

WonderHere[?]

a MINI UNIT of study on

Earth & Space



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Dearest Moms & Dads,

We are honored and thrilled that you've chosen us to come alongside your family as you pursue a wonder-filled education for your children! For the next six weeks, you and your children will embark on a great journey as you explore the vastness of earth and space! This may cause your child to have some wonders along the way! Champion them to pursue those wonders... remember, YOU are their greatest cheerleader!

This unit's Invitations to Play and Create have been specially designed to spark creativity, encourage play, and develop a love of learn-

ing within your child. To us, that's just as important as core academics. We've interwoven rich and diverse literature and texts every week that will teach your family more about Astronomy. Along with weekly nature journaling activities and composer studies, as well as an intentionally crafted empathy project, these six weeks will help your child have an exciting view into space.

Be encouraged, moms and dads! Your child is a problem solver, community-minded, a courageous learner, filled with wonder, and capable of much... and so are YOU! We are here to help you be their best teacher. We're rooting for you!


Tiffany & Jessica



Unit Overview

	Literature	Nature
Week 1: Day, Night, & Sun	<i>Sun Up, Sun Down</i> by Gail Gibbons	Solar-Powered Pictures
Week 2: The Moon & Tides	<i>Margaret and the Moon</i> by Dean Robbins	Moon Tracking
Week 3: Layers of the Earth	<i>Peeling the Earth Like an Onion</i> by Baby Professor	Create a Terrarium
Week 4: Earthquakes & Volcanoes	<i>My Little Book of Volcanoes and Earthquakes</i> by Claudia Martin	Rock Hunt and Sort
Week 5: Stars	<i>Zoo in the Sky: A Book of Animal Constellations</i> by Jacqueline Mitton	Constellation Hunt
Week 6: Space Exploration	<i>If You Were A Kid Docking at The International Space Station</i> by Josh Gregory	Space Station Hunt



	Invitation to Play	Invitation to Create	Composer Study
Week 1: Day, Night, & Sun	Sunshine Shadows Provocation	A Sun Clock	Terry Riley's "Sun Rings"
Week 2: The Moon & Tides	Moon Craters	Phases of the Moon with Oreos	Terry Riley's "One Earth, One People, One Love"
Week 3: Layers of the Earth	Layers of the Earth, LEGO Edition	Playdough Layers of the Earth	Terry Riley's "Sunrise of the Planetary Dream Collector"
Week 4: Earthquakes & Volcanoes	Earthquake Simulations	Paper Mache Volcano	Terry Riley's "Descending Moonshine Dervishes"
Week 5: Stars	Constellation Lacing Cards	Marshmallow Constellations	Terry Riley's "G Song"
Week 6: Space Exploration	Astronaut Pudding	Solar System Model	Terry Riley's "A Rainbow in the Curved Air"

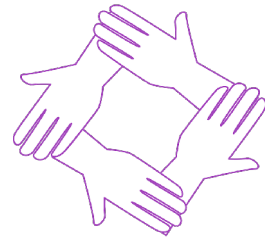
Materials List

	Thematic Tub	Literature	Nature
Week 1: Day, Night, & Sun	<p>These are items to help ignite wonder and curiosity in your child about Earth & Space through hands-on exploration. You can find many of these items on Amazon, but also perhaps at local thrift stores or local big-box stores. You may already even have some of them in your home!</p> <ul style="list-style-type: none"> • Globe • Flashlight • Solar System model kit • Planetarium • 4M Kidz Labs Moon Torch Kit • Moon Sand • Glow in the dark stars • Cotton balls • Popsicle sticks • Telescope 	<i>Sun Up, Sun Down</i> by Gail Gibbons	<ul style="list-style-type: none"> • Scissors • Cardboard • Flat objects • Flat pan • Light sensitive paper • (Sun paper)
Week 2: The Moon & Tides		<i>Margaret and the Moon</i> by Dean Robbins	
Week 3: Layers of the Earth		<i>Peeling the Earth Like an Onion</i> by Baby Professor	<ul style="list-style-type: none"> • Clear/glass container • A plant that can grow in low light • Small rocks/ pebbles • Moss • Soil • Activated charcoal (optional)
Week 4: Earthquakes & Volcanoes		<i>My Little Book of Volcanoes and Earthquakes</i> by Claudia Martin	
Week 5: Stars		<i>Zoo in the Sky: A Book of Animal Constellations</i> by Jacqueline Mitton	
Week 6: Space Exploration		<i>If You Were A Kid Docking at The International Space Station</i> by Josh Gregory	



	Invitation to Play	Invitation to Create
Week 1: Day, Night, & Sun	<ul style="list-style-type: none">• Large sheet of paper• Pencil• Small random items and toys• Poster putty or heavier objects to hold corners	<ul style="list-style-type: none">• Pencil• Paper Plate• Sticky tack (optional)
Week 2: The Moon & Tides	<ul style="list-style-type: none">• 4 cups of flour• ½ cup of baby oil• Small rocks• Round aluminum cake pan	<ul style="list-style-type: none">• 8 Oreos• Pencil• Paper Plate• Toothpick
Week 3: Layers of the Earth	<ul style="list-style-type: none">• Legos in a variety of colors	<ul style="list-style-type: none">• 2 cups flour• 1 cup coarse sea salt• 4 tsp cream tartar• 2 tbsp vegetable oil• 2 cups water• Food coloring• Thin string or floss
Week 4: Earthquakes & Volcanoes	<ul style="list-style-type: none">• Graham crackers• Paper plate• Icing/Cool Whip• Food coloring	<ul style="list-style-type: none">• 1 empty water bottle• Cardboard• Newspapers cut into 3 cm strips• Masking tape• ¼ cup glue• 1 cup flour• 1 ½ cup water• Red food coloring• 4 TBSP baking powder• 1 cup vinegar
Week 5: Stars	<ul style="list-style-type: none">• Constellation Cards (in Curriculum Kit)• Yarn• Plastic training sewing needle	<ul style="list-style-type: none">• Mini marshmallows• Toothpicks• Black construction paper• Food coloring (optional)• Zip lock bags (Optional)
Week 6: Space Exploration	<ul style="list-style-type: none">• Powdered milk• Instant pudding mix• Water• Measuring cup• Measuring spoons• Quart sized ziploc bag	<ul style="list-style-type: none">• Foam balls (various sizes for planets and sun)• Black foam board• Acrylic paint (yellow, orange, red, brown, blue, green)• Hot glue• Foam sheet• White chalk

Unit Projects



Empathy Experience Sun Block Giveaway

During Week One of this unit, your child will learn just how powerful and magnificent the sun really is. It's rays give us light and warmth, but can also be harmful if we're exposed for too long without protection.

