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# One World, One Sky

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*A Member of the University of Maine System*

# One World, One Sky

## Big Bird's Adventure



## Facilitator Guide



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# Look Up and See the Sky!

Looking up at the sky and simply wondering what is out there, is the first step on one of the most exciting adventures!



As you look up at the sky together, you can help children, ages 4-8, to become aware and develop friendships with children around the world. After all, everyone everywhere shares the same sky, and we all have special myths, stories, and songs about the Sun, stars, and Moon.

As children become aware of the Sun, stars, and Moon they will be introduced to basic astronomy concepts, develop a love for science, and find a world of possibilities, learning, and discovery! As a facilitator, you play an important role in encouraging this learning. Through open-ended questions and simple, hands-on activities, you can help nurture children's curiosities and bring the sky to life.

This exciting multiple-media, trilingual (English, Spanish, and Mandarin) program was created through the combined efforts of Sesame Workshop, Adler Planetarium, Beijing Planetarium, and Liberty Science Center.

## As you use these materials you'll:

- Join Big Bird, Elmo, and Hu Hu Zhu on an exciting exploration of the Sun, stars, and Moon as you watch and discuss *One World, One Sky: Big Bird's Adventure*
- Engage in large and small group activities that expand upon the learning in the show and further explore:
  - How the Sun and spinning Earth create our day-night cycle
  - Exciting star patterns and stories from around the world
  - The different phases of the Moon and the craters on the Moon's surface
- Discover new ways to bring the Sun, stars, and Moon into your museum or science center program, through books and hands-on explorations that fit into your program's curriculum and everyday routines

**So, get ready to discover the sky together. Ready, set... let's explore!**

# Using These Materials

The Facilitator Guide is a comprehensive tool to help you integrate exciting explorations of the Sun, stars, and Moon into your museum or science center program.

## MAKE THESE MATERIALS YOUR OWN!

Depending on your needs and the size of your group, choose the activities that work for you.

You will also find wonderful ways to extend the learning in the **Keep Discovering** and **Books Bring Learning to Life** sections.

This wonderful resource is filled with ready-made activities for building an exciting exploration of the sky above. You'll find inspiring questions for you and children ages 4-8 to explore the extraordinary wonders of the sky we all share.

**These materials are designed to be flexible.** There are activities on the Sun, the stars, and the Moon. You can choose any one of the topics, or all three! For each topic, you can do a large group activity or a small group activity. No matter what you choose, you will find fun-filled explorations that children will enjoy.

Here's where to begin:

- Use the interactive **Before You Watch** to spark children's imaginations about the Sun, stars, and Moon and get them excited about the adventure they are about to begin with their *Sesame Street* friends.
- Next, watch the exciting ***One World, One Sky: Big Bird's Adventure* planetarium show**. This can be played in a regular planetarium, a portable dome or even on a traditional video screen.
- After the show, use the interactive **After You Watch** to highlight the cross-cultural message of the show and transition children into the hands-on activities.

## THE ACTIVITIES ARE DIVIDED INTO THREE CHAPTERS:

- We All Share the Sun
- Look Up and See the Stars
- Look Up and See the Moon

## EACH CHAPTER HAS THE FOLLOWING SECTIONS:

- **Large Group Activity:** Hands-on explorations designed for 20-30 children (30-35 minutes)
- **Small Group Activity:** Hands-on explorations designed for 5-10 children (30-35 minutes)
- **Keep Discovering:** Exciting ideas for continuing the learning both indoors and outdoors
- **Books Bring Learning to Life:** Recommended non-fiction, fiction, and cultural lore to extend your explorations of the Sun, stars, and Moon

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# Before You Watch

You are about to watch a wonderful show called *One World, One Sky: Big Bird's Adventure*. Before you begin, talk with children about the exciting things they will see. Ask questions to find out what they already know about the Sun, stars, and Moon and you will spark their curiosity about the sky above.

## INTRODUCING THE ADVENTURE AND TALKING ABOUT THE SKY

Tell children that Big Bird, Elmo, and a new friend from China, named Hu Hu Zhu are about to take them on a fun adventure to the sky.

- What do children see when they look at the sky during the day?
- What do they see when they look at the sky at night?
- What do they already know about the Sun? The stars? The Moon?

## INVITING INTERACTION AND LISTENING FOR LANGUAGE

Explain that during this adventure, Big Bird, Elmo, and Hu Hu Zhu will ask children questions and even sing some songs. Encourage children to answer the characters' questions, sing along, and move to the music!

Big Bird, Elmo, and Hu Hu Zhu will also share some of the wonderful ways that the United States and China are similar and different. Hu Hu Zhu will even help children learn a new language! Ask children to listen carefully for how to say words like, "star" and "Moon" in Chinese. Encourage children to try to remember the new words they hear. If you have time, use the **Chinese Word Pronunciation Guide** on this page to help children learn each word's meaning and practice its pronunciation before watching the show. As you engage in the activities, refer to this guide as often as you like!

### CHINESE WORD PRONUNCIATION GUIDE

nǐ hǎo (pronounced <i>nee how</i> )	hi/hello
běidǒu qīxīng (pronounced <i>bay doe chee sing</i> )	the Big Dipper
běi jí xīng (pronounced <i>bay jee sing</i> )	the North Star
xīng xing (pronounced <i>sing sing</i> )	star
yuè liang (pronounced <i>yueh lee-ahng</i> )	Moon

## INTRODUCING THE PLANETARIUM EXPERIENCE

Tell children that you will be watching *One World, One Sky: Big Bird's Adventure* in a planetarium. A planetarium is a very special place where people can see pictures of the Sun, stars, and Moon. Seeing a planetarium show is like watching a movie about the sky on a huge screen. Just like the inside of a movie theater, the inside of the planetarium may be mostly dark, but an adult may shine a flashlight to help them find a place to sit.

