

Moon Phase Loop

Track the repeating changes you can see.

S4E2.b "Develop a model based on observations to describe the repeating pattern of the phases of the moon (new, crescent, quarter, gibbous, and full)."

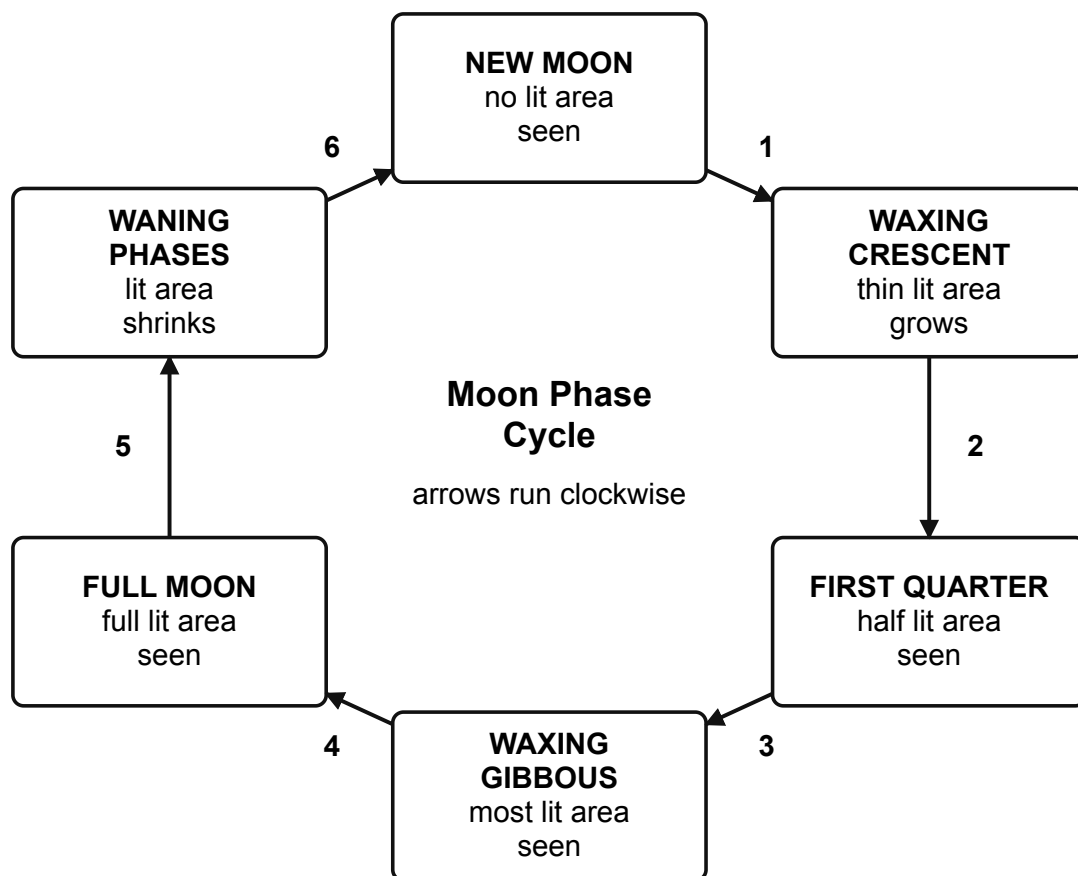
NAME _____

DATE _____

1 LABEL THE MODEL _____ Word bank below

Use the word bank to write one process in each numbered box. Follow the arrows from one stage to the next. First inspect the dated Moon observations your teacher provides. Use their changing illuminated shapes to check the order, then label this model. Use the observation journal to build your own dated cycle on extra paper.

WORD BANK	lit area grows past half	visible lit area appears	visible lit area becomes full
	visible lit area disappears	visible lit area gets smaller	visible lit area reaches half



Arrow numbers match the response boxes on the next student section.

Label the arrows

Use the word bank to write the process for each numbered arrow.

Arrow 1

Arrow 2

Arrow 3

Arrow 4

Arrow 5

Arrow 6

2 RUN THE MODEL --- Use your finished diagram

1 Which stage comes immediately after WAXING CRESCENT?

2 What happens to the visible lit area from FULL MOON to WANING PHASES?

3 Which stage comes immediately before NEW MOON?



CHECK IT

Before you turn it in

- ☐ I used one word-bank process in each box.
- ☐ I followed the arrows around the loop.
- ☐ I checked that the pattern returns to NEW MOON.

TEST THE MODEL

What does this model leave out about the real Moon-Earth-Sun system?