Sunblock helps protect our skin from the sun's powerful rays. As a family, take note of when sunblock goes on sale at the store, or clip special sunblock coupons. Purchase some sunblock here and there and create a mini stockpile of it.

On your next outdoor outing (to the beach, theme park, hiking, or camping), pack the sunblock you've collected to giveaway. Your child can even write and attach a small note explaining what you've learned about our amazing sun and how sunblock is important to protect us from it.

This sunblock giveaway would also be great to give out to homeless people or transient families you may come across in the day to day.





Take a photo of your project +
post it using #wewonderhere!



Phenomena Based Learning (PBL)

Astronomy - the study of outer space - is one of the most exciting, mind-boggling, wonder-inducing topics a child will ever study.

Take a moment to think back on your own experiences having learned about Earth & Space as a child. Perhaps it was introduced to you in a hum-drum manner, with nothing but textbooks and lectures. Or perhaps you were given the chance to explore and research, make models and stargaze in awe.

The latter is what we hope for - and plan for - as we aim to teach our children about the vastness and sheer grandeur of our Earth and outer space. Through child-led, wonder-chasing, phenomena-based project time, your child will get to hone in on the very thing that makes them so excited about space.

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Be sure to set intentional time each day for Project Time. Set out all of the Thematic Tub materials like an



invitation to come explore. Let them tinker, observe, play, and wonder. We promise, this is time well spent.

Spend time going through the *PBL Presentation* with your child each week. Let the weekly Invitation to Play and Invitation to Create activities drive their questions.

Use a journal or notebook to record what they wonder and what they do with those wonders each week. This is an excellent time as the parent to just sit back and observe your child in action. You will get to know more about them during this time than ever!

Minis



If you've got multiple children at home ranging in ages, then you may be all too familiar with this scenario:

You've worked hard to set the tone for your homeschooling day with your oldest. You're both zoned into a lesson in the workbook or are working hard on a project, when your toddler begins clawing for your attention... wanting to help sissy paint her poster or feeling the need to scribble all over her "Your Turn" page. Your oldest starts to get distracted, frustrated even, and that peaceful morning you planned seems to be falling apart. Mom (or dad) guilt sets in, because you want to make yourself available to all your kids.

K-5th, we believe in family togetherness and know that your "Mini" can glean much from this thematic unit.

Taking time to include them in an intentional and developmentally appropriate way will help set a peaceful tone for your homeschooling day, as well as build a solid foundation for their own learning at a young age.

So, here are a couple of ways to "invite" your Mini to learn along with their siblings in a way that won't make you want to tear your hair out! It's also a great opportunity for your older children to help "teach" their younger siblings, so everyone wins!



Take a photo of your Mini at work + post it using **#wewonderhere!**



Book Baskets

Using the basket of Mini-friendly books that are suggested below, allow your mini time to explore the pictures and words. Place writing tools for them to draw as a response to the books in the basket. Have them orally tell you about their drawing, and take a moment to write down what they say on their paper.

- *The Sun Is My Favorite Star* by Frank Asch
- *What Makes Day and Night* by Franklyn M. Branley
- *What Makes a Shadow?* by Clyde Robert Bulla
- *The Sun: Our Nearest Star* by Franklyn M. Branley

Busy Baskets

It's important to give your Mini opportunities to explore and tinker, using and growing their gross and fine motor skills. Place the following materials into a basket for your Mini to play with:

- Playdough
- Flashlight
- Yellow and Black construction paper
- Clothespins
- Moon sand
- Felt planets and stars
- Star stickers
- Glow in the Dark stars



Weekly Routines



Composer Study Terry Riley

The ultimate goal of the Composer Study time is to celebrate rich music together as a family. Throughout this study on Earth and Space your child will listen to music from the composer Terry Riley, who composed these songs to make people feel as if they were moving through the solar system. While listening to these songs, you may feel that you are traveling through space, or the anticipation that an astronaut may feel before lift off. Some songs are rather long, so feel free to just listen to the first few minutes.

As you study each “song of the week,” consider the melody and the lyrics. Younger children may be more interested in the sounds, whereas older students are able to analyze the lyrics.

Take time to have your children think critically about each song and give their “reviews.” This is a great opportunity for them to practice expressing an opinion and supporting their opinion with reasons. Have them write or draw any thoughts about the song in a journal or notebook.



PHOTO: ROBIN LITTLE/REDFERNS; WWW.FT.COM

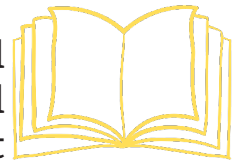
Literature

Each week, your family will have the opportunity to read a new piece of literature together. We recommend reading the book throughout the week, revisiting it to go deeper.

On the first day with the text, as the parent, read aloud to your child. Model for them fluency (an appropriate pace) and vocal inflection (expression). This is important for even older learners who, believe it or not, still enjoy being read to!

On the days that follow engaging with the same text, encourage your child to read aloud to you. For hesitant children or children not yet reading independently, echo read (reading a short

portion of the text and then having your child echo back what you just read) before asking your child to read aloud with more independence.



While reading, ask and answer questions with your child, referring back to the text constantly to find your answers.

We'll also recommend optional novels each week for older children to read.

Remember that the goal is to enjoy the literature together and create a safe space for reading, learning, and gaining new information.



