Things In The Sky

A Two-Week Thematic Unit/ Integrated Learning Segment for First Grade

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ECED 4450 Spring 2018

Focal Science Standard(s): TN Science Standards K-12: Earth's Place in the Universe 1.ESS1: Use observations or models of the sun, moon, and stars to describe patterns that can be predicted.

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Introduction and Rationale (a)

This integrated learning segment is designed to support children as born investigators and engage them with practices and discipline of science that will be progressively built on throughout their educational career. The 2- week unit will focus on using models or observations of the sun, moon, and stars to describe patterns that can be predicted. Children will conduct their own investigations as well as observe models and images of objects in outer space. According to the TN Science Standards, first grade students will learn about patterns in the day and night sky and patterns of the Earth, moon, and sun. The Framework for K-12 Science Education says that these patterns, which are explainable by gravitational forces and conservation laws, in turn explain many large-scale phenomena observed on Earth. This is the overall goal the standard is trying to reach. For first grade, students gain a general idea about moon phases, day and night, and how the effects of the sun. Students begin to understand that the Earth moves causing the phenomenon of day and night. During this unit, students will be presented with opportunities for guided inquiry as well as open inquiry. This unit provides students with engaging, whole group and small group hands- on activities and investigations suitable for multiple learning styles and levels (Bredekamp & Copple, 2009).

Standard/s Addressed, Goals, and Objectives for the Unit (b)

Science Standards addressed. The primary focal standard is for first grade from the TN-Science Standards. The science standard falls within the Earth and Space Science section, which "involve phenomena that range in scale from the unimaginably large to the invisibly small" (p.169; State Board of Education, 2018). *1.ESS1:* Use observations or models of the sun, moon, and stars to describe patterns that can be predicted. A secondary focal science standard will be from Engineering Design, 1.ETS1: Solve scientific problems by asking testable questions, making short- term and long- term observations, and gathering information (p.24; State Board of Education, 2018).

Goals. The goals of this unit are for children to learn and use key vocabulary (e. g., rotate, compare, axis, change, constellation, sun, Earth, moon, stars) and to be able to observe, model, and describe patterns (especially understanding how Earth moves) that can be predicted between the sun, moon, and stars.

Integrated Standards:

Language/ Literacy: (Day 1-10)

1.FL.PWR.3 Know and apply grade-level phonics and word analysis skills when decoding isolated words and in connected text.

1.FL.F.5 Read with sufficient accuracy and fluency to support comprehension.

1.FL.SC.6 Demonstrate command of the conventions of standard English grammar and usage when speaking and conventions of standard English grammar and usage, including capitalization and punctuation, when writing.

Objectives:

The students will understand and retell important facts in fiction and non-fiction texts.

The students will understand topics in text while being read to.

The student will write reflections in their science journals.

Math: (Day 5 and 6)

1.MD.A.1 Order three objects by length. Compare the lengths of two objects indirectly by using a third object.

1.MD.A.2 Measure the length of an object using non- standard units and express this length as a whole number of units.

Objectives:

The students will order the lengths between each shadow tracing from the shortest distance to the longest distance.

The students will measure the length of their shadows as well as the distance between each of their shadows using non- standard units of measure.

Social Studies: (Day 2, 3, 4, 9)

1.17 Identify the shapes of Tennessee and the United States on maps and globes.

1.42 Ask and answer questions about historical events that helped shape our Nation ~~and explain the role Tennessee played in these events.~~

Objectives:

The students will ask and answer questions about the first moon landing.

The students will identify Tennessee and the United States on a globe.

Technology: (Day 1, 2, 3, 7, 8, 10)

Computer Technology: Literacy and Usage 1.1 Students will demonstrate an understanding of the nature and operation of technology systems.

Objectives:

The students will navigate on a computer to complete the Web Quest and moon investigation.

The students will observe online pictures of the sun, moon, and stars.

Art: (Day 4, 5, 6, 7)

Visual Art Curriculum Standards: Standard 2.0 Structures and Functions First Grade

GLE 2. 3 Understand that art has a purpose.

SPI 2.3.1 Explore and describe purposes of artwork selected by the teacher.

Objectives:

The students will draw and create their constellation marshmallow creations mini book.

The students will use a variety of materials to create their Star Jar.

The student will draw their depiction of the sun, moon, and stars.

Movement: (Day 4, 5, 6)

Tennessee Health Education Standards Pre-K-2

Personal Health and Wellness Standard 4: The student will understand the relationship of physical activity and rest to healthy living.

Objectives:

The student will understand the importance of daily physical activity by following along with GoNoodle videos.

A Curriculum Web (c)

Social Studies

- First moon landing
- community helpers: astronaut
- geography and using a globe

Math

- comparing and contrasting things in the day/ night from *Splat the Cat*
- measuring distance between each shadow to track the sun's movement

Literacy/Language

- *sort, same as, observe, compare, describe*
- describe observations with words
- books
- retelling stories
- writing in journals

Movement

- Go Noodle video
- Partner inflatable globe activity

WATER

Focal Science Standard:1.ESS1: Use observations or models of the sun, moon, and stars to describe patterns that can be predicted.

Technology

- Online moon investigation
- Show videos on computer
- Looking at pictures of the sun, moon, and stars

Art

- Drawing constellations mini book
- Tracing their shadows
- Draw sun, moon, and stars and lsit facts about them
- Star Jar

Science

- Observing and recording shadow/ sun movement throughout the day
- anchor charts of prior knowledge
- KLEWS chart
- Plan and conduct an investigation about the moon
- Science non-fiction books
- Oreos activity/ constelations activity

Engineerring: designing constellations marshmallows

- Guest speaker: astronaunt

Title and Description of Learning Experiences (d)

Overview

This unit is set up to spend about 2 days on investigating the moon, 2 days on investigating the sun, and 2 days on investigating the stars. The first activity will Engage children (Primary Connections: 5Es) by making the unit personal to them by writing or drawing things they do in the day and things they do in the night. The room will also engage the students as it will be set up for an outer space theme the duration of the unit. The room will also change daily to support what we will be learning/ doing that day. The activities will give children the chance to Explore and inquire into their peer's questioning and ideas. This unit combines both whole group and small group activities giving children the opportunities to Explain and compare findings or information found between different people or groups. Students will have the opportunities to Elaborate on their learning through student- planned investigations as well as writing opportunities to expand on their learning of new concepts. At the end of each lesson, students will have the Evaluate opportunity to write or draw in their science journals to review and reflect on their learning and understanding of the content. By the end of the unit, children will be able to model the Earth's movement to show the differences between day and night as well as recognize and describe important information and patterns about the sun and moon.

Calendar

Week 1 of 2

Schedule	Monday	Tuesday	Wednesday	Thursday	Friday
Free Play/Center/ Arrival	Have room set up for unit	Set room up for the day	Set room up for the day	Set room up for the day	Set room up for the day
Welcome/Whole Group books	Anchor chart: Things I do in the day, things I do in the night Read *Splat the Cat*	Create KLEWS chart about the moon Read *The Moon Seems to Change*	Read *I Took the Moon for a Walk* Video of the first moon landing	Read *Jump into Science: Sun* Day/ Night Globe Lesson*	Explore the causes of the sun Brainstorm ideas of how to measure the suns movement Recording Shadow Lesson*
Small Group	Retelling practice of the book Compare things in the night/ day from the book	Moon Investigation Activity Part 1	Moon Investigation Activity Part 2 (Conclusion)	Inflatable globe activity	Outside exploration of sun's movement
Transition	Play video about Day and Night			GoNoodle video	
Snack			Oreos Activity		
Specials/ Related Arts Classes	(Music)	(Guidance)	(Computer Lab)	(Art)	(P.E.)
Outdoor Learning/Gross Motor					Record shadows
Small Group		Moon Investigation Activity Part 1	Moon Investigation Part 2 (if needing more time)	Write/ draw reflection in science journal	Reflect in science journals
Free Play/Outside Departure					

** Complete lesson plan*

Week 2 of 2

Schedule	Monday	Tuesday	Wednesday	Thursday	Friday
Free Play/Center/ Arrival	Set room up for day	Set room up for day	Set room up for day	Set room up for day	Set room up for day
Welcome/Whole Group books	Read *Sunshine Makes the Seasons* Anchor Chart compare contrast the seasons Measuring Shadows Part 2	Slideshow of different star patterns Read *What Are Stars*	Read *Zoo in the Sky*	Read *If I Were an Astronaut* Read *Astronaut Living in Space*	Read *national Geographic Little Kids First Big Book of Space*
Small Group	Select materials from around the room to measure shadow	Create a Star Jar	Marshmallow Constellation Creation	Guest speaker: Astronaut	Finish KLEWS chart
Transition		Video about stars and constellations			
Snack			Marshmallow Constellation Creation	Space snacks	Watch movie: *Space Buddies*
Specials/ Related Arts Classes	(Music)	(Guidance)	(Computer Lab)	(Art)	(P.E.)
Outdoor Learning/Gross Motor	Outdoors to measure shadow				
Small Group	Compare and contrast classmates shadow measurements and position drawings	Continue working on Star Jar	Draw their constellations mini book	Write favorite thing about the guest speaker (ticket out the door)	Continue movie
Free Play/Center/ Departure					

** Complete lesson plan*

Titles and Descriptions

Week 1

Day 1

Things I Do in the Day, Things I Do in the Night Anchor Chart: In whole group, create an anchor chart with the students about what they do in the day and what they do in the night. This activity will help students dig into their prior knowledge of what they know about day and night. This activity can include inquiry by getting the students to develop questions and build off questions from their peers.

