

Unit Name: Space Systems: Patterns and Cycles

Time Frame: Trimester 1

Author: Egg Harbor Township STEM Committee

UNIT

Subject: **Science**

Country: **USA**

Course/Grade: **1st Grade**

State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY

The student will investigate and understand the basic relationships between the Sun, Earth, Moon, and Stars including the movement of the Sun and Moon across the sky as well as a comparison of the amount of daylight during the winter to that of the fall.

UNIT RESOURCES

- *Good Night Moon*
- *Out in Space*
- *What Makes Day and Night*
- *American Lives: Astronauts*
- *The Sun: Our Nearest Star*
- *Neighbors in Space Series*
- *Exploring the Galaxy Set*
- *I See the Moon*
- *Faces of the Moon*
- *The Moon Book*
- *The Lollipop Fairies*
- *My Light by Molly Bang*
- *Kittens First Full moon by Kevin Henkes*
- *If you Decide to go to the Moon by Faith McNulty*
- *The Moon Book by Gail Gibbons*
- *And if the Moon Could Talk by Kate Banks*
- *Sun, Moon and Stars by Stephanie Turnbull*
- *Papa, Please get the Moon for me by Eric Carle*
- *So That's How the Moon Changes Shape by Alan Fowler*
- *Shadows and Reflections by Tina Hoban*
- *Chicken Little by Rebecca Emberley*
- *The Man in the Moon by William Joyce*
- *Stars by Mary Lyn Ray*
- *Why the sun and moon live in the sky: An African Folktale by Elphinstone Dayrell*
- *Moonshot: The Flight of Apollo 11 by Brian Floca*
- *Reaching for the Moon by Buzz Aldrin*
- *It's sunny today by Kristin Sterling*
- *On Earth by G. Brian Karas*
- *Sun by Melanie Mitchell*
- *Moon by Melanie Mitchell*
- *Stars by Melanie Mitchell*
- *Energy from the Sun by Alan Fowler*
- *The Sun Our Nearest Star by Franklyn Mansfield Branley*

Internet Resource Links:

<https://sites.google.com/a/solteacher.com/olteacher-com/home/first-grade-virginia-sol-resources/1st-grade-science/science-sol-2-8-sun-earth>

<http://www.childrensuniversity.manchester.ac.uk/interactives/science/earthandbeyond/soonmoonearth/>

<http://www.eyeonthesky.org/ourstarsun.html>

<http://library.thinkquest.org/29033/begin/earthsunmoon.htm>

<http://www.nextgenscience.org/>

<http://www.calendar-updates.com/sun.asp?PostalCode=08234&Submit=Get+Sunrise+%2F+Sunset+Times>

www.brainpop.com

STAGE ONE

GOALS AND STANDARDS

Science:

1-ESS1-1. Use observations of the sun, moon, and stars to describe patterns that can be predicted.
[Clarification Statement: Examples of patterns could include that the sun and moon appear to rise in one part of the sky, move across the sky, and set; and stars other than our sun are visible at night but not during the day.]

** [Assessment Boundary: Assessment of star patterns is limited to stars being seen at night and not during the day.]

1-ESS1-2. Make observations at different times of year to relate the amount of daylight to the time of year.

[Clarification Statement: Emphasis is on relative comparisons of the amount of daylight in the winter to the amount in the spring or fall.]

** [Assessment Boundary: Assessment is limited to relative amounts of daylight, not quantifying the hours or time of daylight.]

1-PS4-2. Make observations to construct an evidence-based account that objects can be seen only when illuminated.

[Clarification Statement: Examples of observations could include those made in a completely dark room, a pinhole box, and a video of a cave explorer with a flashlight. Illumination could be from an external light source or by an object giving off its own light.]

ENDURING UNDERSTANDINGS

- **The amount of daylight changes throughout the year.**
- **The sun and moon appear to rise in one part of the sky, move across the sky, and set.**
- **Stars other than our sun are visible at night but not during the day**
- **Comparisons of the amount of daylight in the winter to the amount in the spring or fall.**
- **Illumination could be from an external light source or by an object giving off its own light.**

ESSENTIAL QUESTIONS

What objects are in the sky and how do they seem to move?