WEEK ONE

Nature Journaling Solar-Powered Pictures



Invite your child to go outside on a sunny day and lay out the objects that you want to make pictures of. You can make prints of leaves, flowers, grass, or small items that you find around the house. In a dim place, lay out a piece of cardboard that is larger than the piece of printing paper. Have your child decide how they want the objects to be arranged on the cardboard. Then you will set the objects aside. Next you will pour water into a flat pan (this will be used to develop your pictures).

Use one sheet of the light-sensitive paper, lay it on the sheet of cardboard, and lay the objects on the paper. Bring the whole stack outside (make sure you are in direct sunlight). Leave it there for three to five minutes. Once that time has passed you will remove the paper and then soak in the flat pan that is filled with water for one minute. Then you will place your print in a shady and dry spot to dry. Have your child write or draw about what you did in a journal or notebook!



RUNWILDMYCHILD.COM/SUN-PRINT-NATURE-ART



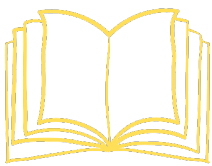
Take a photo of your solar art + post it using #wewonderhere!

Day, Night, & Sun



Composer Study Terry Riley

Song of the Week: "Sun Rings"



Literature Sun Up, Sun Down by Gail Gibbons

Optional Novels for Older Children:

Space Case by Stuart Gibbs



PBL Day, Night, and Sun

What to Know

What to Do

- *On Earth, the change between day & night is caused by the Earth's rotation on its axis.*
- *A full day is 24 hours, meaning it takes about 24 hours for Earth to complete a rotation on its axis.*
- *The amount of daylight changes because the earth sits on a tilt at about 23.5 degrees. Due to this, some spots on earth may have more daylight than others.*
- *As the earth moves around the sun, seasons are established which also effects the length of daylight hours. It takes Earth one year to complete a rotation around the sun.*
- Discuss these points in an age-appropriate way with your child.
- Use the Invitations to Play and Create to begin a discussion about Day, Night, & Sun.
- Have your child spend time exploring through the Thematic Tub.
- Go through the information and online resources in the Week 1 section of the PBL Presentation (located at WonderHere.com/Student).
- Have your child conduct additional research on anything that sparks their interest.
- Have your child record their wonders, research, and creations in a journal or notebook.

WEEK ONE

Invitation to Play Sunshine Shadows Provocation

The idea of a provocation is to lay out materials in an atmosphere that will *provoke* children to explore and learn.

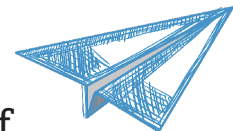
In this provocation, your child will get to play and explore in the sun and with shadows. You'll need...

- Large sheet of paper
- Pencil
- Small random items and toys
- Poster putty or heavier objects to hold corners

Once you gather these items, go outside and sit at a table or on a flat

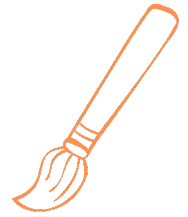
surface where there is full sunlight. Have your child lay out their piece of paper, if it is windy out, lay poster putty down or something heavier on the edges so it doesn't blow up. Stand the objects up on the paper. Now have your child use a pencil to draw the shadows of the objects on the paper.

Have them compare their shadow drawings to the actual figure that cast the shadow. How are they similar? Different? Encourage them to write or draw their thoughts in a notebook.



Day, Night, & Sun

Invitation to Create Sun Clock



Sun clocks, or sun dials, are a form of telling time developed by the ancient Greeks. The sun appears to be moving across the sky, when in reality the earth is rotating in and out of view of the sun. Because of this, we see the sun “rise” in the east and “set” in the west, usually appearing right overhead at around noon. Because of this never-changing pattern, we can rely on the sun’s movements to tell time using shadows.

For this invitation, you’ll need just a pencil and a paper plate. Take the paper plate and have your child write

numbers 1-12 using equal distances between the numbers on the back of the plate.

Next you will make a hole in the middle of the plate and place a pencil in the hole. You may want to use sticky tack to help secure it. Be sure to find north and have the number 12 pointing towards it, so that the sun clock will work correctly.

Check the actual time and see how accurate the sun clock is! Have your child keep checking it throughout the day, making note of its accuracy!



Take a photo of your sun clock + post it using #wewonderhere!



WEEK TWO

Nature Journaling Moon Tracker



There is no better way to study the moon and its phases than to go outside and actually observe the moon!

Invite your child to go outside each night, and try to make it around the same time every night. If possible try to do this activity for the entire month!

In preparation for this, make the Moon Tracker you see below. All you need is:

- a paper plate
- black and white construction paper
- scissors and glue
- a jumbo popsicle stick

Cut a hole in the paper plate. Using the construction paper, cut out and glue each of the moon's phases around the plate. Use your Moon Tracker to observe the moon's changes, distinguishing any differences that they can see from the night before.

Can they tell which phase of the moon it is in? Any similarities between that night and the night before? What about any differences/similarities as the month goes on? Have your child write or draw about what they did in a journal or notebook!



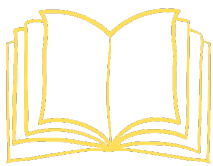
Take a photo of your moon tracker + post it using #wewonderhere!

The Moon & Tides



Composer Study Terry Riley

Song of the Week: "One Earth, One People, One Love"



Literature Margaret and the Moon by Dean Robbins

Optional Novels for Older Children:

Space Case by Stuart Gibbs



What to Know

- *The moon uses gravity to effect the ocean's tide. Tide is the rise and fall of the ocean's water level over a period of time.*
- *This rise and fall of the ocean is directly related to the moons rotation around the earth.*
- *As the moon orbits around the earth, it's gravitational pull causes the ocean to bulge and recede.*
- *High tide occurs when the ocean is directly facing the moon.*
- *Low tide occurs when the waters recede between each high tide.*
- *High and low tide both occur twice a day.*

PBL The Moon & Tides

What to Do

- Discuss these points in an age-appropriate way with your child.
- Use the Invitations to Play and Create to begin a discussion about The Moon & Tides.
- Have your child spend time exploring through the Thematic Tub.
- Go through the information and on-line resources in the Week 2 section of the PBL Presentation (located at WonderHere.com/Student).
- Have your child conduct additional research on anything that sparks their interest.
- Have your child record their wonders, research, and creations in a journal or notebook.

