Ready • Set EXPLORE in the classroom

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# First Grade Lesson Plan – Moon Phase Phenomena!

**Suggested time:** 45 minutes

## Lesson Snapshot:

In this lesson, students will demonstrate proficiency in describing moon patterns. Students will be challenged to use models to depict the different phases of the Moon, focusing on the new moon, first quarter, full moon and third quarter.

The disciplinary core idea and cross cutting concepts are integrated during class discussions centered around the key concept that the phases of the Moon are a phenomenon which can be observed, described, and predicted.

## Background Information:

The Moon is always a natural satellite of the Earth and orbits around the Earth just as the Earth orbits around the Sun. Light from the Sun illuminates both the Earth and the Moon. When observing the Moon from the Earth, it appears to be shining, but it is really the Sun's light reflecting off the Moon's surface. As the Moon orbits around the Earth, different parts of the Moon are in sunlight or darkness at different times. The sunlit part of the Moon can be seen from Earth at certain positions in the rotation while at other positions, only sunlit parts and parts in shadow of the Moon can be seen or not at all. These different combinations of the Moon's appearance are called Lunar Phases. There are eight phases in total: new moon, waxing crescent, first quarter, waxing gibbous, full moon, waning gibbous, third quarter, and waning crescent. This eight phase cycle repeats once a month, which is the amount of time it takes for the Moon to make a full orbit of the Earth. This pattern repeats month after month.

Fun Fact: The Earth and Moon's rotations are so synchronous that from Earth, we only see one side of the Moon. The other side is commonly referred to as the "far side" or the "dark side" of the Moon.

## Science, Technology & Engineering, and Environment Literacy & Sustainability (STEELS) Standard(s):

3.3.1.A: Use observations of the sun, moon, and stars to describe patterns that can be predicted.

3.5.K-2.S: Apply design concepts, principles, and processes through play and exploration.

## Connections to Other Standard(s):

CC.1.4.1.W: With guidance and support, recall information from experiences or gather information from provided sources to answer a question.

CC.1.5.1.A: Participate in collaborative conversations with peers and adults in small and larger groups.

## Objective(s):

Students will be able to use observations of the moon phases to predict the upcoming moon phase.

## Materials:

- ***Moon! Earth's Best Friend*** by Stacy McAnulty
- Moon dough ingredients
  - 2 cups of corn starch
  - 1 cup conditioner
  - Food coloring
  - Glitter (optional)
  - Spoon (1 per group)
  - Bowl (1 per group)

- Sphero Coding Robots
- iPad (1 per group)
- Moon Maze

## Advanced Preparation:

Prepare moon dough ingredients for each group.

Prepare the moon dough in advance if limited on time (optional).

Install Sphero app on student iPads and have the app logged into an account.

## Suggested Implementation:

### Part 1: Shared Read Aloud

Read ***Moon! Earth's Best Friend*** by Stacy McAnulty.

**Explore Students' Background Knowledge:**

"What do we already know about the Moon?"

"When you see the Moon at night does it always look the same?" (No, the moon appears to change shape.)

"Does anyone know one of the phases of the moon?" (new moon, waxing crescent, first quarter, waxing gibbous, full moon, waning gibbous, third quarter, and waning crescent)

### Part 2: Design

Introduce the four moon phases that students will be learning about today (new moon, third quarter, full moon, first quarter).

Students will work collaboratively in groups of three-four to create moon dough.

Distribute corn starch, conditioner, food coloring, spoon and bowl to each group.

Assign each student a job within the group (ex: corn starch, conditioner, food coloring, mixer).

Students will add ingredients to the bowl in the following order:

- Cornstarch
- Conditioner
- Food coloring

The last student will mix ingredients together with a spoon. Once the dough becomes harder, the students can use their hands to mix.

Divide dough among students in the group.

Challenge students to use the dough to create the phases of the Moon. (new moon, first quarter moon, full moon, third quarter moon)

Extension: Encourage students to demonstrate how the moon phases are a predictable pattern.

**Class Discussion Questions:**

"Is the Moon actually changing shape throughout the month?" (No, it is just changing places.)

"What makes the Moon appear to change throughout the month?" (The amount of light the Sun reflects on to the moon during that phase.)

### Part 3: Code

Students will work collaboratively in groups of three-four.

Distribute Sphero Coding Robots to each group.

Provide time for free exploration with the Sphero.

Each group will be challenged to code Sphero through the Moon Maze, demonstrating a predictable pattern by landing on each phase.

### Part 4: Summation

Review/discuss the different moon phases.

Predict: “If the Moon today is a full moon, what will the next moon phase be?”

Review/discuss: “Why are there different phases of the Moon?”