- Materials:
  - Chart paper
  - Markers
- Standards Addressed:
  - 1.ESS1: Use observations or models of the sun, moon, and stars to describe patterns that can be predicted.
  - 1.FL.SC.6 Demonstrate command of the conventions of standard English grammar and usage when speaking and conventions of standard English grammar and usage, including capitalization and punctuation, when writing.

Reading *Splat the Cat*: Read *Splat the Cat* by Rob Scotton and hold a book discussion. Have students break into groups, each with a copy of the book, and compare and contrast things in the night and day. The students will practice the 5 Finger Retelling skill in small groups.

- Materials:
  - *Splat the Cat* (multiple copies for each group)
  - Recording sheet for counting things in the sky in the book

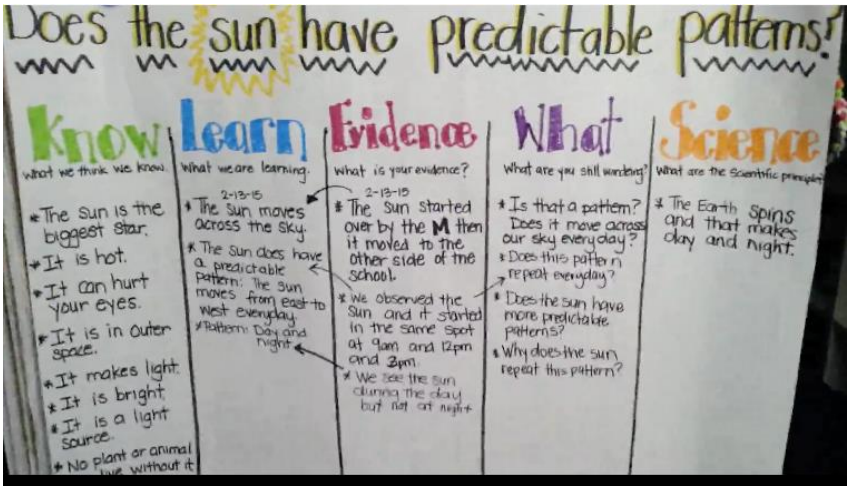
- Standards Addressed:

    - 1.FL.PWR.3 Know and apply grade-level phonics and word analysis skills when decoding isolated words and in connected text.
    - 1.FL.F.5 Read with sufficient accuracy and fluency to support comprehension.

Video: Play an introduction video about the difference between day and night. Here is a video link from PBS Kids: http://pbskids.org/video/peg/2365440792

Day 2

KLEWS (Know, Learn, Evidence, Wonder, Scientific) Chart: Create a KLEWS chart about the moon. KLEWS stands for: Know: What do we think we already know? Learn: What do we want to learn about these topics? Evidence: List evidence we have gathered from our research or project. Wonder: What do we still wonder about? Scientific: List the scientific principles we've learned. This is an inquiry-based activity because it allows the students to raise questions and use their discoveries and solutions throughout the unit to find a scientific support as to why things are the way they are. The students will continue to fill this chart out throughout the unit.



- Materials:
    - Chart paper
    - Markers
- Standards Addressed:
    - 1.ESS1: Use observations or models of the sun, moon, and stars to describe patterns that can be predicted.
    - 1.FL.SC.6 Demonstrate command of the conventions of standard English grammar and usage when speaking and conventions of standard English grammar and usage, including capitalization and punctuation, when writing.

Read *The Moon Seems to Change*: Read *The Moon Seems to Change* by Franklyn M. Branley. Complete a story retelling page using the 5 Finger Retelling.

- Materials:
    - *The Moon Seems to Change* book
- Standards Addressed:
    - 1.FL.PWR.3 Know and apply grade-level phonics and word analysis skills when decoding isolated words and in connected text.
    - 1.FL.F.5 Read with sufficient accuracy and fluency to support comprehension.
    - 1.FL.SC.6 Demonstrate command of the conventions of standard English grammar and usage when speaking and conventions of standard English grammar and usage, including capitalization and punctuation, when writing.

Moon Investigation (Duration: 2 days) (retrieved from:

https://betterlesson.com/lesson/615208/planning-and-conducting-a-moon-investigation) :

- **Materials:**
    - Computers

- Website http://www.moongiant.com
- Recording data sheets
- KLEWS chart from Day 2

- Standards Addressed:
  - **1.FL.F.5** Read with sufficient accuracy and fluency to support comprehension.
  - *1.ESS1:* Use observations or models of the sun, moon, and stars to describe patterns that can be predicted.
  - **Computer Technology: Literacy and Usage 1.1** Students will demonstrate an understanding of the nature and operation of technology systems.
  - **1.17** Identify the shapes of Tennessee and the United States on maps and globes.
  - **1.42** Ask and answer questions about historical events that helped shape our Nation ~~and explain the role Tennessee played in these events.~~

Begin by telling students that scientists plan investigations, for example, "Today we will be planning an investigation, just like scientists do, to answer the question, "How long does it take the moon to go through all of its phases? How long from one full moon to another?" Sometimes scientists use models on the computer, and that's what we will be doing today." Next, introduce the website that the children will be using to do their moon investigation: https://www.moongiant.com. This is a great website because it allows the students to see how the moon moves across the sky by changing the time of day. It also shows the moon phase of any day. Show the children how to navigate the website and ask them what they notice changes when you click the time of day. After the website has been introduced, facilitate the student creation of investigation. Ask the students how they can answer the question, "How long does it take for the moon to through its phases?" using the website. Give students time to turn and think pair share. Next, give the students the option to choose how they want to record their data. Do they want to set up a calendar and draw or write moon phases on each date? Do they want to

record in a T-Chart with the date on one side and phases on the other? Do they want to record sequentially, by finding a full moon and then recording dates for each phase? Model different ways of recording data for the students. Assign groups based upon which students chose to record the same way. Prior to the lesson, it might be a good idea to have the computers already set on the website to make the exploration run more smoothly. While students are working, circulate and check that students are recording in a way that makes sense and will answer the question. Ask questions such as, “How are you recording your data? What does your data show? Have you gone from one full moon to another?”

The following pages, I have attached 3 possible moon data recording sheet options:

Name: _____

Scientists use models to answer questions.
How long does it take for the moon to go through its phases?

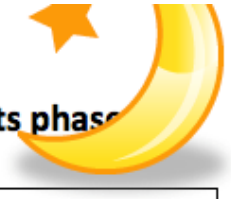
Month: _____

Sunday	Monday	Tuesday	Wed.	Thursday	Friday	Saturday

Name: _____

Scientists use models to answer questions.

How long does it take for the moon to go through its phase

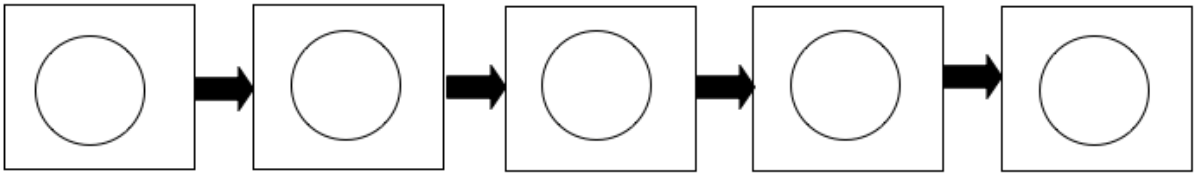


Date	Phase

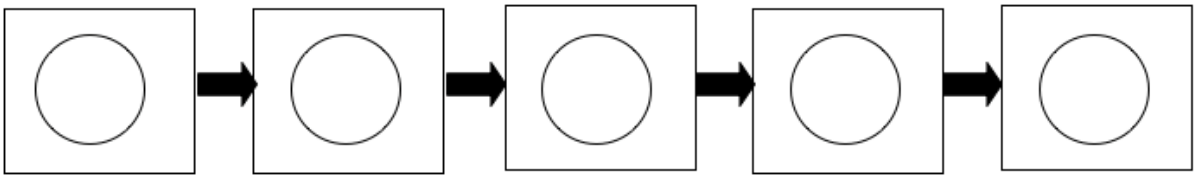
Name: _____

Scientists use models to answer questions.

