



The Moon

FIRST GRADE
TWO-WEEK THEMATIC UNIT PLAN

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Introduction and Rationale (a)

Have you ever wondered why the moon goes through phases? Sometimes we look up in the sky and see a big glowing ball while other times it is just a little sliver in the vast sky. During this unit, students will use inquiry to discover the answer to this question while also addressing some of the most common misconceptions regarding Earth's moon ("the moon"). Students will even begin to understand the value of using models to learn more about the components and mechanisms of the Universe.

The moon is synchronously rotating around the Earth. This means that the moon is spinning as it circles the Earth. Every 27 days the moon completes a full trip around the Earth. As the moon circles the Earth, the view we see of the moon changes. The moon is always reflecting the same amount of light from the sun; however, the view we see changes as the moon rotates around the earth. This is what causes the moon phases that we can see from Earth (NASA, 2019).

This unit plan is designed to facilitate students in using models for recognizing, describing, and predicting the patterns of the moon. Through a series of scaffolded lessons, students will use inquiry to investigate and observe what causes the phases of the moon and how we can use the patterns to predict the phases.

In the field of science, models are developed to understand the mechanics of a particular thing or process. Models also help scientists create a scenario analysis to predict potential outcomes. The use of models is a fundamental building block for understanding earth and space science (Wei, Liu, & Jia, 2014). My unit plan is an excellent choice for children because it allows students to develop and use models to gain a deeper understanding of the moon.

The learning experiences take into consideration a constructivist approach. The experiences are developmentally appropriate and give students hands-on opportunities to work with a variety of different models (Chaille & Davis, 2016).

The 5E's framework of inquiry is the basis for the learning experiences. The design of the unit plan allows the teacher to act in the role of the facilitator (National Science Foundation, 1999). The unit is designed to support students in the process of inquiry. For students to develop inquiry, they must have opportunities to practice inquiry and investigations (Banchi & Bell, 2008). Students are allowed opportunities to test their ideas and form conclusions. In this unit, one way that students are allowed to investigate and test their ideas is through predicting and using models to test and refine their predictions based on what they have learned through the models. The unit begins by **Engaging** students through the integration of technology in the classroom and use of Google Moon. Next, students will start to **Explore** the universe through models. Students will begin to explore and grasp why we see different phases of the moon. Then, students will **Explain** by creating their own model of the phases. Next, students will further **Elaborate** if the moon phases look the same around the world. Finally, students will **Evaluate** their learning via a hands-on

activity. Throughout the unit, the lessons are designed to formatively assess students and provide feedback and guidance to the teacher (National Science Foundation, 1999).

This unit provides students opportunities to engage in all three dimensions of the science education framework: (a) scientific and engineering practices, (b) crosscutting concepts, and (c) disciplinary core ideas (National Academy of Sciences, 2012).

Students will begin to build a foundation in the Earth and Space science disciplinary core idea. Students will also have the opportunity to use scientific practices by planning and carrying out investigations. Students will be prompted with a question in order to predict why the moon has a certain property or characteristic. Students will predict in their science journals and then use models to test their prediction. Finally, students will document in their science journals their conclusions based on what they learned from the models.

Students will also be exposed to crosscutting concept of patterns and system models (National Academy of Sciences, 2012). Students will begin to understand that the moon's phases are a pattern. If the unit is extended over several months, the teacher can further emphasize patterns. Additionally, students will be able to use models to understand systems (National Academy of Sciences, 2012). Students will have the opportunity explore and create their own model.

Standard (b)

Standard

ESS 1.1: “Use observations or models of the sun, moon, and stars to describe patterns that can be predicted” (Tennessee State Board of Education, 2016).

Goals

The standard referenced above falls under Earth and Space Science. In first grade, students begin to learn about the Earth and the Universe. The material students learn in first grade is the foundation for their studies of Earth and Space Science. During first grade, students begin to understand the importance of models and various instruments (i.e., telescopes and technology) in learning about the Universe (Tennessee State Board of Education, 2016).

Unit Objectives

In first grade, students embark on a journey to understand the Earth and how it relates to the Universe. During first grade, students begin to utilize tools and models to observe the sky and predict patterns. In second grade, students build on their knowledge of patterns by learning that the Earth’s events are recurring and that events can extend over a long or short period of time. In third grade, students begin to explore and learn more about the planets. By the end of the year, students can identify properties and the location of planets within the solar system (Tennessee State Board of Education, 2016).

References

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Curriculum Web (c)



Title and Description of Learning Experiences (d)

Overview

The unit plan has been designed as a set of buildable learning experiences. Students will first explore some of the characteristics of the moon. Students will learn that the moon reflects light from the Sun and that the moon is rotating around the Earth.

