

# FAIRBANKS



# MUSEUM & *planetarium*

## Space Science Adventurer Badge for the Brownie Group

*The Moon and its Phases*

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*The following instructions represent additional resources for continued study of the topics covered in our “Space Science Adventurer Badge for the Brownie Group” online class. All materials are the property of Planetarium Educator Hannah Buckner who created them. Any websites included are the property of the individual website owners and have been reviewed by a Fairbanks Museum & Planetarium educator.*

## Overview & Purpose

Students will be able to know the phases of the Moon and that it occurs due to the orbit of the Moon around the Earth.

## Objectives

- Be able to describe the phases of the Moon
- Understand that solar and lunar eclipses occur due to the relationship between the Sun, the Earth, and the Moon

## Highlights of this Lesson

1. The Lunar Phases are cyclical and repeat after about 29-30 days
  - New Moon
  - Waxing Crescent
  - First Quarter Moon/Half Moon
  - Waxing Gibbous
  - Full Moon
  - Waning Gibbous
  - Third Quarter Moon
  - Waning Crescent
  - New Moon (Start of new cycle)
2. The Darker Parts of the Moon are called Maria (Mare for a singular spot) because the Ancient Greeks thought they were seas on the moon → these exist due to ancient volcanic activity around 4–4.5 billion years ago after the Moon first formed

3. A **solar eclipse** can only occur during a New Moon. A **lunar eclipse** can only occur during a Full Moon.

## Lesson Vocabulary

1. Mare/Maria → Latin for “sea”; The basin regions of the Moon that are filled with basalt after volcanic eruptions
2. Eclipse
3. Cycle
4. Waxing
5. Waning
6. New Moon
7. Waxing Crescent
8. First Quarter Moon
9. Waxing Gibbous
10. Full Moon
11. Waning Gibbous
12. Third Quarter Moon
13. Waning Crescent

## Materials

### For Activity 1:

1. Please read *Activity 1: Moon Art Project* first

### For Activity 2: <https://meaningfuleats.com/the-best-gluten-free-chocolate-chip-cookies/#wprm-recipe-container-14008>

1. ~1.5 cups (slightly more) of Flour (1 ⅓ cups Gluten-Free all-purpose flour and ¼ cups almond flour for those with gluten allergies/sensitivities. If any nut allergies, just use more GF flour)
2. 1 stick/1 cup of butter (any butter substitute is fine. Coconut oil or Earth Balance work very well in my experience)
3. 1 Tablespoon (Tbsp) of milk, or almond milk
4. ¾ cups brown sugar
5. ¼ cup granulated sugar
6. 1 egg (or substitute with 1/2 mashed banana or 1/4 cup unsweetened applesauce)
7. 1 teaspoon (tsp) baking soda
8. ½ tsp salt
9. 1 cup chocolate chips
10. Icing for decoration

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## Homework

*Homework material and action description.*

### Activity 1: Moon Art Project

In this activity, you will be choosing an art form to show your understanding of the lunar phases. You can do it through painting, drawing, sewing, crafting, or even song and dance! Whatever you choose, they must have the following:

1. Clear representation of each phase
2. Start and end with a New Moon
3. Correct order of the phases and representation of shadow and light on the Moon

When you have completed your art project, share with your family and friends. Take a picture or send your video to the Girl Scouts of Green and White Mountains Facebook page to share with the other Brownies!

### Activity 2: Baking Phases

1. Following the directions in the link attached in the Materials section, bake the cookies
2. Once they have cooled, ice the cookies with icing to portray the phases of the Moon! The icing will represent the light and the cookie will represent the shadow, OR you can switch it around. Remember, one cookie will be completely covered and one will not be covered at all with icing for the New and Full Moons.
3. Snap some pictures and share with your friends and family! With your parent/guardians permission, share your pictures and thoughts on the activity on the Girl Scouts of Green and White Mountains with your fellow Brownies! Feel free to share your creations with [hbuckner@fairbanksmuseum.org](mailto:hbuckner@fairbanksmuseum.org).
4. Enjoy your Moons!

## Have Any Questions?

If you have any questions, concerns, or comments please feel free to reach AmeriCorps Educator Hannah Buckner at [hbuckner@fairbanksmuseum.org](mailto:hbuckner@fairbanksmuseum.org).