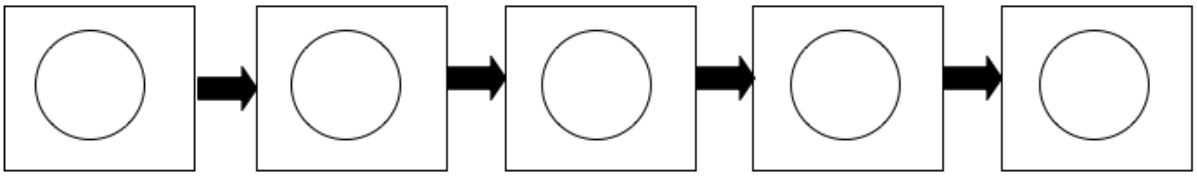
How long does it take for the moon to go through its phases?



te: _____ _____ _____ _____ _____



te: _____ _____ _____ _____ _____



Date: _____ _____ _____ _____ _____

Day 3

***Read I Took the Moon for a Walk*:** At circle time, read *I Took the Moon for a Walk* by Carolyn Curtis. Discuss with the students details of the story.

- **Materials:**
  - *I Took the Moon for a Walk* book
- Standards Addressed:
  - **1.FL.PWR.3** Know and apply grade-level phonics and word analysis skills when decoding isolated words and in connected text.
  - **1.FL.F.5** Read with sufficient accuracy and fluency to support comprehension.
  - **1.FL.SC.6** Demonstrate command of the conventions of standard English grammar and usage when speaking and conventions of standard English grammar and usage, including capitalization and punctuation, when writing.

Moon Landing Video: Watch a video about the first moon landing. If students pose questions during the video, write them down.

- Video links for the first moon landing targeted at first grade:
  - http://www.watchknowlearn.org/Video.aspx?VideoID=57632&CategoryID=2795
  - https://www.youtube.com/watch?v=9jI8Uqip60w

Moon Investigation Part 2: Allow time for students to finish their moon investigations from Day 2 if needed.

Oreos Activity (Duration: 1 day) (retrieved from: https://www.pinterest.com/pin/180284791302722836/) : This activity will be completed during snack time. After completing the Moon Investigation activity, the students will have the opportunity to build

on their new knowledge of how the moon changes in a fun, edible Oreos. Have the students lick off the icing to create a New Moon, First Quarter moon, Full Moon, and Last Quarter Moon. The students can draw the Earth at the center of their paper plate to help them see the relationship between the moon and Earth.

- **Materials:**
  - Paper plates
  - Markers/ crayons
  - Oreos
  - Napkins

<u>Day 4</u>

Read *Jump Into Science: Sun*: Read the book *Jump Into Science: Sun* by Steve Tomecek as an introduction to the sun. Have students add to the KLEWS chart.

- Standards Addressed:
  - **1.FL.PWR.3** Know and apply grade-level phonics and word analysis skills when decoding isolated words and in connected text.
  - **1.FL.F.5** Read with sufficient accuracy and fluency to support comprehension.
  - **1.FL.SC.6** Demonstrate command of the conventions of standard English grammar and usage when speaking and conventions of standard English grammar and usage, including capitalization and punctuation, when writing.

Day and Night Globe Lesson: Complete lesson plan in section E. The students will discover the Earth is rotating, causing day and night. Students will be able to explain why it is daytime for us and it is

night time on the other side of the Earth. The teacher will use a globe with a blue bear taped to one side of the globe and a red bear taped to the other side. Inquiry will occur in this lesson by the teacher posing the problem "we want to figure out how we get day and night." The teacher can do what the children say as they come up with ways to figure out how to create day and night.

- **Materials:**
  - Images of daytime and nighttime activities
  - Images of the sky in the day and night
  - Large globe
  - Inflatable globes for small group
  - Flashlights
  - Large lamp/ bright light
  - Bear figures
  - YouTube to access the Day/ Night song
  - Chart paper for anchor chart
  - Markers

GoNoodle Video: **https://app.gonoodle.com/channels/moose-tube/stay-on-the-sunny-side?s=Search&t=the%20sun**

Science Journal: Have students draw or write a reflection of what they learned during the globe activity.

Day 5

Brainstorm: Have the class brainstorm ideas of how they could measure the suns movement right here on Earth. Write down all responses on chart paper for children to see.

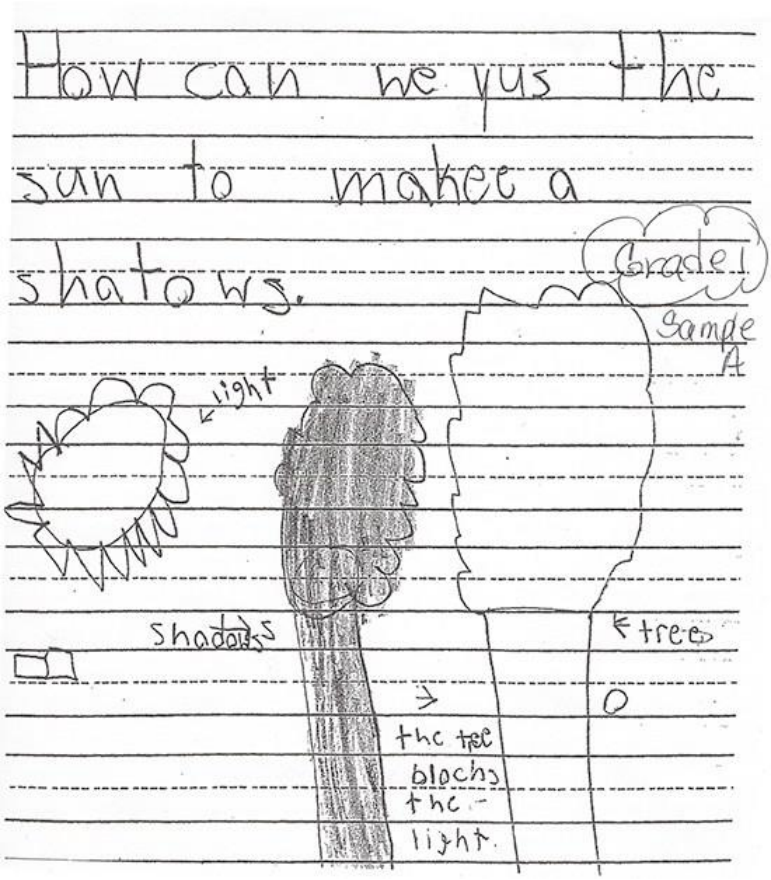
Measuring Shadows Activity (Duration: 2 days) (retrieved from: https://services.math.duke.edu/~plesser/outreach/kenan/Activity%204%20Shadow%20Tracing.pdf **:** Complete lesson plan in section E. For this activity, students will be taken outside in the morning, early afternoon, and late afternoon. Have them trace their shadows. They will begin by measuring the length of their shadows with different tools such as cubes, string, shoes, etc. Then, they will measure the distance between their first shadow, then their second, then third. Students will observe how their shadow changed in shape, size, and direction over the course of the day. Students should relate this to

previous observations of the Sun's motion across the sky. The students will chart their data and order it by length. A big idea from measurement is quantifying a measurement helps us describe and compare more precisely. The students will use nonstandard units such as shoes, string, or hand span to measure the distance between each shadow they traced. Nonstandard and standard units allow for more precision than direct comparison, so the children can compare the measurements between each shadow and see if it moved more or less during certain times of the day.

Week 2

<u>Day 6</u>

Measuring Shadows Activity Part 2 (Duration: 2 days): Complete lesson plan. For this day, allow students to select materials from around the room to measure the shadow with. Once finished and all data is recorded, compare and contrast classmates shadow measurements and position drawings.



Day 7

Slideshow of Star Patterns: As students are entering the room, have a slideshow of different stars and star patterns playing. This can help generate student's questions and thinking once the learning begins.

Read *What Are Stars:* In whole group, begin by adding "stars" to the KLEWS chart. Read the book *What Are Stars?* By Katie Daynes. Add more information to the KLEWS chart after reading the book and gaining more information.

- Standards Addressed:
  - **1.FL.PWR.3** Know and apply grade-level phonics and word analysis skills when decoding isolated words and in connected text.
  - **1.FL.F.5** Read with sufficient accuracy and fluency to support comprehension.
  - **1.FL.SC.6** Demonstrate command of the conventions of standard English grammar and usage when speaking and conventions of standard English grammar and usage, including capitalization and punctuation, when writing.
  - *1.ESS1:* Use observations or models of the sun, moon, and stars to describe patterns that can be predicted.

Stars Video: To reinforce learning, show students this video: https://www.youtube.com/watch?v=nP3fMTp-zqQ This is a fun, kid-oriented video that explains more about stars and constellations.

Star Jar (Duration: 1 day) (Retrieved from: http://twinsontherun.com/2018/02/08/diy-calming-star-jar/): Fill the bottle about ¾ of the way with hot water. Pour the water into a mixing bowl

and let children squeeze in glitter glue, glitter, sequins, and star confetti and other iridescent stars. Once you have the consistency you like, pour the mixture into the water bottle and hot glue the cap on. This activity lets children create an art experience while learning about stars. This activity can leave room for inquiry because students can discover how mixing water and glue can change the consistency. Will glue always have that effect on other materials? They can see if added more or less of a material will make the jar flow differently as well.