Next, through observation, students will begin to describe what they see each night when they look at the moon. Depending on when the unit begins during the course of the month, students will begin to see the moon growing bigger or smaller. Finally, students will learn why the moon has different phases and the vocabulary terms for the phases of the moon.

Please see the unit plan calendar that overviews the timeline of the learning experiences. Also, see the activity descriptions that detail the learning experiences to take place throughout the course of the unit.

Calendar (Week 1 of 2)

Time of Day	Monday	Tuesday	Wednesday	Thursday	Friday
Welcome Whole Group	Google Moon Exploration (1).	Discuss and color last night's moon observation to hang in front of the classroom. Predict tonight's observation (3). <i>Max and the Tag-Along Moon</i> by Floyd Cooper (4).	Discuss and color last night's moon observation to hang in front of the classroom. Predict tonight's observation (6).	Discuss and color last night's moon observation to hang in front of the classroom. Predict tonight's observation (7).	Discuss and color last night's moon observation to hang in front of the classroom. Predict tonight's observation (8).
Small Group		'Where does the moon get its light?' activity (4).			'Does the moon move?' activity (9).
Departure	Take home moon observation calendar and family letter (2).	Students will listen to a song about patterns to begin thinking about detecting changes in their moon observation journals (5).			

Calendar (Week 2 of 2)

Time of Day	Monday	Tuesday	Wednesday	Thursday	Friday
Welcome Whole Group	<p>Discuss and color last night's moon observation to hang in front of the classroom.</p> <p>Predict tonight's observation (10).</p>	<p>Discuss and color last night's moon observation to hang in front of the classroom.</p> <p>Predict tonight's observation (12).</p> <p>Moon's phases song (13).</p>	<p>Discuss and color last night's moon observation to hang in front of the classroom.</p> <p>Predict tonight's observation (15).</p>	<p>Discuss and color last night's moon observation to hang in front of the classroom.</p> <p>Discuss what the class believes that the next two weeks will look like (17).</p> <p>Read <i>I am Neil Armstrong (Ordinary People Change the World)</i> by Brad Meltzer (18).</p>	
Small Group	<p>'Where does the moon get its phases?' activity (11).</p>				
Gross Motor			<p>Gross Motor Moon Phase Card Game (16).</p>		
Individual Work		<p>Construct Oreo Moon Phase Art (14).</p>			<p>Picture card phases – summative evaluation (19).</p>

Titles and Descriptions

Day One (Monday)

Activity 1: I will **Engage** student's interest in the upcoming moon unit by viewing Google Moon in class (Google, 2019). By using Google Moon, we will be incorporating technology in class (**Technology Connection**). I will have students **Explore** Google Moon. As they are exploring, I will ask the student questions about what they see as they explore Google Moon. I will ask students to describe the moon and the characteristics or landmarks they see. Google Moon labels the location of the Apollo landings (**Social Studies Connection**). We will discuss how NASA went to the moon, and because of their research, we can see images of the moon.

Activity 2: Before students leave for the day, they will take home their **Family Letter (g)** and moon calendar journal. The family letter will inform parents of the unit and the moon observation activity. Over the next two weeks, students will be observing the moon at home. Students will look at the moon each night and draw what they are seeing. The calendar was adopted from Mensa for Kids (2019).

Day Two (Tuesday)

Activity 3: Each morning when students come into the class, we will discuss what they observed. Daily as a class, we will shade a big circle of a moon. The moons will hang in a line in the front of the classroom. This will help visually track the changes that we are observing (Fitzsimmons, Leddy, Johnson, Biggam, & Locke, 2013).

Activity 4: Students will **Explore** the characteristics of the moon. We will read a book *Max and the Tag-Along Moon* (Cooper, 2013) (**Literature Connection**). I will ask students where they think that the moon get its light from in order to have them begin thinking about the activity. Students will use models (flashlight and Styrofoam ball covered in aluminum) to investigate the moon's light source. I will ask students to describe in their science journal what they believe is the source of the moon's light (Edwards, 2002).

Activity 5: Students will listen to the Pattern song (GoNoodle, 2016) (**Math Connection**) and I will ask students what they think the moon will look like tonight to see if they can predict and start to detect a pattern (**Math Connection**). Since the moon takes approximately 27 days to create a phase, students will not be able to detect a full pattern in two weeks. However, this unit can be extended over the course of several months in order for students to see a complete pattern. During the two weeks, however, students will begin to understand how the moon grows bigger or smaller over the course of two weeks.

Day Three (Wednesday)

Activity 6: Discuss and color last night's moon observation to hang in front of the classroom and predict tonight's observation (See **Day Two – Activity 3**).

Day Four (Thursday)

Activity 7: Discuss and color last night's moon observation to hang in front of the classroom and predict tonight's observation (See **Day Two – Activity 3**).

Day Five (Friday)

Activity 8: Discuss and color last night's moon observation to hang in front of the classroom and predict tonight's observation (See **Day Two – Activity 3**).

