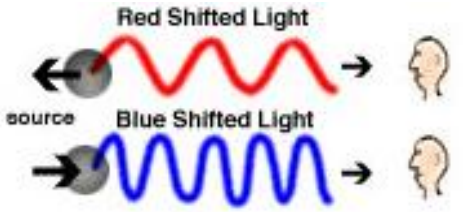
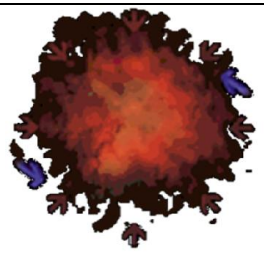
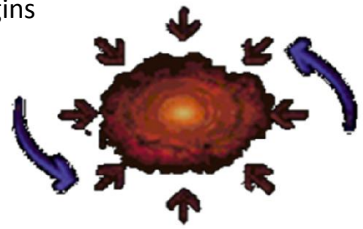
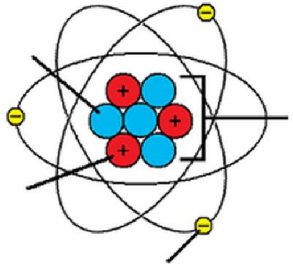
Unit 8 - Astronomy **Name: _____** **Earth/Environmental Science**

Origin of the Galaxy and Solar System
Date:
SWBAT: Explain the origin and organization of the universe.

<table>
<tr><th>Term</th><th colspan="3">Description</th></tr>
<tr><td>Geocentric</td><td colspan="3">Definition:</td></tr>
<tr><td>Heliocentric</td><td colspan="3">Definition:</td></tr>
<tr><td>Big Bang Theory</td><td colspan="3">• States that the universe began from an _____ which has _____ over billions of years to form the universe
• The universe we live in is _____
• We know because we see galaxies and groups of galaxies steadily _____
• This expansion has been occurring since the universe was formed 14 billion years ago</td></tr>
<tr><td>Doppler Effect</td><td colspan="3">• Stars moving away from an observer appear _____, while stars moving towards an observer appear _____
Definition:
 

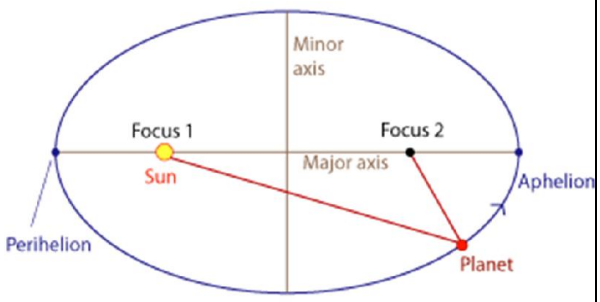
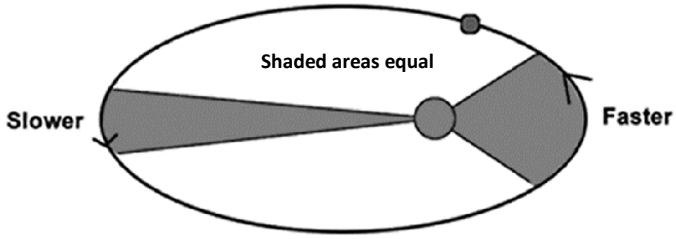
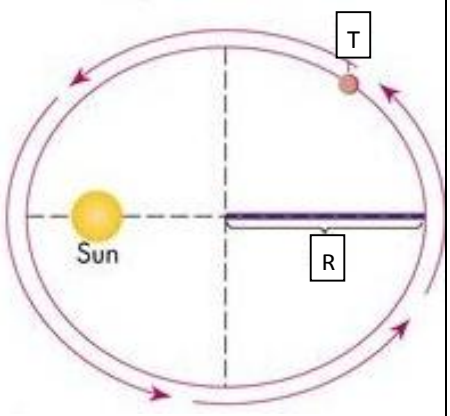
• Moving towards the observer, wavelengths _____: appearing blue
• Moving away from the observer, wavelengths _____: appearing red</td></tr>
<tr><td rowspan="2">Nebular Theory</td><td colspan="3">Definition:</td></tr>
<tr><td>1. Nebulae:
  </td><td>2. Nebulae begins rotating and collapsing due to gravity
  </td><td>3. Centrifugal force compresses dust into objects (stars, moons, planets, etc)
  </td></tr>
<tr><td>Movement of the Galaxy</td><td>The Earth:</td><td>The Solar System:</td><td>Galaxies:</td></tr>
<tr><td>Hierarchy of the Universe</td><td colspan="3">  </td></tr>
</table>

Chemistry and the Sun
Date:
SWBAT: Explain how the sun produces energy through fusion and describe the transfer of radiation to the Earth.

