

Dr. V's Study Guide : Astronomy Unit

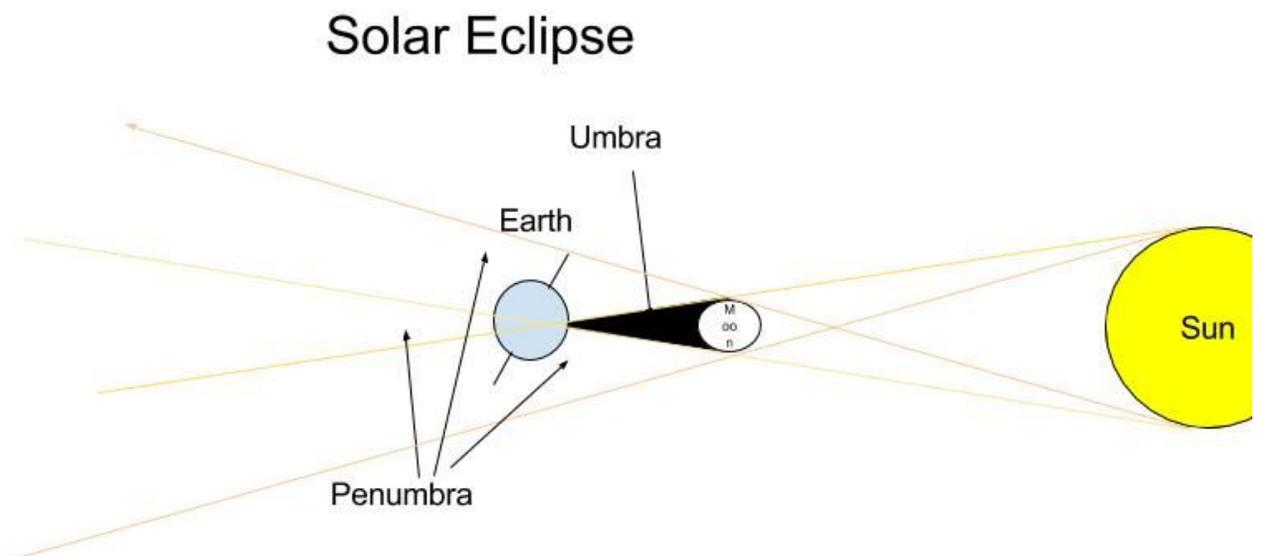
- 1) Place the following in order of increasing size: The Galaxy, the Solar System, a Star, the Universe, a Moon and a Planet.

Moon, Planet, Star, Solar System, Galaxy, Universe

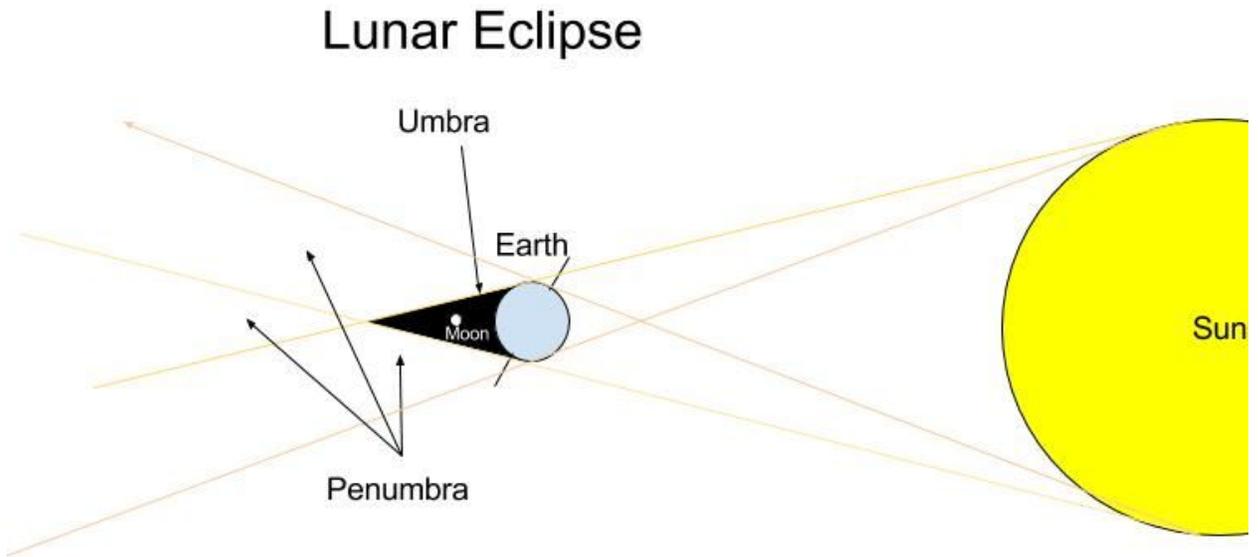
- 2) Draw a diagram of the Sun and the earth which shows why we have seasons. Include a paragraph that helps to explain your diagram. Use the following terms in your answer: Light intensity, tilt, winter, summer, spring, fall, Earth, Sun, northern hemisphere, southern hemisphere, sun angle, and revolution.

