### Driving Question
What are the phases of the moon?

### Grade group
1st-2nd grade

### Safety Considerations
Going outside at night can be dangerous and scary! Always take a grown-up with you and bring a flashlight!

### Materials
- Notebook (or loose paper if you don’t have a spare one)
- Pencil

### Standards:
- **AZ State Science Standard**
  2.E2U1.8 - Observe and explain the Sun’s position at different times during a twenty-four-hour period and changes in the apparent shape of the Moon from one night to another.

- **Next Generation Science Standard**
  1-ESS1-1 - Use observations of the Sun, Moon, and the stars to describe patterns that can be predicted.

### Vocabulary
- **New Moon**: The first phase of the Lunar Cycle; occurs when the moon is between the Earth and the Sun.
- **1st quarter**: The 3rd phase of the Lunar cycle. Appears to be half full.
- **Full Moon**: The 5th phase of the Lunar Cycle; occurs when the Earth is between the Sun and the moon.
- **3rd Quarter**: The 7th phase of the Lunar cycle. Appears to be half full.
- **Waxing**: When the moon is going from a New Moon to a Full Moon.
- **Waning**: When the moon is going from a Full Moon to a New Moon.
- **Gibbous**: When the moon appears to be more than half full.
- **Crescent**: When the moon is less than half full.
Lesson Objective: Students will keep a journal following the phases of the moon. By the end of one month, they will understand the different phases and how the moon changes its appearance in the sky.

Schedule:

**Day 1:** Begin Moon Phase Journal. Can start any time of the month, but should fill it out for 28 days.

**Day 28:** Should be the same phase as Day 1.

**Day 29-30:** Submit (some of) your drawings to our Facebook or email threads.

Instructions:
Overview: Students and parents will go outside every clear night and look for the moon, and then draw what they see, for an entire month, and keep a journal about their observations.

With your pencil and paper and a grown up, go outside to a place where you can get a good view of the entire sky, like your front yard or backyard or porch. You will want to make sure there are no clouds, because they could be blocking the moon, making it harder to find. Try to pick a time to go out when it is after dark, but also will be easy to go out at the same time every day. For example, you could go outside right before bedtime.

Look for the moon in the sky, and answer the following questions in your journal:

1) Write the date and time at the top of your paper.
2) Note the weather. How many clouds are in the sky?
3) What shape is the moon? (*circle, banana, etc*)
4) What phase is the moon in right now? (*Ex: waxing gibbous or full moon, etc*)
5) Draw what you see on your paper. You can be as detailed as you want, and draw it as big or small as you want.
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6) Where in the sky are you looking? *(is it high up, or really far west...*, etc) Note any landmarks that the moon appears near. Example: maybe it looks like it's right on top of that one lamp post right now.

On the next night, and every night after that for the month of April, go out at the same time, and do the same thing, answering the above questions, and drawing the moon in your journal.

If you want, you can put all your drawings on one sheet of paper so at the end of the month you can see them all side by side to see how the moon changes. You can print off a blank calendar which has been provided, and fill that out.

Parents: Note that the moon rises approximately an hour later every single night. This means that after a certain day, the moon might not be up at the time you go out to make your observation, and may even rise after bedtime. An additional activity that can be done, is going outside to look at the moon once before bed, and again after waking up the next morning. Who knows, you may see the moon up in the daytime!

Resources:

Lunar Phase calendar

Another Lunar phase calendar

A really helpful guide to understanding the Lunar phases

Taking it Further! What causes the Lunar phases? *(Hint: it has to do with where the Sun is)*

A diagram of the lunar phases with the moon’s relative position to the Earth and Sun:
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