Activity 9: Students will **Explore** through an activity that the moon rotates around the earth. Using a tin baking pan and ping-pong ball, students will **Explore** that the moon rotates around the earth. There will be a picture of Earth in the center of the tin pan. Students will use these hands on models to begin to see how the moon rotates around the earth (Nicole, 2012).

Day Seven (Monday)

Activity 10: Discuss and color last night's moon observation to hang in front of the classroom and predict tonight's observation (See **Day Two – Activity 3**).

Activity 11: Next, students will participate in a moon inquiry activity. In this activity, students will use models of the Earth, moon and sun to investigate how the phases of the moon are formed.

- a. In order to **Engage** students, I will begin by asking students if the moon looks the same each time they look outside. Students will draw on the knowledge they have from the take home moon inquiry to identify that the shape of the moon changes.
- b. I will have students document in their science journal what they believe causes the Earth to see the moon in different phases (**literacy connection**).
- c. Since we cannot go visit the moon in class, we can use different models to try to determine what causes the different phases. We will use models of the Earth, moon and sun to **Explore** how the phases of the moon are formed.
- d. Students will be divided into groups of two. Each group will receive a Styrofoam ball attached to a wooden dowel (representing the moon) and a flashlight (representing the sun).
- e. One student will be Earth and will hold the moon model. The other student will be the sun and hold the flashlight.
- f. As students take turns and investigate they should be encouraged to document what they are seeing on science journal.
- g. After the inquiry, students **Explain** in their own words why the moon has different phases. Did their hypothesis change?

See **Lesson Plan 1** for more details regarding this inquiry activity (NASA, 2010).

Day Eight (Tuesday)

Activity 12: Discuss and color last night's moon observation to hang in front of the classroom and predict tonight's observation (See **Day Two – Activity 3**).

Activity 13: We will begin the day by having students listen to a song about the moon phases (**Music Connection**) (Flocabulary, 2014).

Activity 14: In order to further **Explain** the phases, I will connect formal language and define the phases of the moon using an Oreo moon activity. Students will receive Oreos. Students will have to create a model showing and labeling the moon phases (**Art Connection**) (Willhite, 2012).

Day Nine (Wednesday)

Activity 15: Discuss and color last night's moon observation to hang in front of the classroom and predict tonight's observation (See **Day Two – Activity 3**).

Activity 16: The teacher will create an anchor chart with students. The anchor chart will be on black paper. As the teacher is creating the anchor chart, one student will come up for each moon and shade the moon in the correct amount. The teacher will then label the vocabulary moon for each of the eight phases. Students will get in groups of eight. Students will each receive a card with an image of a particular moon phase. Students will have to work together without talking to get into the correct order of the moon phase cycle (**Gross Motor Connection**).

Day Ten (Thursday)

Activity 17: Today we will do a final recap of **Activity 3** (See **Day Two**). Daily we have reviewed our moon observation diaries. Based on what we observed the previous night we have shaded with white crayon a construction paper circle representing the moon. Since students are only seeing the first fourteen days of the cycle, we will have them predict what the next 14 days will be as a class. I will ask students what they think will happen to the moon next month? Through discussion, students will begin to detect that we would see a pattern in the phases of the moon if we were to observe it over the next several months.

Activity 18: We will begin to wrap up the unit by reading *I am Neil Armstrong (Ordinary People Change the World)* by Brad Meltzer (2018). The book is based on the life of Neil Armstrong and places an emphasis on the importance of humility and working hard.

Day Eleven (Friday)

Activity 19: Evaluate: Students will have a set of eight moon phase pictures and will have to place moon cards in sequential order (Willhite, 2012). Students will be handed a set of eight laminated moon phase cards. The teacher will show the 'New Moon' and 'Crescent

Moon' phase pictures. The teacher will instruct students to order their eight cards based on what comes after these two pictures. Students will put their eight moon phase cards in order. The teacher will take a picture of the students finished product. The teacher will later complete a checklist denoting if the student was able to order the phase cards. This assessment requires students to be knowledgeable of the phases of the moon. Additionally, by students putting the 'New Moon' and 'Crescent' phases at the end, they will show that they understand that the phases begin to repeat. Knowing the phases repeat is an essential step in understanding that over the course of several months a pattern will form. **(Math Connection)**.

