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**Learning Objectives:**

* Students will be able to identify the phases of the moon, why it occurs and develop an understanding of the scientific process of observation.
* Students will be able to identify scientific inaccuracies in children’s literature, like *Papa, Get Me The Moon*.

**Standards**:

* MST Standard:
Standard 1: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions.
* CCSS ELA:9: Reading informational text. Grade 4: integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.

**Materials:**

* 2.5 inch smooth white foam balls. 1 per student.
* Pencils - 1 per student.
* Lamp
* Student pages: Moon Journal, Moon Survey, Moon Phases Quiz

**Procedure:**

**Engage:** Access Prior Knowledge: Ask students “What do we know about the moon?”

Read: *Next Time You See The Moon* by Emily Morgan

    Ask questions: What have you learned about observing the moon?

            What are you wondering about the moon?

            How might you find the answers to your questions about the moon?

Discuss how scientists find answers though observation, doing experiments (over and over again) and communicating with other scientists.

**Explore:** Give each student a “Moon Journal” “Where going to find out more about the moon by observing it every night.” “look at the moon each night and draw what it looks like in your journal for one month.”  Throughout the month discuss with students what they are observing.  Is the moon the same color every night?” “Was the Moon in the same spot each night?” “Do you see any patterns looking at your Moon Journal?”

**Explain:**

**Moon Survey:** Students for homework will complete Moon Survey worksheet. Once worksheet is complete discuss their different answers they received. “Are there any answers that you think aren’t correct?” “What are some answers that you received?” “ What do you think causes the moon phases?”

**Moon Model:**Students will get to discover why the moon looks different from night to night by using a model. Explain to students that for the model the ball represents the moon, the lamp represents the Sun, and their head represents the Earth. The lights should be turned off and blinds shut. The darker the room the better. Before guiding students with the models allow them to explore.Each student will get their own model and have a turn.

First students need to be facing towards the lamp. The ball needs to a little above their heads. Students will not see lit side of the ball. This model represents a new Moon.

The students will then turn their bodies to the left still looking at the ball and having it above their heads. This model represents a crescent Moon.

Once done with the models asking questions: “Where does the Moon's light come from?” “People think the phases of the moon are created by the Earth's shadow. Does our model show this? Why or why not?” “The different shapes the model represented are called the Moon Phases.”Having students refer back to the  Moon Survey. “Did anyone have the right answer.” “Using the model and our Moon Journal observations what does this tell us about the moon?”

This lesson clearly indicates the 5 E’s (as shown above) and these are some productive questions we could use with students at different stages in the lesson:

* Attention focusing:
	+ What do you know about the moon?
	+ What do you see when you look at the moon?
	+ Do you notice how the moon changes over the course of a month?
* Measuring and Counting:
	+ How many days does it take for the moon to go through one cycle?
	+ How often do we see a crescent moon?
	+ How many other planets have moons? How many moons do other planets have?
* Comparison:
	+ Can you describe the sequence in which we see the moon phases in one month, starting with a new moon?
	+ Can you find a pattern for when the moon rises and sets?
* Action:
	+ What would happen if there was no light source such as the sun to illuminate the moon?
	+ What happens if you live on the other side of the world? How would the moon look if you lived in India?
* Problem-Posing:
	+ Can you find a way to describe how the moon gets its light?
* Reasoning:
	+ Why do you think that we always see the same side of the moon?
	+ Why did they call it the “dark side” of the moon?
	+ Why do you think we have the moon?
	+ Why do you think we see the moon in phases?

**Elaborate:**

**Read Aloud:** Introduce the book Read Papa, Please Get The Moon for Me The author and illustrator is Eric Carle.  Once you read the book once reread again but this  time tell students to listen for things that scientifically incorrect. “When you hear or see something that you don’t think is scientifically correct raise your hand and we will stop and discuss.  Discussing that this book’s purpose wasn’t a science book. Discussing things such as a ladder couldn't reach the moon The moon can’t talk. The moon is too big to carry. The moon phases don’t change the way they are shown in the book.

**Evaluate:**

Informal Assessment: listening to students answers, discussion, pre-assessments (moon journal and moon survey), and pointing out the misconceptions in book.

Formal Assessment: Moon Phases Quiz

**Differentiation:**

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| Child (Initials) | IEP/504 Plans: Classification/Needs And Other Learning Needs | Supports, Accommodations, Pertinent IEP Goals | Responsible Teaching Staff |
| B.B. | Hearing Impaired | Use pendant microphone necklace during instruction, pass microphone to each child during group discussion. |  |
| L.V. | Struggling Reader | More time, check for understanding, repeat directions |  |
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