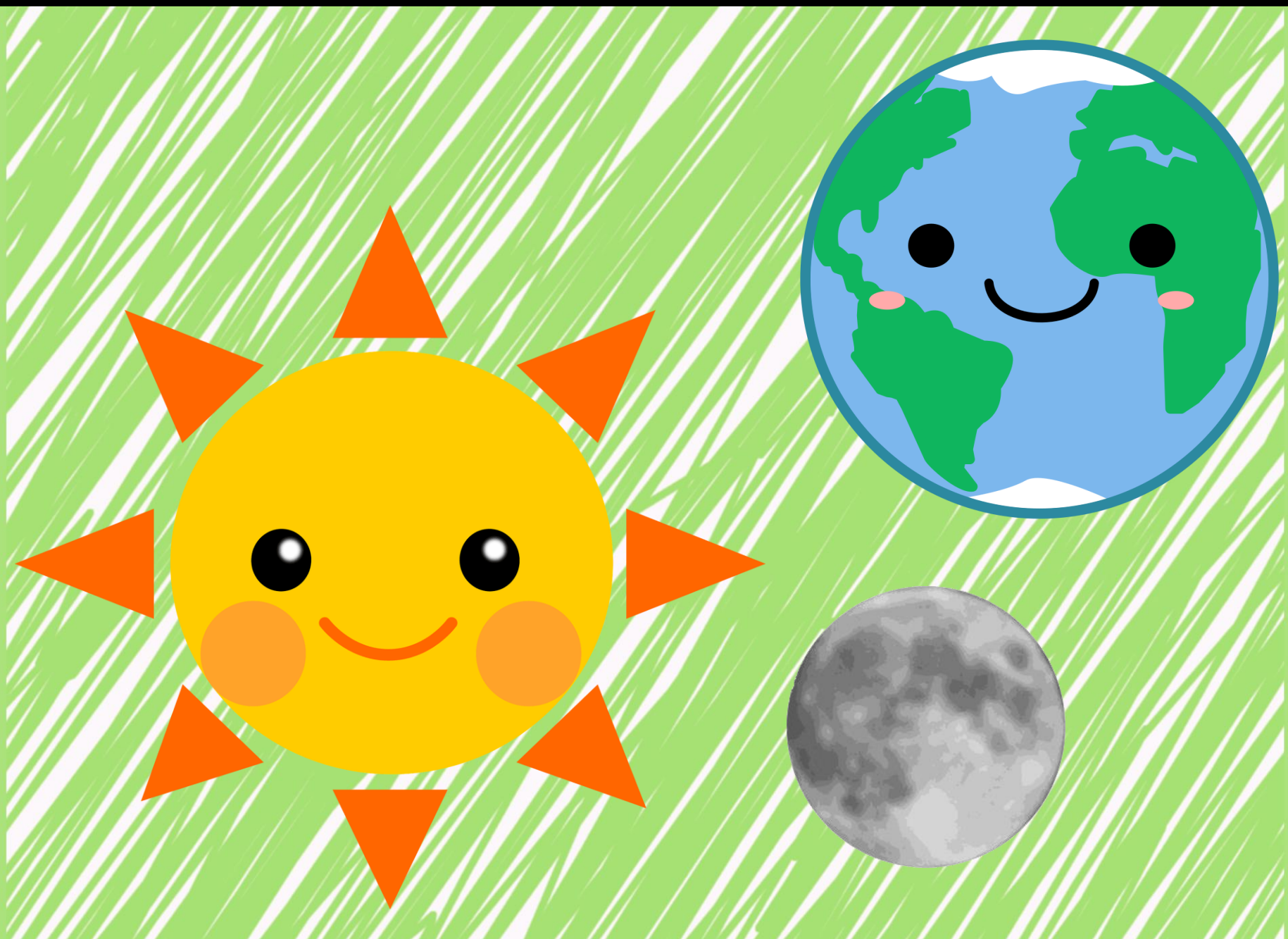
EARTH, SUN, & MOON
SCIENCE 5E LESSON PLAN



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Science 5E Sun, Earth, & Moon Lesson Plan