Invite children to follow you into the planetarium. When everyone is settled and comfortable in their seats, the show can begin!

## After You Watch

Now that children have watched *One World, One Sky: Big Bird's Adventure*, it is time for them to start their own adventures with the Sun, stars, and Moon. Try the activities in the pages that follow to help further what children learned with their *Sesame Street* friends.

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To highlight the cross-cultural message of the show, and help transition children into the activities, you might begin with the following conversation:

- Elmo and Big Bird live in the United States and Hu Hu Zhu lives in China. Even though they live in *different* places, what are some of the things they see that are the *same*?
  - Do they see the same Sun?
  - Do they see the same stars?
  - Do they see the same Moon?
- That's right! Even though Elmo, Big Bird, and Hu Hu Zhu live in *different* places and speak *different* languages, they see the *same* Sun in the sky during the day, and the *same* stars and Moon in the sky at night.





From China to the United States, and Beijing to *Sesame Street*, the Sun is a star that we all share. It may not look like the stars we see at night, but that's just because it's closer. In fact, it's close enough to provide our world and all the people, plants, and animals in it with warmth and light. **But how do people who live in different parts of the world get to see the *same* Sun?** The activities in this section will help children explore this question as they learn how the rotation of the Earth makes it possible for everyone to experience the big, bright Sun, no matter where they live!



# Good Morning, China

Do children remember the first thing Big Bird saw in the sky in the show? That's right! The Sun! Let's begin our own adventure to explore the Sun!

## CHILDREN WILL:

- Discover how the Sun and spinning Earth create our day-night cycle
- Find out that when it is daytime in the United States, it is nighttime in China

## YOU WILL NEED:

- Globe
- Flashlight
- Crayons
- Construction paper

## FOR OLDER CHILDREN:

Add to this activity by reading *What Makes Day and Night* by Franklyn M. Branley.

## ASK CHILDREN:

- Big Bird told us something special about the Sun – do you remember what it was? That's right! The Sun is the one star we can see in the daytime!
- What else do we see in the sky when it is daytime? What do we see in the sky at night?
- Can we see the Sun at night? Why can't we see the Sun at night? Let's find out!

## EXPLORE TOGETHER:

- 1) Show children where the United States and China are on a globe (Earth). You might say something like:
  - The United States is where Elmo and Big Bird live.
  - China is where Hu Hu Zhu lives.
  - Look at how these two places are very far away from one another. They are on opposite sides of the Earth! (If you have two different colored stickers, place one on the U.S. and one on China).
- 2) Now, explain that you are going to pretend that the flashlight is the big, bright Sun. Shine your flashlight so it's daytime in the United States. Then ask:
  - When it's daytime in the United States, is the Sun also shining on China? No, when it's *daytime* in the United States, it's *nighttime* in China!
- 3) Without moving the flashlight, rotate the globe to the east (counterclockwise when seen from above the North Pole) so the light is shining on China. Then ask:
  - When it's daytime in China, is the Sun also shining on the United States? No, when it's *daytime* in China, it's *nighttime* in the United States!
- 4) Explain that the Earth rotates or spins around while the Sun is shining on it. Each time that the Earth rotates or spins completely around we have one day and one night.
- 5) Provide each child with a sheet of construction paper and crayons.
- 6) Explain that they are going to draw a daytime sky on the front of their paper, and a nighttime sky on the back. As they draw their daytime sky ask:
  - What are some of the things we see in the daytime sky?
  - What are some things we do when it is daytime?

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## Good Morning, China (continued)

**The Sun is the one star we can see in the daytime!**



7) As they draw their nighttime sky ask:

- What are some of the things we see in the nighttime sky?
- What are some things we do when it is nighttime?

8) When children have finished their drawings play this game:

- Divide children into two groups and invite them to sit in semicircles, facing each other. One group will pretend to live in China, like Hu Hu Zhu, while the other lives in the United States, like Elmo and Big Bird.
- Hold up the globe and shine the flashlight so that it is daytime in China.
- Then, call out, "Good morning, China!" The China team can then flash their daytime sky as they pretend to wake up and do their morning routines.
- If it's morning in China what should the U.S. children be doing? That's right, they can say, "Goodnight, United States!" as they flash their nighttime sky and pretend to go to sleep. Talk together about why they are sleeping while the China team is awake.
- Repeat the game, this time shining the light so that it is daytime in the U.S. and nighttime in China. Talk about what children in China are doing as you play this game – they are probably asleep!

# Day Turns Into Night

Big Bird and Elmo live in the United States while Hu Hu Zhu lives in China. Even though they live in *different* places, do they see the *same* Sun? That's right, they do! Let's find out how they can see the *same* Sun!



## CHILDREN WILL:

- Discover how the Sun and spinning Earth create our day-night cycle
- Find out that when it is daytime in the United States, it is nighttime in China

## YOU WILL NEED:

- Globe
- Flashlight
- One sticker per child (optional)

## FOR OLDER CHILDREN:

Ask, "If your stomach is the United States, then what country would your back be? That's right – it would be China because the United States and China are on opposite sides of the Earth! Invite them to take the lead as they move their bodies according to what you call out. If you call out, "Daytime in the United States!" can they turn their bodies so their stomachs face the "Sun"? If you call out, "Daytime in China!" can they turn their bodies so their backs face the "Sun"?"