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Lesson Plans (e)

Lesson Plan – One

Lesson Title:
To Infinity & Beyond – Moon Models

Grade/Level: 1st Date/Learning Experience #: 11

Curriculum Standards	Essential Question(s)/I Can Statement(s)
<p><i>State Curriculum Standards –</i></p> <p>Tennessee Science Standard ESS 1.1: “Use observations or <u>models</u> of the <u>sun</u>, <u>moon</u>, and <u>stars</u> to <u>describe</u> patterns that can be predicted.”</p>	<p><i>What question(s) or I Can statement(s) drive your instruction?</i></p> <ol style="list-style-type: none"> 1. Why does the moon have different phases? 2. I can use models to make predictions about the moon.
<p>Lesson Objective(s) – Student Learning Outcome(s) for this learning experience</p>	
<ol style="list-style-type: none"> 1. Students will test predictions through the use of models. 2. Students will explain what causes the different phases of the moon. 	
<p>Knowing Your Learners</p>	
<p>The first grade classroom at the University School has prior knowledge of the moon. When we visited the classroom, the students were able to identify that the moon has different phases. This knowledge will be helpful for students in order for them to make and test predictions of what causes the different phases of the moon. This activity is within the student’s zone of proximal development. With the student’s background knowledge and assistance through inquiry-based questions, students should be able to determine the cause of the moon phases.</p>	
<p>Assessment/Evaluation</p>	
<p>Formative:</p> <p>As students are investigating through models, the teacher will visit the different groups. While talking with the groups, the teacher will ask inquiry-based questions to determine if students understand what causes the different phases of the moon. The teacher will take notes on the key phases or any common misconceptions.</p> <p>Summative:</p> <p>The summative assessment for this lesson will be the student’s documentation in their science journals. Students will document (through writing or illustration) what causes the different phases of the moon. The</p>	<p>Assessment/Evaluation Modifications</p> <ul style="list-style-type: none"> • For students who have difficulty writing they will be able to illustrate or orally provide responses. • Students are able to continue the activity during their RTI or ELL time.

teacher will analyze the science journals to determine student's understanding.

Academic Feedback:

The teacher will use language like sun, moon, prediction, phases, and models to promote students understanding of the vocabulary words related to the standard. Students will then be able to use this vocabulary to explain their understanding. As the teacher moves around the room to each group, they will remind students of the previous activities in the unit related to the moon (**activities 4 & 9**). While students are using the models, the teacher will walk around and guide students. The teacher will prompt with inquiry-based questions for students who are having difficulties. Additionally, the teacher will give all students positive feedback for exploring and testing their predictions.

Academic Language Demands

Function and Product of the Lesson:

Function: The function of this lesson is to make a prediction and test predictions through the use of models.
Product: The product of this lesson is to complete a journal page describing why the moon has different phases.

Academic:

- Describe – Students will need to know that "describe" means to illustrate or write about a particular topic or concept.
- Model – Students will need to know that "models" are used as representations.
- Predict – Students will need to know that "predictions" are guesses at what they think may happen.
- Test – Students will need to know that "testing their predictions" is putting them to work and seeing if they remain true.

Content Vocabulary:

- Moon
- Sun
- Rotate
- Phases
- Reflect

The above vocabulary connects to the standard because students will need to be able to use this vocabulary to describe what causes the moon phases.

Language Supports:

General Supports – The general support will be the student’s journal which will guide them through the scientific practices.

Targeted Supports – Some students will be given a word bank to help them write their description in their science journals.

Individual Supports – Students will be accommodated based on their IEP or 504 plan. Additionally, during RTI time students will have more guided one-on-one time to explore with the models. Additionally, for these students a single lamp could be substituted for the flashlight to help students understand that the sun does not move.

Lesson Part	Description of Activities and Instruction (Teacher Does)	Description of Activities and Instruction (Students Do)	Meeting Individual & Group Needs /Learning Styles
Set/Motivator:	<ol style="list-style-type: none">1. While seated at their desks the teacher will engage students by asking them to think about what they have been documenting in their moon observation.2. The teacher will ask students: “I want you to think about our moon observation’s each night. Does the moon look the same each time you look outside?”	<ol style="list-style-type: none">1. Students will think about what they have been observing each night during the take-home moon observation.2. Students will identify that the moon does not look the same each time they look at it.	The desk arrangement that students are sitting in was intentionally selected by the teacher. The desks form little communities and were matched in order to ensure that students are able to learn from one another and have the least amount of behavior issues.

