



Drive-by Science

A series of quick activities for informal science events



Teaching Moon Phases

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Introduction:

Participants will learn what causes the phases of the Moon and eclipses. This is a smaller version of the full activity: <http://solar-center.stanford.edu/activities/MoonPhases/Teaching-Moon-Phases.pdf>. The full version requires a dark room. This excerpted activity can be done in a lighted room, such as during science fairs and exhibitions.

Materials Needed:

- Small (~5 cm) Smoothfoam™ or Styrofoam™ balls
- 1 sharp pencil or satay stick per ball
- 1 bright LED flashlight (white light)
- 1 image of the Sun (one is attached)
- Masking tape to put Sun image on a wall

Activity Time:

5-10 minutes

Age Group:

8 - adult

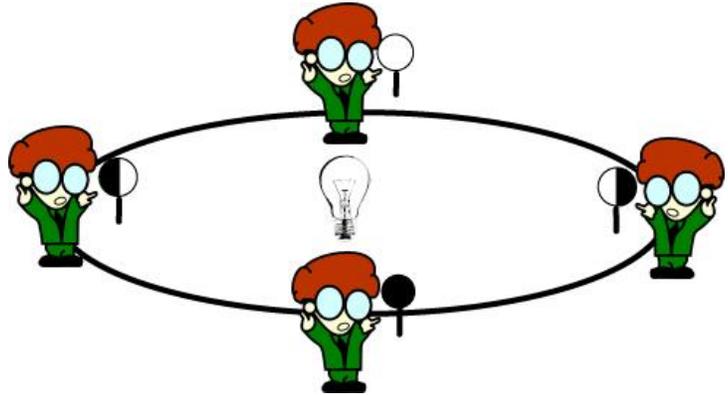


Teaching Moon phases to undergraduates in Kenya.

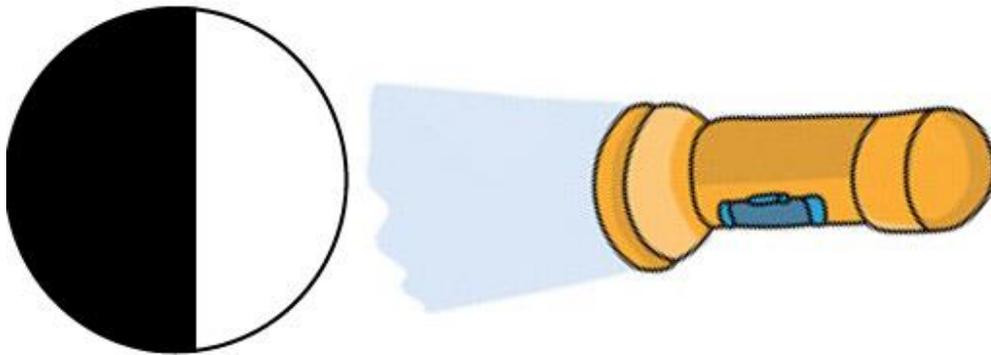
Description:

This activity is normally done using a clear light bulb placed high in the middle of a circle of participants.

The light bulb would represent the Sun, the participant's head the Earth, and the Styrofoam™ ball the Moon. The participant would observe the changes in Moon phase as the Moon ball "orbits" their head, the Earth. However, for this to work a dark room is required. During public events, this is usually not possible.



