Moon Phase Loop

Analyze a practice observation log to identify a repeating pattern.

5.11 "Analyze data that reveal patterns of daily changes in length and direction of shadows, day and night, phases of the moon, and seasonal appearance of some stars in the night sky."

NAME _____ DATE _____

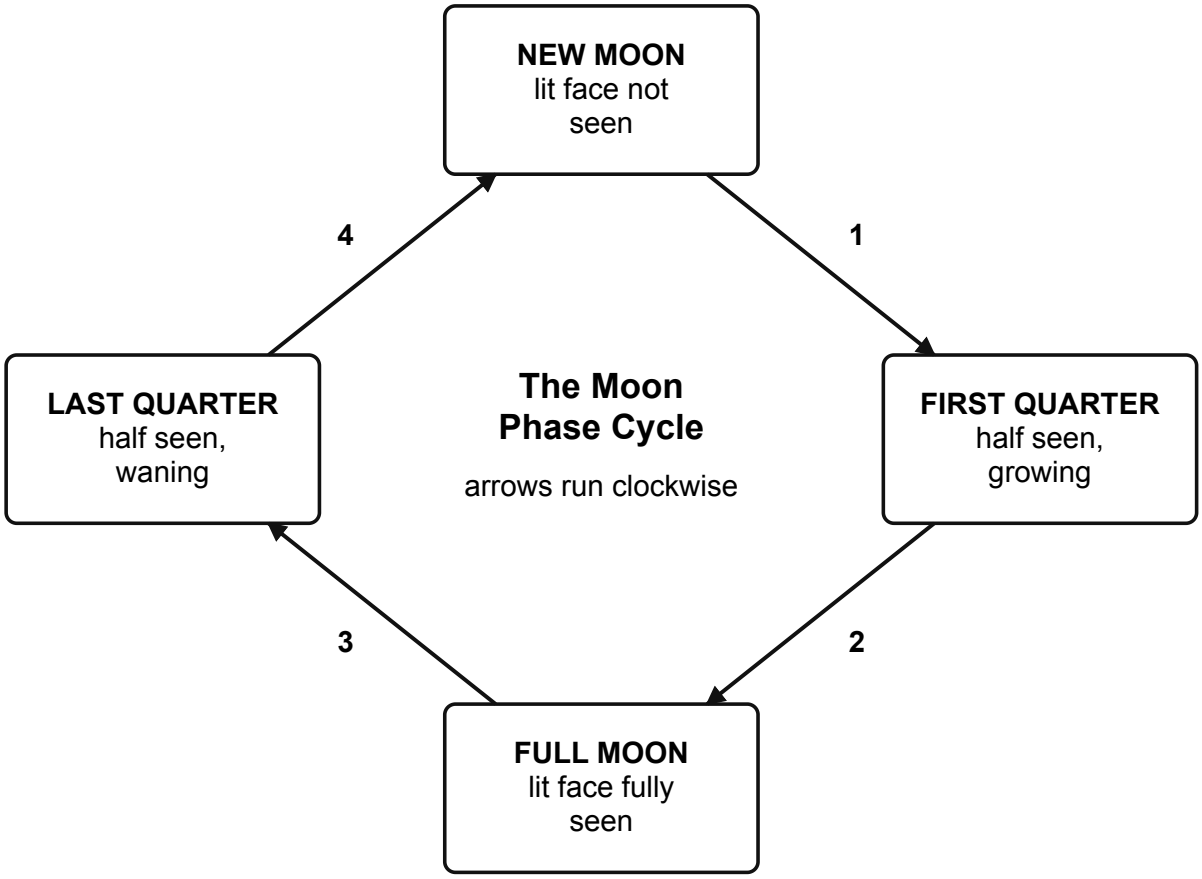
1 LABEL THE MODEL

Word bank below

Simulated observation log, rounded to whole days: day 0, new Moon; day 7, first quarter; day 15, full Moon; day 22, last quarter; day 29, new Moon. Fill the arrow boxes, then use these data to explain and predict the pattern.

WORD BANK

- Orbit: lit view grows to full
- Orbit: lit view grows to half
- Orbit: lit view wanes to half
- Orbit: lit view wanes to none



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

2 RUN THE MODEL

Use your finished diagram

1. Use the two new-Moon entries to estimate the cycle length in this practice log. Show the day-number calculation.

2. Days 7 and 22 both show half the lit face. How does the surrounding data show their different positions in the cycle?

3. If this estimated pattern repeats, around which day would the next full Moon occur? Use the day-15 observation as evidence.

3 CHECK IT

Before you turn it in

- [ ] I used day numbers as evidence.
- [ ] I distinguished growing from waning phases.
- [ ] I labeled my prediction as an estimate.

TEST THE MODEL

Which Moon phases does this four-stage model leave out?

ANSWER KEY

Moon Phase Loop

GRADE 5 · 5.11

PART 1 · COMPLETED MODEL

ARROW	FROM	TO	PROCESS
1	NEW MOON lit face not seen	FIRST QUARTER half seen, growing	Orbit: lit view grows to half
2	FIRST QUARTER half seen, growing	FULL MOON lit face fully seen	Orbit: lit view grows to full
3	FULL MOON lit face fully seen	LAST QUARTER half seen, waning	Orbit: lit view wanes to half
4	LAST QUARTER half seen, waning	NEW MOON lit face not seen	Orbit: lit view wanes to none

PART 2 · RUN THE MODEL

1. **29 - 0 = about 29 days. This is an estimate from rounded simulated data; the real average cycle is about 29.5 days.** (Use the two new-Moon entries to estimate the cycle length in this practice log. Show the day-number calculation.)
2. **Day 7 is between new and full, so the visible illuminated part is growing. Day 22 is between full and new, so it is waning.** (Days 7 and 22 both show half the lit face. How does the surrounding data show their different positions in the cycle?)
3. **Around day 44: 15 + 29 = 44. Accept a clearly explained approximate prediction based on the log, not a claim of an exact real calendar date.** (If this estimated pattern repeats, around which day would the next full Moon occur? Use the day-15 observation as evidence.)

TEST THE MODEL (SAMPLE ANSWERS)

- It leaves out the crescent phases.
- It leaves out the gibbous phases.

This is a simulated log for data analysis, not real dated observations. The Moon phase cycle averages about 29.5 days; the four shown stages omit crescents and gibbous phases. The Sun illuminates about half the Moon while the visible portion changes. Source: NASA Science, Moon Phases.