

# Moon Phases

**Materials:** Styrofoam balls, two large balls of different sizes, bright lights/flashlights, paper, a sharp pin

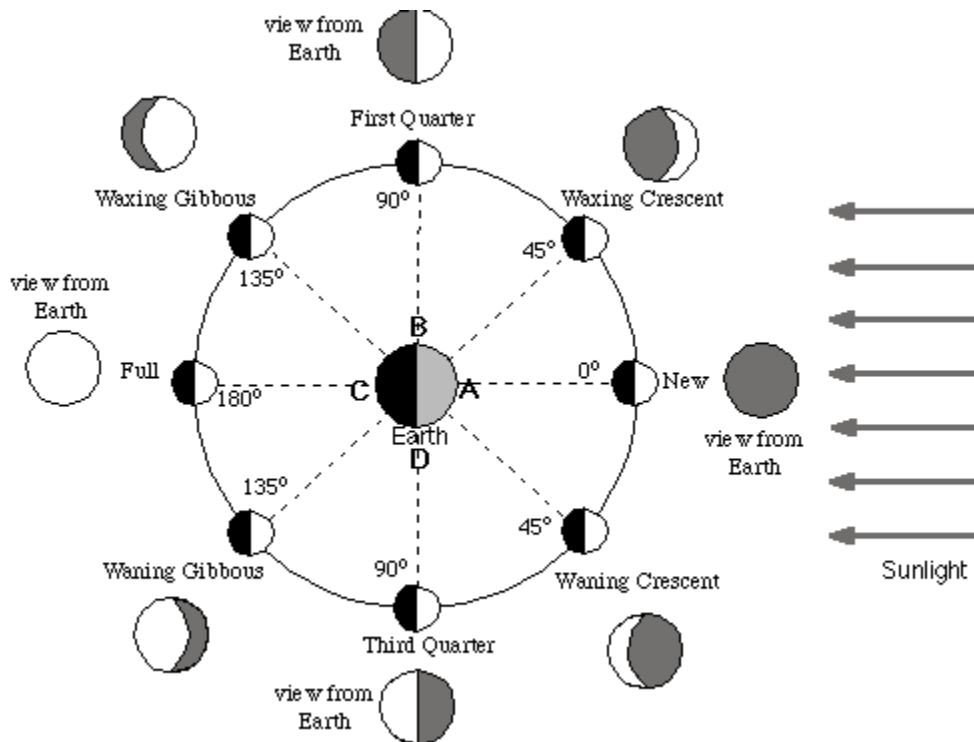
## **PART 1: Different shapes of the moon (together?)**

*Goal:*

1. Understand that the phases of the Moon are the result of the Moon's own shadow from the light of the sun

*Questions:*

1. What shape is the moon? → (A: round)
2. Does the moon always look round? If not, how else does it look?
3. Draw shapes of the moon up on the board. Encourage mirror images (e.g. 1st and 3rd quarter moons)
4. What names are the different shapes? – try to label the ones that come up
5. Is the moon changing its shape? Or does it simply look different?
6. Why is the light part light? What is casting a shadow on on the dark part?



## **PART 2: Lunar Phases**

*Goal:*

1. Learn (or review) the different lunar phases and how quickly it changes

*Directions:*

1. Turn out the lights and turn on bright lamp
2. Move the "moon" to eight different positions around the table (the moon orbits counterclockwise), and ask the students to sketch what they see
  - a. They should also label the different phases (introduce them to terms such as waxing, waning, gibbous, etc.)

Questions:

1. Do you know the current shape of the moon? → (A: *waxing crescent*)
2. How did the moon look last week? → (A: *third quarter - the moon moves about one quarter every week!*)
3. What day will the new moon be? → (A: *was yesterday, so next one will be in ~ 1 month*)

### **PART 3: Eclipses**

Goal:

1. Understand how a solar eclipse works and how the small moon manages to cover the large sun

Questions:

1. Until now, you've been talking about seeing the Moon's shadow on the Moon itself
  - a. What would it look like if you were standing on the Earth and the moon got between you and the Sun? Will anything like this happen soon? → (A: *Yes! We will have a full solar eclipse in Oregon this August (2017)!*)
2. What do you know about solar eclipses?
3. What do you know about the sun and the moon? Which one is bigger? How big are they relative to earth?

Directions:

1. Hold up a large ball and ask them to eclipse the larger ball with their fist. What did they notice?
2. Hold up larger ball and ask them to eclipse again. What did they have to do? (A: *move farther away or move their fist closer to their eye*)

Questions:

4. How far would you need to take the actual moon to eclipse the sun if the sun in a basketball and the moon is a pinprick? → (A: *86 ft apart - a little less than the length of a basketball court*)

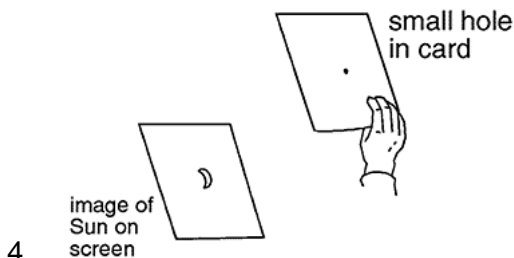
### **PART 4: Viewing Eclipses**

Goal:

1. Learn how to make your own pinhole projector

Directions:

1. With a pin, punch a hole in the center of one of your pieces of paper
2. Go outside, hold the paper up, and aim the hole at the Sun
3. Move other piece of paper back and forth until the image rests on the paper and is in focus



Questions:

1. What other devices can you use to view the solar eclipse? → (A: *eclipse glasses are the most popular, you can also make a sturdier version of the paper by using a cardboard box*)

**(together)**

*Goal:*

1. Learn (or review) terminology for solar eclipses so they can be SUPER EXCITED FOR THE AUGUST 2017 SOLAR ECLIPSE

<http://cs.astronomy.com/asy/b/astronomy/archive/2014/08/14/a-solar-eclipse-glossary.aspx>