<p style="text-align: center;">Instructional Procedures/Learning Tasks:</p>	<ol style="list-style-type: none"> 3. Once students identify that the moon does not look the same, the teacher will say “That’s right! The moon changes shapes because it is going through different phases.” 4. The teacher will instruct students to take out their science journals. 5. The teacher will tell students: “Now I want you to open your science journals and write or draw a picture of why you think the moon has different phases.” 6. Once students have documented their predictions, the teacher will say: “Now since we cannot go visit the moon in class we can use different models to try and determine what causes the different phases.” 7. The teacher will hold up the flashlight and turn it on and ask students: “What do you think this 	<ol style="list-style-type: none"> 3. Students will illustrate or draw in their journals their predictions on what causes the different phases of the moon. 4. Students will identify that the flashlight can be used to represent the sun and that the Styrofoam ball can be used to represent the moon. 5. Students will come up with their partner and pick up models of the moon and sun. 6. One student will be Earth and will hold the moon model. The other student will be the sun and hold the flashlight. 7. As students take turns and investigate and explore using the models. They should be encouraged to document what they see in their science journal. 8. Students will document their final observations. 	<p>Student’s will be paired together based on personality and ability.</p>
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	<p>flashlight can represent?”</p> <p>8. Then the teacher will hold up the Styrofoam ball and ask students: “What do you think this Styrofoam ball could represent?”</p> <p>9. The teacher will divide students into groups of two. The teacher will hand one member of the group a flashlight and call them the sun. The teacher will tell the other member that they will be the earth and will hold the moon.</p> <p>10. The teacher will walk around to the different groups prompting students with inquiry based questions.</p> <p>11. The teacher will instruct students that they have five minutes remaining and to finish wrapping up their documentation.</p>		
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<p>Questions and/or activities for higher order thinking:</p>	<p>a) “What do you think would happen if you hold up the moon a little higher?”</p> <p>b) “What was different about when you held the moon farther out in front of you?”</p> <p>c) “Where is the moon getting its light from?”</p> <p>d) “I see that you’re documenting different phases. How did that happen?”</p> <p>e) “What do you see change on the moon when you rotate?”</p>	<p>a) “When I move it up higher I can see the light reflecting on the moon now.”</p> <p>b) “My shadow isn’t blocking the light from the sun anymore.”</p> <p>c) “The moon is reflecting light from the sun.”</p> <p>d) “When the moon rotates the amount of light we see changes.”</p> <p>e) “The shadow changes.”</p>	
<p>Closure:</p>	<p>12. The teacher will instruct students to come back to circle time. The teacher will select two groups to share with the class why they think the moon has different phases.</p> <p>13. The teacher will tell students: “Tonight when you go home and look at the moon think about how the shape was made because of the different amount of light reflecting from the sun. Tomorrow</p>	<p>9. Students will come back to the circle. If their group is selected, they will share with their classmates why the moon has different phases.</p>	

	we are going to continue exploring the moon by making our own models.”		
<p>Material/Resources:</p> <ol style="list-style-type: none"> 1. Wooden Dowel or Wooden Pencil 2. Styrofoam Ball (> 4 inches) 3. Flashlight 4. Science Journal <p>The materials for the models will help students understand and visualize in a hands-on approach.</p> <p>Additionally, the science journals will help students document the scientific practices. The science journal will help walk students through making predictions, testing, and concluding on what causes the moon phases.</p>		<p>Technology:</p> <p>Students will use models of the sun (flashlight) and moon (Styrofoam ball on a stick).</p> <p>One of the cross-cutting concepts is for students to use models to better understand systems (National Academy of Sciences, 2012). However, according to Damelin, Krajcik, McIntyre and Bielik (2017), thinking about systems is not a natural process, and students should be supported with the right tools. As such, the use of models will be a helpful way to enhance student understanding.</p> <p style="text-align: center;">References</p> <p>Damelin, D., Krajcik, J.S., McIntyre, C., & Bielik, T. (2017). Students making system models: An accessible approach. <i>Science Scope</i>, 40(5), 78-82.</p> <p>National Academy of Sciences (2012). <i>A framework for K-12 science education</i>. Washington, D.C.: The National Academies Press.</p>	
<p>Co-Teaching Strategies Used:</p> <p>Both teachers will rotate around the room to the different groups teaching. As the teachers rotate to the different groups, they will prompt the students with inquiry based questions. Having both teachers rotating around the room and teaching will be the most beneficial because they can prompt students who may be stuck on a particular idea to think of it from a different perspective.</p>			
<p>Management</p>			
<p>Management:</p> <p>Clear and concise instructions will be given to help students in transitioning from one activity to another. At the beginning of the lesson, students will be at their seats. As they move from their seats to pairs, the teacher will give clear instructions and expectations. As students are transitioning the teacher can provide positive feedback. This positive feedback may help redirect students who are not listening.</p>			

Also, as students are working on models, they will be given a five-minute warning. This will help students wrap up the activity and prepare for the transition.

Theory/Rationale

The purpose of this lesson is for students to investigate and determine through inquiry why the moon has different phases. The theory of this lesson is built around the 5E's framework (National Science Foundation, 1999). Students are able to engage, explore, and explain. The lesson allows students to take science into their own hands and figure out for themselves the meaning of why the moon has different phases.

Additionally, students are able to use models to investigate. Learning the importance of models is an important cross-cutting concept in students' science foundation. Using models helps students understand and visualize what is happening in the sky at a smaller hands-on scale (National Academy of Sciences, 2012).