Due to the tilt of the earth (23.5 degrees) the earth rotates at an angle relative to the orbit. The sun's light hit the northern and southern hemisphere's differently. During Summer in N. America the north pole is tipped towards the sun, while during winter in N. America the north pole is facing away from the sun. This change in the direction the earth is tipped impacts the amount of direct rays the hemispheres receive and how much heat that region gets from the sun. As the earth travels in it's counter clockwise direction the N.hemisphere goes from Summer to Fall to Winter as the hemisphere cools and then spring occurs as the hemisphere begins to tip towards the sun and warm up.

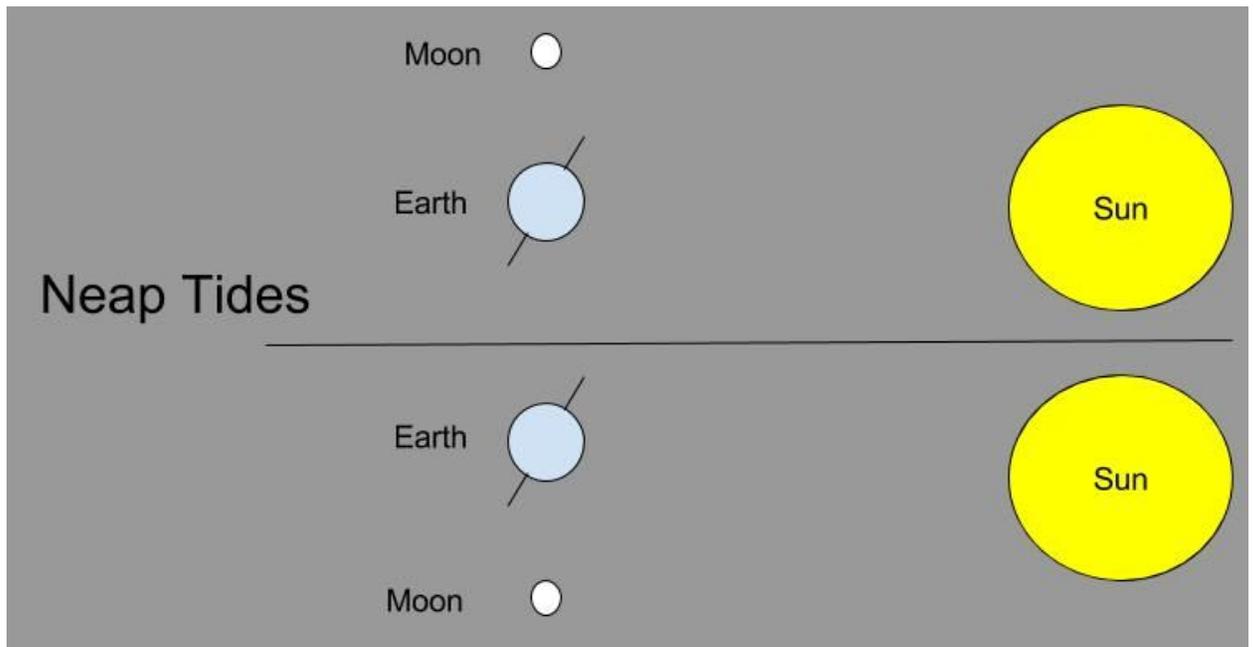
- 3) Draw a solar eclipse and explain the phase of the moon that we see from earth. Label, the umbra and the penumbra, sun, moon, earth.