WEEK TWO

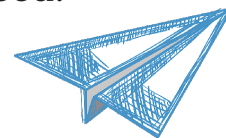
Invitation to Play Moon Craters

Through this hands-on activity, your child will learn how craters on the moon are made. When a stone is dropped or fingerprints are put into the moon sand mixture, your child will observe the “craters” that are left by the stones on the “surface of the moon”.

The moon has much more of a chance of having craters than Earth, this is because if a meteorite or asteroid is coming towards earth, they almost always burn when they come in contact with the Earth’s surface. The moon, however, doesn’t have this protection.

For this activity you’ll need:

- 4 cups of flour
- ½ cup of baby oil
- Small rocks
- Round aluminum cake pan



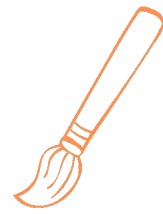
Go outside, gather materials, and sit at a table or flat surface. You will use a round aluminum cake pan filled with about 4 cups of flour, ½ cup of baby oil, and small rocks. Have your child mix around the flour and baby oil until it congeals a bit, and then explore “meteorites” by throwing the small rocks into the pan and seeing the craters they leave behind.



Take a photo of your moon craters & post it using #wewonderhere!

The Moon & Tides

Invitation to Create Oreo Moon Phases



This classic activity is a fun, yummy way to practice recognizing the different phases of the moon! Before starting, take time to discuss why the moon appears to be changing shape. Talk about how it's the light from the sun and the shadow cast by the Earth that causes the moon to "change shapes".

Gather Oreos, toothpicks, a paper plate, and a pencil. Have your child lay the Oreos on the paper plate in the shape of a circle. They will either take off pieces of the cookie or leave the

cookie depending on the phase of the moon. Use these notes to guide you:

- *New Moon*: Full Oreo cookie, no icing showing
- *Waxing Moon*: $\frac{3}{4}$ Oreo cookie, $\frac{1}{4}$ icing
- *1st Quarter*: $\frac{1}{2}$ cookie, $\frac{1}{2}$ icing
- *Waxing Gibbous*: $\frac{1}{4}$ cookie, $\frac{3}{4}$ icing
- *Full Moon*: No top cookie, full icing
- *Waning Gibbous*: $\frac{3}{4}$ icing, $\frac{1}{4}$ cookie
- *Last Quarter*: $\frac{1}{2}$ icing, $\frac{1}{2}$ cookie
- *Waning Crescent*: $\frac{3}{4}$ cookie, $\frac{1}{4}$ icing

Once the cookies are in place, have your child label them correctly. Use the photo below to help you!



Take a photo of your moons + post it using #wewonderhere!



WEEK THREE

Nature Journaling Create a Terrarium



As you and your child learn about the layers of our Earth this week, you will actually get your hands in the earth to gather items and make your very own Terrarium! The word “terrarium” comes from the root word *terra* meaning land and the suffix *arium*, usually denoting a place.

First, gather the following materials: a clear or glass container, a plant that can grow in low light, small rocks or pebbles, moss, soil, and activated charcoal (optional). The activated charcoal

filters toxins and bacteria from the soil and water and keeps bad odors away.

Add 1-2 inch of small rocks or pebbles to your glass container. Add activated charcoal on top of small rocks or pebbles. Add moss, and then potting soil. Plant the plant that you found. Water the terrarium regularly. Finally, decorate the outside of the terrarium if you'd like!

Keep track of your plant's growth and health in a notebook or journal!



Take a photo of your terrarium + post it using #wewonderhere!



Layers of the Earth



Composer Study Terry Riley

Song of the Week: "Sunrise of the Planetary Dream Collector"



Literature Peeling the Earth Like an Onion:

Earth Composition by Baby Professor

Optional Novels for Older Children:

Lucy and the Rocket Dog by Will Buckingham



PBL Layers of the Earth

What to Know

What to Do

- *Earth's layers can be divided into three main layers: the crust, the mantle, and the core. These main layers can be divided further into the continental and oceanic crusts, upper and lower mantle, inner and outer core.*
- *Inner Core Temp: 5,000°C–6,000°C. State: Solid. Composition: iron, nickel.*
- *Outer Core Temp: 4,000°C–6,000°C. State: Liquid. Composition: iron, nickel, sulfur, oxygen.*
- *Lower Mantle Temp: 3,000°C. State: solid. Composition: iron, oxygen, silicon, magnesium, aluminum.*
- *Crust Temp: 22°C. State: Solid. Composition: iron, oxygen, silicon, magnesium and aluminum.*
- Discuss these points in an age-appropriate way with your child.
- Use the Invitations to Play and Create to begin a discussion about Layers of the Earth.
- Have your child spend time exploring through the Thematic Tub.
- Go through the information and online resources in the Week 3 section of the PBL Presentation (located at WonderHere.com/Student).
- Have your child conduct additional research on anything that sparks their interest.
- Have your child record their wonders, research, and creations in a journal or notebook.

WEEK THREE

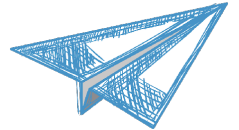
Invitation to Play Layers of the Earth Lego Edition!

Lego play is perfect for fueling creativity, as well as developing dexterity and fine motor skills.

This week, invite your child to play with Legos and make a model of the Earth's layers. Be sure to do this after having reviewed the Earth's layers in this week's literature as well as in the PBL Presentation (found online).

Be sure to have a variety of colors of Legos available that can represent the various layers. Here's a suggestion:

- Red Legos (inner core)
- Orange Legos (outer core)
- Yellow Legos (mantle)
- Brown Legos (crust)
- Blue Legos (outer)
- Green Legos (land)



Have them take their learning a step further and create a "key" or "guide" in a journal or notebook where they show which color represents which layer. Periodically throughout the week, see if your child can recall the layers by heart!



Take a photo of your Lego model & post it using #wewonderhere!