## EXPLORE TOGETHER:

- 1) Show children where the United States and China are on a globe (Earth). You might say something like:
  - The United States is where Elmo and Big Bird live.
  - China is where Hu Hu Zhu lives.
  - Look at how these two places are very far away from one another. They are on opposite sides of the Earth! (If you have two different colored stickers, place one on the U.S. and one on China.)
- 2) Now, explain that you are going to pretend that the flashlight is the big, bright Sun. Shine your flashlight so it's daytime in the United States. Then ask:
  - When it's daytime in the United States, is the Sun also shining on China? No, when it's *daytime* in the United States, it's *nighttime* in China!
- 3) Without moving the flashlight, rotate the globe to the east (counterclockwise when seen from above the North Pole) so the light is shining on China. Then ask:
  - When it's daytime in China, is the Sun also shining on the United States? No, when it's *daytime* in China, it's *nighttime* in the United States!
- 4) Explain that the Earth rotates or spins around while the Sun is shining on it. Each time the Earth spins completely around, we have one day and one night.
- 5) Leave the flashlight on, and dim the lights in your room.
- 6) Ask children to stand together in a group and tell them that they are going to pretend to be the big, round Earth.
- 7) Give each child a sticker to place in the center of his tummy. Ask children to pretend that the sticker is their home. If you don't have stickers, just use the belly button as "home."
- 8) One-by-one, shine the flashlight on each child's tummy. Ask:
  - Is the Sun shining on your home?
  - What does it look like?
- 9) Now, invite children to turn or rotate just like you showed them with the globe (Earth), by helping them turn to their left (counterclockwise).
  - What happens to the light on their tummies? The light can no longer be seen; it's like nighttime on their tummies (and on their homes).
  - Now children can continue turning around and discover that it is daytime again.
- 10) Talk about how turning around caused day and then night on their tummies. This is just what the Earth does!

## **Keep Discovering**

**Have you been inside for a while? Is it a bright, sunny day outside? Go have some fun in the Sun and enjoy its light and the shadows it creates!**

- **Shadow Count** Go on a “shadow walk” and see how many shadows you can count. Encourage children to describe the shadows they see. Which shadows are big? Which shadows are small? Are some short and wide? How about skinny and tall?
- **Sun Warmed** Explore the difference between objects that are in the Sun, and objects that are in the shade. Which feel warmer?
- **Green and Growing** Talk together about all the things you see growing in sunlight.

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## **Books Bring Learning to Life**

**Here are some great books that explore the Sun, day and night, shadows, and Sun stories.**

### **NONFICTION**

#### **For Preschoolers and Kindergartners**

- *Guess Whose Shadow?* by Stephen R. Swinburne  
A photo-essay on how light creates shadows

#### **For 1st and 2nd Graders**

- *What Makes Day and Night* by Franklyn M. Branley  
A simple explanation of how the rotation of the Earth causes night and day

### **CULTURAL LORE**

#### **For Preschoolers and Kindergartners, and 1st and 2nd Graders**

- *Why the Sun and the Moon Live in the Sky* by Elphinstone Dayrell  
This tale explains why Sun and his wife, the Moon, moved to the sky.

### **FICTION**

#### **For Preschoolers and Kindergartners**

- *Nine O’Clock Lullaby* by Marilyn Singer  
A series of bright vignettes satisfies children's curiosity about what children in other parts of the world are doing while they themselves are going to bed.

#### **For 1st and 2nd Graders**

- *Somewhere in the World Right Now* by Stacey Schuett  
Describes what is happening in different places around the world at a particular time

**Tip: Have some of these books on hand so that children who finish the activities early can have a look!**



# Look Up and See the Stars

Across the globe people look up at the night sky and see patterns and pictures in the stars. These star patterns inspire stories all around the world. **What do you see when you look up at the stars?** In the following activities, you'll investigate this question as you help children learn about the Big Dipper, a widely recognized star pattern, and explore even more patterns people have seen in the stars.



# Around the World With the Stars

**Hu Hu Zhu taught us how to say “star” in Chinese. Does anyone remember what he said? That’s right, “xīng xing” (pronounced sing sing) means “star” in Chinese. Let’s open and close our hands and practice saying “xīng xing” together. Now, let’s begin our own adventure to explore the stars!**

## CHILDREN WILL:

- **Observe patterns in the stars**
- **Discover that people around the world see patterns in the stars and tell stories about them**

## YOU WILL NEED:

- Big Dipper Star Chart (one per child; provided on page 14)
- Emperor Star Chart (provided on page 15)
- Ursa Major Star Chart (provided on page 16)
- Star stickers
- White crayons

## FOR OLDER CHILDREN:

Add the North Star, the “friendship star,” to their Big Dipper chart. Help them find the two stars that are farthest from the handle of the Big Dipper. Explain that the North Star is above and in line with these two stars. Show them how to use the North Star Ruler (page 14) so they can measure the distance from the top star and place the North Star on their chart. “Běi jí xīng” (pronounced bay jee sing) means “North Star” in Chinese. Practice saying this word together. Do children remember why the North Star is Hu Hu Zhu’s favorite star?

## ASK CHILDREN:

- Big Bird, Elmo, and Hu Hu Zhu found shapes and patterns in the stars. What shapes did they see?
- Have you ever noticed pictures and patterns when you connect the stars in the sky? What pictures or shapes have you seen?