- **Materials:**
    - Clear bottles (remove label)
    - Glitter glue (fun colors)
    - Clear glue
    - Fine glitter
    - Star confetti
    - Mixing bowl
    - Hot water
    - Hot glue gun
- Standards Addressed:
    - **Visual Art Curriculum Standards: Standard 2.0 Structures and Functions First Grade:**
    - **GLE 2. 3** Understand that art has a purpose.
    - **SPI 2.3.1** Explore and describe purposes of artwork selected by the teacher.
    - *1.ESS1:* Use observations or models of the sun, moon, and stars to describe patterns that can be predicted.

<u>Day 8</u>

Read *Zoo in the Sky:* Begin circle time by reading *Zoo in the Sky* by Jacqueline Mitton. Ask students if they have ever looked up in the night sky and noticed the stars making shapes.

- Standards Addressed:
    - **1.FL.PWR.3** Know and apply grade-level phonics and word analysis skills when decoding isolated words and in connected text.
    - **1.FL.F.5** Read with sufficient accuracy and fluency to support comprehension.
    - **1.FL.SC.6** Demonstrate command of the conventions of standard English grammar and usage when speaking and conventions of standard English grammar and usage, including capitalization and punctuation, when writing.

Marshmallow Constellation Creation (Duration: 1 day) (Retrieved from: https://www.kcedventures.com/blog/astronomy-activities-for-kids-books-about-the-stars): For this activity, the teacher will give the students some materials and have them create their own constellation designs. This activity allows students to get creative and build anything they would like. At their tables, students can discuss their different designs and why they chose them. The teacher can walk around the classroom and facilitate questioning and help make references to the book, *Zoo in the Sky.* As the teacher walks around the room, make notes of student's questions and comments. The teacher can guide the students by asking them if they can create a constellation from the book or one they may have seen in the sky. Once students have created all the marshmallow constellations they want, have them draw their constellation creations in a mini book.

- **Materials:**
    - Small marshmallows
    - Toothpicks
    - Paper to fold and create mini book
- Standards Addressed:
    - *1.ESS1:* Use observations or models of the sun, moon, and stars to describe patterns that can be predicted.

- 1.ETS1: Solve scientific problems by asking testable questions, making short- term and long- term observations, and gathering information.
- **Visual Art Curriculum Standards: Standard 2.0 Structures and Functions First Grade**
  - **GLE 2. 3** Understand that art has a purpose.
  - **SPI 2.3.1** Explore and describe purposes of artwork selected by the teacher.

<u>Day 9</u>

Read *If I Were an Astronaut:* Since a guest speaker will be coming today, present the students with fiction and non-fiction texts about astronauts. This will help students generate questions to ask the astronaut. The first book to read is fiction and is called *If I Were an Astronaut* by Eric Braun. The next book is a non-fiction book called *Astronaut, Living in Space* by Kate Hayden. During the readings, ask students open ended questions that will get them thinking about space travel.

- Standards Addressed:
  - **1.FL.PWR.3** Know and apply grade-level phonics and word analysis skills when decoding isolated words and in connected text.
  - **1.FL.F.5** Read with sufficient accuracy and fluency to support comprehension.
  - **1.FL.SC.6** Demonstrate command of the conventions of standard English grammar and usage when speaking and conventions of standard English grammar and usage, including capitalization and punctuation, when writing.

Guest Speaker: Astronaut: Bring in a real astronaut, or someone with a very similar career to talk with the classroom. Help guide the students with inquiry by setting them up to ask questions.

Astronaut Reflection: As a ticket out the door, have students write their favorite thing they learned from the guest speaker. This is a good check point to see how well the students comprehended what the astronaut was speaking about. Listening to their questions during the presentation can also help the teacher address concerns or help build off what they already know/ are learning.

Day 10

Read *National Geographic: Little Kids First Big Book of Space*: For the last day of the unit, it is important to summarize everything learned during the past 2 weeks. This book by Catherine D. Hughes is 132 pages all about space, so prior to the reading, the teacher will need to go through the book and select major parts relating to what the students have learned about the past 2 weeks. During the reading, the teacher can facilitate questioning and open discussion about content they have covered the past several days. The teacher can listen to questions students have, and rather than telling them the answer see if they can find the answer by looking through past books they have read, asking friends, or looking at activities or anchor charts they have completed over the course of the unit.

- Standards Addressed:
    - **1.FL.PWR.3** Know and apply grade-level phonics and word analysis skills when decoding isolated words and in connected text.
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Completing the KLEWS Chart: Since this chart is a main aspect of the unit, it has taken the full 2 weeks to fill out. At this time, finish filling out all sections of the chart: Know: What do we think we already know? Learn: What do we want to learn about these topics? Evidence: List evidence we have gathered from our research or project. Wonder: What do we still wonder about? Scientific: List the scientific principles we've learned.

- Standards Addressed:
    - *1.ESS1:* Use observations or models of the sun, moon, and stars to describe patterns that can be predicted.
    - 1.ETS1: Solve scientific problems by asking testable questions, making short-term and long- term observations, and gathering information

Space Buddies Movie: As a cap on the unit, end with watching the Disney movie, Space Buddies. This movie is a family-friendly, light hearted movie about dogs going to space. While this movie is fiction, there are still educational moments throughout the movie. The students can write about the movie and make connections to what the dogs experienced in the movie to what they learned throughout the unit.

Two Complete Lesson Plans (e)

Complete Lesson Plan #1: Day and Night Globe Activity

LESSON PLAN TEMPLATE

RESIDENCY I & RESIDENCY II

DATA POINT 2 & DATA POINT 3

Lesson Title: Day and Night Globe **Grade/Level:** 1st **Date/Learning Experience #: 4/3/18**

Curriculum Standards	Essential Question
State Curriculum Standards – Underline your language/vocabulary words ESS1.1 Use observations of the sun, moon, and stars to describe patterns that can be predicted.	*What question(s) or big idea(s) drive your instruction?* Why do scientists use models to describe and predict patterns? How does day and night happen?

Lesson Objective(s) – Student Learning Outcome(s) for this learning experience

Objectives use active verbs, are measureable (if applicable), and link to standards. Consider using Bloom's Taxonomy or Webb's Depth of Knowledge.

TSW discover the Earth is rotating, causing daytime and night time with 85% accuracy.
TSW explain why it is daytime for us and it is nighttime on the other side of the Earth with 85% accuracy.
TSW use a model of the Sun and Earth (their own body) to explain why we see the Sun during the day and not the night with 90% accuracy.

Knowing Your Learners

Describe pre-requisite skills students already know that will help them meet the lesson objective(s). What is your evidence that students need this/these skills(s)? This may include pre-assessment data; student personal, cultural or community assets you have gathered and observations you have made concerning your students.

- Students know that something moves- either the Earth or Sun
- Students know the word "axis"
- Must know the Sun and Moon are two different things in the sky.
- Must know patterns repeat.

Assessment/Evaluation

How will students demonstrate understanding of lesson objective(s)?

Informal: *How will you monitor student progress towards lesson objectives as you are teaching? (formative assessment)*

- During the closure of the lesson, the teacher will get out flashlights and inflatable globes for small groups of about 2-3 students. They will take turns holding the "sun" (flashlight) and the "earth" (inflatable globe), and rotating the "earth", explaining why we experience day and night. While the students are explaining their reasoning, the teacher will note student responses on index cards.
- TTW use think- pair- share or knee partners to check for understanding throughout the lesson.

Assessment Modifications
What modifications will you make on assessments/evaluations for students with diverse and/or special needs (i.e. students with IEP or 504, struggling learners, advanced learners) and will these modifications be within/for small groups or individuals?

- Students with IEP's will be assessed according to their plan.
- Possible challenge is that children do not understand

Formal: *What evidence (formative and/or summative) will you collect and how will you document student learning/mastery of lesson objective(s)? A summative assessment is not needed for every lesson, however, it is required for every lesson submitted for CAEP data collection point (e.g., 3000 courses – ECED 3210, READ 3100, SPED 3300, PEXS xxxx; 4000 courses – ECED 4680, CUAI 4241, SPED 4710, PEXS xxxx, ECED 4780, CUAI 4391, SPED 4850, PEXS xxxx).* TTW use a checklist to assess the children's content knowledge at the end of the lesson. Throughout the unit, work samples will be taken up and added to the student's portfolio. **Academic Feedback:** *How will you give academic feedback? How will your academic feedback promote student understanding of the learning objective(s) or state standard(s)?* Oral feedback while students correctly answer questions. Directing attention to student's modeling the Earth's rotation with their bodies correctly. Open questions to allow students to move their learning forward.	how we are on the giant sphere: show an interactive video to help support this idea.

