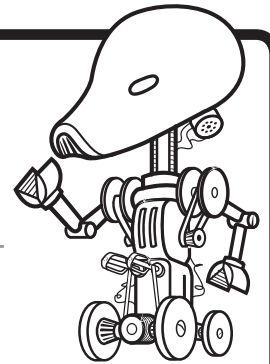


Student Activity Sheet 3B Name _____

Modeling the Phases of the Moon



Date: _____

Team of Scientists:

A) _____ **B)** _____

C) _____

Equipment: 1 flashlight

1 styrene sphere

A. Plan

Think about how your team can model the phases of the Moon. Choose one team member to hold the flashlight and represent the Sun. Choose another to represent an observer on Earth. Choose a third to hold and move a sphere to represent the Moon.

B. Predict

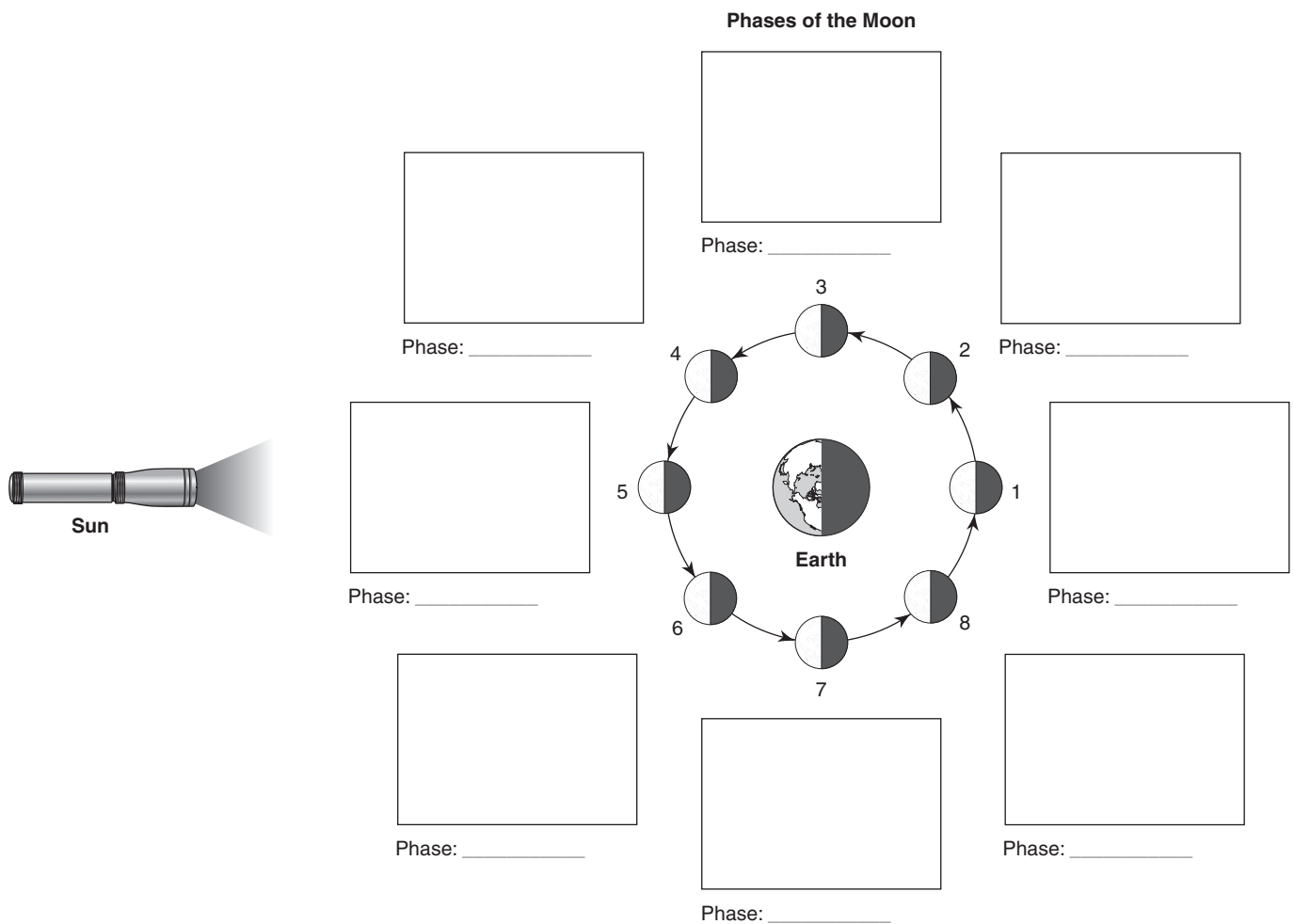
What do you think will change as you model the different phases of the Moon?