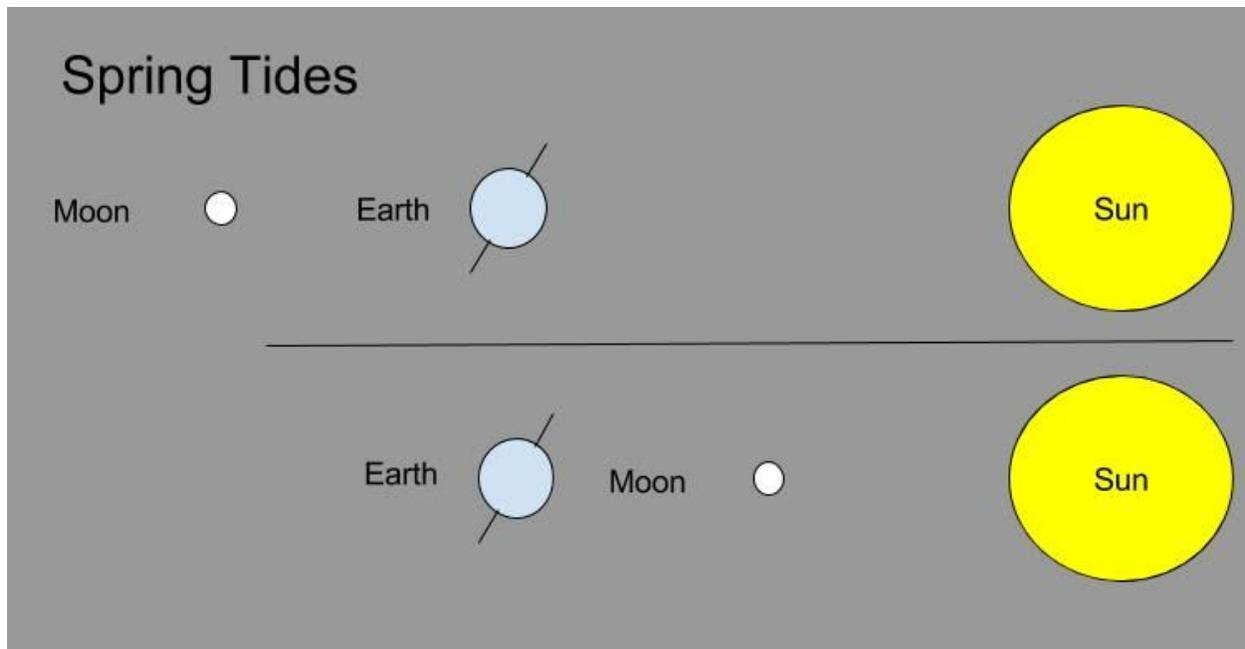
- 4) Draw a lunar eclipse and explain the phase of the moon that we see from earth.
Label, the umbra and the penumbra, sun, moon, earth.



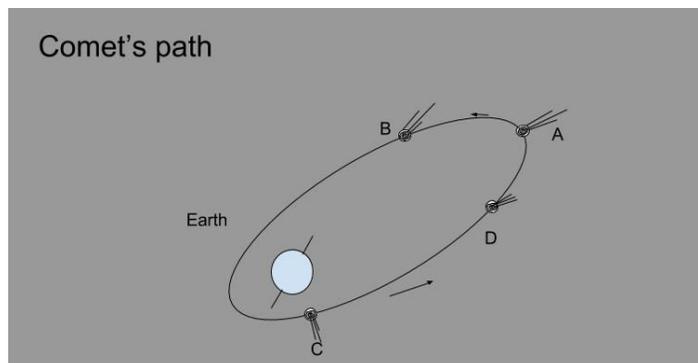
- 5) Draw a diagram that explains what causes neap tides. Include the following terms in your drawing: Moon, earth, Sun.



- 6) Draw a diagram that explains what causes a spring tide. Include the following terms in your drawing: Moon, earth, Sun.



