

Flashlights and Spheres

Inspired by *Moon Chef* by Delia Ruiz.

The moon appears to change shape in a pattern over time. The moon doesn't make its own light; it reflects light from the sun. As the moon and Earth move, different amounts of the light that the moon reflects can be seen from where we are on Earth.

You can use a lamp or flashlight to represent the sun's light and a ball to represent the moon.

Goal: Create reflections and shadows that look like crescents, half circles, and circles.

You will need:

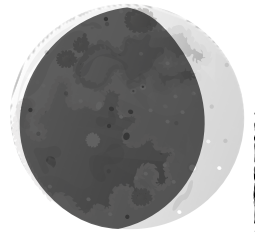
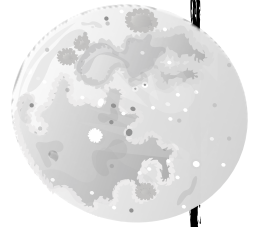
- Spherical objects (a basketball, soccer ball, or similar-sized sphere)
- A light source (flashlight or lamp)
- A dark room or location
- Optional: A chart showing the phases of the moon

What to do:

- In a dark room or location, shine a light on a sphere. Set up the light so that you aren't holding it.
- Stand next to the light, looking at the sphere. How much of the sphere is covered in light?
- Move the sphere closer and farther from the light source. Observe what happens.
- Move so you're looking at the sphere from the side. You, the light, and the sphere will be in a triangle.
 - How much of the sphere is reflecting light?
 - What portion is covered by shadow?
 - Move yourself, the sphere, or the light so that you see the sphere as a lit-up crescent or half-circle, or in complete shadow.
- Try to make the sphere look like the different phases of the moon.

To think about:

We say the moon waxes when it appears to grow bigger and wanes when it appears to grow smaller. Is the moon really getting bigger or smaller? Why does the moon look like it changes shape?



Moon Phases



New Moon
No moon is visible



Full Moon
Appears as a fully lit circle



Waxing Crescent
A thin, curved sliver of light on the right*



Waning Gibbous
More than half a circle, but not a full circle, on the left*



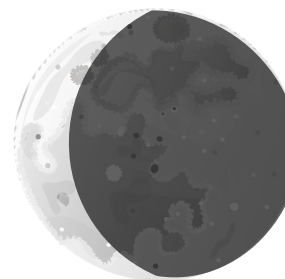
First Quarter
A half circle of light on the right*



Last Quarter
A half circle of light on the left*



Waxing Gibbous
More than a half circle, but not a full circle, on the right*



Waning Crescent
A thin, curved sliver of light on the left*

* in the Northern Hemisphere