## EXPLORE TOGETHER:

- 1) Share the Big Dipper Star Chart with children.  
*Note: Stars in these charts may be emphasized for clarity to children. They do not reflect their relative brightness in the sky.*
  - Do children remember how Big Bird counted and connected these stars?
  - If they use their imagination to connect the stars on this chart, what shape do the stars make?
  - Do they make a space ship? A fork? They make a big soup spoon! It is called the Big Dipper.
- 2) Hu Hu Zhu has his own special name for this big soup spoon. He calls it “běidǒu qīxīng” (pronounced bay doe chee sing). Try saying this together, “běidǒu qīxīng” (bay doe chee sing).
- 3) Use the Big Dipper Star Chart to show children how to create their own Big Dipper star pattern:
  - First, model pointing to and counting the seven stars.
  - Then, show them how to place a sticker on each star.
  - Finally, use a white crayon and model how to connect the stars into the shape of the Big Dipper!
- 4) Provide children with their own Big Dipper Star Chart. Invite them to point to and count the seven stars of the Big Dipper.
- 5) Next, provide each child with seven star stickers and encourage children to place a sticker on each of the seven stars.
- 6) Ask children to use a white crayon to connect the stars into the shape of the Big Dipper.

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# Around the World With the Stars (continued)



People often tell stories and sing songs about the patterns they see in the stars.

- 7) Explain that people often tell stories and sing songs about the patterns they see in the stars. Then, share the following story with children (use page 15 when reading the story):

*In ancient China, people believed that the North Pole of the sky was a great emperor who went around the world in his carriage. When you look up at the Big Dipper imagine a great emperor sitting in his carriage.*

- 8) After you have shared the story ask children:

- If you had a carriage in the sky, where would you go?

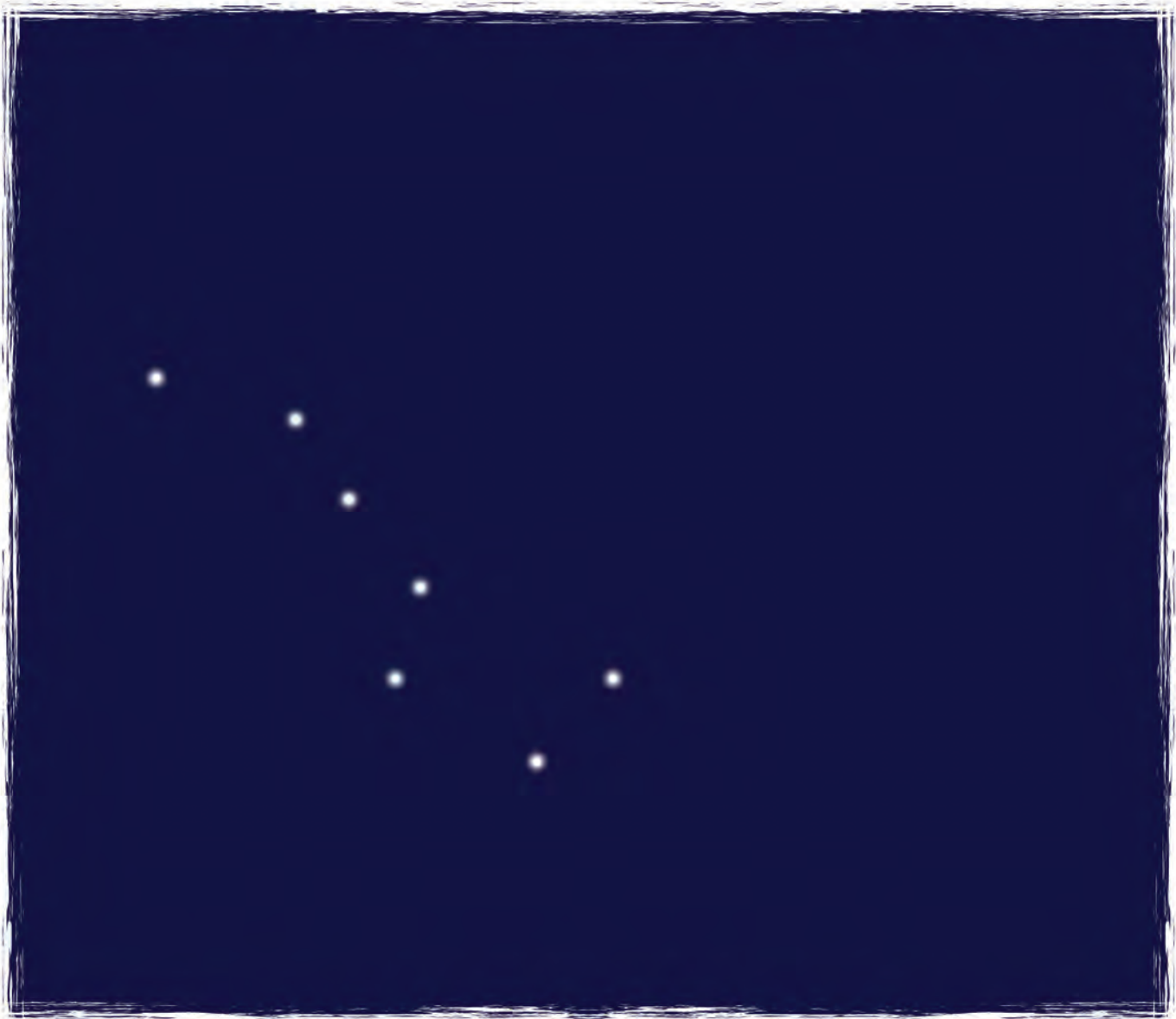
- 9) Explain that in the United States, people share a different story about these same seven stars. Show the Ursa Major Star Chart and tell children that The Big Dipper is part of a bigger star pattern that looks like a bear. Help children spot the seven stars of the Big Dipper within the Ursa Major star chart and explain that Native Americans have told this story about the bear (use page 16 when reading the story):

