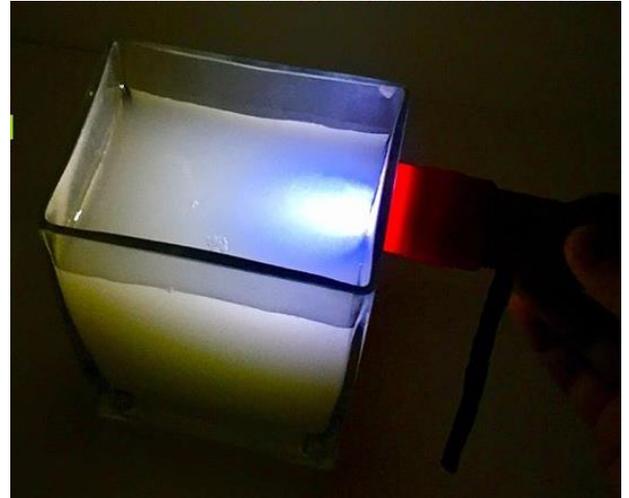
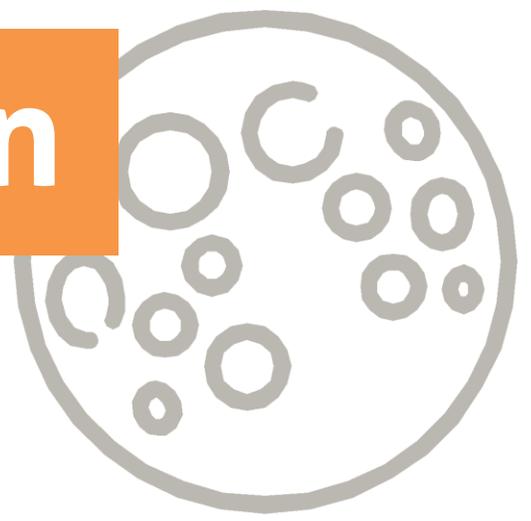


Harvest Moon

Science



2 Activities exploring the Earth, Sun, and Moon around the autumn equinox

Thank You!

Thank you so much for your download. We hope you and your students enjoy this product.

We take pride in knowing that our products empower teachers with a high quality activity that is rich in content. Engaging and equipping students in S.T.E.M. is our passion! We would love to get your feedback on how we may continue to provide for you. Please email us at VivifySTEM@gmail.com with any comments or questions you may have.

- Claire & Natasha, The Vivify Team

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ABOUT THIS ACTIVITY

The following STEM activities are a great way to incorporate science into your home or classroom. These hands-on activities include an engaging experiment designed to demonstrate the physical phenomenon that happens within our Sun-Moon-Earth system. Our students have loved this activity, and we know yours will too!

Moon Phases Activity

Goal: To understand the phases of the moon and why they occur.

1. Hand out the Moon Phases sheet and discuss
 1. Why we see the moon?– it reflects the Sun's light
 2. Why do we not see the whole moon all the time?– because of the moon's orbit around the Earth (refer to the illustration on the handout showing the relative location of the Sun, Earth and Moon as the moon orbits around the Earth)
2. Pass out 8 Oreos (or less if more than one phase may be made out of each Oreo) to each person.
3. Practice making each moon phase out of the Oreos, letting the icing represent the illuminated part of the moon, and the cookie representing the dark part of the moon.