Moon Observation Evidence

NAME _____ DATE _____

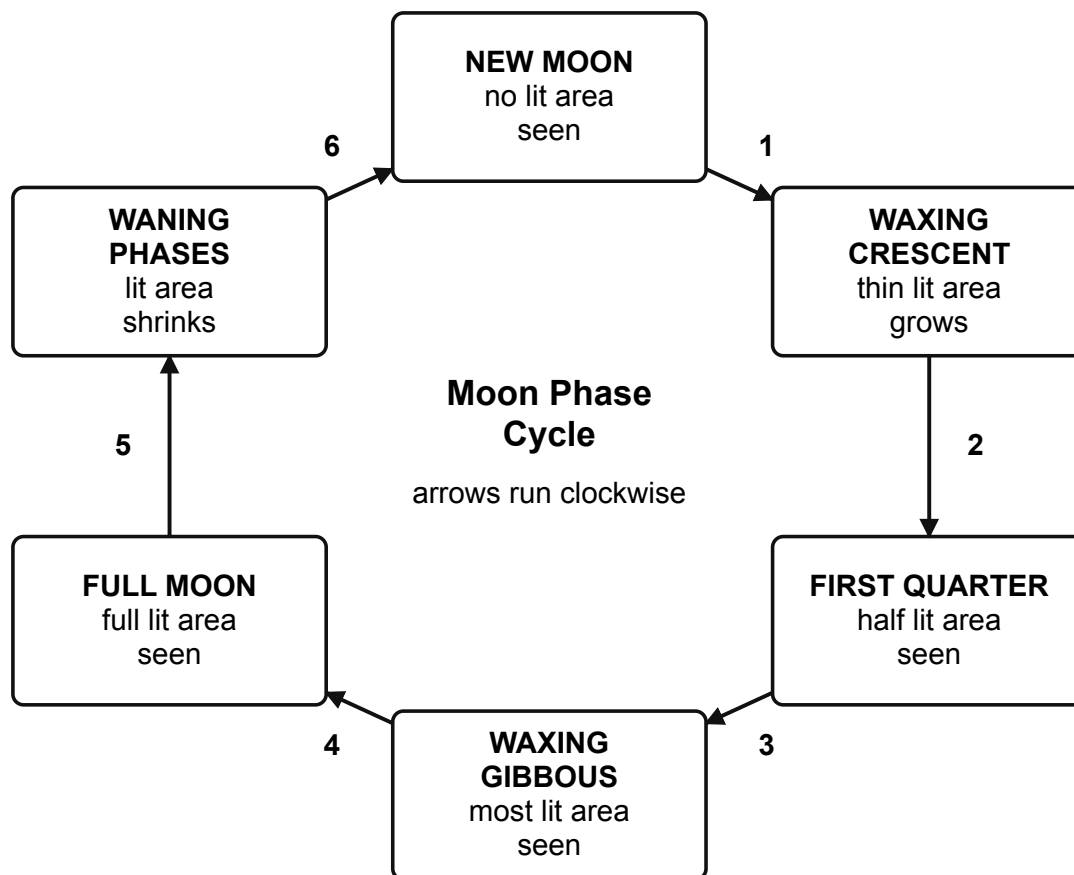
Teacher provides genuine dated Moon photos or class observation sketches spanning a full phase cycle and the start of the next, plus their source and observation dates. Record the source below. These are observations to inspect, not imagined Moon shapes.

Inspect the sequence in date order. For each record sketch the visible illuminated shape and name its phase. Copy this page for more records. On extra paper arrange your observed shapes in a loop with arrows; show waxing, full, waning and return to the initial phase. Cite two dates that support growth or shrinkage and two that support repetition. For new Moon use the identified phase-date record, not a guessed dark sky. Compare your loop with the six-stage model, which groups all waning phases together.

Date	Observed shape or sketch	Phase / source

Optional class observations over about 35 days can build the set; record clouds or nonvisibility honestly. Adult supervises sky viewing; never look at the Sun.

PART 1 • COMPLETED MODEL

**Arrow 1**

visible lit area appears

Arrow 2

visible lit area reaches half

Arrow 3

lit area grows past half

Arrow 4

visible lit area becomes full

Arrow 5

visible lit area gets smaller

Arrow 6

visible lit area disappears

PART 2 • RUN THE MODEL

1. **FIRST QUARTER** (Which stage comes immediately after WAXING CRESCENT?)
2. **The visible lit area gets smaller.** (What happens to the visible lit area from FULL MOON to WANING PHASES?)
3. **WANING PHASES** (Which stage comes immediately before NEW MOON?)

TEST THE MODEL (SAMPLE ANSWERS)

- It leaves out the Moon's exact position in its orbit.
- It leaves out how sunlight shines on the Moon.

The arrow phrases describe the changing amount of the Moon's sunlit half that is visible from Earth. The pattern repeats because the Moon orbits Earth. Provide the dated observational set before labeling; use actual classroom records or sourced Moon photographs with dates covering crescent, quarter, gibbous, full, waning and a repeated phase. Do not call an invented diagram or a calculated animation an observed photo. A trusted phase-date record can identify new Moon when it is not normally visible. Require the learner's observed-shape records, own chronological arrow loop and two dated change/repetition comparisons. Accept hemisphere-dependent orientation; waxing means the visible lit fraction increases, not universally right-lit. The phases repeat about every 29.5 days. The original six-node model compresses waning gibbous, third quarter and waning crescent into one stage. Example only if supported by the supplied dated records: an earlier crescent and later quarter show growth; full then waning quarter show shrinkage; two corresponding phases about a month apart support repetition. Use extra journal copies as needed.