

# OBSERVING THE MOON

RECOMMENDED FOR GRADES K-8

Does the Moon always look the same? Does its surface look different at different times? Did it look the same 400 years ago as it does now? What will your students say when you ask them these questions?

Many students are aware that the Moon goes through phases, but except for the “man in the Moon” — which many admit they have a hard time seeing — they probably haven’t thought about the surface of the Moon and how we view it from Earth. In fact, until Galileo studied it in 1609, not many people tried to explain the variations on the Moon’s surface. In this activity, students examine the lunar surface and make detailed observations of the Moon at different points in its cycle, just as Galileo did 400 years ago.

## MATERIALS

Clear skies, Notebook, Soft pencil, Binoculars

## PREPARATION

First, figure out when you can see the Moon. You will need to see it on two separate days (about 5-10 days apart). Use a sky almanac or a calendar to find the Moon’s phase on the day you will carry out this activity. The outdoor part of this activity requires good weather.

In choosing a day, keep these tips in mind:

- If you need to observe the Moon at the same time of day (or night) for each day, make sure you choose an appropriate phase for the first observation.
- For morning hours, it is best to begin two or three days before the last quarter phase.
- For evening hours, it is best to begin two or three days before the first quarter phase.

Once you know the Moon’s phase, the chart provided here will help you decide the best time of day (or night!) for lunar viewing.

## ACTIVITY

Draw two 10-cm circles in your observing notebook. List the time, date, sky conditions, and location. Indicate the phase of the Moon within your circle. Now, sketch in the light and dark areas. A soft pencil works best. Some students like to smudge their lines to show light and dark. Repeat the activity using binoculars; they will allow you to see more detail. At another phase (five to ten days later), repeat the activity.

## ANALYSIS *(Questions for the students to answer)*

Compare the unaided-eye and binocular drawings done on the same date with each other. What details are visible? Can you identify any features from the lunar map? Now compare the drawings from one date to the other. What changed?

Near full Moon, patterns of dark and light on its surface are easy to distinguish. The “maria” — smooth, almost crater-free regions on the Moon — are easiest to see then.





During crescent or quarter phases, the craters and mountains cast distinct shadows and become more noticeable, especially near the terminator (the edge of the shadow).

Some students may mention that the Moon changes colors. It actually doesn’t — the colors are due to the effects of our own atmosphere, not anything intrinsic to the Moon.

## EXTENSION

For an in-class activity, make craters by dropping marbles into a deep basin of flour sprinkled with dry chocolate mix. You should get nice craters with elevated edges, and some with a series of splashed out materials centered on the crater. In a darkened room, shine a flashlight onto the cratered surface and show how the angle of the flashlight determines the length of the shadows.

As a math extension, calculate the angle between the Sun and Moon for different phases. As an English extension, write a poem about the Moon.

				
<b>Phase</b>	<b>New</b>	<b>First Quarter</b>	<b>Full</b>	<b>Last Quarter</b>
<b>Rise</b>	<b>Sunrise</b>	<b>Noon</b>	<b>Sunset</b>	<b>Midnight</b>
<b>Highest in Sky</b>	<b>Noon</b>	<b>Sunset</b>	<b>Midnight</b>	<b>Sunrise</b>
<b>Set</b>	<b>Sunset</b>	<b>Midnight</b>	<b>Sunrise</b>	<b>Noon</b>

# FEATURES OF THE LUNAR LANDSCAPE

