

PEANUTS and SPACE FOUNDATION

A Tale of Two Rocks

OBJECTIVES

Students will:

- ◆ Read *Snoopy, First Beagle on the Moon!* and *Shoot for the Moon, Snoopy!* to learn some background knowledge.
- ◆ Sort rocks based on physical properties.
- ◆ Create a picture graph and bar graph that represents their data sets with 3 categories.

SUGGESTED GRADE LEVELS

3rd – 5th

SUBJECT AREAS

Earth Science, Physical Science

TIMELINE

60 minutes

NEXT GENERATION SCIENCE STANDARDS

- ◆ 2-PS1-1: Plan and conduct an investigation to describe and classify different kinds of materials by observing their properties.
- ◆ 2-ESS1-1: Use information from several sources to provide evidence that Earth events can occur quickly or slowly.
- ◆ 4-ESS2-1: Make observations and/or measurements to provide to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.
- ◆ 4-ESS2-2: Analyze and interpret data from maps to describe patterns of Earth's features.

21st CENTURY ESSENTIAL SKILLS

Critical thinking/problem solving, collaboration and teamwork, carrying out investigations, peer communication, and constructing explanations

BACKGROUND

- ◆ According to NASA.gov, NASA has proudly shared an association with Charles M. Schulz and his American icon Snoopy since Apollo missions began in the 1960s. Schulz created comic strips depicting Snoopy on the Moon, capturing public excitement about America's achievements in space. In May 1969, Apollo 10 astronauts traveled to the Moon for a final trial run before the lunar landings took place on later missions. Because that mission required the lunar module to skim within 50,000 feet of the Moon's



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surface and “snoop around” to determine the landing site for Apollo 11, the crew named the lunar module Snoopy. The command module was named Charlie Brown, after Snoopy’s loyal owner.

- ♦ These books are a united effort between Peanuts Worldwide, NASA and Simon & Schuster to generate interest in space among today’s younger children. The character of Snoopy has been allowed to be reimagined for this special partnership and for the opportunity to head into outer space.
- ♦ Earth is very much alive and constantly producing, redistributing, destroying, and reproducing its materials. (Rocks) The interaction between the atmosphere, geosphere, the biosphere, and the hydrosphere is where we see the erosion and redistribution of Earth’s material. Humans play a role in altering the surface of the Earth as well. Objects within our solar system have also impacted Earth to cause sudden change. All of these processes are happening still and will continue to change the surface of our Earth. When we compare and contrast Earth with all of the other rocky bodies in our solar system, we see stark differences. This is what makes Earth so unique. As we look at the moon, the moon we see today and all of its features is pretty much the same as we saw it a hundred years ago. The two things that will alter the surface of the moon are objects impacting the moon and human contact. Before the moon cooled down to what it is today, there were flows of magma and lava that moved material around in addition to the giant impacts. All of the mountains you see on the surface of the moon were the result of such impacts.

VOCABULARY

Igneous, Sedimentary, Metamorphic, Impact, Geosphere, Biosphere, Atmosphere, Hydrosphere, Erosion, Geology, Geologist, Picture graph, Bar graph, Rock Cycle

MATERIALS

- ♦ Ziplock baggies
- ♦ Pencils
- ♦ Notebooks
- ♦ Markers
- ♦ Internet connectivity
- ♦ Pencils

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LESSON PROCEDURES

1. Read *Snoopy, First Beagle on the Moon!* and *Shoot for the Moon, Snoopy!* to the entire class to give students some background knowledge.
2. Discuss how Snoopy's brother Spike finds a "strange rock". Pair up your students and have them discuss what that rock could have looked and felt like. Have the students share aloud how they would describe this "strange" moon rock. Ask, "Do you think that they would look like Earth rocks, or would they look different?" (*Snoopy First Beagle on the Moon!* pp. 21–26, references to Moon geography/landscape, "Strange rocks and dust," *Shoot for the Moon, Snoopy!* p.19, "Surface of the Moon.")
3. Arrange students into groups of 3 and tell them that they will be taking a trip out to the schoolyard to draw a map of their schoolyard and gather 10 different samples of rocks. Give them a time limit of 10 minutes. When they pick up a rock they must identify on the map where they got it from using ziplock baggies and number both the bag and the map..
4. Tell the students that when they return to the classroom, they will create a list of rules (as a class) for how they will categorize (sort) the rocks.
5. Have each group follow the agreed upon rules and sort their rocks (still in their baggies) according to those rules and create a picture graph or a bar graph which represents their data sets of their categories. Tell them scientists who study rocks (Geologists) categorize rocks similarly to help them identify and recognize the different types of rocks.
6. Have the students share their map of the schoolyard and where they found their rocks.
7. Ask the students if the similar rocks were found in the same spot on their map or in different parts of the schoolyard. Tell them that materials which are not anchored down to the planet or moon surface may move around by forces such as weathering, erosion, and natural sources..
8. Tell the students: "We are going to make a T-chart that compares how the rocks in the schoolyard are moved from place to place to how rocks on the Earth are moved from place to place.
9. Create the T-chart in front of the class and ask the students to think of as many things that they can to explain how the rocks in the schoolyard get moved around. Ask students to consider the human factors as well as the natural factors.