*A girl changed herself into a bear and chased after her little sister and seven brothers. The seven brothers flew up into the sky to hide. They became the seven brightest stars of the Great Bear. They are the stars that make up The Big Dipper.*

- 10) After you have shared the story ask children:

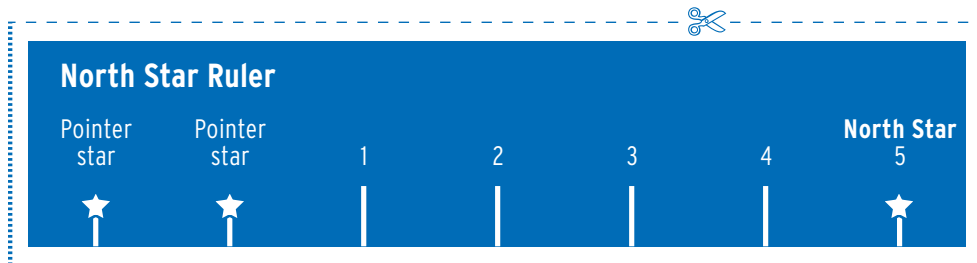
- If you could change into an animal, what animal would you be?

- 11) Encourage children to take the Big Dipper Star Chart home to share with friends and family. Children can work together with their families to make up their own story about the seven stars of the Big Dipper. They might even display their chart on the wall so they can look at it each night!



### Big Dipper Star Chart

Cut out the North Star Ruler. Explain that the two stars at the beginning are called the pointer stars because they point to the North Star. The North Star is above and in line with the pointers, about 5 times as far away from the Big Dipper as the pointers are from each other. Show them how to align the pointers with the North Star Ruler to place the North Star on their chart.





**Emperor Star Chart**



**Ursa Major Star Chart**



# Dragon Stories

**Big Bird, Elmo, and Hu Hu Zhu used their imaginations to find shapes and patterns in the stars. What were some of the shapes and patterns they saw? Let's use our own imaginations and look for more patterns in the stars!**

## CHILDREN WILL:

- Use their imaginations to discover their very own star patterns
- Learn about two different constellations in the shape of a dragon

## YOU WILL NEED:

- Star Chart (provided on page 19)
- Draco the Dragon Star Chart (provided on page 20)
- Draco the Dragon Star Chart with Graphic (provided on page 21)
- Spring Dragon Star Chart (provided on page 22)
- Star stickers (15 per child)
- White crayons

## FOR OLDER CHILDREN:

Add on to this activity by asking children to make up a story about the star pattern they created. They can work in pairs to share their stories with one another, or share them with the whole group!

## EXPLORE TOGETHER:

*Note: Stars in these charts may be emphasized for clarity to children. They do not reflect their relative brightness in the sky.*

- 1) Share the Star Chart on page 19 with children and model using your imagination to look for patterns in the stars. You might point and say something like:
  - If I use my imagination to connect these three stars, I think I can make a triangle.
- 2) Then, show children how to put a sticker on each of the stars, and use a white crayon to draw lines to connect them.
- 3) Provide children with their own star chart and encourage them to look for patterns.
  - What do they see?
  - Can they find three stars that make a triangle?
  - Can they find four stars that make a curvy shape?
- 4) Now, give children stickers and encourage them to place them on the stars that create the patterns they see.
- 5) After children have placed their stickers on each star of their pattern, give them a white crayon and encourage them to draw lines to connect the stars.
- 6) If children have any leftover stickers, encourage them to look for another pattern in the stars, following the same steps.
  - Can they make any other shapes, like a square, a circle, or even an animal?
- 7) Gather as a group and look at the patterns children found. Encourage them to talk about their discoveries.
  - What patterns do they see on each other's charts?
- 8) Share the Draco the Dragon Star Chart (on page 20). Explain that this is another pattern people have found in the stars.
  - Can you guess what it is?
  - Point out the head, the legs, the back, and the tail. Is it a cat? Big Bird? A dinosaur?
  - It's a dragon, Draco the Dragon! (Show children the Draco the Dragon Star Chart with Graphic on page 21)

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# Dragon Stories (continued)



**Around the world, people use their imaginations to find shapes in the stars and make up wonderful stories. What stories can you tell with your shapes?**

- 9) Explain that people in China (where Hu Hu Zhu lives) see a dragon in the sky with different stars (see Spring Dragon Star Chart on page 22). Here is the story they love to tell about the dragon they see in the stars.

*In northern China, in the early days of February, something wonderful happens. As the sun sets, stars in the shape of a dragon appear in the sky. Farmers know what this means; it is the best time to plant the seeds for that year. An ancient legend about a dragon, a king, and beans with golden blossoms told them so. According to the legend, the king of the sky was angry with the people and ordered the dragon in charge of the rain to stop every drop from falling to the Earth. For three years, there was a terrible drought. People looked up and begged for rain to grow their crops. The dragon felt sympathy for the people and poured down rain on the Earth. The king didn't like that at all. He decided to keep the dragon away from the sky, but he promised to release the dragon if he received beans with golden blossoms. The people tried to find the beans with golden blossoms to give to the king. A year went by, and on February 2nd, families in the village discovered that cooking corn kernels until they popped made the golden, bean-like kernels "blossom"! When the king saw the golden blossoms, he had no choice but to let the dragon go back to the sky. Now, that day is remembered as the "Spring Dragon Holiday." As the dragon lifts its head on February 2nd to appear in the sky, people eat popcorn and hope for lots of rain and a great harvest.*

- 10) Encourage children to share their patterns with family and friends at home.