I think _____

because _____

C. Model, Observe, and Record

- Look at the diagram below. It shows the set positions of the Sun and Earth and the changing position of the Moon, numbered from 1 to 8, as it moves in its orbit around Earth. These are the positions the members of your group will take to complete the observation.
 - The student in the Sun role should stand in one place.
 - The student in the Earth role is the observer and should sit in one place (so as not to block the sunlight from reaching the Moon), only rotating to face the student in the Moon role.
 - The student in the Moon role should stand, changing position eight times.
- When your teacher darkens the room, the team member in the Sun role turns on the flashlight and shines it toward Earth and the Moon.
- The Moon begins at position 1 on the diagram. In the space near position 1, the person in the Earth role draws how the lit and dark parts of the Moon appear from his or her position.
- Have the student in the Moon role move to each of the remaining positions in the diagram. The Earth observer should turn to face the Moon as the Moon revolves. The flashlight should not move. Each time, the student in the Earth role should record his or her observations.
- Switch roles and repeat the activity until all team members have recorded their observations of the Moon's phases from the position of the Earth.



D. Identify

Use the diagram below to identify the phases of the Moon that you observed. Label your drawings on the diagram in Part C with the name of each phase.



New
moon



Waxing
crescent



First
quarter



Waxing
gibbous



Full
moon



Waning
gibbous



Last
quarter



Waning
crescent

E. Conclude

1. Number and list the phases of the Moon in the order in which you observed them. _____

2. Based on your observations, what can you infer about the meaning of the words *waning* and *waxing* in terms of the Moon? _____

3. To an observer on Earth, what about the Moon appeared to change? _____

4. Does the Moon's actual shape or the amount of the Moon's surface that is lit by the Sun actually change during its revolution around Earth? Explain your answer. _____

