



Classroom Teacher Preparation

Earth Science 6: Lunar Landing Challenge

Please use the following to prepare for the next SfS lesson.

Description:

In this team problem-solving exploration, an astronaut crew has suffered an emergency crash landing on the Moon 60 miles from their destination. Everything is damaged except for 14 specific items. Each student must decide which items are most useful, based on their knowledge of their Moon and resources available. Individuals then come together in teams to share ideas and negotiate team choices as they rank the salvaged items in terms of their importance in allowing them to reach their base. At the conclusion, item scores can be compared to real NASA scientist rankings.

Lesson Objectives – SWBAT (“Students Will Be Able To...”):

3rd-5th

- Use provided evidence and prior knowledge to evaluate items first individually and then support their claims in a group
- Explain some of the challenges associated with lunar exploration

Disciplinary Core Idea (DCI)

ESS1: Earth’s Place in the Universe – ESS1.B Earth and the Solar System

- (3rd-5th) The Earth’s orbit and rotation, and the orbit of the moon around the Earth cause observable patterns.

Science & Engineering Practice (SEP)

Engaging in Argument from Evidence

- (3rd-5th) Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.

Crosscutting Concept (CCC)

Cause and Effect

- (3rd-5th) Cause and effect relationships are routinely identified, tested, and used to explain change

Preparation:

This lesson can serve as an introduction to space exploration or can be used as a team-building exercise. No prior knowledge of the Moon or space exploration is needed.

Room Set Up for Activities:

Students will work individually first, then in groups of 3-5 (maximum of 8 groups), working at their desks or on the floor.

Safety:

There are no safety precautions for this activity.



Related Modules

This lesson may be taught as part of a sequence or group of related modules on **Space Science**. Modules include:

Earth Science 7: Celestial Mechanics – Students learn about the Moon’s orbit around the Earth, how the Moon progresses through its eight major phases, and optionally, the tides and eclipses.

Earth Science 8: Solar System – This lesson provides an overview of the objects that make up our solar system, with an emphasis on scale. Students will learn about the vastness of space and will challenge their assumptions about the scale of our solar system by building their own scale model.

Earth Science 11: Stars – Students ask questions and learn about stars, then use simple graphing with a scientific tool to find the age of a star cluster using color and brightness.

For other module sequences and groups, look here: www.sciencefromscientists.org/sequences

Standards Covered:

Please click the following link to our website to review the standards covered by this lesson, listed by state: www.sciencefromscientists.org/standards/

Lessons are matched to both national NGSS and local state standards.

After Our Visit:

Our Classroom Post can be found on our website at sciencefromscientists.org/cohorts. Use the name of your school/cohort and password to log in.

To help Evaluate, check out our Open Response questions online at sciencefromscientists.org/open-response-questions. They are freely available for all of our lessons for current teachers. Use the password supplied by your instructor to log in.

As a Lesson Extension and for a continuation on the challenges and quirks of space living, students can make their own astronaut pudding and explore other resources (including NASA videos) about eating in space, available [here](#).

Additional Resources:

- NASA Moon Page: <http://moon.nasa.gov>
- NASA Tour of the Moon video (4:35): <https://www.youtube.com/watch?v=2iSZMv64wuU>
- NASA Radiation Challenge (for teachers and advanced students): https://www.nasa.gov/pdf/284273main_Radiation_HS_Mod1.pdf
- Wired article about Margaret Hamilton, “Her Code got Humans on the Moon and Invented Software Itself” <https://www.wired.com/2015/10/margaret-hamilton-nasa-apollo/>