**Star Chart**



**Draco the Dragon Star Chart**



**Draco the Dragon Star Chart with Graphic**





**Spring Dragon Star Chart**

## Keep Discovering

Have you been sitting for a while? These fun activities will get your group up and moving!

- **Sidewalk Star Patterns** Have a sidewalk art show! Invite children to draw sidewalk constellations using Sidewalk Chalk.
- **Star Patterns** Provide children with penny-sized, circle cut-outs to use as stars. Invite them to make their own constellations by gluing the circles onto a sheet of black paper. What patterns do they see in their constellation? Encourage them to connect the circles, using white crayons. How many patterns will they make?
- **Stargazing** As children head home, encourage them to look up with their families when the sky grows dark. Who can spot the first star?

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## Books Bring Learning to Life

Here are some books that explore the stars.

### NONFICTION

#### For Preschoolers and Kindergartners

- *Stars* by Steve Tomecek  
Introduces stars and what they are made of, how they shine, their positions with relation to Earth, and more

#### For 1st and 2nd Graders

- *The Big Dipper* by Franklyn M. Branley  
Explains basic facts about the Big Dipper, including which stars make up the constellation, how its position changes in the sky, and how it points to the North Star

### CULTURAL LORE

#### For Preschoolers and Kindergartners

- *Coyote Places the Stars* by Harriet Peck Taylor  
Coyote arranges the stars in the shapes of his animal friends.

#### For 1st and 2nd Graders

- *How the Stars Fell Into the Sky: A Navajo Legend* by Jerrie Oughton  
This retelling of a Navajo folktale explains how First Woman tried to write the laws of the land using stars in the sky, only to be thwarted by the trickster Coyote.

### FICTION

#### For Preschoolers and Kindergartners

- *Twinkle, Twinkle, Little Star* by Iza Trapani  
In this expanded version of the 19th-century poem, a small girl goes with a star on a journey through the night sky, examining both heavenly bodies and the Earth below.

#### For 1st and 2nd Graders

- *Zoo in the Sky* by Jacqueline Mitton  
This award-winning book captures the glittering light show of the constellations.

**Tip: Have some of these books on hand so that children who finish the activities early can have a look!**



# Look Up and See the Moon

The Moon's appearance changes in a regular cycle that lasts about a month. When Big Bird looked up at the sky he noticed that the Moon had a crescent shape – it looked like a skinny banana! At other times the Moon appears round and full, like a big ball, or half-full like a slice of watermelon, and sometimes the Moon can't be seen at all. The following activities will help children to discover, observe, and name these different Moon shapes and help children learn more about the surface of the Moon.

# The Many Phases of the Moon

Hu Hu Zhu taught us how to say, “Moon” in Chinese. Does anyone remember what he said? That’s right – “yuè liang” (pronounced yueh lee-ahng) means “Moon” in Chinese. Let’s make a big, round Moon with our arms and practice saying “Moon” in Chinese. Say, “yuè liang” together. Now, let’s begin our own adventure to explore the Moon!

## CHILDREN WILL:

- Discover patterns in the way the Moon’s appearance changes
- Learn more about the surface of the Moon

## YOU WILL NEED:

- Large pictures of each Moon phase: Crescent Moon, Half Moon, Gibbous Moon, and Full Moon (provided on pages 27-30)
- Smaller Pictures of the Moon Phases (provided on page 31)
- Stapler

## FOR OLDER CHILDREN:

Ask if they can name any of the Moon pictures you hold up, or call out a name and see if they can find the matching picture. Write the names where children can see them, and encourage them to label each Moon picture on the back.

## ASK CHILDREN:

- When Big Bird looked up into the night sky, what did the Moon look like? That’s right, it looked like a skinny banana!
- Have you ever looked at the Moon in the sky? What did the Moon look like to *you*?

## EXPLORE TOGETHER:

*Note: For younger children, it is clearer to use the visually consistent and popular term, “half moon” for this phase, although the most accurate term is “quarter moon.” Older children might see why it is actually called a “quarter moon.”*

- 1) Share all four of the Moon phase pictures with children. Hold them up, and for each one ask:
  - Have you ever seen the Moon look this way?
  - What does the Moon look like in this picture? (Encourage children to describe the different phases in their own words.)
- 2) Next, hold up the picture of the Half Moon and the Full Moon. Ask:
  - How are these pictures different from each other?
  - How are they the same?
- 3) Explain that although children don’t see part of the Moon in the Half Moon picture, that part is still there; it is just in the shade. Unlike the Sun, the Moon does not shine by itself. The light part of the Moon is bright because the Sun’s light is shining on it.
- 4) Then, hold up the pictures of the Gibbous and Crescent Moons.
  - How are these pictures different from each other? How are they the same?
  - Which picture shows more of the Moon in the shade?
  - Which picture shows more of the Moon in the light?
- 5) Introduce children to the special names that these Moon shapes have, as noted on the pictures.

