

Aloha Telescope Lesson Plan

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Lesson: Lunar Crash Landing

Grade Level

6th Grade

Time Allotment

30 minutes

Standards

S6E1. Obtain, evaluate, and communicate information about current scientific views of the universe and how those views evolved.

Further Investigations

- “Argument-Driven Inquiry in Earth and Space Science” by Victor Sampson, Ashley Murphy, Kemper Lipscomb, and Todd L. Hunter

Vocabulary

- craters
- maria
- lunar
- satellite
- rills
- rays
- atmosphere

Related Resources

- “Understanding Student Ideas in Astronomy” by Page Keeley and Cary Sneider
 - Seeing the Moon
- [National Geographic: Facts About the Moon](#)
- [The Earth's Moon](#)
- [Lunar Crash Landing](#)

Lesson Plan Overview

In this activity, students visualize the Moon’s environment and what it would be like to visit the lunar surface. From the list provided, students will select items they think will help them survive a crash landing on the Moon.

Teamwork is essential in this activity since different members of the group may have different prior knowledge. There is no right answer to the challenge, although some answers are more appropriate than others.

Materials

Crash Landing! Handout
Item Cards (one set per group)

Lesson

Open with a group discussion about what students already know about Moon and its surface. Elicit responses about the atmosphere and topography.

Read the scenario below out loud:

“Imagine a time in the future when there are lunar bases. People are living and working on Moon, exploring and learning about it, and doing other kinds of research that can't be done on Earth. On a routine journey from Earth to a lunar base, there is an accident. Something has gone wrong and you crash land on the Moon's surface, sixty miles from the nearest base. It is daylight on the Moon and will be for the next few days. In the Moon's lower gravity, that is not too far to walk, but you are limited in what you can carry. What should you take with you?”

Student's Mission:

1. Students should sort the cards into two groups: items they would take with them and things they would leave.
2. Students should put the ones they would take with them in order of usefulness, from essential-for-survival to not-so-important.
3. Once all students come to an agreement with their group, have each group share their list and discuss.

Differentiation:

- Provide students who need support with related links (see “Related Resources”) to help with background knowledge of the moon. If students are having difficulty, tell them to consider atmosphere, magnetic field and gravity.
- Students who need enrichment should write justifications about why they did not include certain items.
- Discuss items that were not in the cards that students could justify bringing.

Telescope Connection

Students will be able to identify features on the moon such as craters, maria, and valleys.

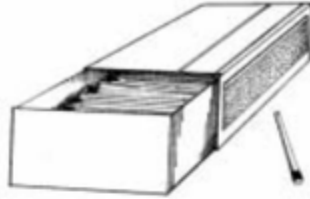
Item Cards

Magnetic Compass



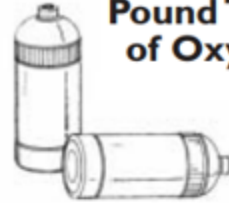
True North on Earth varies from magnetic North by as much as 23 degrees. How well could you navigate on the Moon with this?

Box of Matches



These might be useful to make a signal fire or camp fire in case of a crash on Earth, but would they be useful on the Moon?

Two 100 Pound Tanks of Oxygen



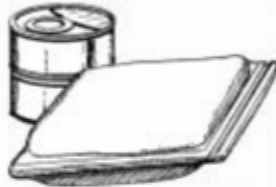
These tanks would weigh 100 pounds on Earth, but in the Moon's lighter gravity, they would weigh less than 17 pounds each.

Self-Igniting Signal Flare



This flare could work underwater or in the vacuum of space.

Food Concentrate



Astronaut food is notoriously bad, but light weight and compact. Just add water and that bowl of mush could taste like a pot roast.

Solar-Powered FM Transceiver

This radio transmitter and receiver requires only sunlight to function properly.



50 Feet of Nylon Rope



Nylon rope is tough and light weight.

Moon Constellation Map

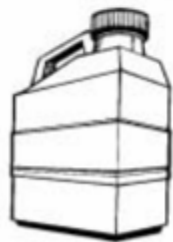


Navigating by the stars on the Moon would be very much the same as navigating by the stars on Earth.

Portable Heating Unit



This unit is designed to work on its own batteries with no external power source.



5 Gallons of Water

Water is essential to life and to reconstituting dehydrated food

First Aid Kit with Hypodermic Needles



Hypodermic needles fit special openings in the standard issue space suit.

Self-inflating Life Raft that uses a Carbon Dioxide Canister



This raft is standard issue on shuttles that land on Earth, in case of an emergency water landing.

Answer Key

Item (Ranking)		Explanation
Oxygen (1)	Keep	The most pressing survival requirement
Water (2)	Keep	Replacement of tremendous liquid loss on side of Moon exposed to sunlight
Constellation Map (3)	Keep	Primary means of navigation; stars are visible if you look away from the Sun in the sky
Food (4)	Keep	Efficient means of supplying energy requirements
FM transceiver (5)	Keep	For communication with any rescue ship on line of sight
Rope (6)	Keep	Useful in scaling cliffs or use in case of emergency
First aid kit (7)	Keep	Needles for medicines and vitamins fit special aperture on suit
Raft (8)	Leave	Low priority; but carbon dioxide bottle possible propulsion source
Flares (9)	Leave	Low priority; possible distress signal when rescue ship is sighted
Heater (10)	Leave	Not needed unless on dark side
Compass (11)	Leave	Useless; Moon has no global magnetic field
Matches (12)	Leave	No air on Moon, so matches will not burn