Term	Description			
Matter	Definition:			
	Solid:	Liquid:	Gas:	Plasma:
Element	Definition:		Example: Oxygen, Hydrogen, Chlorine, etc	
Atom	Definition: <u>Subatomic Particles</u>			
	Electrons:	Protons:	Neutrons:	Label the Part of an Atom: 
	Nucleus:	Electron Cloud:		
Fusion vs Fission	<u>FUSION</u>		<u>FISSION</u>	
Sun	Made of _____ Average rotation: Surface temp: Interior temp:		The sun _____ energy into space. This energy is called _____ Differentiated by: • The sun mostly emits ultraviolet, visible light, and infrared	
Cosmic Rays	Definition: • Most deflected by Earth's magnetic field!			
Photosynthesis	Life on Earth relies on solar energy from the sun! • Plants transform solar energy into _____ to make food for themselves.			

Unit 8 - Astronomy **Name: _____** **Earth/Environmental Science**

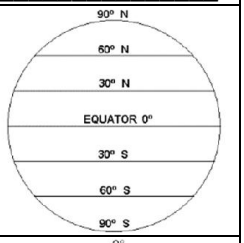
Kepler's Law of Planetary Motion
Date:
SWBAT: Explain planetary orbits especially that of Earth, using Kepler's Laws.

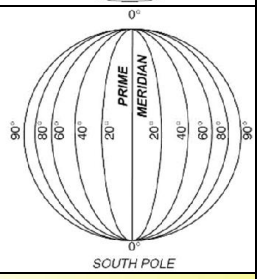
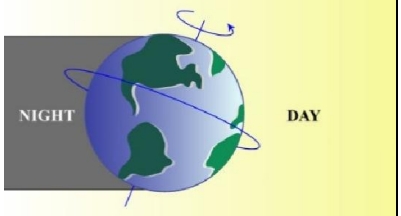
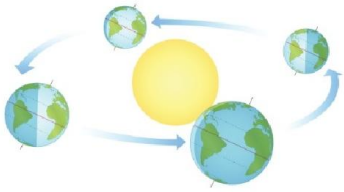
Term	Description
Dead Astronomers and Mathematicians	• Tyco Brahe – Danish astronomer with an island observatory • Johannes Kepler – Austrian mathematician came up with laws describing how the planets move around the sun
KEPLER'S LAWS OF PLANETARY MOTION	
1st Law of Planetary Motion	A planet's orbit is an _____ with the _____ at one focus and nothing at the other focus. Ellipse – Circle –  *An elliptical orbit of a planet (greatly exaggerated)*
	Perihelion: / Aphelion:
2nd Law of Planetary Motion	The line joining the planets to the Sun sweeps out _____ in _____ as the planet travels around the ellipse • Planets travel faster when _____ to the sun • Planets travel slower when _____ from the sun 
3rd Law of Planetary Motion	The ratio of the square of the revolution time for two planets is equal to the ration of the cubes of their semi-major axes $T^2=R^3$ • T: the time it takes a planet to go completely around the sun (Years) • R: the average distance from the sun (AUs)  1. How far from the sun is a planet with a revolution of 5 years? 2. How long is the revolution of a planet with a distance of 4.5 AUs from the sun?
	• If you know the distance from the sun, you can find the _____ of a planet. OR • If you know the year, you can find the _____ for a planet.
Kepler's Laws	• Kepler's Laws apply to any _____ body orbiting any other _____

Earth Motions and Tilt
Date:
SWBAT: Explain how Earth's rotation and revolution affect its shape and is related to seasons.

