**Astronomy: The Sun-Earth-Moon-System**

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Creation Theory:**

* The moon is thought to be created from a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that flew off after a \_\_\_\_\_\_\_\_\_\_\_\_ with Theia, an ancient planet in our solar system

**If it has a similar composition to the Earth, why does it look to be so different?**

* Due to a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_AND \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on the moon, we see large amounts of impact craters on surface

**Why do we always see the same side of the Moon?**

****\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**An Elliptical Orbit:**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_: When Moon is furthest from Earth.

- Moon’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ looks smaller

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: When moon is closest to earth

In the following activity we will model why we see the **phases** of the moon. A “phase” refers the portion of the moon we see **illuminated.**

There is always \_\_\_\_\_% of the moon illuminated.

1. Shade in the side of the moon that is not illuminated with respect to the sun within the **smaller** circles on your diagram
2. Model the motion of the moon, making sure **not** to rotate the moon as you go from position 1, 2, 3, 4 and back to 1 The illuminated side should always be facing the sun (front of the room here**). Draw the phase you observe**, paying particular attention to which side is illuminated.

**Summary:** The Cycle of lunar phases is due to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the moon around the \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Waxing= Light on \_\_\_\_\_\_\_**

**Waning= Light on \_\_\_\_\_\_\_**

\*Notice how the time that the moon rises and sets, and is at its highest point in the nighttime sky also depends upon its position in orbit, and thus its phase. For example, The full moon will first become visible (rise) at sunset and set at sunrise and will be at its highest point in the sky at midnight to an observer on earth. *The moon rises and sets 50 minutes later each night due to the moons revolution around the earth.*

How many days does it take to complete one revolution around the Earth? \_\_\_\_\_\_\_\_\_\_\_

How many days does it take to complete one full cycle of phases?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Between each phase, there are approximately \_\_\_\_\_\_\_\_\_\_\_ days.

**Why does it take longer to complete one full cycle of phases as compared to one full revolution?**

Description/your summary:

**A Lunar Eclipse**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The Lunar phase that occurs when this happens: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**A Solar Eclipse:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 The Lunar Phase that occurs when this happens:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Why are solar and lunar eclipse so rare?

**The Tides:**

**How many tides do we experience a day?**

Low tides:

High Tides:

Time between High🡪 High \_\_\_\_\_\_\_\_\_\_\_\_\_

Time between Low🡪 Low \_\_\_\_\_\_\_\_\_\_\_\_\_\_

How come they are not spaced exactly 12 hours apart?

**Spring Tide: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Occurs during which lunar phases? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Draw an image below:**

**Neap Tide: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Occurs during which lunar phases? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Draw an image below:**

**Identifying High and Low Tides Graphically:**

**Predicting future High and Low tides based on Tidal Data:**

** Predict the timeof next high tide:**

**Predict the time of the next low tide:**

**If tidal range is decreasing…..**

**If tidal range is increasing….**