



Lunar Lollipops

Problem: To model the phases of the moon.

Background Information: There are eight phases of the moon:

- **New Moon** – the moon is between the sun and the earth and we see the shadowed side of the moon
- **Waxing Crescent** – the rotation from a new moon toward a first quarter, backwards "c" shape will appear on the moon.
- **First Quarter** – the right half of the side of the moon facing earth is lit. The right shoulder is pointed towards the sun.
- **Waxing Gibbous** – the rotation from a first quarter to a full moon.
- **Full Moon** – the earth is between the moon and the sun; the entire lit side of the moon is visible on Earth
- **Waning Gibbous** – the rotation from a full moon to a last quarter; less and less of the moon is lit each night.
- **Last Quarter** – the left half of the side of the moon facing the earth is lit; left shoulder is pointing to the sun.
- **Waning Crescent** – the rotation from a last quarter to a new moon; a "c" shape of light is seen on the left side of the moon.

Materials:

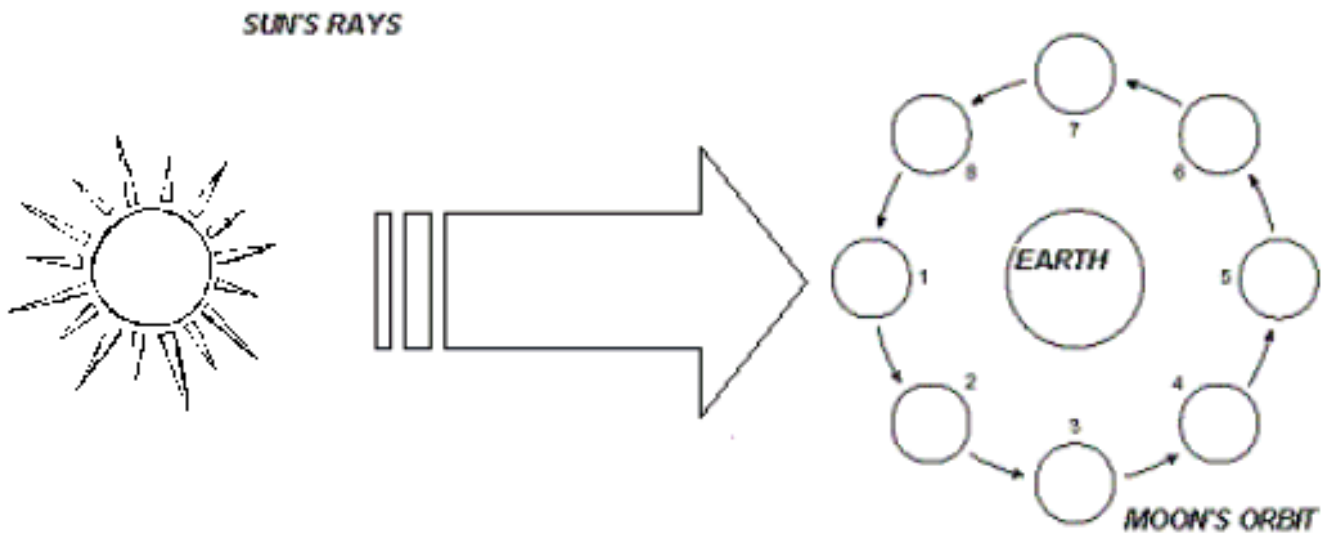
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| Wrapped lollipop | Round, white sticker | Small lamp |
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Procedure:

1. Put the sticker on one side of the lollipop. This represents the moon.
2. The lamp represents the sun. You represent Earth.
3. Turn off the lights in the classroom. Turn on your small lamp.
4. Hold the lollipop stick in your left hand and face the sun.
5. Hold the moon so that it is between the Earth and the sun.
6. Notice that the side of the moon facing the Earth has no reflected light shining on it. This phase is called the NEW MOON.
7. Shade in a NEW MOON on the diagram. Begin with # 1.
8. Move the moon about 45 ° toward the **left** (counter-clockwise) around the sun. Observe the sunlight reflected by the moon. You should see the right hand edge of the lollipop lit up as a crescent. This is the WAXING CRESCENT phase of the moon.
9. Shade in the WAXING CRESCENT on the diagram.

10. Move the moon about 90 ° toward the **left** around the sun. Observe the sunlight reflected by the moon. You should see the right half lit up. This is the FIRST QUARTER phase of the moon.
11. Shade in the FIRST QUARTER on the diagram.
12. Move another 45 °. This is the WAXING GIBBOUS phase.
13. Shade in this phase on the diagram.
14. Move the moon another 45 °. It should now be directly opposite the sun. This phase is the FULL MOON.
15. Shade in this phase on the diagram.
16. Switch the moon to your right hand.
17. Keep on moving the moon in 45 ° increments. You will observe the reverse of the phases; this time with the left hand side of the moon lit up.
18. Shade in each phase on the diagram.

Data:



Conclusion:

Using the data diagram; label each phase of the moon.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____