn about the movement of the Moon relative to the Earth, the lunar cycle and the phases of the Moon.

# HIDE AND SEEK MOON

## Background Information PHASES OF THE MOON

**Full Moon:** The Moon is said to be full when the Sun shines on it, lighting up the half that we can see. When the Moon is full, it is halfway through its monthly orbit of the Earth. This Moon often appears a rich yellow when it is full and sits low in the sky. This color is due to the fact that we look at it through the thicker, dustier part of the atmosphere that is close to the ground.

**Waxing Crescent Moon:** The black area is the night on the Moon, where the Sun is not shining. The brighter area is the day on the Moon, where the Sun is reflecting brightly off its surface. The line on the Moon between the night and the day is called the "Lunar Terminator." The bright area, just visible on the edge of the dark limb, is called "Earthshine." This is caused by the sunlight reflecting off Earth's oceans and lighting up some of the darkness on the Moon.

**First Quarter Moon:** When the Moon is one-quarter of the way around the Earth in its monthly orbit we see a quarter of it lit up from our place on Earth. However, half of the Moon is lit up by the Sun shining on the Moon's surface at this point.

**Last Quarter Moon:** The Moon is three-quarters of the way around the Earth in its monthly orbit, and we see a quarter of it lit up from Earth. However, half of the Sun is shining on the Moon's surface at this point. From the Northern Hemisphere, all of the sunlight is now on its left-hand side and from the Southern Hemisphere, all of the sunlight is now on the right-hand side.

**Waning Crescent Moon:** At this point, the Moon has traveled almost all the way around the Earth once and is almost a New Moon. During the New Moon the Sun's light is shining only on the far side of the Moon, so we cannot see it at all from Earth.

# HIDE AND SEEK MOON

## Instructions

1. **Students will color one plate black.** This plate represents the new Moon. Leave this plate whole.
2. **Paint two plates like the full Moon.** They can be painted white, yellow or gray. Students can add craters, dark areas or any other details as they wish.
3. **Cut one plate in half.** These will be the first and last quarter Moon. Color it in using the same color as the full Moon plates. Each student will use only half of the plate, so two students can share one plate.
4. **Show students how to find the center of a plate** by gently folding one of the full, colored plates in half at the edges or by making a tiny mark at the top and bottom of the plate using a ruler placed in the center of the plate circle.
5. **Using a pencil, show students how to lightly trace an arc from one mark to the other.** Cut from one mark to the other in a crescent as smoothly as possible. The small section will be the crescent Moon, the large part of the plate will form the gibbous Moon.  
*Note: Check the student's arcs before they begin cutting.*





# HIDE AND SEEK MOON

6. **You are now ready for assembly!** Place the black Moon on a table, then stack each plate on top in the following order: crescent, quarter, gibbous, full. Hold the pile of plates together and punch a hole in all layers at the top, making sure the hole goes through each plate.

*Note: You will have to double-check this for younger students or do it yourself.*

7. **You can now review the lunar phases** using your assembled booklet! Students can also write the names of the phases on the plates.
8. **View the complete 29-day cycle of the Moon** by turning it upside down so that the lit side of the Moon is on the opposite side.



## Additional Information

**Crescent** comes from the Latin word *cresco*, meaning "to grow."

**Gibbous** comes from the Latin word *gibbus*, meaning "hump on the back."

**Phase** comes from the Greek word *phaino*, meaning "to appear, to bring to light."

**Waning** comes from the Middle English word *wanien* or *wanen*, meaning "to lessen."

**Waxing** comes from the German word *wachsen*, meaning "to grow."

*Courtesy of: Universe Awareness*





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The STEAM Kits for Early Childhood Learning (SKECL) is an early childhood series that builds on the sense of wonder about science and space. It encourages children and their caregivers to explore ideas from measurement to the Moon, with a range of hands-on activities and experiences. SKECL helps to create a foundation for STEAM learning through exploration and discovery.

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