KNOWLEDGE AND SKILLS

Vocabulary:

- **Seasons (fall, winter, spring, summer)**
- **Sun – closest star to Earth**
- **Earth – the planet in which we live**
- **Moon – the natural satellite of Earth**
- **Stars – a fixed ball of gas giving off light, far away from Earth**
- **Rotation – the act spinning**
- **Sunrise – the time in the morning when the sun appears**
- **Sunset – the time in the evening when the sun disappears**
- **Model – an example**
- **Effect – something that is caused by an action**
- **Compare – to examine or look at two or more things**
- **Observation – the act of watching**
- **Noon – when the sun is at the highest point in the sky**
- **Day – between sunrise and sunset; when it is light out**
- **Night – between sunset and sunrise; when it is dark out**

Students will know:

Night and day are caused by the rotation of the Earth.

The amount of daylight changes throughout the year with the seasons.

The Moon rotates around the Earth.

The stars are in the sky both day and night. During the day our star, the sun, makes our sky so bright that we cannot see the much dimmer stars.

STAGE TWO

PERFORMANCE TASKS

Create a model of the Earth, sun and moon system to illustrate the moon's orbit of Earth simultaneously with Earth's orbit of the sun. This is also an effective way to model eclipses and the position of Earth, the moon and the sun during the moon's phases.

OTHER EVIDENCE

Formative assessments

- Teacher Questions
- Class Discussions

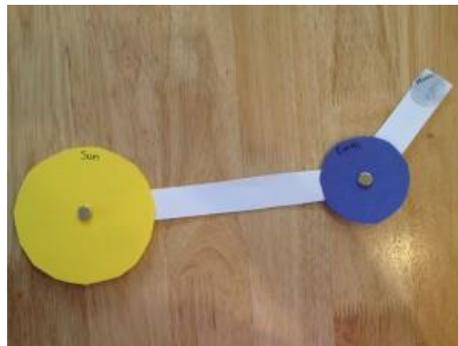
Relating concepts of science standards to reading and math activities

STAGE THREE

LEARNING PLAN

Activities, experiences, and lessons:

Model of the Sun, the Earth, and the Moon



You will need:

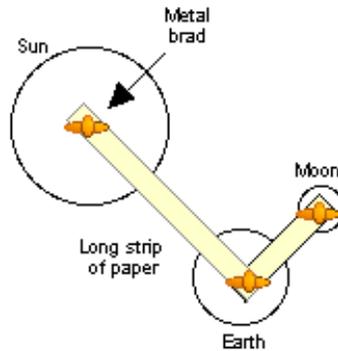
- Yellow construction paper (for the sun)
- Blue construction paper (for the Earth)
- Gray paper (for the moon)
- White paper (for the connectors)
- 3 small brads
- Scissors
- Ruler

Alternatively, if you don't have colored construction paper, you could use white paper or even paper plates, and use crayons to color it in. If you have a color printer, you can also use the colored template.

Directions:

- Cut out the templates and trace them onto the colored paper
- The large circle represents the sun
- The middle sized circle represents the Earth
- The smallest circle represents the moon
- Then cut out two strips of paper; these will be the connectors (BOTH 1 inch thick)
- One should be about 5 inches
- The other about 8.5 inches long
- Place the brads in through the center of each circle and the end of the connectors.

See Diagram Below for Placement of BRADS; your model should look something like this:



Model of the Sun, the Earth, and the Moon

- Students can use this model to demonstrate how the Earth orbits around the Sun, and how the Moon orbits around the Earth as well as demonstrate night, day, and when stars are visible.
- Students may also demonstrate moon phases
 - Note that although the relative sizes of the Earth and the Moon are roughly accurate (about 3:1), the Sun should be much, much larger (the Sun is over 100 times bigger than the Earth).
 - The Earth is over 370 times farther from the Sun than it is from the Moon. If this model were accurate, the Earth and the Sun should be over 90 feet apart (given that the Earth-Moon distance in the model is about 3 inches).