Assessment Theory/Rationale: *I am administering/giving/collecting _____ because my students need_____. This is appropriate because _____. Provide citation (APA, 6th edition) for learning theory and/or research.*

- I am administering/ giving/ collecting data by observing student's responses with checklists and jottings and collecting work samples for portfolios because my students need to reflect and grow on their own learning and determine what they can do with independent success. This is appropriate because jottings and work samples can provide the teacher with important knowledge of students, informs ongoing curricular and pedagogical practice, and see how learners are progressing.

Jalongo, M.R., & Isenberg, J. P (2012). *Exploring your role in early childhood* education (4th ed.). Upper Saddle River, NJ: Pearson.

Academic Language Demands

Function and Product of the Lesson *The function is the verb, usually a Bloom's verb (e.g., analyze, interpret, recount), that guides the language objective of the lesson. This includes a product that students will either write, say, present, or do that involves Academic Language (e.g. essay, present, recount).*

TSW use appropriate vocabulary to describe how day and night works.
Vocabulary words will be placed in the literacy center for extended work.

Academic Vocabulary *What specialized terms and phrases do students need to understand and use to complete the function?*

- Model
- Observations
- Predict

Content Vocabulary *What are the key vocabulary words, symbols, or sounds in this lesson?*

- Rotate
- Axis
- Globe
- Earth
- Sun
- Day
- Night

~~**Syntax and/or Discourse (not Early Childhood)**~~
~~Syntax~~ ~~*What are the specific ways or conventions for organizing symbols (e.g., linear, horizontal, words (grammar), phrases, or graphics that students need to know to be able to do what you are asking?*~~

~~Discourse~~ ~~*What are the specific ways in which members of a discipline (e.g., scientist, historian, etc.) talk, write, and communicate knowledge that students need to know to be able to do what you are asking (e.g., essays, presentations, performance, journal, debate, historical account, signal)?*~~

Language Supports *What general instruction will you provide to help students in the whole class (e.g., word walls, learning partners, guided notes) learn the discourse/syntax? What focused instruction (e.g., Venn diagrams, graphic organizers, outlines, student examples, sentence stems) will you provide to help students learn the discourse/syntax (can be completed in small groups)? What individual instruction that targets the needs of an individual student(s) will you provide to help that student(s) learn the discourse/syntax? What opportunities will you provide for students to practice language/vocabulary and develop fluency? What tools (e.g., EQ or vocabulary board, Venn diagram, anchor chart, vocabulary cards, graphic organizer, peer support, sentence stems, pictures, table, chart, thinking map, modeling, sort, song, body movements, games) will you use to help students meet the language demands?*

General Supports – *Strategies used to support the whole class and may be used to support more than one demand (e.g., Venn diagram, learning partners, word wall, anchor chart, vocabulary cards, graphic organizer, sentence stems, pictures, table, chart, thinking map, modeling, sort, song, body movements, games). These strategies can cross disciplines and be used in a variety of lessons.*

- The teacher will utilize an anchor chart to introduce day and night differences between the pictures from the sky walk.
- Students will use academic and content language throughout whole group discussions and in small group work.
- Vocabulary will be placed on the word wall.

Targeted Supports – *Strategies that focus toward a specific language demand (e.g., Venn diagrams, graphic organizers, outlines, examples, sentence stems). These may be addressed during small groups. These can be general supports that are modified for specific students or groups of students.*

- The anchor chart will be utilized as an example.
- Students will have examples of day and night posted on the wall from the pictures.

Individual Supports – *Supports used to target the specific needs of an individual student (e.g., ELL, student with autism, struggling reader or writer, student with significant language delays). These students may or may not have been formally identified and may or may not have an IEP or 504 plan.*

- Students will have personalized vocabulary cards with pictures at their desks. This can be for both ELLs and students with IEPs.

Language Theory/Rationale: *I am _____ because my students need_____. This is appropriate because _____. Provide citation (APA, 6th edition) for learning theory and/or research.*

I am utilizing vocabulary cards and an anchor chart as a language support to provide a visual model for my students. In addition, I am providing picture examples of vocabulary words on the wall for further assistance. Pre-teaching vocabulary terms, providing visual aids, and encouraging English learners to speak are effective instructional practices for English learners.

Bredekamp, S. & Copple, C. (2009). *Developmentally appropriate practices in early childhood programs.* Washington, DC: National Association for the Education of Young Children.

Instruction – When designing your instruction, consider when you will implement formal and informal assessments/evaluations, when you will provide feedback, and when you will teach academic language. Therefore, this section should include aspects written above.

Lesson Part	Description of Activities and Instruction (Teacher Does)	Description of Activities and Instruction (Students Do)	Meeting Individual & Group Needs /Learning Styles *Plans instruction to meet the needs of individual students. Adaptations are tied to learning objectives. Specific individual or group learning includes requirements in IEP or 504 plans.*

Set/Motivator: *Restate and address your Essential Question. How do you engage student interest in the content of the lesson? How does this relate to previous learning? Use knowledge of students' academic, social, and cultural characteristics.*	1. Introduce lesson to class by having photographs of daytime and nighttime skies posted around the front of the room. 2. Tell the children they are going to go on a "Sky Walk" and observe what they see in the photos. Guide them to notice similarities and differences. 3. TTW transition the students to line up and begin walking around observing the images.	1. TSW be on the rug. 2. TSW line up to go on their "Sky Walk". 3. TSW begin walking in line observing what they see in the pictures.	Have different types of pictures, some easy to recognize and some more difficult to recognize. Have a group of pictures for a student to look at their desk if they are known to misbehave or have limitations.
Instructional Procedures/Learning Tasks: *Provide specific step-by-step details of lesson content aligned with objectives, utilizing a variety of teaching strategies.*	4. Once the students have completed their Sky Walk, tell them to go back to their spots on the rug. 5. TTW begin talking about daytime. Ask the student's questions such as "When do you usually play outside? Where does the light come from? What are some things you do during the day?" 6. Ask the students to describe which pictures are of the daytime. 7. TTW write student responses on an anchor chart. 8. TTW begin talking about nighttime. Ask the students questions such as, "When do you see stars? When you go	4. TSW go back to their spots on the rugs. 5. TSW listen to the teacher's questions and respond. 6. TSW use their observations of the photos to help answer the teacher's questions about daytime. 7. TSW listen to the teacher's questions about the night time and use their observations from the Sky Walk to answer the questions. 8. TSW turn to their knee partner and share what they have learned	

	to sleep, and then wake up in the middle of the night, do you see the sun? What are some things you do in the evening when it is dark outside?" 9. TTW ask the students to describe which pictures are of the nighttime. 10. TTW write student's responses on an anchor chart. 11. TTW tell the students to turn to their knee partner and tell them something new about daytime and nighttime they have learned. 12. TTW use a globe (model) of the Earth. 13. TTW place a red bear (or any object) on Earth, in the same place that we leave. 14. TTW ask the children if anyone can point to where we live and place the bear on that spot with tape. 15. TTW place the blue bear on the opposite side of the Earth, in China.	about day and night time. 9. TSW point to where they think they live on the globe. 10. TSW observe where the teacher is placing the red and blue bear. 11. TSW notice how the sun is shining only on one side of the Earth, where the red bear is. 12. The students will notice where the blue bear is, and that it is dark all around. 13. TSW answer the teachers question, "Do you think it is always dark where the blue bear lives and always light where the red bear lives?" 14. The students could pose questions for inquiry at this point. 15. TSW observe what happens as the teacher begins rotating the globe, noting that the blue bear is	

	16. TTW ask the children, "We want to figure out how we can get day and night. How can we make it day for the red bear and night for the blue bear?" 17. TTW let the students play around with the globe and test their ideas about how they think they can get day and night. 18. TTW turn off the lights and use a flashlight as the sun. 19. TTW tell the students to notice how the sun is shining only on one side of the Earth, where red bear is. 20. TTW ask the students if it is daytime where red bear is right now. 21. TTW tell the students to notice blue bear. It is dark where he lives. Our flashlight, our sun, isn't on his side of the world right now. What does this mean? 22. TTW ask the students if they think it is always dark where blue bear lives	now in the daytime and the red bear is now in the nighttime. 16. TSW pretend they are the Earth and rotate according to the lyrics of the song. 17. While the students are still standing, the teacher will show images of activities in the daytime and nighttime and ask the students to turn the appropriate way, towards or against the sun.	

	and always light where red bear lives. 23. TTW tell the students to watch as the Earth spins, also known as rotates. TTW slowly rotate the globe, now red bear is getting ready for bed, and blue bear is waking up getting ready to go to school. 24. TTW lead the discussion towards the fact that day and night repeat and that makes it a pattern! 25. TTW tell the students that they can all pretend they are the Earth. 26. Tell the students to stand up and pretend that we live on the tip of our noses. Ask the students to face the Sun (lamp or flashlight) so that it is daytime on their noses. 27. Next, ask them to slowly rotate so that it is nighttime on their noses, facing away from the sun. 28. Play the "Day/Night Song" while they are rotating to follow along with the words.		

