

Wonders of Nature: Day 2

We live in a world filled with wonder! This week, young scientists invoke their innate sense of curiosity and wonder, as they explore our natural world by taking time to look up to the sky and down to the earth. They investigate natural phenomenon on a large scale, such as the phases of the moon, as well as on a more minute, less obvious scale, such as the resourceful way that plants can inhabit seemingly uninhabitable spaces and much more!

These curated activities are listed in a suggested sequence but may be done in the order that works best for you and your young scientists. Learn more about this series in the [Introduction to Weekday Wonders](#).



Question of the Day

Have you ever wondered why the moon changes shape in the sky?



Daily Nature Journal

Have your young scientist spend some time outside today completing their daily nature journal entry. Use the [Guide to Nature Journaling](#) to support them in nature journaling each day.



Nature Journal

Encourage your young scientist to go outside and look at the sky. Ask your young scientist if he/she can figure out where the sun rises and sets. Shadows point west in the morning and east in the afternoon. The sun rises in the east and sets in the west. The moon will rise and set in roughly the same places. Encourage your young scientist to write or draw in the Nature Journal about where to sit or stand to observe the moon and to identify landmarks for finding the moon in the sky in the coming days. We are very lucky in Chattanooga, TN this week (July 14, 2020) because the moon doesn't rise until 2:05 am. Don't set your clock to get up and see it! It won't set until 3:29 pm so there will be plenty of time during the day to find it in the sky. It will seem pale in the sunlit sky.

Help your young scientist find the moon and watch its journey across the sky throughout the day. Your young scientist may enjoy recording when and where in the sky he/she can find the moon this week. (To help him/her anticipate the moon's movement, consult Time and Date.com, Chattanooga, TN, USA, Moonrise, Moonset, and Moon Phases at <https://www.timeanddate.com/moon/usa/chattanooga>. You can find other cities and dates at the www.timeanddate.com/moon site as well.)

Ask your scientist what shape the moon is. Encourage him/her to continue to write about and/or draw the shape of the moon as the days pass. To help your young scientist understand why the moon appears to change shape, do the activity below.



Shadows on the Moon

For this activity, help your young scientist gather the following materials.

Materials:

- 1 spherical fruit, one with uniform color works well, like an orange
- 1 fork
- 1 lamp, a single bulb with no shade works best
- A darkened room, the darker, the better

Place the lamp on an elevated surface like a table. If the lamp is short, put it on a chair on a table. This is your "sun." Stab the fruit with the fork and give it to your young scientist. The fruit is the "moon."

Ask your young scientist to stand facing the "sun", about 10 feet away and hold the fork in his/her left hand, fruit-up, at arm's length so that the fruit is above the level of your young scientist's head. There should be a narrow crescent of light from the "sun" on the right side of the "moon" while all the rest of it is in its own shadow. This is a "new moon," when we do not see the lit side of the moon.

Now direct your young scientist to move the "moon" slowly to the left by slowly pivoting his/her entire body, keeping the arm straight and higher than his or her head. As the "moon's" angle relative to the "sun" changes, more and more of the "moon's" surface is illuminated until the "moon" is "full."

At this point, your young scientist should have his/her back to the "sun." If his/her head is casting a shadow on the "moon", remind him/her to hold the fruit higher (for now). Ask your young scientist to continue the slow pivot to the left and watch the illuminated portion of the "moon" shrink to a crescent on the left side of the "moon" as more and more of the sphere falls into its own shadow. As the pivot continues, finally there is no illuminated surface and the "moon" is "dark". This is a model of the moon's phases.

Extension: Eclipses

Tell your young scientist that now, his/her head is the "Earth". From the final position in the model above, ask your young scientist to lower the fork in his/her left hand until the "moon" is at eye level. Have him/her pivot left until his/her back is to the "sun". The "moon" is now in the "Earth's" shadow. This is a lunar eclipse.

Now ask your young scientist to continue the pivot until he/she is holding the “moon” between his/her eyes and the “sun”. He/she should not be able to see the lamp bulb any longer, only the dark circle of the “moon” and the “sun’s” bright “corona” around it. This is a total solar eclipse.



Sweet Moon Phases

To make a delicious model of moon phases, go to the Science Bob website at <https://sciencebob.com/oreo-cookie-moon-phases/> and follow the simple, illustrated instructions for the Oreo Cookie Moon Phases activity. Of course, any sandwich cookie with contrasting colors can be used, but chocolate filling on vanilla cookie will present technical difficulties.

Helpful Terms: Whenever the illuminated portion of the moon is growing larger, it is said to be **waxing**. If the illuminated part is shrinking, the moon is said to be **waning**. If the illuminated portion is smaller than a semi-circle, we call that a **crescent**. If the illuminated portion is larger than a semicircle, that moon is described as **gibbous**.



Moon Phase Charades

Encourage your young scientist to use his/her body movements to indicate different phases of the moon. See if you (or another young scientist) can guess which phase he/she is communicating. Suggest to your young scientist that he/she doesn’t have to stand in one place to accomplish this. He/she may run in circles (or parts of circles) or interact with a stationary object in your yard or house to help you (or another teammate) guess. You might also help your young scientist be more successful by encouraging him/her to rehearse the movements before presenting them. A mirror might be helpful. Remind your young scientist that this is a silent activity for although the moon inspires both poetry and song, it doesn’t speak!