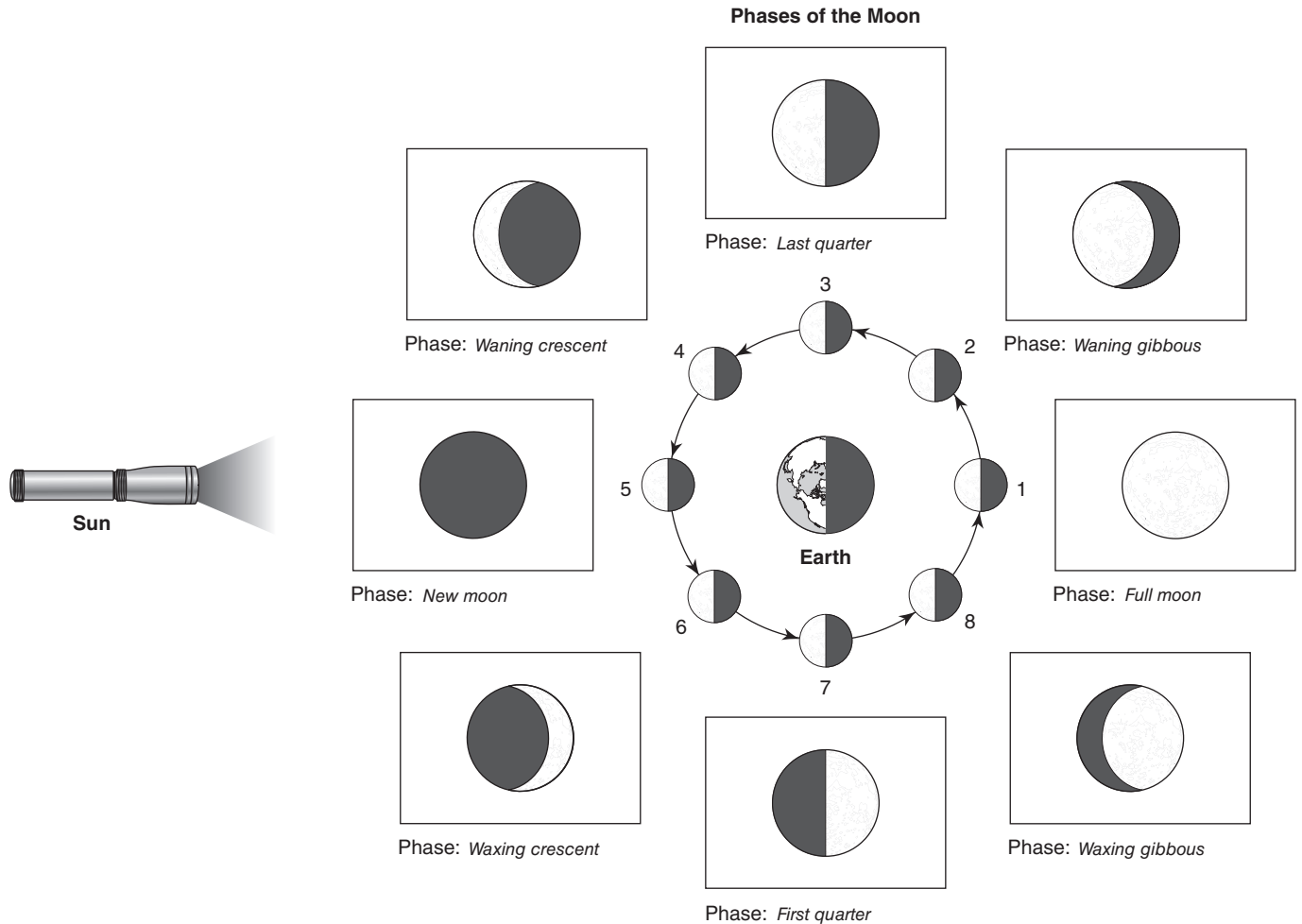
5. What causes the phases of the Moon? _____

6. What are two questions you have about the Moon's phases? _____

Student Activity Sheet 3B: Teacher's Version

Modeling the Phases of the Moon

C. Model, Observe, and Record



E. Conclude

1. Number and list the phases of the Moon in the order in which you observed them. (1. *Full Moon*, 2. *waning gibbous*, 3. *last quarter*, 4. *waning crescent*, 5. *new moon*, 6. *waxing crescent*, 7. *first quarter*, 8. *waxing gibbous*)
2. Based on your observations, what can you infer about the meaning of the words *waning* and *waxing* in terms of the Moon? (*Waning means decreasing or getting smaller. Waxing means increasing or getting larger.*)
3. To an observer on Earth, what about the Moon appeared to change? (*The shape of the Moon appeared to change.*)
4. Does the Moon's actual shape or the amount of the Moon's surface that is lit by the Sun actually change during its revolution around Earth? Explain your answer. (*No. Half of the Moon is lit by the Sun throughout its revolution.*)
5. What causes the phases of the Moon? (*As the Moon revolves around Earth, the amount of the half of the Moon lit by the Sun changes as viewed from Earth. This makes the lit part of the Moon seem to change shape, or phase.*)
6. What are two questions you have about the Moon's phases? (*Students' questions will vary.*)

