



PHASES OF THE MOON



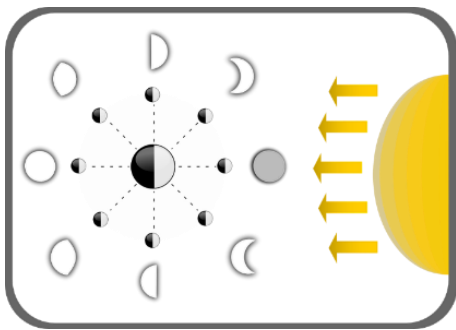
Have you looked up at the night sky and noticed that the shape of the Moon changes from night to night? At times, the Moon appears as just a thin sliver, or **crescent**, like the tip of your fingernail. Sometimes the crescent faces left and at other times, it faces right. The Moon can take the shape of a perfect half circle, and then in about two weeks, it looks like a bright, full circle. There are even times when the Moon seems to vanish! What on Earth is going on?

The changes in the shape of the Moon throughout the month are called the Moon's **phases**. The Moon doesn't really change shape at all, but it does look different throughout the month as we view it from planet Earth.



The Moon does not give off its own light. The light that we see as "moonlight" is the reflection of the Sun's light from the surface of the Moon. The Moon **orbits**, or travels around, the Earth, and the Earth orbits the Sun. As the Sun lights up different parts of the Moon while it is traveling around the Earth, we are seeing different parts of the Moon.

It takes the Moon 27.3 days to complete an orbit around the Earth. Since the Earth is moving around the sun at the same time, it takes the Moon 29.5 days to move through its eight phases. This is known as a **lunar month**. When the Moon is getting bigger, it is said to be **waxing**. When it is getting smaller, it is **waning**.



There are **eight phases** of the Moon. In the image directly above, follow along as you read the descriptions below, beginning with the gray new Moon between the Earth and Sun and moving counterclockwise (up and to the left). In the black and gray image on the right, you can follow along from left to right.



New moon: A new Moon is when we can't see the Moon because it is directly between the Sun and the Earth. If we look towards the Moon, we are looking at the unlit half.



Waxing crescent moon: This is when the Moon looks like a crescent that is increasing in size from day to day. In the Northern Hemisphere, this will appear on the right side of the Moon.



First quarter moon (half moon): After the waxing crescent phase, this is when half of the lit portion of the Moon can be seen. This happens one week after the new Moon.



Waxing gibbous moon: As the Moon continues to increase in size (waxes), the waxing gibbous Moon is when more than half of the Moon can be seen. The word **gibbous** means humped or rounded.



Full moon: A full Moon occurs when the Moon is on the opposite side of the Earth from the Sun. This is when we can see the entire lit-up portion of the Moon.



Waning gibbous moon: As the shape of the Moon gets smaller again, it is said to wane. The waning gibbous Moon is once again not quite full, but greater than a half. In this phase, you will see this on the left side of the Moon instead of the right.



Last quarter moon (half moon): This is when only half (the left half) of the Moon is lit again. This comes after the waning gibbous Moon.



Waning crescent moon: This is when the Moon looks like a crescent again, but it is now on the left side of the Moon. It will keep getting smaller (waning) until it seems to disappear.



