

Moon Phases

Moonphase Garden with Skyling

Learning target

Explain the Moon's changing appearance without using Earth's shadow as the cause.



Before you begin

Use the reference page and discussion prompts on their own, or open the optional browser adventure. No earlier lesson or physical kit is required.

For online play: use an internet-connected current browser with local storage enabled. Read the three-part Gemling briefing, answer the quick check, and apply the evidence at three checkpoints. Retry feedback supports review; results are not a secure test or gradebook.

Use for teacher-led review, science centers or partner practice. Independent readers may need support with the vocabulary below. The design target is grades 3-5; choose support based on the learner.

Vocabulary and concepts to discuss

Sunlit half; changing viewpoint; repeating phases; phases versus eclipses

Open Moonphase Garden - direct lesson link

Scan the QR code or use the clickable link. This guide is usable offline; the adventure runs on an external educational website.



Moon Phases - key ideas

1. The first clues

The Sun lights roughly half of the Moon. As the Moon orbits Earth, we see different amounts of that sunlit half.

2. How the clues connect

The repeating visible shapes are Moon phases. Ordinary phases are not caused by Earth's shadow; a lunar eclipse is a different alignment.

3. Our evidence record

Our simplified sequence shows new Moon, first quarter, full Moon and last quarter before repeating. A full Moon shows the sunlit face toward Earth; the Moon itself has not changed shape.

Keep the science accurate

Moon phases arise from the visible sunlit portion, not usually from Earth's shadow.

Apply the evidence

Use a specific observation from this lesson to explain one choice. Point to a clue, then connect that clue to a scientific idea.

Curriculum reference: <https://www.nextgenscience.org/dci-arrangement/5-ess1-earths-place-universe>

Talk through the evidence

1. What causes ordinary Moon phases?

Expected answer: Our changing view of the sunlit portion

Reasoning: The repeating visible shapes are Moon phases. Ordinary phases are not caused by Earth's shadow; a lunar eclipse is a different alignment.

2. Has the Moon changed its actual shape?

Expected answer: No

Reasoning: Our simplified sequence shows new Moon, first quarter, full Moon and last quarter before repeating. A full Moon shows the sunlit face toward Earth; the Moon itself has not changed shape.

3. Which phase follows first quarter in our four-step sequence?

Expected answer: Full Moon

Reasoning: Our simplified sequence shows new Moon, first quarter, full Moon and last quarter before repeating. A full Moon shows the sunlit face toward Earth; the Moon itself has not changed shape.

4. What does a full Moon show us?

Expected answer: The sunlit face toward Earth

Reasoning: Our simplified sequence shows new Moon, first quarter, full Moon and last quarter before repeating. A full Moon shows the sunlit face toward Earth; the Moon itself has not changed shape.

Guide the discussion

Ask learners to name the evidence that supports their answer. If an answer differs, revisit the matching key idea on page 2 and invite a revised explanation.

Online rewards: this lesson grants one fixed digital Expedition Discovery. Five saved digital Gemling friends become available only after all six distinct subject lessons are complete, in any order. Digital rewards do not establish physical ownership.