



# High Touch High Tech®

Science Experiences That Come To You

## Equinox - Oreo Phases of the Moon

### Ingredients & Supplies:

- OREO cookies
- paper plate
- popsicle stick or plastic knife
- OREO phases of the Moon printout

### Instructions:

You can make a model of the Moon phases with Oreo cookies! First, you need to get your materials. You'll need a paper plate, a popsicle stick or plastic knife, the Moon Phases printout (see below) and OREO cookies.

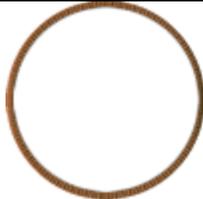
First, you will slowly twist open 4 OREO cookies. You want the frosting to stay on one side when you separate the halves. It's tricky, so twist the OREOs very slowly.

Next, place the 4 opened cookies on your paper plate with the frosting side up. Look at your Moon Phases printout. Which cookie represents the New Moon? This cookie has no frosting. The Waxing Crescent has a small sliver of frosting. The First Quarter, or Half Moon, has half the amount of frosting.

Go through each phase to match an OREO cookie to the different phases of the Moon. Use your popsicle stick or plastic knife to scrape off any frosting to better model a Moon phase.

Once you are complete, you can eat your yummy phases of the moon! Enjoy!

## OREO Phases of the Moon

<p>1</p>  <p><b>New Moon</b> Completely (or almost completely) dark.</p>	<p>2</p>  <p><b>Waxing Crescent</b> A small sliver of light on the right.</p>	<p>3</p>  <p><b>First Quarter (or Half) Moon</b> The <i>right</i> half of the Moon is light.</p>
<p>4</p>  <p><b>Waxing Gibbous</b> Three quarters of the right side of the Moon is light. The light is in the shape of a humpback (which is what the word "gibbous" means!)</p>	<p>5</p>  <p><b>Full Moon</b> The entire Moon is bright.</p>	<p>6</p>  <p><b>Waning Gibbous</b> Three quarters of the <i>left</i> side of the Moon is light.</p>
<p>7</p>  <p><b>Third Quarter (also Half) Moon</b> The <i>left</i> half of the Moon is now light.</p>	<p>8</p>  <p><b>Waning Crescent</b> A small sliver of light now appears on the <i>left</i> side.</p>	



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## The Science Behind It:

Approximately 4.5 billion years ago when the Earth was still forming and was just molten (hot) rock, a large Mars-sized comet collided with the planet. This extreme impact sent debris flying into Space. Scientists believe that this collision blew chunks of Earth into orbit. These rocks then clumped together to form the Moon!

The diameter of the Moon is about  $\frac{1}{4}$  that of the Earth. The Moon is 238,857 miles away from us! If you had an imaginary rocket moving as fast as a speedy jet plane, it would take you 16 days to get to the Moon!

The Moon orbits the Earth once every 27.3 days. One complete orbit around the Earth is called a *revolution*.

As the Moon orbits the Earth, we can only see half of the Moon's surface. The side that we can see is called the "near side." The side that we never see is called the "far side" or the "dark side."

When you look at the Moon, it appears to be shining light. What you see is actually a reflection of the Sun's light. The side of the Moon we see is lit up, while the other side is in darkness.

Earth is in constant movement around the Sun, while the Moon is always orbiting the Earth. As the Moon makes it way around Earth, we see the lights reflection off the moon at different angles. Sometimes we see a lot of light, and sometimes only a sliver. These are the different Moon **phases**.

When the Moon looks full, it means we can see the whole sunny side of the Moon from where we are on Earth. This is called a **full Moon!** When the Moon is not reflecting any light, it is called a **new Moon**.

When the moon is fully lit and begins to reflect smaller slivers of light, it is called **waning**. Then, the lighted sections begin to increase until the Moon is full again. This is called **waxing**. The Moon cycles through all eight phases every 29.5 days. This cycle is called a **Lunar month**.



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## Equinox

An Equinox occurs when the Earth's axis of rotation (the line from the North pole to the South pole) is *exactly* parallel to the motion of the Earth around the Sun. The Earth's axis is straight relative to the Sun. During an equinox, the rays of the Sun shine directly on the equator. During the equinox, the length of time during the day and night are the same!

There are 2 equinoxes during the year. One happens approximately on March 20, called the **vernal** or **Spring equinox**. The other is on September 22, called the **autumnal equinox**.

The moon phases are directly affected by the equinoxes because of the position of Earth to the Sun. During the autumnal equinox, the Moon phase is the Third Quarter Moon. During the Spring equinox, the Moon phase is the First Quarter Moon.



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