

Images of the Moon: Predicting Phases and Features

Activity A1

Grade Level: 4–9+



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What’s This Activity About?

What is the image that comes to your mind when you think of seeing our Moon in the sky? For many students, it is simply the familiar ‘crescent-Moon’ shape; for others, it is a bright ‘full’ Moon. Some students will picture a series of images related to the Moon’s changing appearance, but their personal sequence is often incomplete or incorrect because they have never systematically observed the Moon’s different shapes.

This activity investigates students’ existing knowledge of the Moon’s appearance, making their observations in the next activities more meaningful. It helps to uncover students’ preconceptions about how the Moon’s appearance changes, and is a great way to spark their curiosity about discovering the actual sequence of phases.

What Will Students Do?

Students will first draw an image of how they think the Moon looks and then discuss why their pictures may vary. Then they will analyze a series of lunar phase photos and sort them into a satisfactory sequence based on their experiences and ideas.

After creating their photo sequences, students can start an observation program over many nights to discover how the Moon’s appearance actually changes.

Tips and Suggestions

- Use this as an introduction to the Moon’s phases, followed by the next activity, “Observing Phases and Features.”
- One of the strongest parts of this activity—and often the hardest for teachers—is not providing the “correct” answers when students ask about the sequence of phases. By not revealing the answer, you will encourage personal observation and discovery.
- This activity can be adapted to model:
 - How the Sun moves across the sky during the day
 - How the Sun’s position at dawn, noon, or dusk changes
 - How the different constellations move across the sky during the night

What Will Students Learn?

Concepts

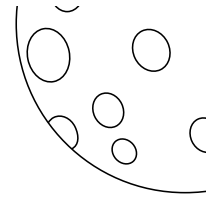
- Phases of the Moon
- Positions of the Moon and Sun in the sky

Inquiry Skills

- Visualizing
- Ordering
- Predicting
- Inferring
- Organizing

Big Ideas

- Patterns of change
- Systems

Moon Gazing
Lesson 1: Images of the Moon

Lesson 1: Images of the Moon

Everyone has a mental image of the Moon. Often this is a single image, like the full Moon. This activity is a pre-assessment of students' existing knowledge of the Moon's appearance that will make their observations in the following lessons more meaningful.

Concepts

Students share their prior understanding and beliefs about the Moon and its phases.

Objectives

Students will:

- draw their mental image of the Moon;
- analyze images drawn by different students;
- predict the sequence of the Moon's phases based upon prior knowledge using lunar photos;
- recognize that the Moon's appearance changes; and,
- question how and why the Moon's appearance changes.

Materials

- Blank paper
- Lunar photographs (Set #1)
- Scissors
- Tape or glue
- Astronomy Notebook

Procedures

1. Distribute one blank sheet of paper per student. Ask the students to close their eyes and create a mental picture of what the Moon looks like to them. Have them draw this mental image on their blank papers.
2. In small groups of three or four, have students compare their pictures. Discuss why the pictures vary (if they do).

Teacher's Note: You and other students should not judge the appropriateness of each drawing or the student's reasons for his or her drawing. Use the drawings and discussion as clues to student preconceptions about the Moon.

3. Have students post their drawings in the front of the room so all students can view them. Through an open discussion comparing the drawings, ask students "What questions do you have about the Moon?" Guide students to pose questions they might be able to answer through observing the Moon over several weeks.

Some of the questions that might be brought forth are:

- Does the Moon have different shapes?
 - Why does the Moon's appearance change?
 - What causes its changing shapes?
 - How long does it take to change?
 - When can you see the Moon's different shapes?
 - Is there a pattern to the changing shapes?
 - Does the face of the Moon always have the same features?
4. Once it has been established that the Moon changes shape or has phases, distribute copies of the lunar photographs, tape or glue, scissors and a blank sheet of paper to each work group. Their goal is to place the photographs on the sheet of paper in the order they think they would see them if they observed the Moon throughout several weeks. Allow 10 to 15 minutes for discussion and decision making.
 5. Once each group is satisfied with the order of the photos, students should tape or glue them to the blank sheet of paper. Number the pictures from one to six in the order each would be seen. Be sure to indicate which way is up.
 6. When all of the groups have completed their photo sequences, have them move around the room to see the predictions of other groups. Ask work groups to explain their reasoning for choosing the sequence they used. These reasons should not be judged for appropriateness since the students are only presenting their best guess. During the post-assessment using this activity (Lesson 3), students should have a much better grasp of the order of the photos and the reasons for that order.
 7. The students' predictions should be posted on a wall of the room for ongoing reference during Lesson 2. Alternately, one member of each work group can keep the team's photo sheet in his or her Astronomy Notebook for later reference.