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Lesson Plan – Two

Lesson Title: Oreo Moon Model

Grade/Level: 1st Date/Learning Experience #: 14

Curriculum Standards	Essential Question(s)/I Can Statement(s)
<p><i>State Curriculum Standards –</i></p> <p>Tennessee Science Standard ESS 1.1: “Use observations or <u>models</u> of the <u>sun</u>, <u>moon</u>, and <u>stars</u> to <u>describe patterns</u> that can be predicted.”</p>	<p><i>What question(s) or I Can statement(s) drive your instruction?</i></p> <ol style="list-style-type: none"> 1. What is the order of the moon’s phases? 2. What are the names of the eight phases of the moon? 3. I can identify the order of the moon phases. 4. I can label the phases of the moon.
<p>Lesson Objective(s) – Student Learning Outcome(s) for this learning experience</p>	
<ol style="list-style-type: none"> 1. Students will create a model of the sequence of the moon’s phases. 2. Students will label a model of the moon’s phases. 	
<p>Knowing Your Learners</p>	
<p>The first grade classroom at the University School has prior knowledge of the moon. When we visited the classroom, the students were able to identify that the moon has different phases. Additionally, based on the earlier lessons in the unit plan students identified what causes the phases of the moon. In the previous lesson, students had the opportunity to explore with different models to determine what caused the phases of the moon. Next, this lesson is to explain to students and connect the vocabulary of the different phases.</p>	
<p>Assessment/Evaluation</p>	
<p>Formative:</p> <p>As students are creating models, the teacher will walk around to the different students. While talking with the students, the teacher will ask questions to determine if students understand the sequence of the phases of the moon. The teacher will take notes on students understanding. These notes will help the teacher in planning future lessons.</p> <p>Summative:</p> <p>None.</p> <p>Academic Feedback:</p> <p>The teacher will use language New Moon, Waxing Crescent, First Quarter, Waxing Gibbous, Full moon, Waning Gibbous, Third Quarter, and Waxing Crescent. Students will then be able to use this vocabulary to label their model.</p>	<p>Assessment/Evaluation Modifications</p> <ul style="list-style-type: none"> • For students who have difficulty writing they will have assistance in labeling the phases. • Students are able to continue the activity during their RTI or ELL time.

As the teacher moves around the room, they will remind students of the different phases that they saw in **Activity 11**. The teacher will ask questions to help students who have incorrectly labeled their model to prompt them to review their model. Additionally, the teacher will provide positive feedback for all students.

Academic Language Demands

Function and Product of the Lesson:

Function: The function of this lesson is to identify and label the phases of the moon.

Product: The product of this lesson is a model showing the eight labeled phases of the moon.

Academic Vocabulary:

- **Label** – Students need to understand that this means to give something a name.
- **Sequence** – Students need to understand that this means to put something in order.
- **Model** – Students need to understand a model is a representation.
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Content Vocabulary:

- Moon
- Phases
- New moon
- Waxing Crescent
- First Quarter
- Waxing Gibbous
- Full moon
- Waning Gibbous
- Third Quarter
- Waxing Crescent.

This connects to the standard so students will be able to name and predict the sequence of the phases of the moon.

Language Supports:

General Supports – Students will be able to use a graphic organizer containing the sequence and phases of the moon.

Targeted Supports – For students requiring targeted support, the model will be pre-labeled with the correct name of the phase.

Individual Supports – Students will be accommodated based on their IEP or 504 plan. Additionally, during RTI time students will have more guided one-on-one time to create their models.

Lesson Part	Description of Activities and Instruction (Teacher Does)	Description of Activities and Instruction (Students Do)	Meeting Individual & Group Needs /Learning Styles
Set/Motivator:	<ol style="list-style-type: none"> 1. To Engage students, the teacher will ask: “Do you remember the other day when we explored with models? Today, we are going to create our own model of the moon.” 	<ol style="list-style-type: none"> 1. Students are sitting at the carpet area. 	
Instructional Procedures/Learning Tasks:	<ol style="list-style-type: none"> 2. The teacher will create an anchor chart with the eight phases of the moon on black construction paper with the outline of eight circles. The teacher will call on a student to shade in each phase with a white crayon. 3. To Explain, the teacher will label the vocabulary name of each phase once it has been shaded. 4. The teacher will say “Now we have all the information that we need to create our own model out of Oreos. 5. The teacher will then hold up the pre-labeled vocabulary cards and instruct students to 	<ol style="list-style-type: none"> 2. Students will participate in the creation of the anchor chart by helping shade in each phase. 3. Students will put hand sanitizer on their hands and pick up a plate of model supplies. 4. Students will pull apart mini Oreo and remove the white filling as needed to depict the moon phase. 5. Students will place the pre-labeled vocabulary card around the plate in the correct order. 	