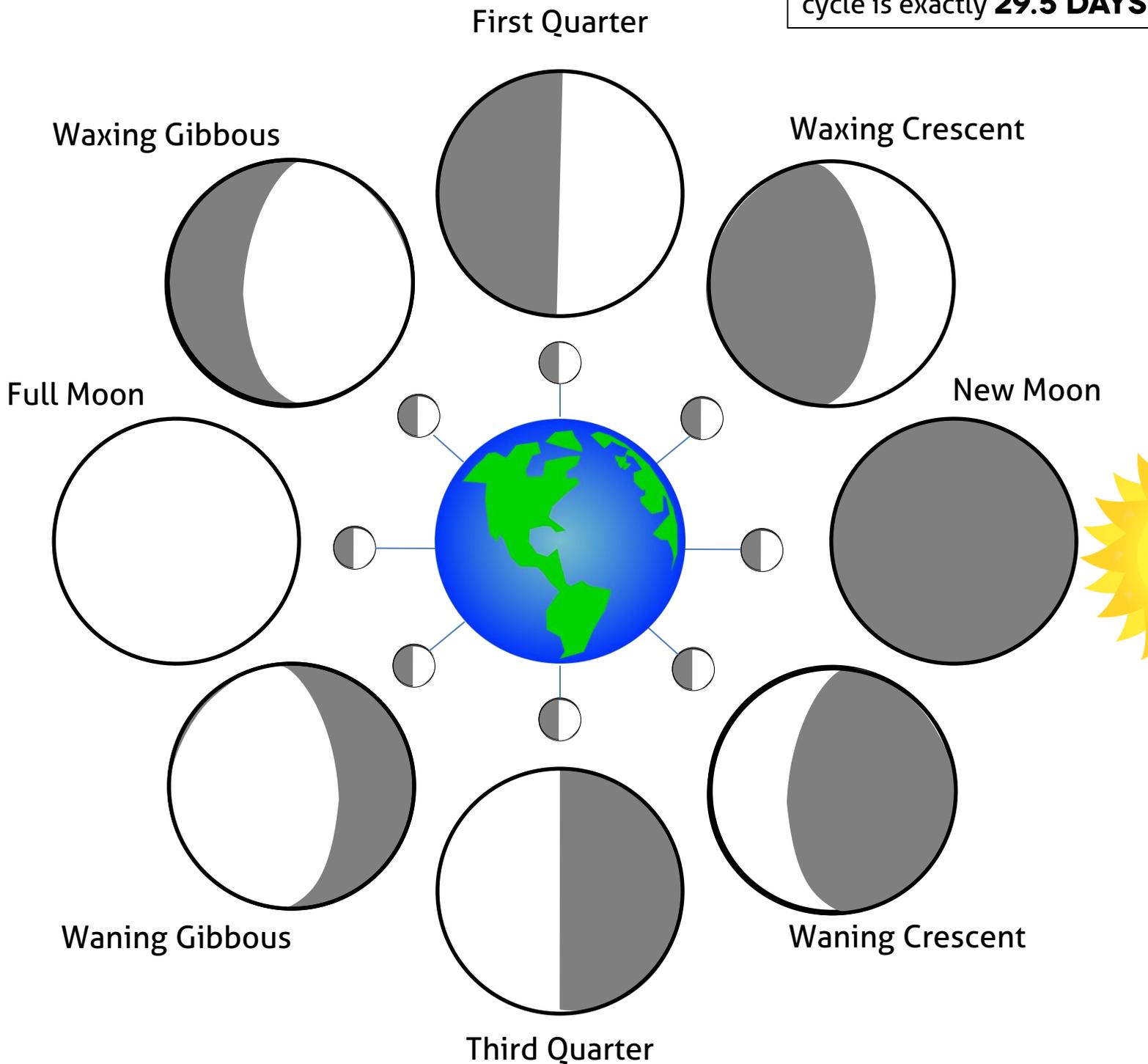
Harvest Moon Experiment

Goal: to expand on the knowledge of the Moon's movement relative to the Earth and explain the occurrence of the Harvest Moon and its characteristics.

1. Hand out the Harvest Moon sheets
2. Watch this video explaining the Harvest Moon <https://www.space.com/22812-what-is-a-harvest-moon-nasa-explains-the-science-video.html>
3. Read over the handout to emphasize the definitions of Autumn Equinox and Harvest Moon
4. Provide each group of students the listed supplies.
5. Perform the experiment as instructed.
6. Read through the explanation and try the experiment again if desired!

MOON PHASES

The complete moon phase cycle is exactly **29.5 DAYS**



Waxing = Growing
Waning = Shrinking

Gibbous = More than half of the moon is illuminated
Crescent = Less than half of the moon is illuminated

The Harvest Moon

A sight to see around the Autumn Equinox

The autumn equinox happens in the Northern Hemisphere on either September 21st or 22nd when the Sun is on the equator at local noon. What this means is that the length of the day time is roughly the same as the length of night.