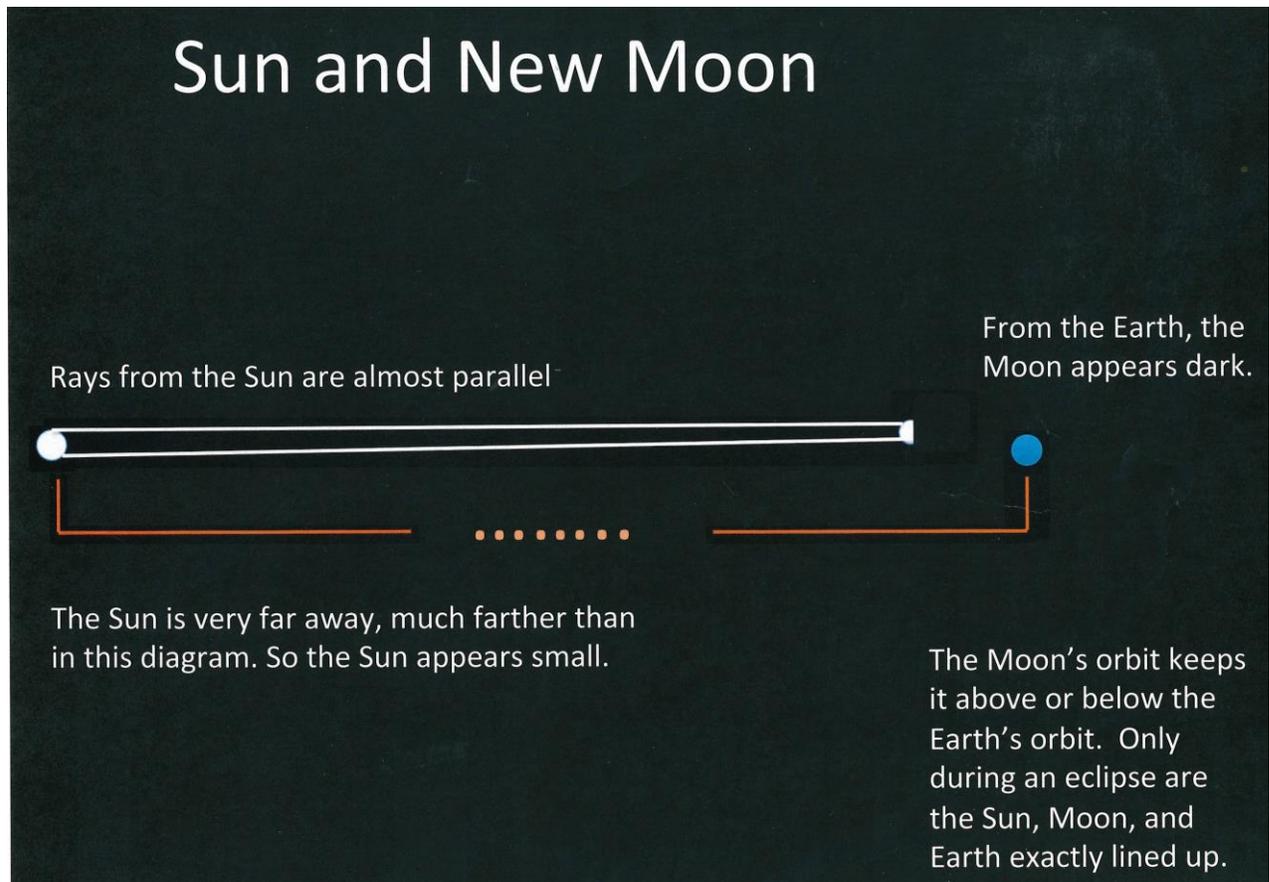
In this version, we use a paper image of the Sun (attached) taped on a wall visible from the users table or station. A flashlight held near the Moon ball will represent the light from the Sun.