Subject / grade level: 3rd Grade Science

Materials:

- Picture of the flat earth with the sun and moon orbiting it for engage portion of lesson - http://40.media.tumblr.com/tumblr_lyjizni4p71qa64bjo1_500.jpg
- Smart Board or projector
- 1 "Sun, Earth, and Moon Model" per table group
- 1 sheet of notebook paper for each table group
- Class set of pencils
- Anchor chart with 1 sheet paper
- Markers
- Whiteboard
- Whiteboard markers
- Video of the earth's orbital path (show 0:00-0:20 ONLY) - https://www.youtube.com/watch?v=82p-DYgGFjI
- Video to show sixes & distances of the Sun, Earth, and Moon - https://www.youtube.com/watch?v=OjWVtQGwrLU
- Picture of the entire solar system - http://www.youthareawesome.com/wp-content/uploads/2011/05/solar-system.jpg
- Class set of "Model of Earth & Moon's Orbit" sheet from TeachersPayTeachers located on page 3 here (FREE) - https://www.teacherspayteachers.com/Product/Space-Model-of-Earth-Moons-orbit-565681
- Class set of scissors
- Class set of crayons
- Class set of glue bottles/glue sticks
- Class set of 2 brads per student
- Class set of "Earth, Moon, and Sun Summary" page (attached at end of this document)

TEKS

3.(8) Earth and space. The student knows there are recognizable patterns in the natural world and among objects in the sky. The student is expected to:
(C) construct models that demonstrate the relationship of the Sun, Earth, and Moon, including orbits and positions

Lesson objective(s):

The students will construct a model that demonstrates the relationship, orbit, and positions of the Sun, Earth, and Moon and write a brief summary to describe the model.

Differentiation strategies to meet diverse learner needs (special needs):

- ELL
- G/T
- Special Needs

Misconceptions created by Model that need to be addressed during the lesson:

- The Earth, Sun & Moon are the only objects/plants in our solar system.
- The orbital path of the Earth around the Sun stays the same every year.
- The sizes and distances of the Earth, Sun, & Moon are not exactly to scale.

ENGAGE

- On the Smart Board or projector screen, display the photo of the flat earth with the sun and moon orbiting it (http://40.media.tumblr.com/tumblr_lyjizni4p71qa64bjo1_500.jpg) .
- Tell students that many years ago, people thought the Earth was flat and motionless. They also thought the Earth was the center of the solar system, and that the sun and moon revolved (or orbited) around the Earth. Ask: Why do you think that scientists thought this? Have you ever thought this yourself?
- Tell students: Today, scientists know that both of the misconceptions are false.
- Tell students that today they will be looking closer at how the Sun, Earth, and Moon are related by exploring a model to represent this relationship. What does it mean when something is represented?
- Students should be asking themselves: What does the shape of the Earth look like? What does the movement of the Earth look like? What is the center of the solar system? How are the Sun, Earth, and Moon all related?

EXPLORE

- The students will be given time to observe the Sun, Moon, and Earth model in their table groups. They will have the opportunity to be hands-on with the model, to touch it and move around the objects to see how everything revolves/orbits and rotates.
- Students will discuss with their table group what they observed.
- They will write down their group's observations on a sheet of notebook paper using pencils.

EXPLAIN

- The teacher will write on the anchor chart the heading "Observations".
- The teacher will ask students: After looking at the model, what is an observation about the Earth, Sun, and Moon that your group discussed? The teacher will call on groups with their hands raised, and write down the observations on the anchor chart paper.
- Ask the teacher writes down the observation, she should be looking for responses such as: "the moon moves around the Earth", "the Earth moves around the Sun", "the Earth spins", "the Earth is round/spherical", "The Sun is the largest, and the moon is the smallest" and "The moon spins" (the academic language/terms of "orbit" or "revolve" or "rotate" are not necessary at this time).
- If students are not diving deep enough into their observations (for example, if they are not coming up with the explanation that "the earth revolves around the sun") the teacher may have to ask further guiding questions. These include but are not limited to: "What do you notice about the relative sizes of the 3 objects?" "What do you notice about the distances?" "What do you notice about the shape of the Earth/Moon/Sun?" "What do you notice about the movement of the Earth?" "What do you notice about the movement of the Sun?" and "What do you notice about the movement of the Moon?"
- Refer back to the model whenever applicable. The teacher can gesture to parts of the model, or move the model herself to illustrate a concept or observation.
- Close this portion by saying "Those are all great observations! Now lets learn even more about these observations."

