

NAME: \_\_\_\_\_ PERIOD: \_\_\_\_\_ DATE: \_\_\_\_\_

LAB PARTNERS: \_\_\_\_\_ LAB #38

## PHASES OF THE MOON

### MATERIALS

Seven Oreo cookies  
Plastic spoon  
Paper towel

APPROXIMATE TIME 1 – 1 ½ periods

### OBJECTIVES

To determine the phases of the moon using Oreo cookies.

### PROCEDURES:

1. Each pair of students will receive 7 Oreo cookies. (DO NOT EAT THE COOKIES IN LAB!)
2. Separate your cookies carefully, so one ½ has all the frosting, and the other ½ no frosting. Do not make a mistake. There will be NO replacement cookies!



Figure 1: Properly separated cookie.

3. Use your plastic butter knife to scrape off the frosting from the first cookie making a shape with the frosting that resembles the cookie in figure 2. (Pile all the extra frosting on a separate paper towel to be discarded later, DO NOT EAT DURING LAB!)

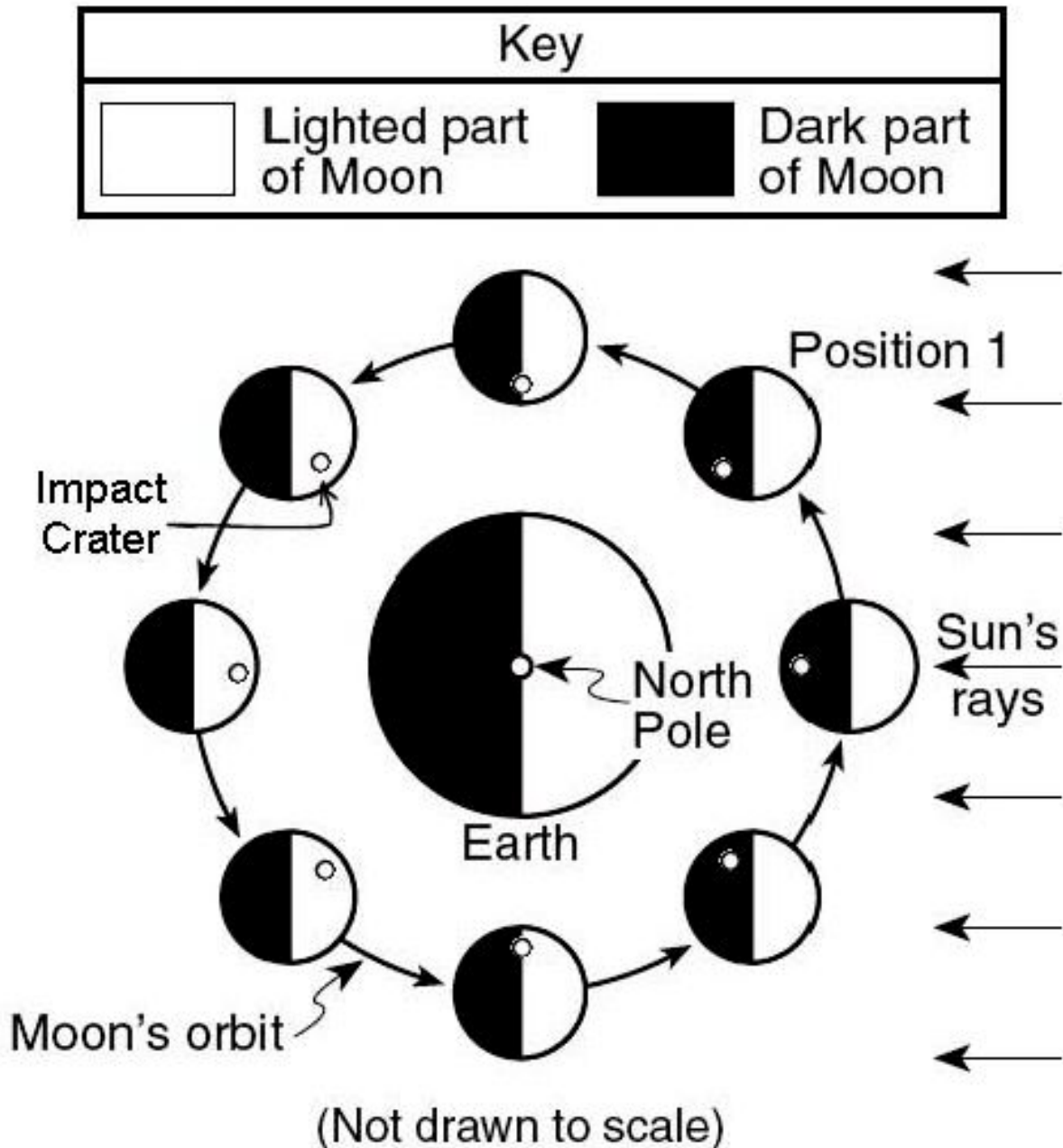


Figure 2: Oreo frosting scraped to represent a moon phase.

