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| **IESS 8 Unit 2: Astronomy** | | |
| **REQUEST FOR PROPOSAL**  Students will develop a display which explains and illustrates a proposed mission to send a probe to an assigned planet. | | |
| **SCIENCE CONCEPTS** | **LABS AND ACTIVITIES** | **CONNECTION TO R.F.P.** |
| **How does the Movement of the Earth Impact Us?**   * *I can defend the heliocentric model against the geocentric model using the evidence of the apparent movement of the Sun, moon, stars and planet across the ecliptic.* * *I can explain the Goldilocks Theory* * *I can describe the relationship between a satellite and the body around which it revolves.* * *I can describe a period of revolution and rotation.* * *I can explain how a solar year is determined.* * *I can explain how Earth’s motions affect its seasons.* | * READ: What causes seasons? * INV: Tracking the Sun * GRAPH ORG: How Does the Earth Move? | * We need to compare Earth’s rotation to the orbit of our planet in order to plan our mission’s launch window. * We need to compare the predictable path of Earth’s orbit to our planet’s orbit in order to plan the path for our mission. * We need to compare the tilted axis of Earth to the axis of our planet in order to predict possible seasonal patterns. |
| **How Does Gravity Affect Us?**   * *I can describe Newton’s three laws of motion.* * *I can explain Keplers three Laws* * *I can explain the Universal Law of Gravity* | * INV: Loopy Ellipse Lab * Newton and Planetary Graphic Organizer * Kepler Mission Lab and Star Wheel | * We need to apply Newton’s three laws to the predictable patterns of the Sun and the planets in order to plan our mission. |
| **How does the Movement of the Moon Impact Us?**   * *I can explain the role and interaction of revolution, rotation and gravity on the Sun-Earth-Moon system.* * *I can identify the Moon’s phases and why they appear as they do: Waning, Waxing, Gibbous, Crescent, New, Full.* * *I can explain the difference between Sidereal and Synodic Lunar Months* * *I can compare and contrast Tides: Neap and Spring.* * *I can identify the types of eclipses and explain why they happen(lunar, solar, total, annular, partial, umbra, penumbra, 2 eclipse “seasons” per Earth year, yearly/monthly variations in lunar position and length of visibility of the moon)* * *I can describe the Earth-moon interactions. (relationship between lunar phase and tide, tidal bulge and rate of lunar revolution, tides and Earth-moon distance.)* | * INV: Motion of the Moon * INV: Moon Calendar * READING: Eclipses and Phases * INV: Analyzing Tides * READING: Tide Rises Tide Falls * QUIZ: Moon Phases, Eclipses and Tides * If We Had No Moon | * We need to compare movement of Earth’s moon to the satellites (moons) of our planet for flyby, orbit, or landings. * We need to compare the impact of the gravity of Earth’s moon on its tides to the satellites of our planet in order to predict the impact of gravitational pull. |
| **What is the Story of Our Sun?**   * *I can identify the interior and exterior properties of the sun.* * *I can explain the following processes that occur on the sun:*   *thermonuclear process, sunspot cycle, coronal mass ejection, flares, solar wind, aurora* | * INV: Observe Sun Spots * READ: Structure of the Sun | * We need to explain the ways in which the suns’ processes might impact our mission. |
| **What is the Story of Our Solar System?**   * *I can explain the theories of the evolution of our solar system* * *I can identify the physical and chemical components of the 4 inner planets.* * *I can compare and contrast the 4 inner planets in list form and classify them based on different characteristics.* * *I can use mathematics to create a scale model of the solar system and compare measurements.* * *I can identify the physical and chemical components of the 4 outer planets.* * *I can compare and contrast the 4 outer planets in list form and classify them based on different characteristics.* * *I can use mathematics to create a scale model of the solar system and compare measurements.* * *I can describe the properties of asteroids and where they are found.* * *I can describe the characteristics of comets.* * *I can explain the formation of meteoroids.* | * RESEARCH: Planetary Facts * INV: Asteroids, Meteors and Meteorites * INV: Comets * Graphic Organizer: Geocentric Vs. Heliocentric * Capture sheet for textbook reading | * We need to explain how our planet formed in the evolution of our solar system. * We need to identify the makeup of our planets. (i.e. chemical makeup, type of atmosphere, etc.) * We need to calculate the size of our solar system to different scales in order to accurately measure the distance of our mission probe path. * We need to be able to explain the location, properties and paths of asteroids and comets in order to avoid possible collisions with our probe. |
| **What is a Star?**   * *I can identify the different wavelengths of the electromagnetic spectrum.* * *The student will describe the purpose and advantage of current tools, delivery systems and techniques used to study the universe. Assessment limits* * *I can describe tools used to study the universe. (optical and radio telescopes, spectrometers)* * *I can describe the systems used to deliver data gathered by tools used to study the universe. (satellite-based, ground-based, space probe)* * *I can explain the techniques used to study the universe. (imaging, spectroscopy).* * *I can describe properties of stars.* * *I can use an H R Diagram**to compare different types of stars.* * *I can describe the stages of medium and high mass stars.* * *I can explain the processes that define each stage.* | * READ: Characteristics of Stars * NOTES: Life Cycle of a Star * INV: Spectrometers * QUIZ: Life Cycle of a Star and Characteristic of Stars * Model: Life Cycle of Star Comic Strip * Research: Magnetosphere, Auroras, Storm Signals, | * We need to know how to sense different wavelengths in order to understand how to study our sun and its planets. * We need to know the type of star our sun is in order to explain the history of our assigned planet and its possible future. * We need to be able to understand the types and properties of stars in order to plan for an extension to our mission. * We need to understand the stages of stars and the processes that define each, in order plan a mission extension. |
| **Galaxies**   * *I can identify the shapes of galaxies.* * *I can describe how scientists measure the distance of galaxies in space.* | * INV: A Galaxy Far Far Away | * NEED connections for this one. |
| **Expanding Universe**   * *I can identify and explain evidence that proves that the universe is expanding.* | * INV: Now That’s a BIG Universe! * READING: The Big Bang! | * We need to understand the Big Band Theory in order to understand the history of our planet and its place in the universe. |