ELABORATE

- In this portion, the teacher will provide students with more academic vocabulary to use while describing the Earth, Moon, and Sun.
- Go through the students' observations listed on the anchor chart paper one by one to elaborate and provide academic language for each one. As a new vocabulary word is introduced, write it on the whiteboard.
- For example, one observation might have said "The Earth moves around the Sun/The Moon moves around the Earth". The teacher would say "Yes, this observation is correct because the Earth does move around the Sun/the Moon does move around the Earth. In science terms, we call this **revolving**.

When the Earth moves all the way around the Sun 1 full time, the Earth has completed one **revolution**. When the moon moves all the way around the Earth one time, the Moon has completed one revolution. It takes the Earth one year to complete one trip around the sun. It takes the moon about 27 days to revolve around the Earth one time. The path that the Earth takes when it revolves around the Sun is called its **orbit**. The Moon also orbits around the Earth. The orbital paths of the Earth and the Moon can change slightly every year." Refer to the model when applicable to illustrate a concept being discussed. To illustrate the concept of revolving, the teacher can place an object on the floor and move in a circular shape around the object and say "I am revolving around the object." Then the teacher can pick up the object and move it in a circle around her head and say "Now the object is revolving around me". Invite students to try making their pencils revolve around their heads, and have them get up to revolve around their desks (whole-body activity). Also, the teacher can refer to this video of the Moon and Earth's varying orbital paths to illustrate the concept (Be sure to only show the first 20 seconds): https://www.youtube.com/watch?v=82p-DYgGFjI it's important for the teacher to address this because the model does not!

- For another example, a second observation could have said "The Earth/moon spin". The teacher could say "When the Earth and Moon spin, scientists call that **rotating**. It takes the Earth one day (or 24 hours) to complete 1 **rotation** on its axis. It takes the moon about 27 days to complete 1 rotation on its axis." The teacher could reference the model to show rotating. Or the teacher could spin around and say "I am rotating on my axis." Invite students to rotate on their axis for a whole-body teaching experience.
- Address the other planets in the solar system (Earth is not the only one)! Use this picture to show the size and location of the other plants: http://www.youthareawesome.com/wp-content/uploads/2011/05/solar-system.jpg
- Also, the teacher could discuss the actual size and distance of the Sun, Moon, and Earth. For example: the moon is closer to the Earth than the Earth is to the Sun. The sun is much larger than both the Earth and Moon. The Moon is much smaller than the Earth. Here's a brief video to illustrate these concepts: https://www.youtube.com/watch?v=OjWVtQGwrLU
- Other vocabulary to be introduced includes: **sphere/spherical shape** of the Earth/Moon/Sun.
- After each observation has been discussed, ask students questions to check for comprehension: Does the Earth stop revolving around the sun? Does the moon stop spinning on its axis? Describe the movement of the Earth/Moon. What is the center of the solar system?

EVALUATE

- Pass out the "Model of Earth & Moon's Orbit" sheet found on page 3 of the document (https://www.teacherspayteachers.com/Product/Space-Model-of-Earth-Moons-orbit-565681). Students should create their own model of the sun, earth, and moon that can be used for reference later or that can be taken home. Students should color the objects, cut them out, and assemble them according to instructions.
- Then, pass out the "Earth, Moon, and Sun Summary" page to students (can be found at the end of this page). They should respond to the prompt "Describe the movement of the Earth, Moon, and Sun in space" by writing about a paragraph, using appropriate academic language/vocabulary.
- Use the rubric below to assess student's work:

Rubric

	4 points	3 points	2 points	0-1 points
Student-Constructed Model	The model includes all components and is correctly constructed.	The student made 1 or fewer errors in constructing the model.	The student made 2 or more errors in constructing the model.	The model was either not constructed or incomplete.
Paragraph - Orbit	Correctly explains the orbits of both the Earth and Moon.	Correctly explains only the orbit of the Earth OR only the orbit of the moon.	Incorrectly explains the orbit of both the Earth and Moon.	Does not make an attempt to explain the orbits.
Paragraph - Rotations	Correctly explains the rotation of both the Earth and Moon.	Correctly explains the rotations of only the Earth OR only the Moon.	Incorrectly explains the rotations of both the Earth and Moon.	Does not attempt to explain the rotations.
Paragraph - Sizes/Distances	Correctly describes the sizes and distances of the Earth, Sun, and Moon.	Correctly describes the sizes and distances for only 2 of the Earth, Sun, and Moon.	Correctly describes the sizes and distances only 1 or less of the Earth, Sun, and Moon.	Does not describe the sizes or distances.

TOTAL POINTS: _____

COMMENTS:

_____

_____

_____

_____

Horizontal Alignment within the Grade chosen for the 5E lesson

What other TEKS can be aligned to this lesson (what will this lesson build upon and build for)?

3.3(C) represent the natural world using models such as volcanoes or Sun, Earth, and Moon system and identify their limitations, including size, properties, and materials

--The models used in this lesson plan will incorporate this standard. Students will understand more about how the world around them can be represented through models, and understand that these models are not perfect and do have limitations.

3.3(D) connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists

--Students could discuss scientist jobs that would involve studying the orbits of planets such as astronomers, etc.

3.4(A) collect, record, and analyze information using tools, including microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, wind vanes, rain gauges, pan balances, graduated cylinders, beakers, spring scales, hot plates, meter sticks, compasses, magnets, collecting nets, notebooks, sound recorders, and Sun, Earth, and Moon system models; timing devices, including clocks and stopwatches; and materials to support observation of habitats of organisms such as terrariums and aquariums

--The "Sun, Earth, and Moon system models" piece of this standard is especially applicable to this lesson. The students will use the model to observe and record information in order to learn something new.

3.8(B) describe and illustrate the Sun as a star composed of gases that provides light and heat energy for the water cycle

--The students could learn more in-depth about the properties of the Sun after this lesson.

3.8(D) identify the planets in Earth's solar system and their position in relation to the Sun

--The other planets' orbits around the Sun could be discussed after this lesson.

Vertical Alignment within the Grade Chosen for the 5E lesson

Prior Grade

What other TEKS can be aligned to this lesson (what will this lesson build upon and build for)?

- 2.8(D) observe, describe, and record patterns of objects in the sky, including the appearance of the Moon

How would you integrate this foundational knowledge for developed 5E lesson?

- In second grade, students had to learn about the appearance of the Moon.
- This lesson builds on this knowledge by discussing how the Moon orbits around the Earth and how the Moon spins.

Next Grade

What other TEKS can be aligned to this lesson (what will this lesson build upon and build for)?

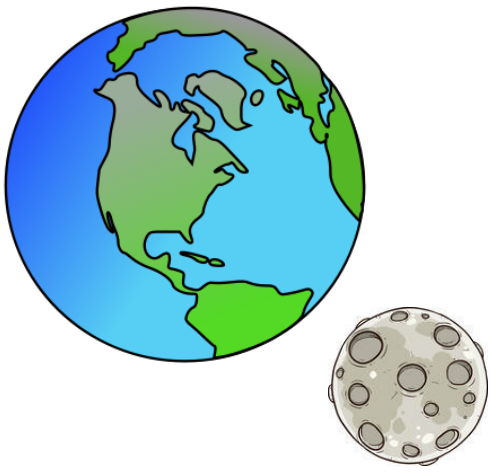
- 4.8(C) collect and analyze data to identify sequences and predict patterns of change in shadows, tides, seasons, and the observable appearance of the Moon over time

How would this aid their knowledge in future grades?

- This lesson would give students a foundation of knowledge to build upon later by letting them fully understand how to Moon revolves and rotates around the Earth.

Scientist: _____

Describe the movement of the Earth, Moon, and Sun in space. Write a paragraph to respond.



CREDITS

Special thanks to these artists