

Moon Mania

Topic: Lunar Exploration: The Moon, Robots on the Moon, Space Exploration

Grades: K-6

Objectives/Skills: The students will be able to:

1. Define moon, lunar, astronaut, geology, technology, and robot (see definitions at the end of lesson)
2. Construct and complete a KWL (Know, Want to Learn, Learned) chart on moon knowledge
3. Explain the current NASA mission to the moon
4. Participate in a kinesthetic example of communicating commands to a lunar rover (NASA Rover Relay)
5. Learn to make scientific observations (NASA Edible RAT)
6. Identify the different types of rocks (NASA Edible RAT)
7. Communicate observations in a science journal

Florida New Generation Standards for Math, Science and Reading/Language Arts:
(see attached sheets)

Overview: The purpose of this lesson is to introduce the students to lunar exploration and the technology involved, while building teamwork and scientific processing skills. The students will activate their prior knowledge of the moon, engage in cross-curricular activities that teach about the current NASA mission to the moon, and provide information on the moon and its place in our solar system, and finally participate in two simulations that promote scientific thinking and discovery. The information will be enforced through a variety of activities including multimedia and hands-on experiments.

Materials:

- NASA Trailer Video (on CD)
- Field Trip to the Moon DVD by NASA
- *Lunarnautics Educator Guide* (on CD)
- *Lunarnautics Student Guide* (on CD)
- Rover Relay Lesson Plan (*Lunarnautics Educator Guide* p.129-130), objects to retrieve (cloth, jump rope, ball, traffic cones, yardstick, etc.)
- The Moon Book by Gail Gibbons
- Edible Rock Abrasion Tool (RAT) Lesson Plan (*Lunarnautics Educator Guide* p. 81-82, *Lunarnautics Student Guide* p.36-38), RAT experiment supplies for each student: 1 fig type cookie, 1 cup cinnamon sugar mixture, 1 jumbo pretzel stick, 1 paper muffin liner, 1 Popsicle stick, 1 ruler, 1 pencil
- Science Journal
- Moon Mania Journal Rubric (on CD)

Procedure (This lesson is best taught over a period of several days):

ENGAGE

1. Show NASA Trailer Video (on CD) and discuss what was seen in the short clip.
2. Tell the students that today they are astronauts on a voyage to the moon.
3. Have the students create a KWL chart in their Science Journals. Divide the page into 3 columns.
4. Label the first column “Know” and have them fill in what they already know about the moon and our exploration of the moon.
5. Label the second column “Want to Learn” and have them fill in what they want to learn about the moon and lunar exploration.
6. Label the third column “Learned” and explain that at the end of the lesson, that will be filled in on what they learned today.
7. Show the Field Trip to the Moon DVD by NASA to give the students the feel of traveling to the moon to do the remainder of the lesson.

EXPLORE

1. NASA Rover Relay (See Lesson Plan, Educator Guide, p. 129-130)

EXPLAIN

1. Bring the class back together after the Rover Relay activity and discuss how the activity simulated robotic communication.
2. Ask the students how robotic communication could affect the exploration of the moon.
3. Show the students The Moon Book by Gail Gibbons. Discuss the genre of the book. Take a picture walk with the students to introduce the content and have them make predictions.
4. Read the book to the students. Be sure to stop and take questions/discuss where needed.
5. After reading, have the students write down three things that they learned from the book in their science journal. (L part of KWL Chart) Also, define and discuss the vocabulary words.

ELABORATE

1. NASA Edible RAT (See Lesson Plan, Educator Guide p. 81-82, Student Guide 36-38)
2. Answer the Student Guide questions in their science journal.

Math Simplifications/Extensions: Classify the shape (rock sample) as rectangle, parallelogram, etc. Identify the number of sides and vertices. Estimate the measurements prior to doing the actual measuring. Find the perimeter, area, and volume of lunar rock. Measure to the nearest $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, and $\frac{1}{16}$ inch. Convert from inches to centimeters or centimeters to inches. Measure the mass of the lunar rock.

EVALUATE

1. Judge the quality of the students’ responses in their individual science journals based on the attached rubric.

DEFINITIONS* (Depending on the grade level, these can be scaled up or down):

Moon: the earth's natural satellite that shines by reflecting light from the sun and revolves about the earth in about 29½ days

Lunar: of, relating to, or resembling the moon

Astronaut: a traveler in a spacecraft

Geology: **1**: a science that deals with the history of the earth and its life especially as recorded in rocks **2**: a study of the features of a heavenly body (as the moon)

Technology: **1**: the use of science in solving problems (as in industry or engineering)

2: a technical method of doing something

Robot: a device that automatically performs tasks that are complicated and often continuously repeated

*Definitions are from www.wordcentral.com

Additional Resources:

Books (Optional)

If You Decide To Go To The Moon by Faith McNulty ISBN #: 0-545-00085-8

Astronaut Handbook by Meghan McCarthy ISBN #: 978-0-375-84459-1

One Giant Leap: The Story of Neil Armstrong by Don Brown ISBN #: 0-618-15239-3

Background Information for Teachers in Lunarnautics Educator Guide

The Moon p.58

Lunar Geology p.59-62

Mining and Manufacturing on the Moon p.63-69

Lessons in Lunarnautics Guide that could be substituted for Elaborate section

Lunar Core Sample (Educator p.79-80, Student p.35)

Strange New Moon (Educator p.72-73)

Digital Imagery (Educator p.74-75, Student p.32)

Edible Clementine Spacecraft (Educator p.98-99, Student p.44-45)