Layers of the Earth



Invitation to Create Playdough Layers of the Earth

Your child will create their own model of the layers of the Earth with homemade play dough! Gather 2 cups flour; 1 cup coarse sea salt; 4 tsp cream tartar; 2 tbsp vegetable oil; 2 cups water; wooden spoon; cooking pot, red, orange, yellow, brown, blue, and green, food coloring; thin string or floss.

Combine all ingredients and stir until all clumps are gone. Put mixture on the stove on low, stir constantly. When the mixture doesn't stick to the sides of pot, it is finished. Cool mixture to room temperature, and knead the

dough approximately 1-2 minutes. Separate dough into 7 balls, and add a different food dye to each ball. Knead dough mixing food coloring into the dough completely. Remember to use "warmer" colors for the inner layers and green and blue in the outside as the water and land.

Leave the "core" in a ball shape, but flatten out the rest of the balls. Wrap each color in the next until you complete the entire Earth. Use floss or string to cut the Earth in half and reveal your beautiful creation!



Take a photo of your playdough model & post it using #wewonderhere!

WEEK FOUR

Nature Journaling Back Yard Find



As we study Earthquakes and Volcanoes this week, there will be some emphasis on rocks and rock formation.

For your Nature Journaling activity, you and your child will go outside in your backyard, neighborhood, or hiking trail, and search for different types of rocks.

Your child might find smooth pebbles, jagged rocks, skipping stones, and even large boulders! Gather as many rocks as you can find, and place them in a bag or basket to take home.

Once you're back home, spread out all the rocks you've collected. If you have a magnifying glass, encourage your child to use it and write or draw any notable observations in their journal or notebook.

Once the rocks have been thoroughly observed, take time to sort them together. Your child may want to group them according to their color, and then again according to their size or shape. They can even be sorted according to texture (smoothness or roughness) or patterns.



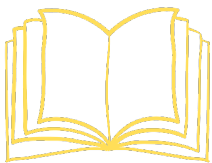
Take a photo of your rock collection + post it using #wewonderhere!

Earthquakes & Volcanoes



Composer Study Terry Riley

Song of the Week: "Descending Moonshine Dervishes"



Literature *My Little Book of Volcanoes and Earthquakes* by Claudia Martin

Optional Novels for Older Children:

Lucy and the Rocket Dog by Will Buckingham



PBL Earthquakes + Volcanoes

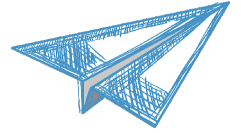
What to Know

What to Do

- *The three main types, or classes, of rock are sedimentary, metamorphic, and igneous and the differences among them have to do with how they are formed.*
- *An earthquake is caused by the movement of tectonic plates. Earth's crust is made up of tectonic plates that sit atop the earth's slowly flowing mantle. The tectonic plates bump and slide within the earth's crust very slowly, sometimes causing earthquakes.*
- *A volcano is a vent in the earth's crust that allows rock fragments, magma (lava), hot vapor and gases to be erupted.*
- Discuss these points in an age-appropriate way with your child.
- Use the Invitations to Play and Create to begin a discussion about Earthquakes & Volcanoes.
- Have your child spend time exploring through the Thematic Tub.
- Go through the information and online resources in the Week 4 section of the PBL Presentation (located at WonderHere.com/Student).
- Have your child conduct additional research on anything that sparks their interest.
- Have your child record their wonders, research, and creations in a journal or notebook.

WEEK FOUR

Invitation to Play Earthquake Simulations



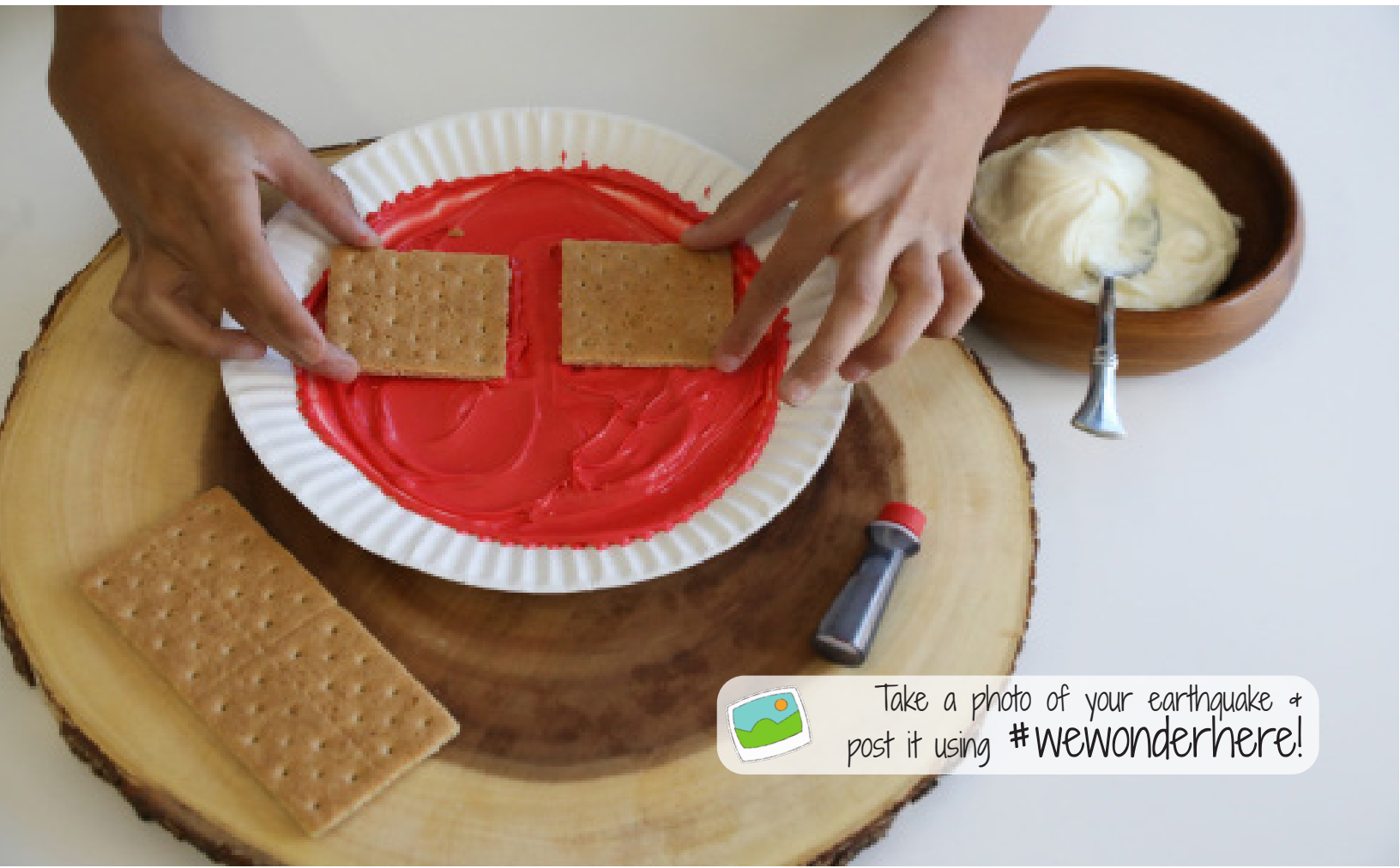
Your child will create a tasty earthquake simulation by using graham crackers and icing!