## Extension Activities:

- Using lesson plan Part 2: Design, introduce the other four moon phases (waning gibbous, waxing gibbous, waxing crescent, waning crescent).
- Demonstrate that stars are in the sky during the daytime, however, they are not visible by shining a flashlight on the classroom ceiling with the lights on. Once the lights are turned off, the light of the flashlight is visible. Discuss the position of the stars do not change in the sky. Provide an opportunity for students to research a star and/or constellation.
- Observe the position of the sun in the sky. Encourage students to draw and track the sun over several school days at different times of the day. Incorporate a compass to explore the patterns of the sun in more detail.

## PBS Resources and Links:

The Moon and Its Shapes | Ready Jet Go! | PBS LearningMedia (video short: 3:11)

The Pattern of the Moon’s Changing Appearance | PBS LearningMedia (interactive model)

PEEP Observes the Moon | Interactive Storybook | PBS LearningMedia (interactive storybook in English and Spanish)

Make a Moon Phase Box | Ready Jet Go! | PBS LearningMedia (activity)

## Connections to Other Standard(s):

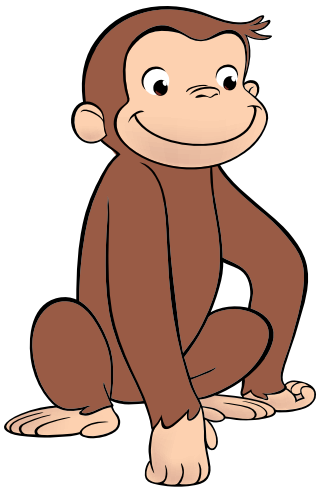
CC.1.4.1.A: Write informative/ explanatory texts to examine a topic and convey ideas and information.

CC.2.4.1.A.4: Represent and interpret data using tables/charts.

## Resources/Acknowledgments:

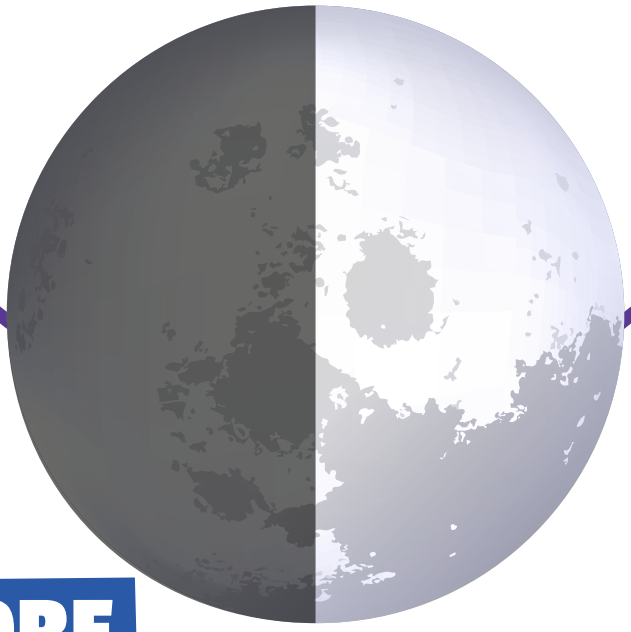
STEELS Hub - SAS

NASA- Lunar Phases and Eclipses



## Full Moon

## First Quarter Moon



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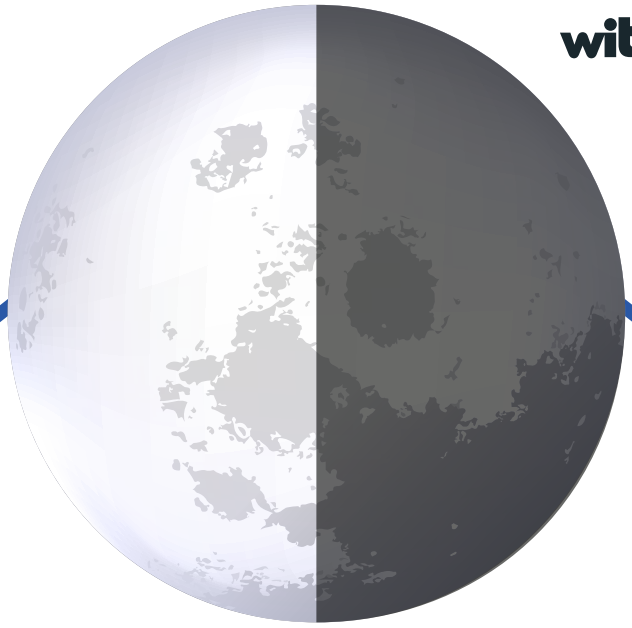

## Third Quarter Moon

## New Moon