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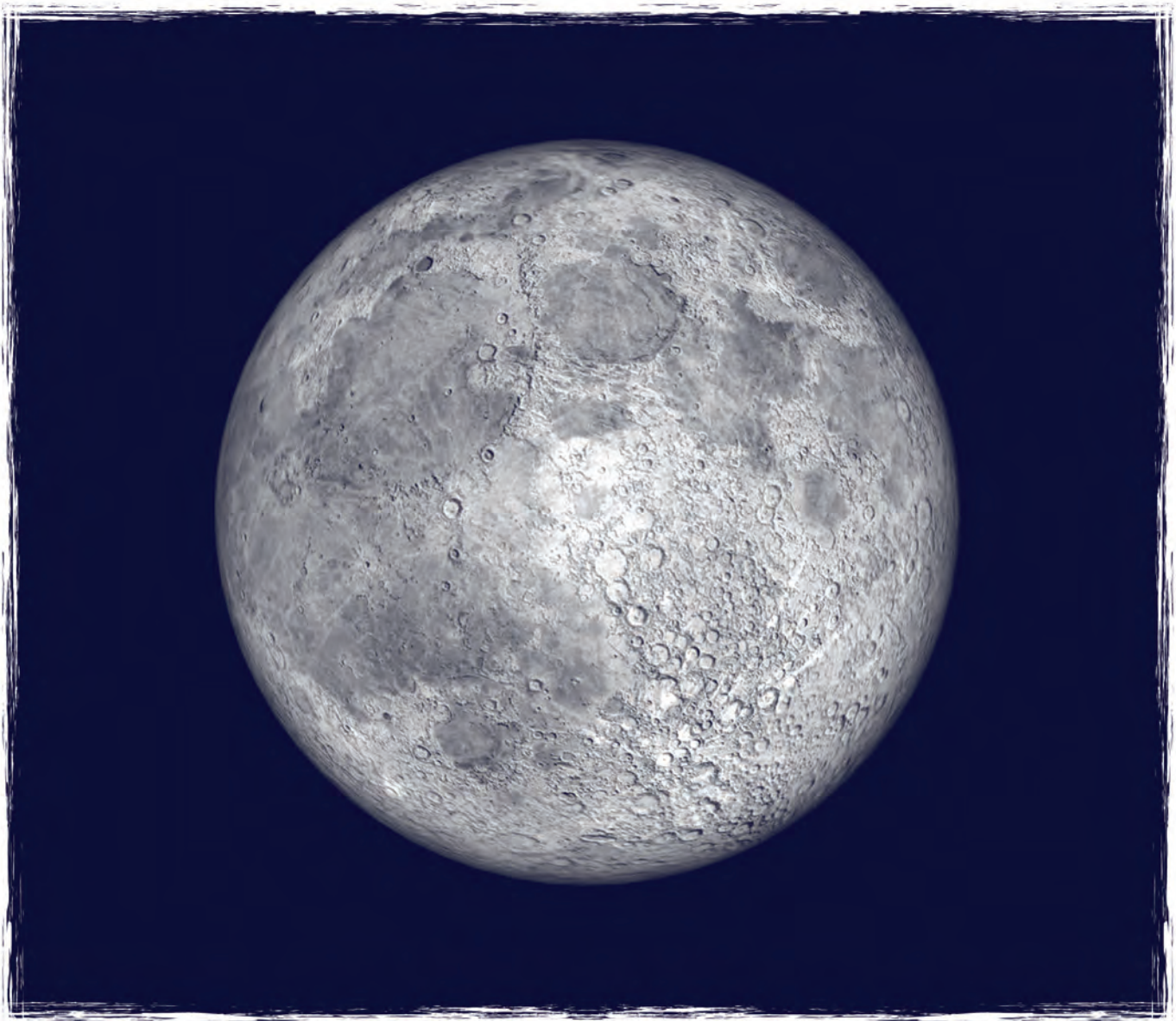
# The Many Phases of the Moon (continued)



**One night a month, we see no Moon in the sky! What do you think we call the Moon then? It would make sense if we called it no Moon, or dark Moon, but we call it New Moon. Maybe that's because we know we will have a new chance to start seeing the Moon again, two or three nights after the New Moon.**

- 6)** Give each child the handout Smaller Pictures of the Moon Phases on page 31. Ask them to cut along the dotted lines so they have four separate Moon phase pictures. As they work, ask:
  - Do you remember the holes Elmo and Hu Hu Zhu jumped into and out of on the Moon?
  - What were those called? That's right – craters!
  - Point to the craters you see in each picture of the Moon!
- 7)** Invite children to place all the Moons they've cut out in front of them. Then, show the pictures of the Moon from the start of this activity.
  - Which of the Moons they cut out match each Moon phase you hold up?
- 8)** Help children staple their Moon phase pictures together and encourage them to take them home to share with friends and family.





**Full Moon**

Sometimes we can see the whole Moon in the sky. It looks big and round and it's very bright. We call this the Full Moon.