Before this Invitation, take time to review the “Earthquakes” video in the PBL Presentation found online at WonderHere.com/Student.

Review how the Earth’s tectonic plates shift, causing the Earth to rumble. This is a great opportunity to discuss the notion of *cause and effect*: actions occur, causing other actions to occur as a direct effect.

Gather graham crackers, a plate, and icing, dyed with red food coloring.

Have your child spread the red icing on top of the plate so it is fully covered. Lay two halves of graham crackers (representing the plate tectonics) on top of the icing, right next to each other in a normal position. Push the graham crackers together, sliding one on top of the other. Have your child get creative, using rumbling sound effects and visuals! Older children can even make a stop motion video to capture the effects of the plates sliding together.



Take a photo of your earthquake + post it using #wewonderhere!

Earthquakes & Volcanoes

Invitation to Create Paper Mache Volcano



For this week's Invitation to Create we present you with the quintessential science experiment... the paper mache volcano! First, gather your materials (listed in the Materials List at the beginning of this Instructor Guide).

Tape the open bottle to the cardboard make sure it's steady. Take one piece of cardboard and tape it from the top of the bottle to the bottom of the volcano. Your child will be creating somewhat of a 4 sided pyramid. Continue this process until the volcano shape is made.

Make the paper mache paste by mixing glue, flour, and water in a bowl. Dip newspaper into the paste, hold the strip in one hand and remove excess mixture by running two fingers over the strip. Dip many newspaper strips one at a time on the sides and the base of the volcano. Dry overnight. Once dry, paint the volcano! To erupt, pour baking soda into the opening of the bottle. Mix vinegar and food coloring in a jar. Pour mixture into the bottle opening, then... KABOOM!



Take a photo of your volcano + post it using #wewonderhere!

WEEK FIVE

Nature Journaling Constellation Hunt



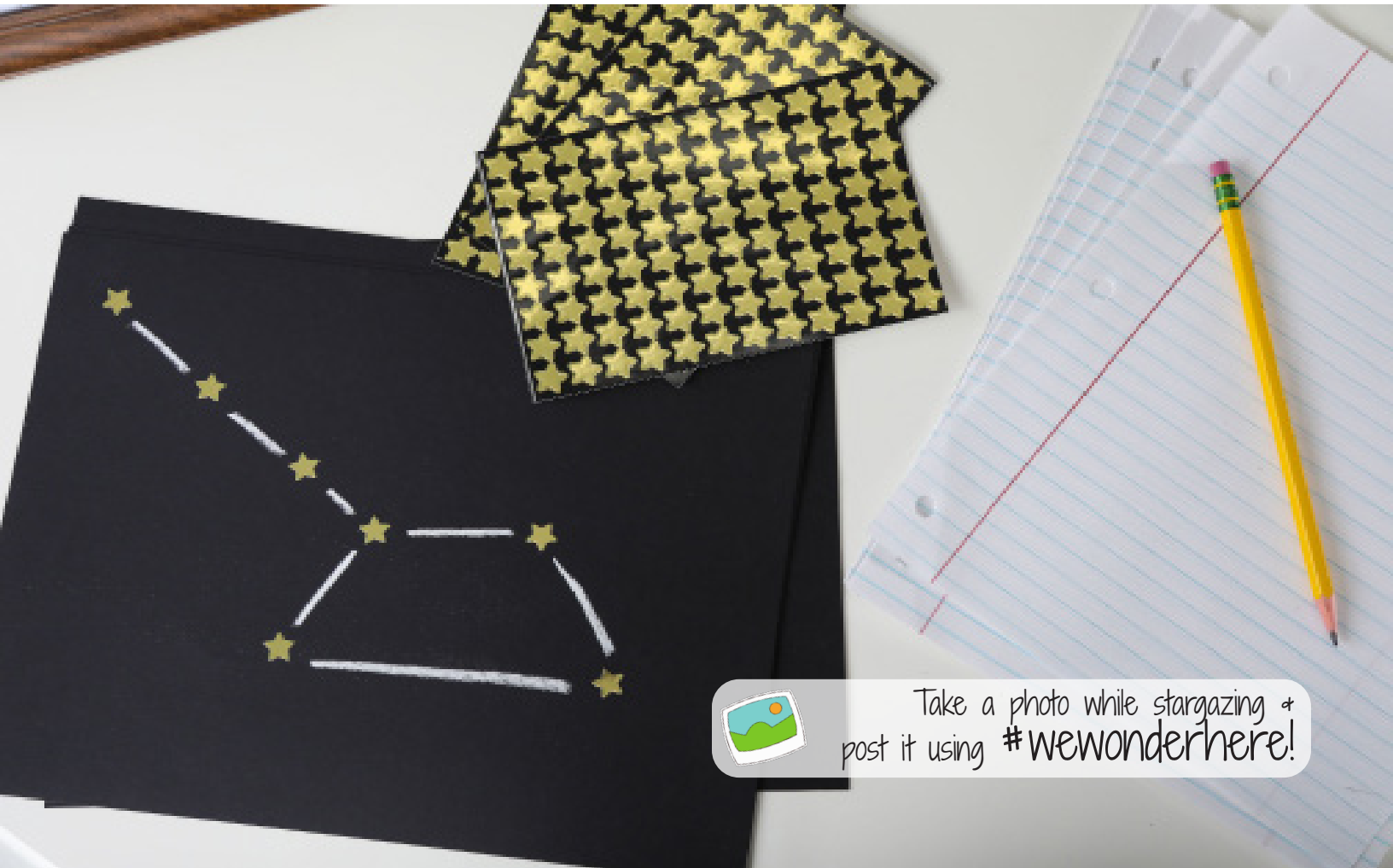
Your child will learn a lot about stars this week through this week's literature, *Zoo in the Sky*, and through the information in the PBL Presentation. They may be surprised to learn that stars are hot balls of gas, and that the sun itself is a medium-sized star!

