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

**Grade 9 Astronomy**

**Lesson 4 – The Moon**

Birth of the Moon

* The moon was likely formed by the collision with another \_\_\_\_\_\_\_\_\_\_\_\_\_ about 4.5 billion years ago. The smaller planet (Thea) was absorbed by the Earth and the debris it expelled became the Moon.

The Moon’s Orbit

* The early moon was very close to earth and orbited very quickly. It has drifted away over billions of years and now takes roughly \_\_\_\_\_\_\_\_ days to orbit the earth. The orbit is not totally circular meaning that the distance to the moon changes throughout every month.

The Moon’s Face

* The rotation of the moon is locked by gravity to the earth, so its period or “day” is the same as its orbital period around the earth. Thus, it always keeps the same face toward us; we cannot see the far side except by launching a rocket and looking back.

Phases of the Moon

* As the Moon revolves around the Earth, different amounts of the sun’s light is reflected toward the Earth.
* \_\_\_\_\_\_\_\_\_\_\_\_ moon phases = more illuminated each night.
* \_\_\_\_\_\_\_\_\_\_\_\_ moon phases = less illuminated each night.
* \_\_\_\_\_\_\_\_\_\_\_\_ moon phases = less than half illuminated.
* \_\_\_\_\_\_\_\_\_\_\_\_ moon = half illuminated
* \_\_\_\_\_\_\_\_\_\_\_\_ moon = more than half illuminated

Lunar Eclipse

* When the \_\_\_\_\_\_\_\_’s shadow passes over the moon we see a lunar eclipse. When the eclipse is total the moon appears \_\_\_\_\_\_ due to the refraction of red light which bends the most of all the colours as it passes through Earth’s atmosphere.

Solar Eclipse

* A solar eclipse happens when the \_\_\_\_\_\_\_\_\_\_\_ shadow passes across the earth. When solar eclipse is total the sun’s corona can be viewed.

The Ecliptic

* In order for an eclipse to happen the sun, moon and earth must be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .
* The plane of alignment in the solar system is called the ecliptic. The moon’s orbit only crosses the ecliptic occasionally when aligned with the sun which makes eclipses so rare.

Tides

* The moon’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ causes the tides on earth. Since the pull of gravity decreases with distance this produces a stretching effect on the bodies of water. The result is that \_\_\_\_\_\_\_\_\_ high tides are produced every day. On the side closest to the moon where the pull is the strongest and on the side farthest from the moon where it is the weakest.

The Sun and Tides

* The \_\_\_\_\_\_\_\_\_\_\_\_\_ gravity also affects the tides on Earth but to a smaller extent than the moon. It can enhance high tides when on the same side as the moon or reduce high tides if perpendicular to Earth.

Spring and Neap Tides

* When the sun and the moon are working together extreme (\_\_\_\_\_\_\_\_\_) tides.
* When the sun and the moon are perpendicular to each other you get moderate (\_\_\_\_\_\_\_\_\_\_\_) tides.