**Gibbous Moon**

**Sometimes what we see looks almost like a Full Moon, but not quite.  
We call this the Gibbous Moon.**



**Half Moon**

**Sometimes we can see just about half of the Moon. What do you think we call the Moon then? That's right, a Half Moon.**

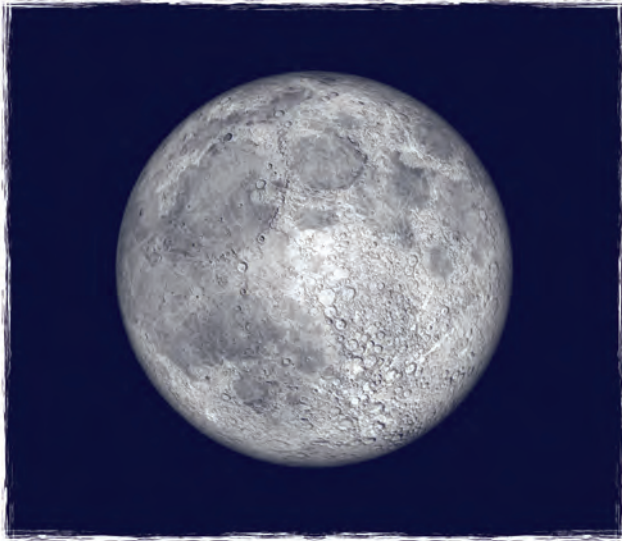
*Note: For younger children, it is clearer to use the visually consistent and popular term, "half moon" for this phase, although the most accurate term is "quarter moon." Older children might see why it is actually called a "quarter moon."*





**Crescent Moon**

**Sometimes we see just a little bit of the Moon. We call this a Crescent Moon.**



**Smaller Pictures of the Moon Phases**



# Crater Creations!

Hu Hu Zhu and Elmo learned that the Moon is very different from Earth.

Do children remember some of the ways the Moon is different? Are there any trees, plants, or animals up there? Let's begin our own adventure to explore the Moon!

## CHILDREN WILL:

→ Learn about the Moon's surface as they create their own craters in clay

## YOU WILL NEED:

- Pictures of the Full Moon (1 per child; provided on page 27)
- Clay (one lump per child)
- Paper plates (1 per child)

## FOR OLDER CHILDREN:

Instead of making a flat model of the Moon's surface, encourage older children to roll their clay into a ball, or press it around a round object like a tennis ball, so they can create their craters on a 3-D sphere!

## EXPLORE TOGETHER:

- 1) Ask children about all of the things Elmo and Hu Hu Zhu explored on the Moon.
  - Does anyone remember the holes they jumped in and out of?
  - What are those holes on the Moon's surface called? That's right! They are called craters!
- 2) Share the picture of the Full Moon from page 27. Invite children to point to the craters they see on the Moon's surface.
  - What do you notice about the craters?
  - How are they the same? How are they different?
  - Are all of the craters the same shape? The same size?
- 3) Invite children to make their own models of the Moon's surface using clay.
  - Show them how to take a ball of clay and press it flat onto a paper plate. Explain that you are going to pretend this is the surface of the Moon.
  - Then, use your fingers, thumb, and the palm of your hand and show children how to create craters in the clay.
- 4) Provide each child with their own picture of the Full Moon, a paper plate, and a lump of clay. Invite them to follow the steps you just showed them to create their own crater-filled surface of the Moon!





## Keep Discovering

Here are even more fun activities to encourage your group to explore the Moon!

- **Moon Hunt** Encourage children to look for the Moon during the day – a clear day with few clouds works best. Try in the afternoons, about a week after the New Moon. Check the newspaper or a calendar to find a good day for your hunt, and look up! It can be a thrilling challenge to spot the Moon in the daytime sky!
- **Moon Collage** Help children to cut out and then glue pictures from recycled magazines, old newspapers, or online to create a collage of different pictures of the Moon. How are the pictures the same? How are they different? Can children name any of the phases they see?
- **Moon Log** Give children sheets of black paper stapled together, star stickers, and white chalk to take home. Ask families to do lunar observations for a week. Children can use the chalk to record their observations on the black paper, and draw what the Moon looks like each night. They might even notice that the Moon's location changes!



## Books Bring Learning to Life

Here are some great books that explore the phases of the Moon, the Moon's surface, and Moon stories.

### NONFICTION

#### For Preschoolers and Kindergartners

- *The Moon Seems to Change* by Franklyn M. Branley  
Explains the phases of the Moon and the changes that seem to happen to it as it goes around Earth

#### For 1st and 2nd Graders

- *What the Moon is Like* by Franklyn M. Branley  
Sights and experiences on a Moon visit

### CULTURAL LORE

#### For Preschoolers and Kindergartners

- *Moon Rope/Un lazo a la luna* by Lois Ehlert  
Fox and Mole try to climb to the Moon on a rope woven from grass in this adaptation of a Peruvian folktale.

#### For 1st and 2nd Graders

- *Armadillo Ray* by John Beifuss  
Curious about the true nature of the Moon, Armadillo Ray asks different animals for their opinion.

### FICTION

#### For Preschoolers and Kindergartners

- *And If the Moon Could Talk* by Kate Banks  
As evening turns into nighttime, the Moon looks down on a variety of nocturnal scenes, including a child getting ready for bed.

#### For 1st and 2nd Graders

- *Henry's Moon* by Geoffrey Moss  
Henry lives in a big city, and rarely sees the Moon. So, he builds a Moon for his bedroom window.

**Tip: Have some of these books on hand so that children who finish the activities early can have a look!**

# Bringing It All Together!

Keep the learning going by encouraging children to share their work with their families at home and remind them to look up!

**Congratulations!** Together with children you have explored:

- How the Sun and spinning Earth create our day-night cycle
- Exciting star patterns and stories from around the world
- The different phases of the Moon and the craters on the Moon's surface

**TO HELP CHILDREN WRAP-UP THEIR EXPERIENCE, YOU MIGHT END YOUR EXPLORATIONS WITH THE FOLLOWING QUESTIONS:**

- What is one new thing you learned today?
- What did we learn about people in the United States and in China?
- What is something you might like to share with your friends or family?