Take time to study stars and constellations with your child. Pick out your favorite ones together! Adventure outside one evening and lay under the stars. If you have a telescope, bring it out with you!

See if your child can spot any constellations. Can you spot the...

- Big Dipper
- Little Dipper
- Orion, "The Hunter"
- Taurus, "The Bull"
- Gemini, "The Twins"

Using a flashlight, have them sketch what they see. Then, go inside and gather some black paper, chalk, and star stickers. Have your child recreate the constellations from their sketches!



Take a photo while stargazing + post it using #wewonderhere!

Stars



Composer Study Terry Riley

Song of the Week: "G Song"



Literature Zoo in the Sky by Jacqueline Milton

Optional Novels for Older Children:

Space Rocks! by Tom O'Donnell



What to Know

- *Stars are luminous balls of gas in the sky, mostly made up of hydrogen and helium. Stars are held together by their own gravity. Earth's nearest visible star is the sun.*
- *Constellations are a group of stars forming a recognizable pattern that is traditionally named after its form or identified with a mythological figure.*
- *There are eighty-eight constellations with defined boundaries.*
- *Some of the most easily recognizable constellations are the Ursa Major (Big Dipper), Ursa Minor (Little Dipper), Orion (The Hunter), Taurus (The Bull), and Gemini (The Twins).*

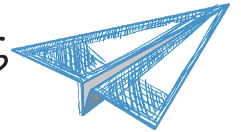
PBL Stars

What to Do

- Discuss these points in an age-appropriate way with your child.
- Use the Invitations to Play and Create to begin a discussion about Stars.
- Have your child spend time exploring through the Thematic Tub.
- Go through the information and online resources in the Week 5 section of the PBL Presentation (located at WonderHere.com/Student).
- Have your child conduct additional research on anything that sparks their interest.
- Have your child record their wonders, research, and creations in a journal or notebook.

WEEK FIVE

Invitation to Play Constellation Lacing Cards



As your child has been learning throughout this week, constellations are easily identifiable groups of stars that look like a figure when you envision lines connecting the stars. In this Invitation, your child will practice using their dexterity to “connect stars”.

Sewing and lacing are excellent fine motor skill activities that will keep your child peacefully busy doing something that will connect the work of their minds and their hands.

Gather the Constellation Lacing Cards

in your Curriculum Kit, as well as a practice plastic needle (or a real needle for older children with sewing experience) and some yarn.

Have your child lay out the Constellation Lacing Cards and begin to lace the yarn through the holes. Have them continue lacing in and out until they have completed the form of the constellation. After lacing each of the cards, challenge older or eager children to design their own Constellation Lacing Cards with other constellations!



Take a photo of your lacing cards + post it using [#wewonderhere!](#)

Stars



Invitation to Create Marshmallow Constellations

For this week's Invitation to Create, your child will create constellations using marshmallows and toothpicks! This fun activity will have them snacking and building all at once.

Gather mini marshmallows, toothpicks, black construction paper, a hot glue gun (optional), food coloring (optional), and zip lock bags (optional).

Place a toothpick into a marshmallow to create the constellation shape. Place the finished constellations on top of the black construction paper.

Your child may need to break some toothpicks to help them to create the correct shapes while creating their constellations.

If you'd like, you can hot glue the constellations down in order to make it a more permanent art fixture.

If your child wants colored stars, place the marshmallows in a zip lock bag and drop a few drops of food coloring into the bag. Shake up the bag to spread the food coloring and then use the marshmallows.



WEEK SIX

Nature Journaling Space Station Hunt



After these five weeks of studying Earth & Space, as your child if they can imagine actually LIVING in outer space? Well, astronauts do and you might even be able to see them!

You and your child will go outside on a clear night, and look for a Space Station! How can you be sure you're seeing a space station? A space station looks like a plane that is moving fast in the sky, but the light is steady it does not blink.

The light on a space station is very bright, and it is often the brightest thing in the sky (besides the Moon)!