	<p>place them next to Oreos that shows this phase.”</p> <ol style="list-style-type: none">6. The teacher will have students line up and will sanitize their hands with hand sanitizer and have them pick up a plate which has the mini Oreos, spoon, and pre-labeled vocabulary strips.7. The teacher will walk around and encourage students not to eat the models yet and prompt them with questions to have them thinking as they create their models.8. As the teacher is walking around the room they will be taking notes on any common problems creating the eight phases.9. The teacher will warn students that they have five minutes to finish creating their models before they share and have snack.		
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<p>Questions and/or activities for higher order thinking:</p>	<p>a) “How is our model similar to the real moon?”</p> <p>b) “How is our model different from the real moon?”</p>	<p>a. “It shows the different phases” or “The moon is white where the light shines.” or “the moon is dark where the light isn’t hitting.”</p> <p>b. “It is flat, and the moon is round.” or “there isn’t a sun”</p>	
<p>Closure:</p>	<p>10. The class will walk around to two different peer’s models.</p> <p>11. The teacher will instruct students that they may eat their models if they would like to during snack.</p>	<p>6. Two students will explain to the class their model and point out the eight phase names.</p> <p>7. Students will eat their model if they wish to do so.</p>	
<p>Material/Resources:</p> <ul style="list-style-type: none"> • Mini Oreos • Marker • Plastic Spoon • Paper Plate • Graphic Organizer <p>The materials for the models will help students create their own model of the moon’s phases.</p>		<p>Technology:</p> <p>Students create their own hands on model of the moon’s phases. As students create each phase they will have a better understanding of the sequence.</p>	
<p>Co-Teaching Strategies Used:</p> <p>Both teachers will rotate around the room to the different students. As the teachers rotate to the different students they will prompt the students with questions and check for understanding. By having both teachers rotating around the room and teaching will be the most beneficial because they can prompt students who may be trying to eat the model instead of creating their own model.</p>			

Management

Management:

In order to help students transition from one activity to another, student will be given clear and concise instructions. As students are transitioning, the teacher can give positive feedback. This positive feedback may help redirect students who are not listening. Additionally, music will be played to help students focus during the transition. In addition, as students are working on models, they will be given a five minute warning. This will help students wrap up the activity and prepare for the transition.

Theory/Rationale

Using models is an important cross-cutting concept in science (National Academy of Sciences, 2012). In this lesson, students are able to create their own models. Additionally, students are asked open-ended questions about their models. When students are asked questions about their models and what makes them similar or different from what they are representing it deepens students thinking. Creating models allows students to take ownership. In addition, questioning also gives teachers an insight into what students understand about what the models are representing (Eichinger, 2005).

References

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Assessment/Unit Evaluation (f)

Overview

For this unit plan, the teacher will utilize both formative and summative assessment. The teacher will evaluate students on whether or not they have gained an understanding of the science content related to the earth and space science standard. The teacher will look for understanding related to identifying, describing, and predicting the daily moon changes. Additionally, students are to be evaluated on scientific practice skills including making predictions and documenting observations.

Formative

The unit plan is a set of buildable experiences that address common misconceptions that often interfere with a student's understanding of the moon. Throughout the unit plan, there are several opportunities for formative assessment to ensure that students understand the terms as well as the meaning behind why the phases are occurring.

During [Activity 4](#) and [Activity 9](#), the teacher will assess for the understanding that the moon reflects light from the sun and rotates around the earth. The teacher will assess via review of science journals and classroom discussions. The teacher will look to see if students either write or illustrate these two concepts. Knowing these characteristics is a critical step in the understanding of the moon's phases.

Depending on the feedback collected from the formative assessment during these activities, the teacher will decide if it is necessary to have additional activities to ensure that children understand the foundational understanding before proceeding.

During [Activity 11](#), the teacher will review students' science journals to see if students understand the scientific practices. In this activity, students make a prediction, test the prediction, and document their findings. Teachers will use a checklist to assess if students understand the steps of the scientific practices. The teacher will check to see if students made a prediction and documented a conclusion based on their experimentation with the models. See [Lesson Plan 1](#) for assessment modifications.

Summative

During [Activity 19](#), students will be assessed on if they can organize pictures depicting the moon's phases in sequence. Students will be handed a set of eight laminated moon phase cards. The teacher will show the 'New Moon' and 'Crescent Moon' phase pictures. The teacher will instruct students to order their eight cards based on what comes after these two pictures. Students will put their eight moon phase cards in order. The teacher will take a picture of the student's product. The teacher will later complete a checklist on if the student was able to order the phase card. This assessment requires the students to be knowledgeable of the phases of the moon. Additionally, by students putting the crescent and new moon phases at the end, they will show that they understand that the phases begin to repeat. Knowing the phases repeat is an essential step in understanding that over the course of several months a pattern will form.