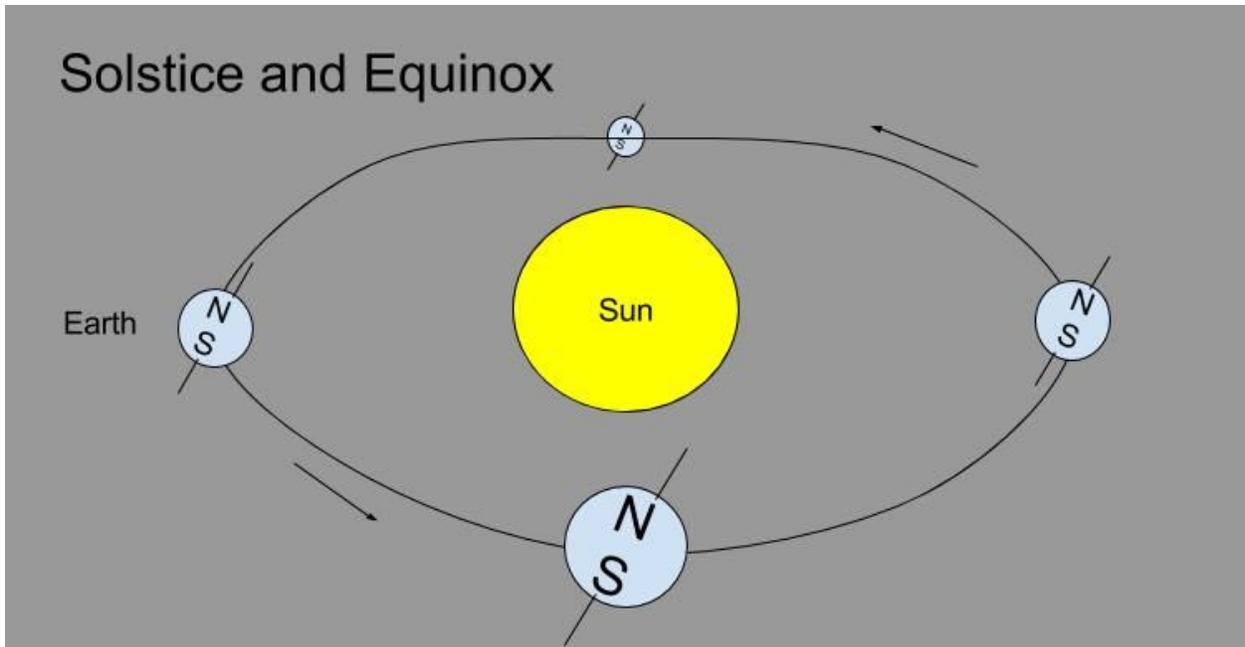
- 7) Explain why the speed of a comet increases as it gets closer to the sun and why does it slow down as it leaves? *As a comet racing around its orbit, the Sun's gravity is always pulling it towards the Sun. At position A the comet is at its slowest point as it begins to circle back towards the Sun.*



The comet speeds up at position B and begins to move faster due to the pull from the Sun's gravity. As the comet moves closer to the Sun it gets faster and faster until it is moving so fast that it can move away from the Sun at position C. As soon as the comet starts moving away from the sun it begins to slow down on its way to position D.

- 8) Why does Venus have the warmest temperature of all the planets but Mercury is the closest planet to the sun? *Venus has a thick atmosphere unlike Mercury which lack an atmosphere. The thick atmosphere on Venus is rich in greenhouse gases (CO₂) that traps heat from the Sun and cause it to have a very high temperature.*
- 9) Explain what causes a solstice and an equinox. Why is June 21st have two different names on earth? *In the Northern hemisphere the summer solstice (most hours of daylight) will occur on June 21st. Earth on the left in the image below.*

The same time the Southern hemisphere will experience their winter solstice (least hours of daylight)

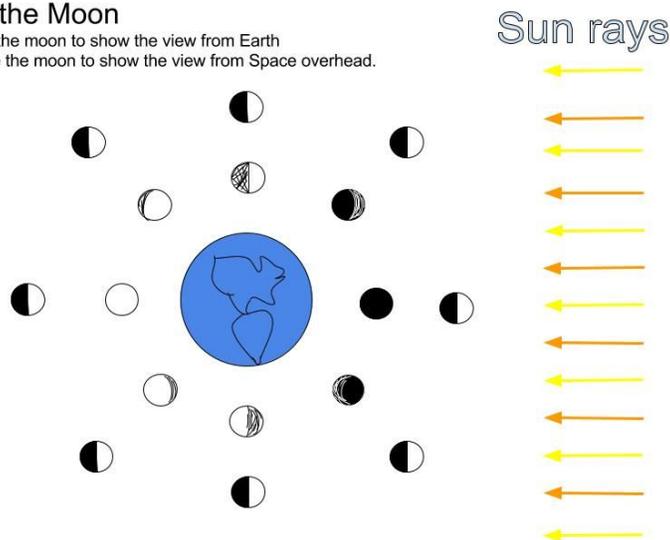


10) Explain what impact rotation and revolution have on the earth. **Rotation** cause the Earth to experience day and night which takes 24 hours in total. **Revolution** is the same as orbit and means that the Earth moves around the sun which take one year or 365.25 days.

11) Draw the phases of the moon with both the perspective from earth and the overhead perspective. Refer back to the GC assignment.

Phases of the Moon

Inner ring: Shade the moon to show the view from Earth
Outer ring: Shade the moon to show the view from Space overhead.



12) Why do we NOT have a lunar and solar eclipse each time the moon revolves?
The orbit of the Moon is not in the same level (plane) as the Earth's around the Sun. As a result, the moon does not always line up with the Earth and the Sun

during the full and new moons. The Moon revolves around the Earth with a 5 degree tilt.

13) Why does a full tide cycle (H to L to H to L to H) take 25 hrs and not 24hrs? The tide cycle should take 24 hours, the time it takes for the Earth to rotate however by the time the Earth goes all the way around the Moon has moved along its orbit and it takes the Earth 1 more hour to reach the same point in the high tide where it started the tide cycle.