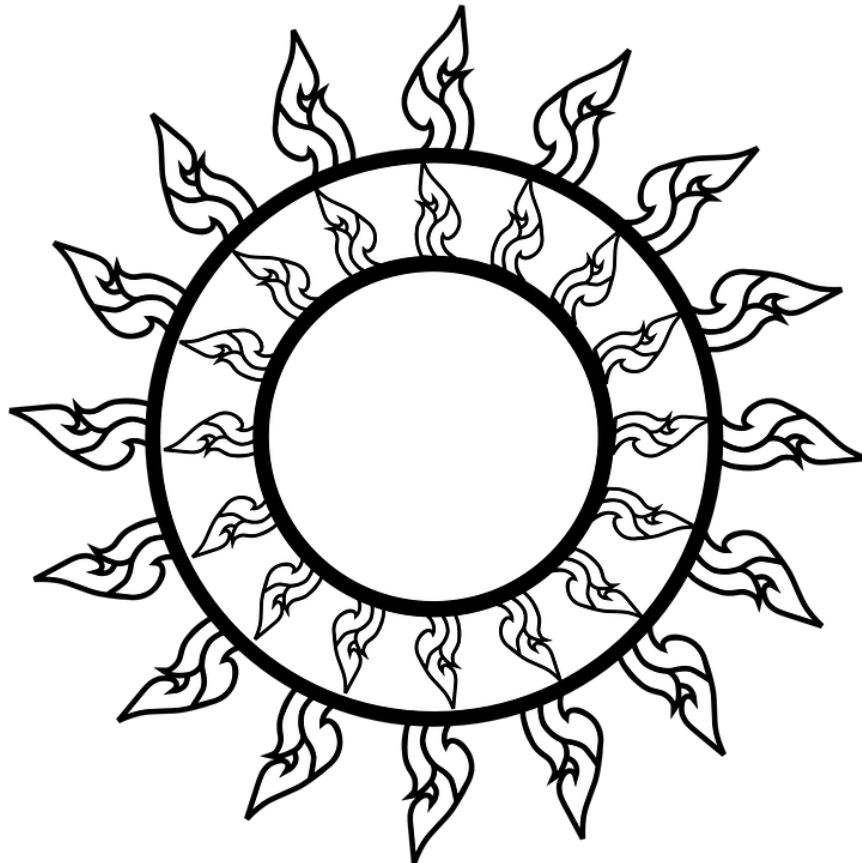
Interesting facts about the Moon

- The scientist, Galileo, was the first person to make an accurate map of the Moon. He did this in the year 1609 using a telescope he developed, which magnified things up to 20 times.
- The first manned Moon landing was NASA's Apollo 11 in 1969.
- Neil Armstrong was the first person to walk on the Moon. There are 12 people who have walked on the Moon, all were American astronauts.
- The moon is the Earth's only natural **satellite**. A satellite is something that orbits a planet.
- The Moon is about 238,857 miles from the Earth.
- We can only see one side of the Moon. The other side is always facing away from us.
- The gravitational force of the Moon on Earth causes high and low tides in the oceans around the world.
- There is less gravity on the Moon than on Earth, about 1/5 as much.
- A "**blue moon**" is when there are two full moons in one month. This happens about every 3 years.

ACTIVITY: Make a model of the eight phases of the Moon using crème-filled sandwich cookies (like OREOS)

Materials:

- A bag of cookies. You will only need 8, but pulling the cookies apart can be tricky, so plan on using a few extras.
- Paper plate, dinner plate, or a few pieces of white paper. You can arrange your Moon cookies on a plate or on paper.
- Craft stick or butter knife to scoop away some of the frosting.
- Optional: Pictures of the Earth and Sun. You can print and color the images below or draw your own. If you add images, you will need some extra paper, scissors, markers, crayons, or colored pencils.



PROCEDURE:

1. Very carefully, twist a cookie and separate it into two halves, leaving as much of the frosting as possible on one half. If at first you don't succeed, you may eat the cookie and try again. 🌞

- Once you have successfully separated 8 cookies, use your craft stick or butter knife to create the 8 phases of the moon by scraping off some of the frosting.
- Arrange the phases of the Moon in order in a circle. You can place them on a plate or on a few pieces of white paper. Label them if you like.



Astronauts quotes about visiting the Moon:

"It's a brilliant surface in that sunlight. The horizon seems quite close to you because the curvature is so much more pronounced than here on earth. It's an interesting place to be. I recommend it." — *Neil Armstrong, describing the Moon*

"Since that time, I have not complained about the weather one single time. I'm glad there is weather. I've not complained about traffic, I'm glad there's people around... boy we're lucky to be here. Why do people complain about the earth? We are living in the Garden of Eden." — *Alan Bean – In the Shadow of the Moon*

"I often tell young kids, and particularly my grandkids — don't ever count yourself out. You'll never know how good you are until you try. Dream the impossible and then go out and make it happen. I walked on the Moon. What can't you do?" — *Gene Cernan, Last Man on the Moon*

ADDITIONAL RESOURCES

Materials available from the Washoe County Library System:

[*All about the Moon*](#) by Wes Lipschultz

[*Awesome Astronomy*](#) by Raman Prinja

[*A Big Mooncake for Little Star*](#) by Grace Lin

[*Faces of the Moon*](#) by Bob Crelin

[*How Astronauts Use Math*](#) by Mary Hense

[*Imagine the Moon: A Primer of Full Moon Names*](#) by Gereald Fierst

[*Long Night Moon*](#) by Cynthia Rylant

[*The Moon*](#) by Margaret W. Carruthers

[*The Moon*](#) by Melanie Chrismer

[The Moon](#) by Elaine Landau

[The Phases of the Moon](#) by George Pendergast

[The Phases of the Moon](#) by Suzanne Slade

[Reaching for the Moon: The Apollo Astronauts](#) by Hal Marcovitz

[Science Kids: All About the Moon \[DVD\]](#) by Wonderscape Entertainment, LLC

[Space Heroes, Amazing Astronauts](#) by Buckley, James

[Why Does the Moon Change Shape?](#) By Stewart, Melissa

Videos:

Freeschool, "Phases of the Moon: Astronomy and Space for Kids" <https://youtu.be/f4ZHdzl6ZWg>

PBS Learning Media, "Voyage to the Moon: 50 Years Ago and Today – STEM in 30"

<https://knpb.pbslearningmedia.org/resource/voyage-to-the-moon-50-years-ago-and-today-video/stem-in-30/>

Peekaboo Kidz, "Phases of the Moon - Why Does The Moon Change Its Shape – Space – Dr. Binocs Show"

<https://youtu.be/BQvo7vyCmuE>

SciShow Kids, "Why Does the Moon Change?" <https://youtu.be/yXe0yxzYkjo>

Websites:

NASA Kids' Club <https://www.nasa.gov/kidsclub/index.html>

NASA, Mars Odyssey <https://mars.nasa.gov/odyssey/index.cfm>

NASA Science, Space Place - Explore Earth and Space <https://spaceplace.nasa.gov/>