The Earth rotates on an axis that is not straight up and down, but tilted at an angle of about 23.5 degrees. This tilt is what gives us our seasons. In the northern hemisphere, when we are tilted towards the Sun, we get the direct light that brings us the heat of summer. Tilted away, we get the cold winter. Likewise, the southern hemisphere experiences summer during the northern hemisphere's winter as they are tilted away from the sun when the northern hemisphere is tilted towards the sun.

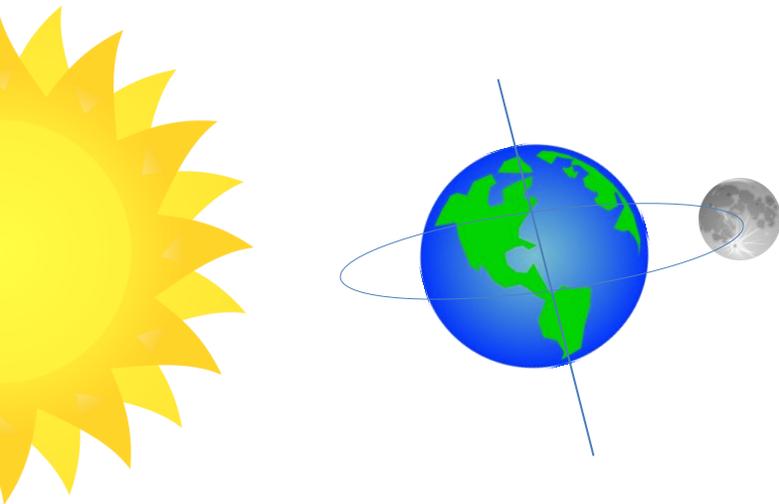
The autumn and spring equinoxes occur midway between the shift of the Earth's tilt towards or away from the sun.



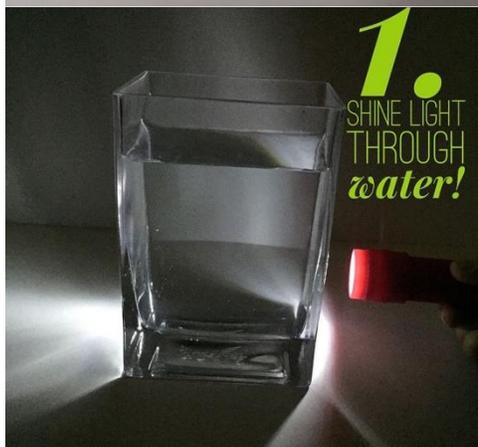
The **Harvest Moon** is the full moon closest to the autumn equinox. This typically within two weeks before or two weeks after the day.

Usually, the moon rises about 50 minutes after sunset. But when a full moon happens close to the autumn equinox, it rises only about 30 minutes later. This happens because the orbit of the moon around the earth is about 5 degrees from horizontal. Around the autumn equinox, the orbit makes a narrow angle with the evening horizon. This means that the moon rises just after sunset and thus is illuminated by more of the sun's light making it appear to be a full moon for a few nights in a row.

The harvest moon rising just after sunset can also give it an orange hue for the same reason that sunsets bring forth so much color.



Why Does the Moon Look Orange?



Do the experiment on the left to discover why the Harvest Moon looks yellow, orange, or even red as it rises just after sunset.

Light is scattered as it runs into particles in its path. Blue light is scattered the most because it has the shortest wavelength. Orange and red is scattered the least due to their long wavelengths

Looking at a beam of light from the side, you see the easily scattered blue light, just like the daytime sky or calm ocean.

Looking straight at the light or furthest from the flashlight you see the yellow or red color. At sunrise and sunset, the path of the sun's light takes it though more of our atmosphere and thus more particles. This is why the yellow/orange/red light is what we mostly see as the Harvest Moon is illuminated.

More particles = more light scattered

Blue is easily scattered

Red, orange, and yellow pass through until enough particles are present to scatter their light.