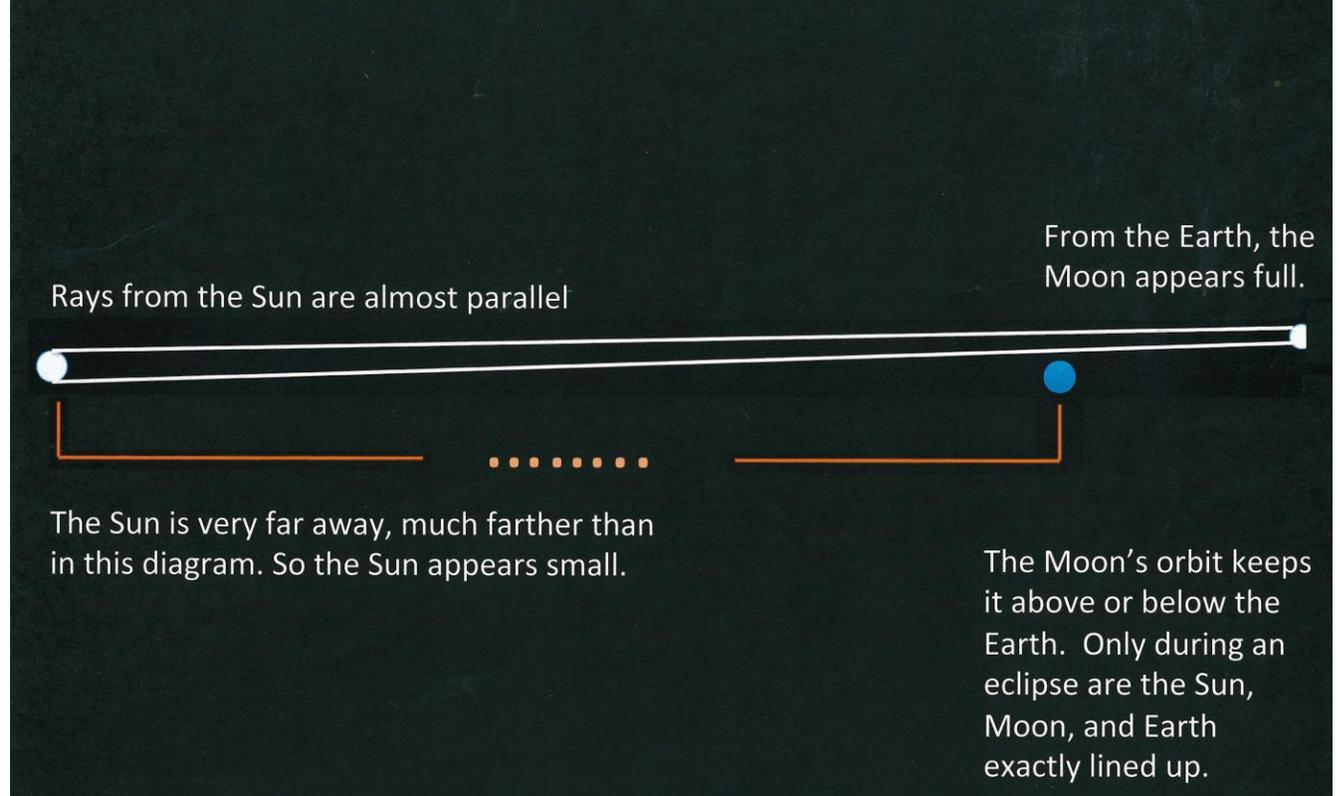
Procedure:

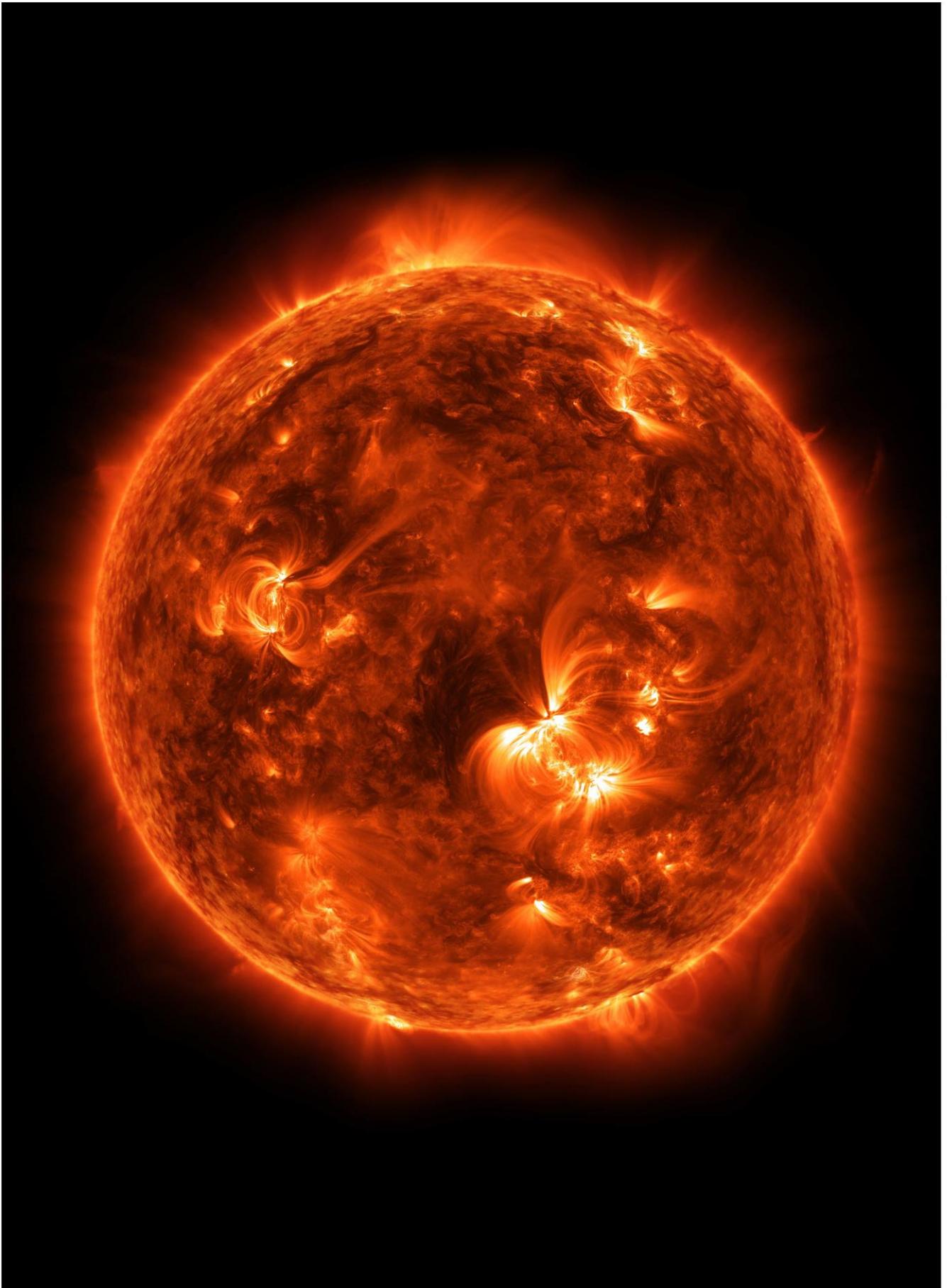
1. Tape the Sun image on a wall visible from your station. If you are outside, or have no wall, you might pick something visible to represent the Sun.
2. You will hold your small flashlight, which will represent the light from the Sun.
3. Ask potential participants if they know what causes the phases of the Moon. Accept whatever answer they give. Then ask if they would like to experiment to discover what causes the phases.
4. Hand the participant a Moon ball on a stick. Point to the Sun image and ask them to imagine the light coming from the "Sun". Holding your flashlight a few inches from the Moon ball, shine the light from your small flashlight in the direction from the "Sun". Point out that half the ball is lit, and half is dark.
5. Ask the participant to face the "Sun" and hold the ball up between themselves and the Sun. Again place your flashlight so that it is mimicking the light from the Sun. Ask the participant what they see. [dark moon, or New Moon]
6. Ask the participant to turn around 180 degrees, so the back of their head is facing the Sun. Have them hold the Moon ball high enough that it catches the light from the Sun, your flashlight. Now what do they see? [Full Moon]

7. Have the participant go back to the New Moon position. Then have them move their Moon ball slightly to the left (i.e. counterclockwise). Again hold up your flashlight in the direction from the Sun. What do they see? [small, waxing crescent]
8. Ask the participant to continue moving the ball in a circle to the left until they find First Quarter, Waxing Gibbous, and New Moon, all with you shining the flashlight from the direction of the Sun.
9. Continue moving the ball & flashlight counter-clockwise through Waning Gibbous, Last Quarter, and back to New Moon.
10. Ask participants to verbalize what causes the phases of the Moon [result of looking at the illuminated half of the Moon at different times during its month-long orbit around the Earth]
11. If you have time, you could demonstrate a total solar eclipse and a total lunar eclipse. Ask participants why we don't have these eclipses every month. [Moon's orbit is tilted so it rarely falls exactly in line with the Sun and Earth] Mentioning scale at this point often helps.



Sun and Full Moon





The Sun in extreme ultraviolet, artificially colored. NASA