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10. Explain to the students that there are 3 types of rocks found on Earth. Igneous, Sedimentary, and Metamorphic. Tell them that they form different ways. Igneous rocks form when magma/lava cools. Sedimentary rock forms when layers and layers of sand become compacted by weight, and metamorphic rock becomes metamorphic when heat and pressure are applied.
11. Show the students the animation of the rock cycle (<https://www.geolsoc.org.uk/ks3/gsl/education/resources/rockcycle/page3892.html>).
12. Explain to the students that the Earth is still very much alive and constantly building and breaking down rocks through the Rock Cycle process and the process of erosion.
13. Tell the students that they are going to now fill in the other side of the T-chart. Ask the students to help you create a list of things that move Earth's materials around from one place to another.
14. Show students the "An Object at Rest" video. Prompt students to pay attention to the main character in the video (the rock) and ask them to try to remember all the ways that this character gets moved around (<https://vimeo.com/126177413>).
15. Ask the students to recall how "Spike", Snoopy's brother, found that strange rock on the moon. Ask the students to partner-pair-share and discuss how they think that rock could have gotten there. Give them a minute to do so. (*Snoopy First Beagle on the Moon!* pp. 21–26, references to Moon geography/landscape, "Strange rocks and dust," *Shoot for the Moon, Snoopy!* p.19, "Surface of the Moon.")
16. Have the students share their ideas. Explain that the moon does not have an atmosphere and doesn't have any geologic processes.
17. Visit the following website: <https://solarsystem.nasa.gov/moons/earths-moon/in-depth/> and scroll down to all of the subjects listed under the tab "In Depth".
18. Show the students some samples of lunar rock by visiting the following site: https://www.lpi.usra.edu/lunar/missions/apollo/apollo_17/samples/.
19. Tell the students to partner up and create a T-Chart that compares and contrasts how materials are moved around on the Earth and our moon.