	29. While the students are still standing, hold up pictures of daytime and nighttime activities, asking them which way they would be facing during the time that activity would take place.		
Questions and/or activities for higher order thinking: *These are open-ended and cannot be answered by yes or no. These can be asked at various points throughout the lesson and guide rather than direct student thinking.*	Can you explain to a Kindergarten friend why we have day and night? (Analysis) Can you predict what will happen to the light the red bear sees when we rotate the globe? (Synthesis) Can you create a model of how the Earth rotates around the sun? (Evaluation)		
Closure: *Makes clear connections to real-world situations and requires students to reflect on and apply their learning through verbal or written expression.*	30. Take out flashlight and small inflatable globes and break students into groups of 2-3. 31. Tell the students to take turns holding the "sun", the "earth", and rotating the "earth" while explain to each other why we experience day and night. (formative assessment). 32. TTW tell the students to think pair share how the earth changes from day to night. 33. TTW tell the children that tomorrow they will get to explore the moon!	18. TSW break into groups of 2-3 and complete the activity with the inflatable globes and flashlights. 19. TSW think pair share with their partner.	Place student in a group with the teacher if they need support.

Material/Resources/Technology: *What do you need for this lesson? Identify the specific materials, resources and instructional technologies that you will use. How will you model these technologies to engage students and add value to and improve their learning?*

- Images of daytime and nighttime activities
- Images of the sky in the day and night
- Globe

- Inflatable globes for each group
- Flashlights for each group
- A large lamp or bright light
- Bear figures, two different colors (or any object of 2 different colors)
- YouTube to access the Day/Night Song
- Chart paper for anchor chart
- Markers

Co-Teaching Strategies Used: *(highlight and explain all that apply): One Teach, One Observe; One Teach, One Assist; Station Teaching; Parallel Teaching; Supplemental Teaching; Alternative (Differentiated); Team Teaching*

- One teach, one assist: head teacher can be explaining tasks and posing questions while co teacher walks around classroom assisting groups
- One teach, one observe: co teacher is taking anecdotal notes and using a checklist while the head teacher is delivering the lesson.

Instruction Theory/Rationale: *I am _____ because my students need_____. This is appropriate because _____. Provide citation (APA, 6th edition) for learning theory and/or research.*

- I am using a variety of engaging learning experiences and contexts, such as whole group and small group discussion because my students need to be able to collaborate and share ideas with one another, as well as cooperate in whole group discussions. This is appropriate because teachers need a variety of instructional strategies to suit particular learning goals, specific situations, and the needs of individual children.

Bredekamp, S. & Copple, C. (2009). *Developmentally appropriate practices in early childhood programs.* Washington, DC: National Association for the Education of Young Children.

Meeting Individual & Group Needs Theory/Rationale: *I am _____ because my students need_____. This is appropriate because _____. Provide citation (APA, 6th edition) for learning theory and/or research.*

- I am using tiered lesson supports such as working in a group with the teacher because my students learn at different rates and do not all need to be on the same level. This is appropriate because my children can meet the same learning goals, but through different pathways.

Van de Walle, J. A., Lovin, L. H., Karp, K. S., & Bay-Williams, J. M. (2014). *Teaching student-centered mathematics: Developmentally appropriate instruction for grades pre-k-2* (2nd ed.). Boston, MA: Pearson.

Management/Safety Issues

Management Issues: *Explanation of processes and/or procedures, transitions from one activity to another, strategies for gaining attention, motivating students to engage in the lesson and focus on learning (e.g. work boards, posted procedures, modeling, positive feedback, redirection).*
Set up in a location where children will have plenty of room to move around and the light switch can be easily accessed.
If children misbehave in groups, put them at the guided reading table to work with the teacher.
Know transitions from circle time to small group.

Safety Issues: *Are there any safety issues that need to be considered when teaching this lesson (e.g., outdoor activities, lab experiments, equipment use)? Expectations are explicitly outlined and are included as part of the instructional process.*

Ensure there is enough room for students to move around and model with their bodies.

Know drills and safety precautions.
References
Bredekamp, S. & Copple, C. (2009). *Developmentally appropriate practices in early childhood programs.* Washington, DC: National Association for the Education of Young Children. Jalongo, M.R., & Isenberg, J. P (2012). *Exploring your role in early childhood* education (4th ed.). Upper Saddle River, NJ: Pearson. Van de Walle, J. A., Lovin, L. H., Karp, K. S., & Bay-Williams, J. M. (2014). *Teaching student-centered mathematics: Developmentally appropriate instruction for grades pre-k-2* (2nd ed.). Boston, MA: Pearson.

Complete Lesson Plan #2: Measuring Shadows

LESSON PLAN TEMPLATE

RESIDENCY I & RESIDENCY II

DATA POINT 2 & DATA POINT 3

Lesson Title: Measuring Shadows **Grade/Level: First Grade** **Date/Learning Experience #: 4/24/18**

Curriculum Standards	Essential Question
State Curriculum Standards – Underline your language/vocabulary words 1.ESS1.1 Use observations or models of the sun, moon, and stars to describe patterns that can be predicted. 1.MD.A.2 Measure the length of an object using non-standard units and express this length as a whole number of units.	*What question(s) or big idea(s) drive your instruction?* • How can we use our shadows to measure the sun's movement? • How can we observe how the sun moves?

Lesson Objective(s) – Student Learning Outcome(s) for this learning experience

Objectives use active verbs, are measureable (if applicable), and link to standards. Consider using Bloom's Taxonomy or Webb's Depth of Knowledge.

- TSW observe the changes in shadow size and shape over different times of day with 90% accuracy.
- TSW measure and compare the lengths between each of their 3 shadow tracings with 90%accuracy.

Knowing Your Learners

Describe pre-requisite skills students already know that will help them meet the lesson objective(s). What is your evidence that students need this/these skills(s)? This may include pre-assessment data; student personal, cultural or community assets you have gathered and observations you have made concerning your students.

- TL knows that either the sun or Earth moves.
- TL has played with their shadow before.
- TL knows how to use non-standard units of measurement.

Assessment/Evaluation

How will students demonstrate understanding of lesson objective(s)? **Informal**: *How will you monitor student progress towards lesson objectives as you are teaching? (formative assessment)* • The teacher will use observations and anecdotal notes while circulating outside as the students trace and measure their shadows. • TTW ask open questions to encourage student thinking. • TTW ask the students to turn to their knee partner and restate their learning. **Formal:** *What evidence (formative and/or summative) will you collect and how will you document student learning/mastery of lesson objective(s)? A summative assessment is not needed for every lesson, however, it is required for every lesson submitted for CAEP data collection point (e.g., 3000 courses – ECED 3210,*	**Assessment Modifications** *What modifications will you make on assessments/evaluations for students with diverse and/or special needs (i.e. students with IEP or 504, struggling learners, advanced learners) and will these modifications be within/for small groups or individuals?* • Students with IEP's will be assessed according to their plan.

READ 3100, SPED 3300, PEXS xxxx; 4000 courses – ECED 4680, CUAI 4241, SPED 4710, PEXS xxxx, ECED 4780, CUAI 4391, SPED 4850, PEXS xxxx). • TTW collect student's recording sheets and science journals as work samples to track student responses and progress. • TTW create an anchor chart with the students comparing and contrasting the different lengths of measurement between their shadows. **Academic Feedback:** *How will you give academic feedback? How will your academic feedback promote student understanding of the learning objective(s) or state standard(s)?* • Oral feedback while students are tracing and measuring their shadows. • Asking students open/ inquiry-based questions during the experiment. • Directing attention to students correctly standing with their backs against the sun to show how to correctly record their shadows.	• Children might not grasp the understanding that they are on a planet that is moving, so showing a video or modeling with objects prior to the lesson can help them grasp this concept.

Assessment Theory/Rationale: *I am administering/giving/collecting _____ because my students need_____. This is appropriate because _____. Provide citation (APA, 6th edition) for learning theory and/or research.*

I am collecting anecdotal notes, asking open questions, and collecting students' recording sheets because my students to reflect and grow on their learning. Collecting recording sheets can track what the students can do with independent success. This is appropriate because work samples and jottings can provide the teacher with important knowledge of the students, informs ongoing curricular and pedagogical practice, and see how learners are progressing.

Big Ideas in Math Collaborative, Erikson Institute. (2013). *Big ideas of early mathematics: What teachers of young children need to know*. Pearson. http://a.co/hKwAqi4 (ISBN-13: 978-0132946971. ISBN-10: 0132946971)

Academic Language Demands

Function and Product of the Lesson *The function is the verb, usually a Bloom's verb (e.g., analyze, interpret, recount), that guides the language objective of the lesson. This includes a product that students will either write, say, present, or do that involves Academic Language (e.g. essay, present, recount).*

- TSW use appropriate vocabulary to describe how the sun moves across the sky.
- Vocabulary word cards will be placed in the literacy center for extended work.

