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Laboratory of Tree-Ring Research

Tiny Sparks: Science and Storytelling in Early Learning

Lesson Title: Chasing Shadows: Exploring Eclipses Through Stories and Art

Grade Level: Kindergarten
Lesson Length: 50 minutes

AZ Science Standard:	***K.E2U1.5*** *Observe and ask questions about patterns of the motion of the sun, moon, and stars in the sky.*
Learning Objective:	● *Students will be able to demonstrate basic understanding of what an eclipse is by explaining or showing how the moon can block the sun's light.* ● *Students will be able to create a simple representation of an eclipse through art, demonstrating their grasp of the concept visually.*

Vocabulary	Materials
● *Astronomy* ● *Moon* ● *Sun* ● *Eclipse* ● *Lunar*	● *The book "Eclipse" by Andy Rash* ● *Prepare small cardstock "moon" or have students cut out moon shape (need scissors)* ● *Chalk pastels* ● *Flashlights* ● *Globe* ● *Small and large balls* ● *Activity sheets: the lunar cycle and the astronaut moon maze*

Costume Element:
Costumes play a vital role in storytelling by engaging children in immersive experiences, visually representing characters and concepts, and boosting cognitive skills through interactive play. They encourage creativity and support multi-sensory learning, making scientific concepts more accessible and memorable for young learners.

- *Astronaut Costume: Use official NASA patches to create a realistic astronaut look, fostering immersive experiences for children learning about space exploration.*
- *Planetary Costumes: Dress up as planets like Earth, Mars, or the Sun to visually represent different celestial bodies in the solar system.*
- *Alien Costumes: Engage children with creative alien designs, encouraging imaginative play and exploration of extraterrestrial life concepts.*
- *Galileo Galilei Costume: Embody the famous astronomer to introduce historical figures in astronomy and their contributions to scientific understanding.*

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Guiding Questions:

- *What do you think is happening when we can't see the sun during an eclipse?*
- *How does the moon's shadow make you feel? Why do you think the animals in the story felt confused?*
- *What other things can block light and make shadows? How are they similar to or different from the moon blocking the sun?*
- *If you could watch an eclipse, what would you want to observe or learn about it?*

Engagement/Introductory Activity:

- *Gather children in a circle*
- *Introduce the book " Eclipse" by Andy Rash*
- *Show the cover and ask children what they think the story might be about*

Exploratory Activity:

Story Time (10 minutes)

- *Read "Eclipse" by Andy Rash aloud*
- *Engage children by asking questions about the characters' reactions to the eclipse*

Discussion (5 minutes)

- *Ask children what they learned about eclipses from the story*
- *Discuss why the animals in the story were confused by the eclipse*

1st Science Activity: Eclipse Demonstration (10 minutes)

- *Use a flashlight (sun), a large ball (Earth), and a smaller ball (moon) to demonstrate an eclipse*
- *Dim the room and have children observe how the "moon" blocks the "sun's" light*
- *Allow children to take turns creating their own mini eclipses*

2nd Science Activity - Day and Night Cycle Model (10 minutes):

- *Create a simple model of the Earth's rotation using a globe or ball and a flashlight. Have students:*
- *Observe how rotating the "Earth" creates day and night*
- *Discuss how this relates to the sun's apparent movement in the sky*
- *Consider how an eclipse might fit into this cycle*

This activity helps students:

- *Understand the broader context of celestial movements*
- *Relate the eclipse phenomenon to daily experiences of day and night*
- *Develop spatial reasoning skills*
- *Practice using scientific models to explain natural phenomena*

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1st Art Activity: Eclipse Chalk Art (15 minutes)

Demonstrate how to create an eclipse drawing:

- *If not using prepared cardstock moons, have the students trace and cut out a cardstock or thin cardboard circle, about 4 inches (10 cm) in diameter.*
- *Color the circle heavily with chalk. Make thick lines with lots of chalk. If available, use multiple colors such as white, yellow, and orange.*
- *Place the circle in the center of the black paper, chalk side up.*
- *With your fingers or a tissue, smudge the chalk from the circle outward on the black paper to create rays all around the Sun. And more chalk if needed. Hint: Help the child by holding the circle in place so it doesn't move around.*
- *Remove the circle to reveal the solar eclipse!*

2nd Art Activity: Moon phase art (15 minutes) - Optional

- *Using the lunar cycle moon images, teach students about the different phases of the moon by having them create artwork using black paper and white chalk. Students can draw the moon's phases and tell stories about each phase.*
- *Students can trace the vocabular words about the lunar cycle or the astronaut moon maze. activity sheet. These activities help students develop crucial pre-writing skills by refining their fine motor control, enhancing hand-eye coordination, and familiarizing them with the shapes of letters and numbers.*

Conclusion (5 minutes)

- *Display children's artwork*

Recap what they learned about eclipses and the phases of the moon

- *Ask children to share their favorite part of the lesson*

Explain:

- *"Can you tell me what happened when we used the balls and flashlight to make an eclipse? What did you see?"*
- *"How did your chalk drawing show an eclipse? What parts of your picture represent the sun and the moon?"*
- *"What was the most interesting thing you learned about eclipses today? Was there anything that surprised you?"*
- *"Why is the moon not always full?"*
- *"If you had to explain what an eclipse is to a friend who wasn't here today, what would you tell them?"*

Extension Activity/Questions:

Shadow Play Exploration:
Set up a "shadow play" area with a bright light source and various objects. Encourage students to:

- *Create different shadows by placing objects between the light and a wall or screen*
- *Observe how changing the distance between the object and light affects shadow size*

- *Experiment with overlapping shadows from multiple objects*

This activity allows students to:
- *Apply their understanding of how objects can block light (like in an eclipse)*
- *Explore concepts of size, distance, and perspective*
- *Develop vocabulary related to light and shadows*
- *Make connections between the eclipse phenomenon and everyday experiences*

Evaluation Activity:
Enlist the teacher's help to record the following data as needed.

Observational Assessment:
- *Observe students during the eclipse demonstration and art activity, noting their engagement and comments*
- *Document students' behaviors and conversations in anecdotal notes*

Performance-Based Assessment:
- *Ask students to demonstrate an eclipse using the flashlight and balls, assessing their understanding of the concept*
- *Evaluate students' chalk art drawings for representation of eclipse elements*

Verbal Assessment:
- *Use open-ended questions during and after activities to gauge understanding*
- *Engage in purposeful interactions to elicit children's thinking about eclipses*

Work Samples:
- *Collect and analyze students' eclipse chalk drawings as evidence of learning*
- *Use a portfolio approach to document progress over time*