4. What is the name of this moon phase? \_\_\_\_\_
5. **Repeat step C with the other cookies scraping the frosting to the shape of the other 6 phases as seen by Earthlings. You will need to create waxing and waning phases.**

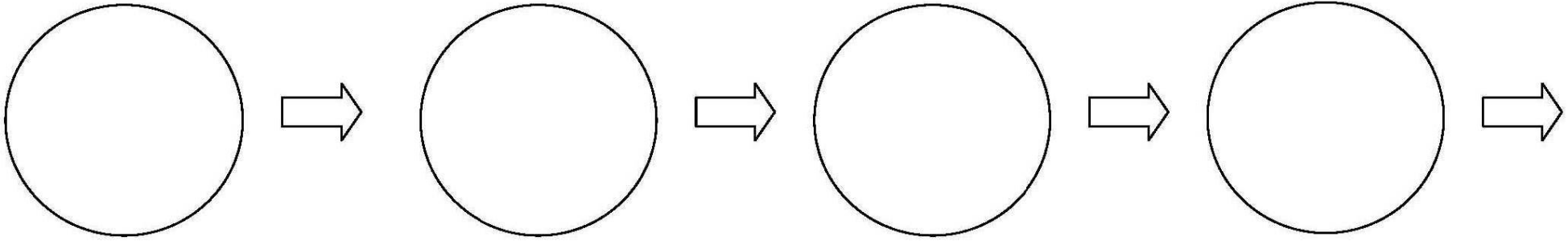
6. **Diagram A** represents the Moon in its orbit around the Earth, as viewed from the Earth's North Pole. Position 1 on the diagram represents a certain location of the Moon in its orbit.
7. **On Diagram B**, place the cookie moons you created in their proper locations starting from Position 1 and working counterclockwise according to the order on Diagram A. (**When you are done show your teacher and then draw and label the moon phases.**)
8. How will you represent the final phase, the New Moon? \_\_\_\_\_

**Diagram A** – This diagram represents the Moon in its orbit around the Earth, as viewed from the Earth's North Pole. Position 1 represents a certain location of the Moon in its orbit.



**DIAGRAM B – How Earthlings view the Moon** (place your cookie moons here).

**Position 1**

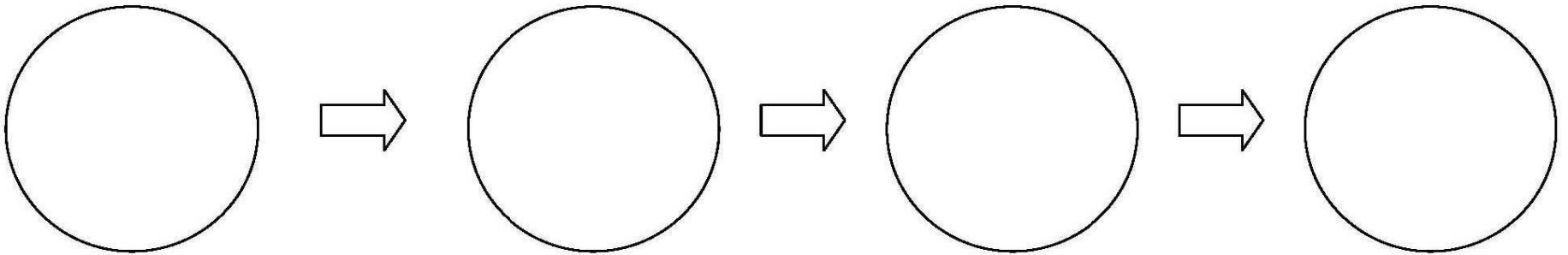


Position 1

Position 2

Position 3

Position 4



Position 5

Position 6

Position 7

Position 8

**LABORATORY QUESTIONS**

1. Describe the process that causes the moon to appear as these different phases to Earthlings.

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2. Explain why we always see the same side of the moon. \_\_\_\_\_

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3. Using your ESRT, what is the period of revolution of our moon? \_\_\_\_\_

4. Using your ESRT, what is the period of rotation of our moon? \_\_\_\_\_

5. How many days does it take the moon to complete one cycle of phases as viewed from the earth?  
\_\_\_\_\_

6. Using the diagram to the right, an observer at location X notices the moon's size change throughout the month. What would cause this to occur?