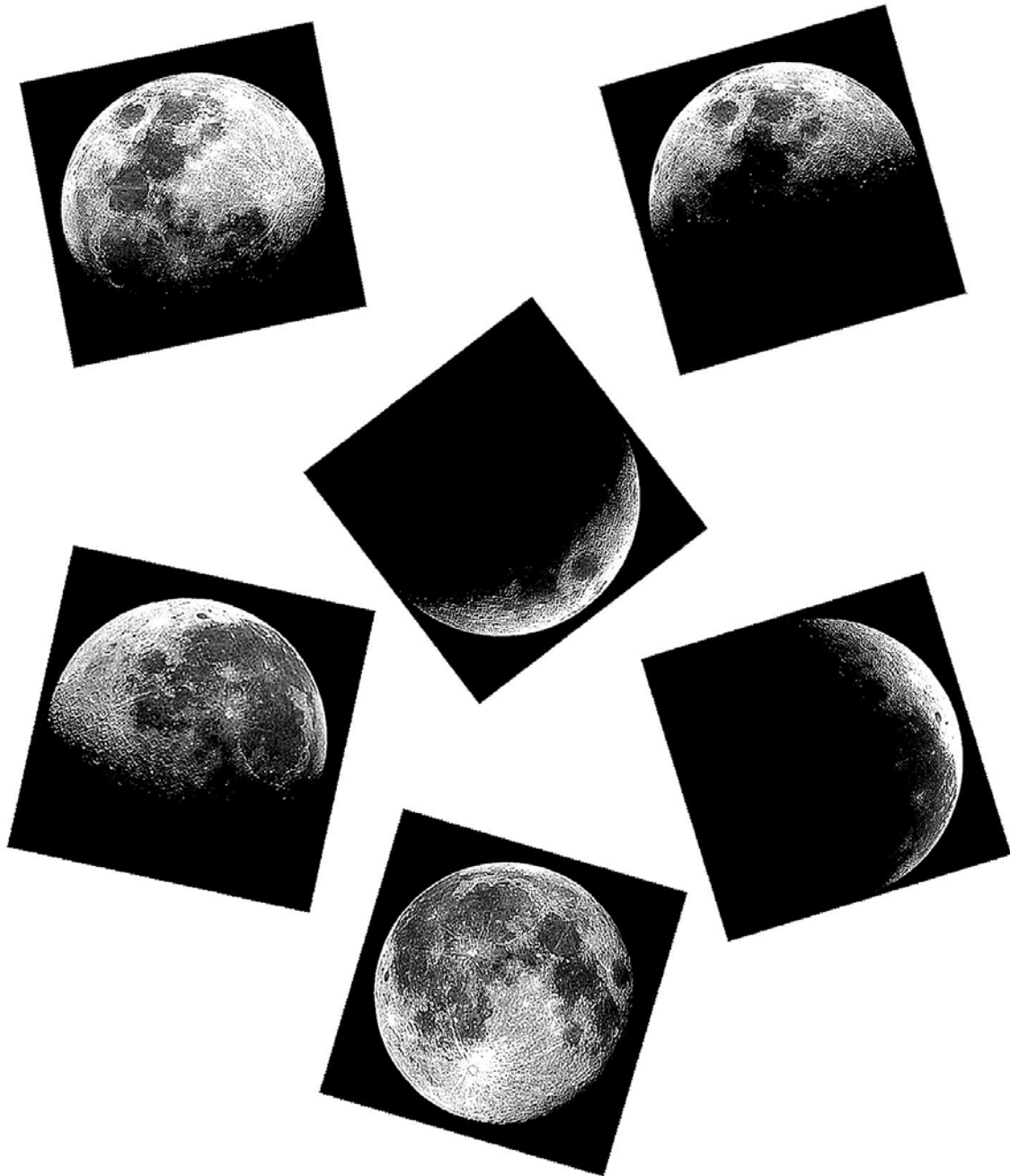
Teacher's Note: Students will want to know the "right" answer to sequencing the Moon photographs and also will want to discover the answers to some of the questions raised during the class discussion. It is important not to share the right answer at this point, but to use Lesson 2 as a means for students to discover the correct order of the photographs.

Set #1 — One Possible Order of Moon Phase Photos



Lunar Photographs – Set #1

Cut out each picture. Arrange them in the order you would expect to see the Moon during the next several weeks.



Astro Adventures, *Moon Gazing, Lesson 1: Images of the Moon*
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