Academic Vocabulary *What specialized terms and phrases do students need to understand and use to complete the function?*

- Predict
- Model
- Non-standard units
- Observe

Content Vocabulary *What are the key vocabulary words, symbols, or sounds in this lesson?*

- Shadow
- Rotate
- Earth
- Sun
- Pattern

~~**Syntax and/or Discourse (not Early Childhood)**~~
~~Syntax *What are the specific ways or conventions for organizing symbols (e.g., linear, horizontal, words (grammar), phrases, or graphics that students need to know to be able to do what you are asking?*~~
~~Discourse *What are the specific ways in which members of a discipline (e.g., scientist, historian, etc.) talk, write, and communicate knowledge that students need to know to be able to do what you are asking (e.g., essays, presentations, performance, journal, debate, historical account, signal)?*~~

Language Supports *What general instruction will you provide to help students in the whole class (e.g., word walls, learning partners, guided notes) learn the discourse/syntax? What focused instruction (e.g., Venn diagrams, graphic organizers, outlines, student examples, sentence stems) will you provide to help students learn the discourse/syntax (can be completed in small groups)? What individual instruction that targets the needs of an individual student(s) will you provide to help that student(s) learn the discourse/syntax? What opportunities will you provide for students to practice language/vocabulary and develop fluency? What tools (e.g., EQ or vocabulary board, Venn diagram, anchor chart, vocabulary cards, graphic organizer, peer support, sentence stems, pictures, table, chart, thinking map, modeling, sort, song, body movements, games) will you use to help students meet the language demands?*

General Supports – *Strategies used to support the whole class and may be used to support more than one demand (e.g., Venn diagram, learning partners, word wall, anchor chart, vocabulary cards, graphic organizer, sentence stems, pictures, table, chart, thinking map, modeling, sort, song, body movements, games). These strategies can cross disciplines and be used in a variety of lessons.*
Have vocabulary words written on an anchor chart or place vocabulary words on the word wall and in the literacy center.

Targeted Supports – *Strategies that focus toward a specific language demand (e.g., Venn diagrams, graphic organizers, outlines, examples, sentence stems). These may be addressed during small groups. These can be general supports that are modified for specific students or groups of students.*
Provide sentence stems on the recording sheet. For example, "My shadow is _____ at 8:30 a.m.," "My shadow is ___ at 12:00 p.m.," and so on.

Individual Supports – *Supports used to target the specific needs of an individual student (e.g., ELL, student with autism, struggling reader or writer, student with significant language delays). These students may or may not have been formally identified and may or may not have an IEP or 504 plan.*
Provide vocabulary word cards with pictures on a clip ring for the child to keep at his/her desk. Write vocabulary word cards in the student's home language as well as in English with a picture.

Language Theory/Rationale: *I am _____ because my students need_____. This is appropriate because _____. Provide citation (APA, 6th edition) for learning theory and/or research.*
I am using anchor charts, vocabulary cards, and visual images for language supports because my students need to understand the content and academic vocabulary to have full comprehension of this lesson. Pre-teaching vocabulary terms, providing visual aids, and encouraging English learners to speak are effective instructional practices for English learners.
Van de Walle, J. A., Lovin, L. H., Karp, K. S., & Bay-Williams, J. M. (2014). *Teaching student-centered mathematics: Developmentally appropriate instruction for grades pre-k-2* (2nd ed.). Boston, MA: Pearson.

Instruction – When designing your instruction, consider when you will implement formal and informal assessments/evaluations, when you will provide feedback, and when you will teach academic language. Therefore, this section should include aspects written above.

Lesson Part	Description of Activities and Instruction (Teacher Does)	Description of Activities and Instruction (Students Do)	Meeting Individual & Group Needs /Learning Styles *Plans instruction to meet the needs of individual students. Adaptations are tied to learning objectives. Specific individual or group learning includes requirements in IEP or 504 plans.*

Set/Motivator: *Restate and address your Essential Question. How do you engage student interest in the content of the lesson? How does this relate to previous learning? Use knowledge of students' academic, social, and cultural characteristics.*	• Start the activity by discussing shadows. Ask students, "What is a shadow? How is it made? Where do shadows come from?" • TTW explain to the children that today they will be experimenting with shadows. (Be sure the students understand that a shadow occurs when something is blocking the light).	• TSW be sitting on the rug for whole group discussion. • TSW share their ideas and thoughts.	• Extension: Have students trace the shadow of a tree or other permanent object and see how its shadow movement compares to their own.
Instructional Procedures/Learning Tasks: *Provide specific step-by-step details of lesson content aligned with objectives, utilizing a variety of teaching strategies.*	• TTW take the students outside at 8:30 in the morning. • TTW ask the students, "How can we observe how the sun moves? Do you think we can use shadows to see if the sun moves?" • TTW gather several materials such as chalk, string, tape, sticks, rocks, etc to take outside. • TTW hold a discussion with the class about what materials they think will work best to track the sun's movement. • TTW test the student's responses, discovering that chalk will work best. • TTW explain to the students that they are going to become shadow experts by measuring	• TSW share their ideas about the teacher's questioning. • TSW give ideas about what materials they believe will work best to track the sun's movement.	

	their shadows at 3 different times of the day. • TTW ask children to predict what will happen with the shadows. The teacher can record their responses on an anchor chart. • TTW model how to stand with back to the sun on the marked X. The students will stand on the same X each time they come outside. The teacher will have a student trace her shadow. • TTW next model how to measure the length of the shadow using non-standard units of the student's choice. • TTW break the students into pre-assigned pairs. • TTW tell the students to stand on the X and trace each other's shadow and measure the length, from head to toe, with non-standard units and write it on their recording sheet. • TTW circulate asking students questions such as, "How many units long is your shadow? What do you think will happen to your shadow?" • Once the students have finished, go back inside and have them write and draw in their science	• TSW make predictions about what their different shadows will look like. • TSW trace the teacher's shadow. • TSW break into partners. • TSW create an X (this will be the constant throughout the experiment) to stand on each time they are getting their shadows traced. • TSW measure the length of their shadow using non-standard units of measure. • TSW go back inside and record their observation and predictions in their science notebook. • TSW share with the teacher what they predict will happen next.	

	journals what they did and what they think will happen to their shadows next. Will their shadows change during the day? • TTW ask the students to share their predictions. • TTW take the class back outside at noon to see if their shadows have changed. • Since the students have noticed their shadows have changed, TTW instruct the students to stand on their same X and have their partner trace where their shadow is again. • TTW take the students back inside and have them record and draw their findings in their science journals. • TTW take the students outside again at 2:00. • The students will notice another change, so TTW instruct the students to trace their shadow again. • TTW instruct the students to not only measure the lengths of their shadows but measure the distance between each shadow as well. • TTW ask the students if they notice a change between the distances of each shadow?	• TSW go back outside to repeat their shadow tracing. • TSW notice that their shadows have moved when they stand on their X. • TSW trace and measure their shadows again. • TSW go back inside and record their observations and predictions in their science journal. • TSW go back outside for the third and final time to record their shadows. • TSW work with their partner to trace and measure their shadow. • TSW measure the length of the shadow as well as the distance between each of their shadows. • TSW respond to the teacher's questions. • TSW go back inside to record their findings. • TSW participate in discussion of what they discovered about their shadows and the sun.	

	• TTW take the children back inside and have them record their final findings in their science journal. • TTW hold a discussion asking the students, "When were your shadows the longest? Why were the shadows long and thin in the morning? When were they the longest? Why? Do you think the Earth is moving or is the sun moving?" • TTW make a chart comparing the different measurements of shadows among the students.		
Questions and/or activities for higher order thinking: *These are open-ended and cannot be answered by yes or no. These can be asked at various points throughout the lesson and guide rather than direct student thinking.*	• Compare and contrast the measurements of your shadows at the different times of day. (Analysis) • Can you use your findings from the experiment to justify how the sun moves during the day? (Evaluation) • Can you design a model to track the sun's movement during the day? (Synthesis)		
Closure: *Makes clear connections to real-world situations and requires students to reflect on and apply their learning through verbal or written expression.*	• TTW ask the students to turn to their knee partner and share what they learned today about shadows and the sun. • TTW ask a few students to share their partners responses. • TTW tell the students that tomorrow they will be learning more about stars!	• TSW turn to their knee partner and restate their findings and learning. • Some students will share their responses with the class.	
Material/Resources/Technology: *What do you need for this lesson? Identify the specific materials, resources and instructional technologies that you will use. How will you model these technologies to engage students and add value to and improve their learning?*			

- Anchor chart
- Chalk
- Sticks
- Paperclips
- Beads
- Cubes
- Counters
- Any non-standard unit of measure available
- Recording Sheets

Co-Teaching Strategies Used: *(highlight and explain all that apply): One Teach, One Observe; One Teach, One Assist; Station Teaching; Parallel Teaching; Supplemental Teaching; Alternative (Differentiated); Team Teaching*

- One teach, one assist: head teacher will be explaining tasks and posing questions while co teacher circulates assisting students who need it.
- One teach, one observe: co teacher is taking anecdotal notes while head teacher is delivering the lesson.