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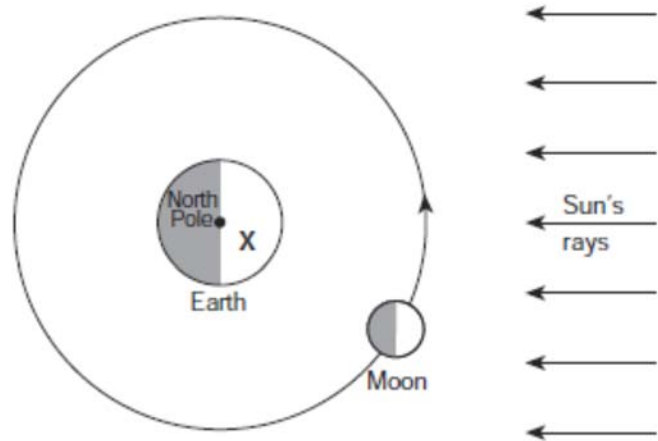
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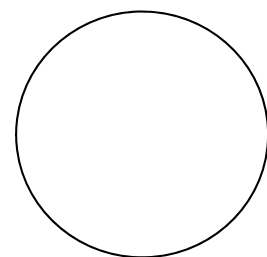
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(Not drawn to scale)






7. Using the above diagram, an observer at location X views the moon at the position shown. Which phase of the moon will the observer see? Be sure to draw what it would look like and the name of the phase.





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Base your answers to questions **8** through **12** on the calendar below, which shows the month of July of a recent year. The dates of major Moon phases, as seen in New York State, are shown.

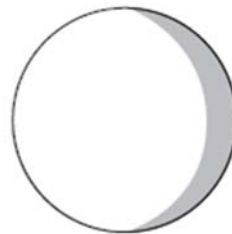
**July**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
 1	2	3	4	5	6	7
 8	9	10	11	12	13	14
15	 16	17	18	19	20	21
22	 23	24	25	26	27	28
29	 30	31				

Key	
	New Moon
	First-quarter Moon
	Full Moon
	Last-quarter Moon

8. The diagram below represents the phase of the Moon observed from New York State one night during the month of July. On which date was this phase of the Moon visible from New York State?

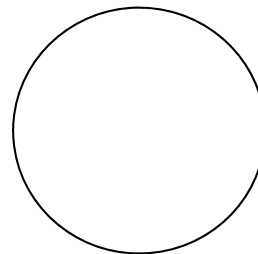
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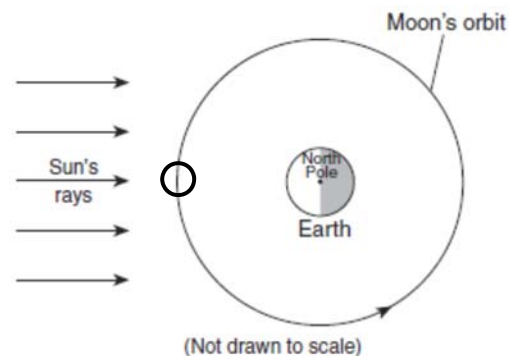
9. On which date will the next first-quarter Moon phase occur? \_\_\_\_\_

10. On which date will the next full Moon phase occur? \_\_\_\_\_

11. Draw what the moon phase would look like July 4<sup>th</sup>:



12. On the diagram below, a circle is drawn (O) on the Moon's orbit to show the position of the Moon on July 30<sup>th</sup>. Place an "X" on the Moon's orbit where it will be on August 6<sup>th</sup>:



Shown below are different phases of the moon as seen by an observer in the Northern Hemisphere. Base your answers to questions 13 through 16 on the diagram below:



A                      B                      C                      D                      E

13. **Ranking Instructions:** Beginning with the *waxing gibbous* phase (which you need to identify on your own) of the Moon, rank all of the five moon phases shown above in the order that the observer would see them over the next four weeks (be sure to write the picture letter and the phase name in the space provided!).

Moon Phases Sequential Order	
Phase Name	Letter
Waxing Gibbous	

14. If you started with letter B, how many week(s) will it take to go to letter E? \_\_\_\_\_

15. If you started with letter B, how many week(s) will it take to go to letter C? \_\_\_\_\_

16. If you started with letter B, about how many week(s) will it take to go to letter A? \_\_\_\_\_

17. How many week(s) would it take to observe the sequence of Moon phases shown? \_\_\_\_\_



18. How many week(s) would it take to observe the sequence of Moon phases shown? \_\_\_\_\_