Letter to Families (g)

English

Hello Families,

This week we are beginning our study on the phases of the moon. Over the next two weeks, students will engage in a variety of activities that help them learn more about the moon and its phases.

Today, in class we explored Google Moon (<https://www.google.com/moon/>) and discussed the characteristics of the moon. We also talked about observing the moon each night to detect patterns. Tonight, ask your students about what they saw while exploring Google Moon.

Also, this week students will begin observing the moon each night and observing what they see on the attached moon observation diary.

1. Please take your student outside each night and have them look at the moon.
2. Have students describe to you what they see when they look at the moon.
3. Then have students document on the observation calendar diary what they see each night.
4. Please send your student's moon observation diary with them to school each day. We will use this to discuss what changes we see in the moon.

If for some reason the weather does not allow you to view the moon on a particular night you can use the U.S. Naval Observatory's website listed below. This website will show you what the moon looks like outside right now. Using the site have students draw what the Observatory shows the moon as looking.

U.S. Naval Observatory Website: <https://aa.usno.navy.mil/imagery/moon>

Thank you so much in making this unit a success!

Ms. Schock

Spanish

Hola familias,

Esta semana estamos comenzando nuestro estudio sobre las fases de la luna. Durante las próximas dos semanas, los estudiantes participarán en una variedad de actividades que los ayudarán a aprender más sobre la luna y sus fases.

Hoy, en clase exploramos Google Moon (<https://www.google.com/moon/>) y discutimos las características de la luna. También hablamos de observar la luna cada noche para detectar patrones. Esta noche, pregúntales a tus alumnos qué vieron al explorar Google Moon.

Además, esta semana los estudiantes comenzarán a observar la luna cada noche y observarán lo que ven en el diario de observación de la luna adjunto.

1. Por favor, saque a su estudiante afuera cada noche y haga que miren la luna.
2. Haga que los alumnos le describan lo que ven cuando miran a la luna.
3. Luego, pida a los estudiantes que documenten en el calendario de observación lo que ven cada noche.
4. Por favor envíe el diario de observación lunar de su estudiante con ellos a la escuela todos los días. Usaremos esto para discutir qué cambios vemos en la luna.

Si, por alguna razón, el clima no le permite ver la luna en una noche en particular, puede usar el sitio web del Observatorio Naval de los Estados Unidos que figura a continuación. Este sitio web le mostrará cómo se ve la luna en este momento. Usando el sitio, haga que los estudiantes dibujen lo que el Observatorio muestra a la luna mirando.

Sitio web del Observatorio Naval de los Estados Unidos:
<https://aa.usno.navy.mil/imagery/moon>

¡Muchas gracias por hacer de esta unidad un éxito!

Sra. Schock

Chinese

你好家长们,

本周我们开始研究月球的各个阶段。在接下来的两周内，学生将参加各种活动，以帮助他们更多地了解月球及其各个阶段。

今天，我们在课堂上探讨了Google Moon (<https://www.google.com/moon/>) 并讨论了月亮的特征。我们还讨论了每晚观察月球来观测它的模式。今晚，向学生询问了他们在浏览Google Moon时所看到的内容。

此外，本周学生将开始每晚观察月球，并观察他们在月球观察日记上看到的内容。

- 1.请每天晚上带你的孩子到外面看看月亮。
- 2.让学生向他们描述他们看到的月亮的样子。
- 3.然后让学生在观察日历日记上记录他们每晚看到的内容。
- 4.请每天让学生带月球观察日记到学校。我们将用它来讨论我们在月球上看到的变化。

如果由于某种天气原因不允许您在特定的夜晚观看月球，您可以使用下面列出的美国海军天文台的网站。这个网站将向您展示月亮在外面的样子。使用该网站让学生绘制天文台所显示月亮的样子。

美国海军天文台网站：<https://aa.usno.navy.mil/imagery/moon>

非常感谢你帮助这个单位成功！

舒克女士

Family Letter – Moon Calendar

MOON PHASES CALENDAR						
Month:				Year:		
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
○	○	○	○	○	○	○
○	○	○	○	○	○	○
○	○	○	○	○	○	○
○	○	○	○	○	○	○
○	○	○	○	○	○	○
○	○	○	○	○	○	○

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Families

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<https://www.nasa.gov/kidsclub/index.html>

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List of Resources Used in Unit (i)

Materials and supplies

- LED Flashlight
- Styrofoam Ball (> 4 inches)
- Black construction paper
- White crayon
- Aluminum Foil
- Aluminum Pie Pan
- Ping Pong Ball
- Wooden Dowell or Wooden Pencil
- Paper Plate
- Plastic Spoons
- Oreo Cookies
- Markers

Print and non-print

- Max and the Tag-Along Moon
- I am Neil Armstrong (Ordinary People Change the World)
- Moon Calendar

Technology resources

- SmartBoard
- Google Moon

References

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