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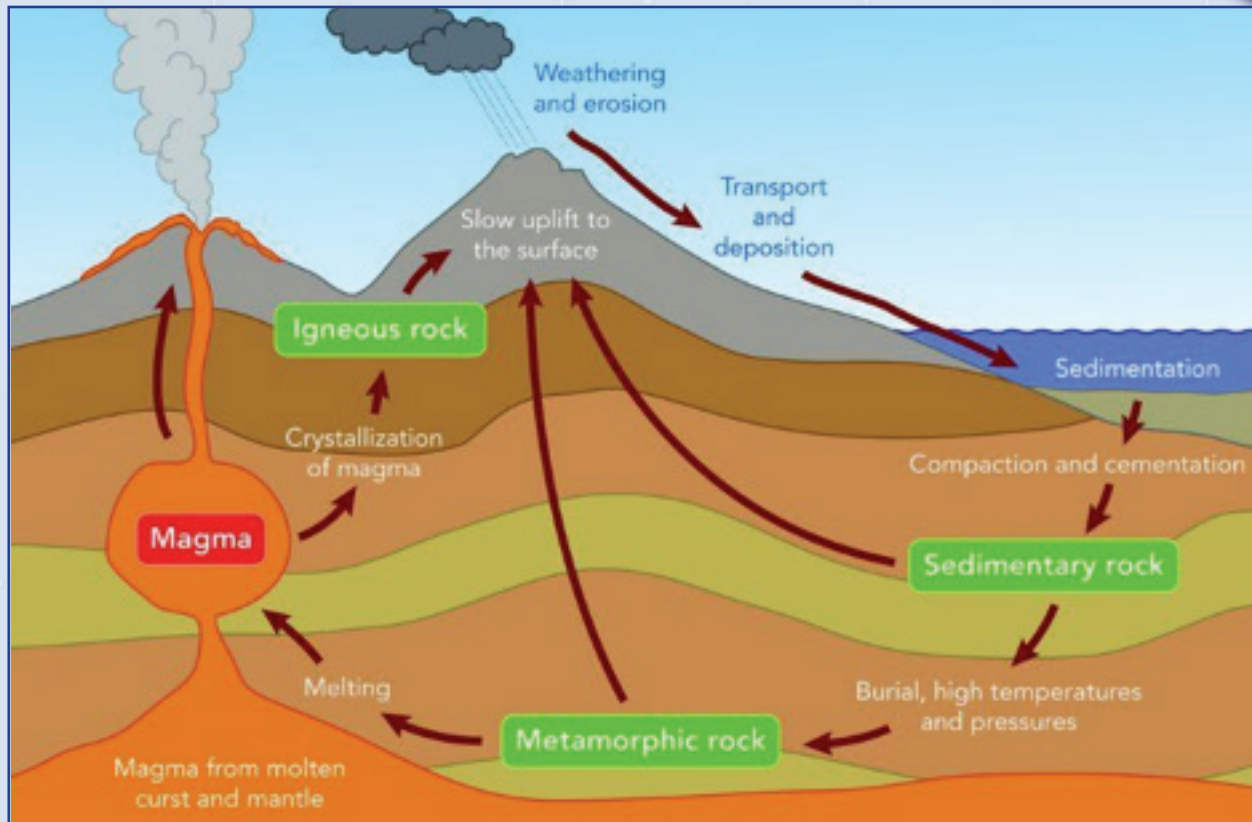
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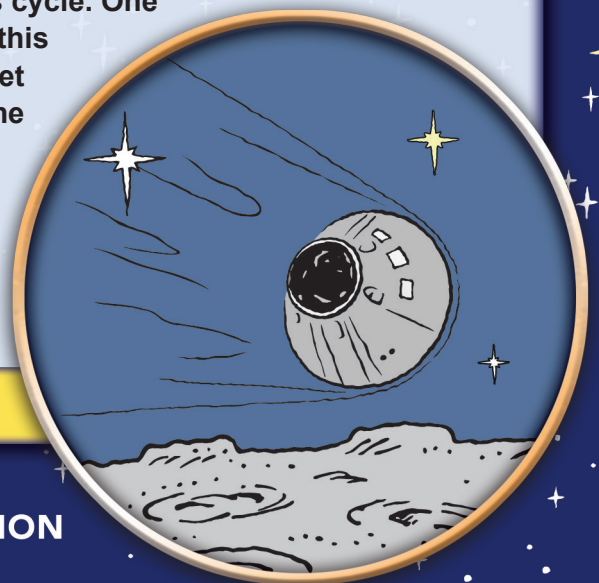
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EXTENSIONS

- ♦ Show the students the following image:



- ♦ Explain to the students that this is the **COMPLETE** rock cycle. It is important to pay attention to **ALL** of the components (parts) of this cycle. One by one, focus on each component and eliminate it from this rock cycle and ask the students whether or not our planet could have a rock cycle without it. Example: Eliminate the atmosphere. Now lead the students into a discussion that focuses on all of the things that take place in the rock cycle where the atmosphere comes into contact with the surface of the Earth.



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- ♦ Ask the students whether or not you have a complete rock cycle if those components (parts) are missing.
- ♦ Tell the students that they are going to be grouping up and each group will be given a rocky planet or a moon of a Gas planet to research and ask students to decide whether or not the planet or moon could have a rock cycle occur. Have students provide all of the evidence from their research.

RESOURCES

Schultz, Charles M. (2019). Snoopy, First Beagle on the Moon! New York, NY: Simon & Schuster.

Schultz, Charles M. (2019). Shoot for the Moon, Snoopy! New York, NY: Simon & Schuster.

Apollo 15 Mission. Retrieved from https://www.lpi.usra.edu/lunar/missions/apollo/apollo_15/samples/

The Rock Cycle Animation. Retrieved from <https://www.geolsoc.org.uk/ks3/gsl/education/resources/rockcycle/page3892.html>

(2019, August 22). An Object at Rest. Retrieved from <https://vimeo.com/126177413>

Retrieved from <https://solarsystem.nasa.gov/moons/earths-moon/in-depth/>

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