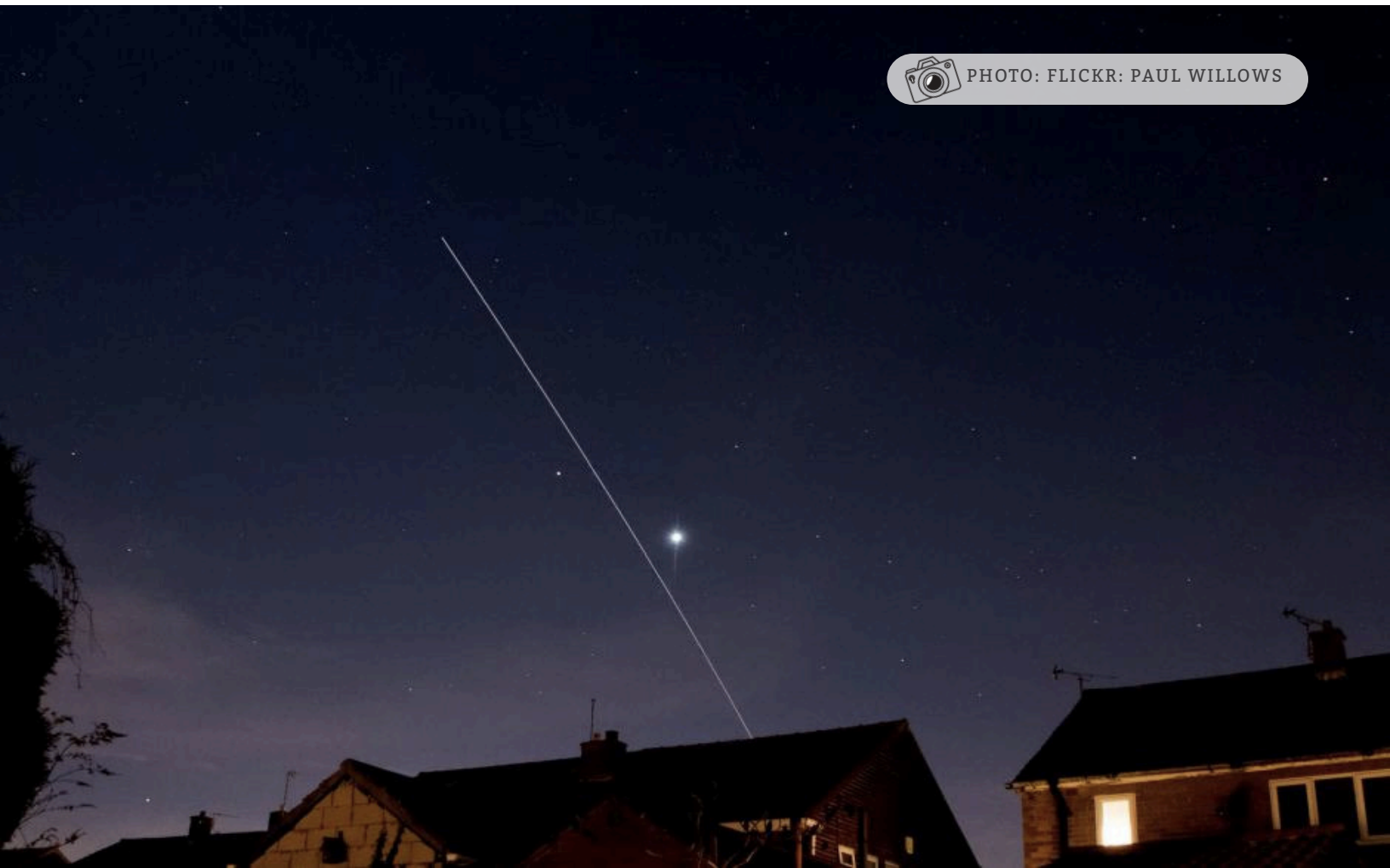
If you need some guidance, Use this website to assist you in spying the space station!

SpotTheStation.NASA.gov/Sightings

Have your child write or draw what they observed in a journal or notebook.



PHOTO: FLICKR: PAUL WILLOWS

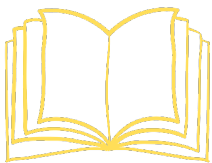


Space Exploration



Composer Study Terry Riley

Song of the Week: "A Rainbow in the Curved Air"



Literature *If You Were a Kid Docking at the International Space Station* by Josh Gregory

Optional Novels for Older Children:

Space Rocks! by Tom O'Donnell



PBL Space Exploration

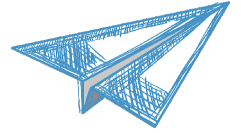
What to Know

What to Do

- *Astronauts are people who travel and work in space to learn more about what's beyond our planet.*
- *To be an astronaut, you have to have studied and applied science.*
- *Space exploration began October 4, 1957 when the Soviet Union launched a satellite, Sputnik 1, into space.*
- *Humans have been curious about the mysteries held in the distant sky from the beginning of time. With the launch of this first satellite, people began to slowly collect answers for their countless questions.*
- *On July 20, 1969, the Apollo 11 crew lands on the Moon for the very first time ever!*
- Discuss these points in an age-appropriate way with your child.
- Use the Invitations to Play and Create to begin a discussion about Space Exploration.
- Have your child spend time exploring through the Thematic Tub.
- Go through the information and online resources in the Week 6 section of the PBL Presentation (located at WonderHere.com/Student).
- Have your child conduct additional research on anything that sparks their interest.
- Have your child record their wonders, research, and creations in a journal or notebook.

WEEK SIX

Invitation to Play Astronaut Pudding



Because astronauts are in space for long periods of time, they need to eat foods with a long shelf life that won't go back. Because of this, much of the food they take to space is dehydrated, then re-hydrated when ready to eat. Your child will make a sweet treat, much like what Astronauts might eat in space!

Gather your materials:

- Powdered milk
- Instant pudding mix
- Water

- Measuring cup
- Measuring spoons
- Quart-sized zip lock bag

Directions:

1. Measure 1 TBSP and 2 TSP of dry instant pudding mix in a zip lock bag.
2. Pour in $\frac{1}{2}$ cup of water into the bag and zip the bag tightly.
3. Shake the mixture until combined.
4. Cut off one corner of the bag and have your child squeeze it in their mouths, much like an astronaut would!

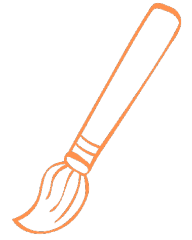


Take a photo of your pudding & post it using #wewonderhere!



Space Exploration

Invitation to Create Solar System Model



And now, for the project everyone gets excited about... the 3D Solar System Model! Many creative liberties can be taken when creating this model. The one thing we would encourage is to guide your child into making a heliocentric model with the planets in the correct order.

In other words, make sure the sun is at the center of the model, and the model shows the planets orbiting the sun in increasingly larger orbiting rings.

Materials

- Foam balls (various sizes for planets and sun)
- Black foam board
- Acrylic paint (yellow, orange, red, brown, blue, green)
- Hot glue

Have your child use the knowledge they've learned about outer space to put these materials together in a way that shows off our Solar System! Encourage them to brainstorm and research before beginning.



Take a photo of your model & post it using #wewonderhere!