<table>
<tr><th>Term</th><th colspan="4">Description</th></tr>
<tr><td>Earth's Circumference</td><td colspan="2">Around the equator:</td><td colspan="2">Around the poles:</td></tr>
<tr><td>Earth's Shape</td><td colspan="4">Oblate Spheroid
Spherical:
• As Earth rotates, the sphere is distorted by _____</td></tr>
<tr><td>Axis</td><td colspan="4">Definition:

The earth _____ on its axis and is tilted at _____</td></tr>
<tr><td>Latitude</td><td colspan="4">Definition:

Nickname:
 
</td></tr>
<tr><td>Longitude</td><td colspan="4">Definition:

Nickname:
 
</td></tr>
<tr><td>Rotation</td><td colspan="4">Definition:
 
</td></tr>
<tr><td>Revolution</td><td colspan="4">Definition:
  </td></tr>
<tr><td rowspan="2">Seasons</td><td colspan="2"><u>Reason #1: Number of Daylight Hours</u>
• The amount of sunlight varies in the year
• In the summer you have _____ hours of sunlight and _____ in the winter</td><td colspan="2"><u>Reason #2: Angle of Sunlight</u>
• The angle of the sun's rays cause different _____
• This is caused by the _____</td></tr>
<tr><td><u>Vernal Equinox</u>
Date:

Light/Dark:

Sun Overhead:</td><td><u>Summer Solstice</u>
Date:

Light/Dark:

Sun Overhead:</td><td><u>Autumnal Equinox</u>
Date:

Light/Dark:

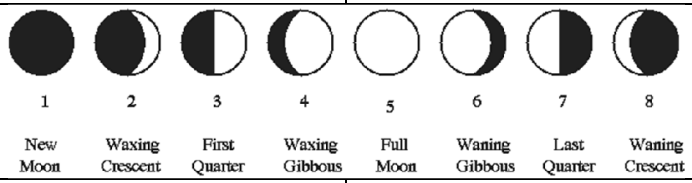
Sun Overhead:</td><td><u>Winter Solstice</u>
Date:

Light/Dark:

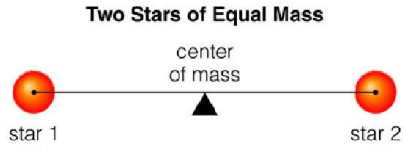
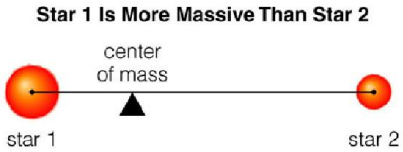
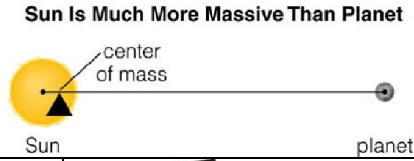
Sun Overhead:</td></tr>
</table>

Unit 8 - Astronomy **Name: _____** **Earth/Environmental Science**

The Moon and Tides
Date:
SWBAT: Describe how the moon causes eclipses and affects tides.

Term	Description			
Moon	"Satellite" – Gravitational Pull: 1/6 of Earth's gravity. Too weak to _____ Temp in sunlight: Temp in darkness:			
Movement	Type of orbit: Rotation:		The rotation of the moon is equal to its revolution. What does this mean?	
Giant Impact Hypothesis	Definition:			
Lunar Eclipse	Definition:		Illustration:	
Solar Eclipse	Definition:		Illustration:	
Phases				
Tides	Spring Tide		Neap Tide	
	Description:	Illustration:	Description:	Illustration:

Planets and Movement
Date:
SWBAT: Differentiate between the types of planets and describe their movement in space.

Term	Description			
Inner Planets	1.	2.	3.	4.
	Closest to the sun Nickname:		Traits:	
Outer Planets	5.	6.	7.	8.
	Farthest from the sun Nickname:		Traits:	
Rules to be a Planet	1.	2.	3.	
Barycenter	Definition: "The center of mass where two or more celestial bodies orbit each other. • The sun is not _____ in our solar system, it moves as the planets tug on it, causing it to orbit the _____   			
Precession	Definition: This changes the stars near the Pole, but does not affect the seasons. • Current "Northern Star":			
Nutation	Definition: Changes in the angle: • Occurs over an 18 yr period and is due to the Moon • Slightly impacts seasonal effects