Instruction Theory/Rationale: *I am _____ because my students need_____. This is appropriate because _____. Provide citation (APA, 6th edition) for learning theory and/or research.*

I am cultivating and building on children's curiosity to emphasize inquiry in scientific observations. This is appropriate because children are encouraged to observe and ask questions about the world while I provide materials and offer experiences and explanations that teach about important scientific concepts.

redekamp, S. & Copple, C. (2009). *Developmentally appropriate practices in early childhood programs.* Washington, DC: National Association for the Education of Young Children.

Meeting Individual & Group Needs Theory/Rationale: *I am _____ because my students need_____. This is appropriate because _____. Provide citation (APA, 6th edition) for learning theory and/or research.*

I am modifying my instruction and assessment to meet the individual and group needs of my students. By adjusting the level of difficulty, I am allowed students to work up to their zone of proximal development.

redekamp, S. & Copple, C. (2009). *Developmentally appropriate practices in early childhood programs.* Washington, DC: National Association for the Education of Young Children.

Management/Safety Issues

Management Issues: *Explanation of processes and/or procedures, transitions from one activity to another, strategies for gaining attention, motivating students to engage in the lesson and focus on learning (e.g. work boards, posted procedures, modeling, positive feedback, redirection).*

Direct children's attention to only focus on the sun and their shadow, nothing else.
Monitor children at all times since the majority of the activity takes place outside.
Know transitions from circle time to small group to line up and vice versa.

Safety Issues: *Are there any safety issues that need to be considered when teaching this lesson (e.g., outdoor activities, lab experiments, equipment use)? Expectations are explicitly outlined and are included as part of the instructional process.*

Ensure the outdoor area is a safe place for children to be working.
Know drills and safety precautions.

References

Early Math Collaborative, Erikson Institute. (2013). *Big ideas of early mathematics: What teachers of young children need to know*. Pearson. http://a.co/hKwAqi4 (ISBN-13: 978-0132946971. ISBN-10: 0132946971)

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Jalongo, M.R., & Isenberg, J. P (2012). *Exploring your role in early childhood* education (4th ed.). Upper Saddle River, NJ: Pearson.

Van de Walle, J. A., Lovin, L. H., Karp, K. S., & Bay-Williams, J. M. (2014). *Teaching student-centered mathematics: Developmentally appropriate instruction for grades pre-k-2* (2nd ed.). Boston, MA: Pearson.

Unit Evaluation Plan (f)

Formative

Throughout the unit, the teacher will be taking anecdotal notes and observations.

- Taking notes and recording what is seen or heard can help guide the questioning and lesson for the next day. Students may have a full understanding of why day and night happens, so the teacher can move on to a more complex concept.

Checklists will be used to determine if the students are meeting certain criteria when completing activities.

- The teacher can individualize the criteria on the checklist based on that student's specific learning level.

Think-pair-share will be used frequently after readings and discussions.

- Think-pair-share allows students to collaborate and bounce ideas off one another. Social interaction is an important factor in early childhood development, so providing ample opportunities for students to talk to other students about their learning can help make it more meaningful to them.

Summative

Complete the KLEWS chart with the class

- Having the class complete this together can provide for opportunities of discussion and inquiry. Maybe the class still has questions after the unit has ended? This can help the teacher identify the knowledge the students have gained as a whole.

Have students model, draw, or write one fact about what they learned about the sun, moon, and stars.

- This could be the end of unit test. Instead of having the students answer questions, give them the opportunity to show what they learned in a way that is comfortable for them. Giving the students the ability to show what they learned in whatever way they please (with some guidelines) can help adapt the summative assessment to meet the needs of lower level learners, ELLS, and children with special needs/ abilities.

Collect students Science Journals as work samples.

- Collecting student's work samples allows for the teacher to track trends in students learning over time.

A Letter to Parents (g)

Dear Families,

Over the next two weeks, we will be exploring things in the sky! Well… Outer Space that is! We have so much fun with this unit every year and it is amazing how much knowledge the children gain in such a short time. The standard we will be focusing on this unit is ESS1.1 Use observations of the sun, moon, and stars to describe patterns that can be predicted. I like to spend about 2 days discussing the sun, 2 days discussing the moon, and 2 days discussing the stars. The other days are filled with hands-on learning experiences. Since this is such a broad standard, I would love for you to help support your child's learning at home as well. This can be as simple as asking your child what they learned about each day. Having children restate their learning can really make a concept stick with them. I will attach the calendar for this unit, so you can follow along with our learning! You can also read to/ with your child If you have any books about the sun, moon, or stars lying around. Below I have attached 2 extension activities that can also be carried out at home. If you have any questions or concerns, feel free to email or call me!

Thanks, Blake Pierce

Email: piercebn@etsu.edu

Phone: 555-5555

Extension activity ideas:

Night Sky Observations: Since your child doesn't experience nighttime while at school, take them outside when it is dark and have them draw or write down everything they see in the night sky. Feel free to take pictures and send them to me! Ask them questions about what they are drawing or writing about. What sounds do they hear that they don't hear in the day? Do they see anything similar to what they see during the day? Why is it dark? Can they see very much at night? Where did the sun go? Can they still see the sun even though it's dark? When will it start to get light again?

Track the Moon: We will also be touching on the moon phases: new moon, first quarter, full moon, and last quarter. Take your child outside once it gets nice and dark out. Every night, have your child date and draw what the moon looks like on a piece of paper. Discuss with them the differences of the moon each night. Have them bring their drawings to school the last day of the unit and they can compare their findings with the rest of the class!

List of References (h)

Teachers

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List of Resources Used in the Unit (i)

Materials and supplies

Things I Do in the Day, Things I Do in the Night Anchor Chart:

- Chart paper
- Markers

KLEWS (Know, Learn, Evidence, Wonder, Scientific) Chart

- Chart paper
- Markers

Moon Investigation:

- Computers
- Website http://www.moongiant.com
- Recording data sheets
- KLEWS chart from Day 2

Oreos Activity Materials:

- Paper plates
- Markers/ crayons
- Oreos
- Napkins

Day and Night Globe Lesson:

- Images of daytime and nighttime activities
- Images of the sky in the day and night
- Large globe
- Inflatable globes for small group
- Flashlights
- Large lamp/ bright light
- Bear figures
- YouTube to access the Day/ Night song
- Chart paper for anchor chart
- Markers

Measuring Shadows Activity:

- Chalk
- Chart paper
- Data recording sheet
- Non- standard units of measure: paper clips, cubes, shoes, pencils, etc.

Star Jar Materials:

- Clear bottles (remove label)
- Glitter glue (fun colors)
- Clear glue
- Fine glitter
- Star confetti
- Mixing bowl
- Hot water
- Hot glue gun

Marshmallow Constellation Creation:

- Small marshmallows
- Toothpicks
- Paper to fold and create mini book

Astronaut Reflection Ticket Out the Door:

- Paper
- Pencil

Print and non-print

Read *Splat the Cat*:

- *Splat the Cat* by Rob Scotton (multiple copies for each group)
- Recording sheet for comparing and contrasting things in the night and day

Read *The Moon Seems to Change*:

- *The Moon Seems to Change* by Franklyn M. Branley
- 5 Finger Retelling page

***Read I Took the Moon for a Walk*:**

- *I Took the Moon for a Walk* by Carolyn Curtis

Read *Jump Into Science: Sun*:

- *Jump Into Science: Sun* by Steve Tomecek

Read *What Are Stars:*

- *What Are Stars?* By Katie Daynes

Read *Zoo in the Sky:*

- *Zoo in the Sky* by Jacqueline Mitton

Read *If I Were an Astronaut:*

- *If I Were an Astronaut* by Eric Braun

Read *National Geographic: Little Kids First Big Book of Space*:

- *National Geographic: Little Kids First Big Book of Space* by Catherine D. Hughes

Technology resources

Day and Night Video:

- Computer to access http://pbskids.org/video/peg/2365440792

Moon Landing Video:

- Computer and Video links for the first moon landing targeted at first grade:
  - http://www.watchknowlearn.org/Video.aspx?VideoID=57632&CategoryID=2795
  - https://www.youtube.com/watch?v=9jI8Uqip60w

Moon Investigation:

- Computers
- Website http://www.moongiant.com

GoNoodle Video:

- Computer to access **https://app.gonoodle.com/channels/moose-tube/stay-on-the-sunny-side?s=Search&t=the%20sun**

Slideshow of Star Patterns:

- Computer to access the internet to retrieve pictures of constellations and stars

Stars Video:

- Computer to access the video: https://www.youtube.com/watch?v=nP3fMTp-zqQ

Space Buddies Movie:

- Copy of *Space Buddies* DVD
- DVD player or computer with the ability to play DVDs

Other

- Provide optional materials for children with food allergies
- Christmas lights (to represent stars)

- Outer space theme decoration supplies