



Moon on a Stick

A M.A.R.S. Resource Document

Object: Learn about the phases of the moon.

Age: 7 years and older

Materials - For each participant you will need:

- a ping pong ball
- a short dowel (about 8" long) or a pencil
- some flat gray paint
- glue or wood putty

Preparation:

1. Attach the dowel or pencil to the ping pong ball by doing the following: Poke a hole in the ping pong ball. Insert the dowel or pencil until it touches the far end of the ball. Glue or putty the dowel at the point where it enters the hole. Let dry.

2. Coat the ping pong ball with flat gray paint. Spray paint is the easiest type for this, but it requires a well-ventilated area. Apply a few coats and let dry.

Activity Requirements:

1. A "moon on a stick" for each participant.

2. A morning with a bright sun low in the sky, or a bright horizontal light source such as a flood light or spot light.

Activity:

1. Go outside to the low morning sun, or turn on your horizontal light source.

2. Hold out your "moon on a stick" at arms length with the ping pong ball pointing up. You are now the Earth and the light source is the sun.

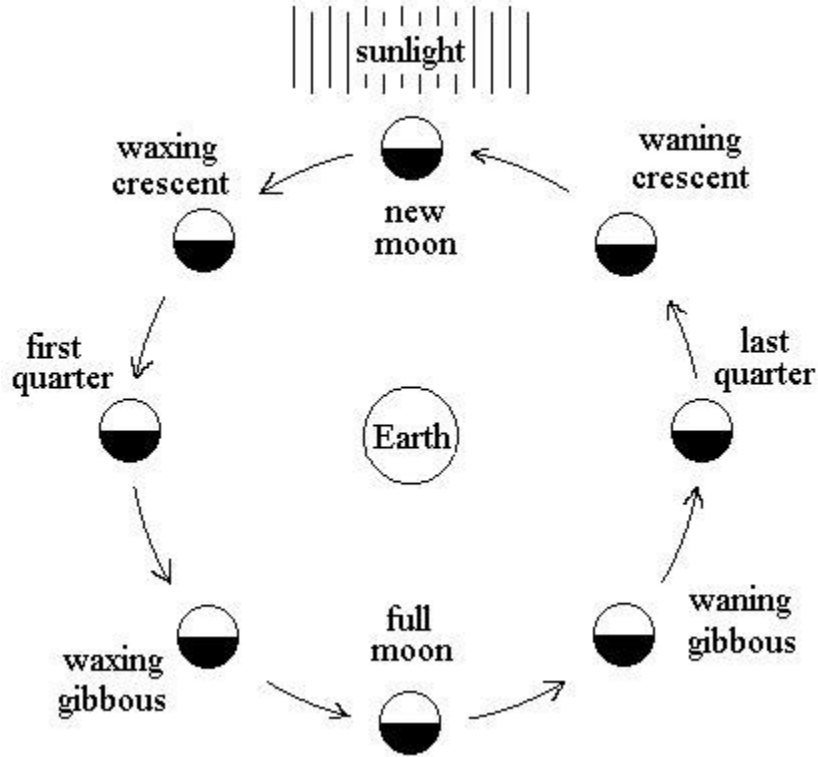
3. Imitate the phases of the moon:

- Start with your "moon" extended toward the "sun." The side of the "moon" facing toward you is completely in shadow. This is a New Moon.
- Slowly turn to the left until you are turned halfway away from the "sun." The "moon" is now showing you a waxing quarter, or a First Quarter Moon.
- Turn completely away and you see a fully lighted side of your "moon." This is a Full Moon.
- Continue turning until you are halfway toward the "sun." Your "moon" is showing you a waning quarter, or Last Quarter Moon.

- Continue turning until your "moon" is extended toward the "sun." You have completed one cycle of phases, which normally takes 29.5 days. Your "moon" is new again and ready to begin another cycle.

Here are different phases that you can try to simulate. They are listed in the order of a phase cycle:

- new moon
- waxing crescent
- waxing quarter, or first quarter
- waxing gibbous
- full moon
- waning gibbous
- waning quarter, or last quarter
- waning crescent
- new moon, again



Don't forget:

- total solar eclipse: the moon completely covers the sun
- total lunar eclipse: the moon is completely in the shadow of the Earth (your head)

When they ask why we don't see a lunar eclipse and solar eclipse every month, mention that the moon is tilted 5 degrees to the ecliptic (the plane of the sun's orbit), and so does not line up on the ecliptic every time it passes through a new or full phase.

Once you have gone through the phases, make a game out of it by calling a phase out and seeing who can simulate it first. Have fun with your "moon on a stick".

For more astronomy activities, check out www.marsastro.org, the website of the Museum Astronomical Resource Society (MARS Astronomy Club), Tampa, Florida.