Origin of the Galaxy and Solar System

Date:

SWBAT: Explain the origin and organization of the universe.

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| Term | Description | | |
| Geocentric | Definition: | | |
| Heliocentric | Definition: | | |
| Big Bang Theory | * 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 | | |
| Doppler Effect | * 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 | | |
| Nebular Theory | Definition: | | |
| 1. Nebulae: | 1. Nebulae begins rotating and collapsing due to gravity | 1. Centrifugal force compresses dust into objects (stars, moons, planets, etc) |
| Movement of the Galaxy | The Earth: | The Solar System: | Galaxies: |
| Hierarchy of the Universe |  | | |

Chemistry and the Sun

Date:

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

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| Term | Description | | | | | | |
| Matter | Definition: | | | | | | |
| Solid: | Liquid: | | | Gas: | | Plasma: |
| Element | Definition: | | | | | Example: Oxygen, Hydrogen, Chlorine, etc | |
| Atom | Definition:  Subatomic Particles | | | | | | |
| Electrons: | Protons: | | Neutrons: | | | Label the Part of an Atom: |
| Nucleus: | | Electron Cloud: | | | |
| Fusion vs Fission | FUSION | | | | | FISSION | |
| 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. | | | | | | |

Kepler’s Law of Planetary Motion

Date:

SWBAT: Explain planetary orbits especially that of Earth, using Kepler’s Laws.

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| 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 | http://www.atnf.csiro.au/outreach/education/senior/cosmicengine/images/cosmoimg/keplerellipse.gifA planet’s orbit is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with the \_\_\_\_\_\_\_\_\_\_\_\_\_ at one focus and nothing at the other focus.  Ellipse –  Circle – | |
| Perihelion: | Aphelion: |
| 2nd Law of Planetary Motion | http://www.school-for-champions.com/astronomy/images/keplers_laws_areas_swept.gifThe line joining the planets to the Sun sweeps out \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ as the planet travels around the ellipse   * Planets travel faster when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the sun   **Shaded areas equal**   * Planets travel slower when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from the sun | |
| 3rd Law of Planetary Motion | http://america.pink/images/2/4/1/7/7/6/1/en/2-kepler-laws-planetary-motion.jpgThe 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  T2=R3   * T: the time it takes a planet to go completely around the sun (Years)   R   * 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.

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| Term | Description | | | |
| Earth’s Circumference | Around the equator: | | Around the poles: | |
| Earth’s Shape | Oblate Spheroid  Spherical:   * As Earth rotates, the sphere is distorted by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | |
| Axis | Definition:  The earth \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on its axis and is tilted at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | |
| Latitude | Definition:  Nickname: | | | |
| Longitude | Definition:  Nickname: | | | |
| Rotation | Definition: | | | |
| Revolution | http://www.howitworksdaily.com/wp-content/uploads/2012/06/Seasons.jpgDefinition: | | | |
| Seasons | Reason #1: Number of Daylight Hours   * The amount of sunlight varies in the year * In the summer you have \_\_\_\_\_\_\_\_\_\_\_\_\_ hours of sunlight and \_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the winter | | Reason #2: Angle of Sunlight   * The angle of the sun’s rays cause different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ * This is caused by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
| Vernal Equinox  Date:  Light/Dark:  Sun Overhead: | Summer Solstice  Date:  Light/Dark:  Sun Overhead: | Autumnal Equinox  Date:  Light/Dark:  Sun Overhead: | Winter Solstice  Date:  Light/Dark:  Sun Overhead: |

The Moon and Tides

Date:

SWBAT: Describe how the moon causes eclipses and affects tides.

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| 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 | http://www.astro.umd.edu/resources/introastro/images/waxing.gif | | | |
| 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.

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| 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 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   http://www.physast.uga.edu/~rls/1020/ch5/05-12.jpghttp://www.physast.uga.edu/~rls/1020/ch5/05-12.jpghttp://www.physast.uga.edu/~rls/1020/ch5/05-12.jpg | | | | | | |
| Precession | Definition:  This changes the stars near the Pole, but does not affect the seasons.   * Current “Northern Star”: | | | | | | full-460px-Praezession.png |
| Nutation | Definition:  Changes in the angle:   * Occurs over an 18 yr period and is due to the Moon * Slightly impacts seasonal effects | | | | | |