# Diocese of Wheeling-Charleston

## SCIENCE UNIT

**Create An Alien Project: Students will create an alien being as simulation of a humanoid/animal body while taking into consideration the differences gravity, atmosphere, and other environmental factors of the planets will have on the humanoid/animal body. Evaluate, understand and explain the effect that space travel will have on the humanoid/animal body. Use of Math to calculate real-life scenarios that would be present in space to assure safe & efficient movement throughout the galaxy**.

| **Name of Teacher:** Kathy Lewis-Payne, Saints Peter & Paul | **Grade Level:** 7 |
|---|---|

**Domain**: **Research and evaluation of planet environmental factors & their effect on a body. Research and effect of space travel on a body. Application and calculation of distance, time, and weight in space.**

**Estimated Duration of Unit:** Five Weeks

**Specific Clusters Addressed:** **Understanding interrelationships among physics, chemistry, biology, earth/environmental science, & astronomy through the use of skepticism, careful methods, logical reasoning & creativity while investigating & making logical conclusions from research data the observable universe. Cross-Curricular opportunities through use of math to enhance the communication, representation, conclusions, and connections while analyzing & connecting change in various context. Cross-Curricular opportunities through the use of the elements of art and principles of design to effectively communicate ideas and results.**

**Teaching Strategies:** Use of lecture, guided instruction, inquiry, problem solving skills and internet to guide students through research & evaluate the galaxy & effects on body as the result of space travel, calculate & apply math skills in distance, time and weight as applied to space travel. Use of guided instruction to create visual aspects of project.

**Catholic Identity Connections:** Use of religious references when applicable

**Cross Curricular Opportunities**: Math & Art

**Assessment (authentic/published - summative/formative):** Homework, quizzes, worksheets, online activities, feedback during guided instruction, and final report of scientific findings on project.

**Standards Addressed**

| Standard No. | Standards |
|---|---|
| SC.0.7.1.07 | Apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe |
| SC.0.7.2.01 | Demonstrate understanding of the interrelationships among physics, chemistry, biology, earth/environmental science, & astronomy |
| SC.0.7.1.12 | Use inferential reasoning to make logical conclusions from collected data. |

| Description of Activity | Resources | Date of Completion |
|---|---|---|
| **Introduction/Lecture-Application/project instructions** | Worksheet | Week 1 Day 1 |
| **Guided online instruction on Mercury: Facts, Figures, Characteristics** | http://www.space.com/36-mercury-the-suns-closest-planetary-neighbor.html | Week 1 Day 2 |
| **Guided online instruction on Venus: Facts, Figures, Characteristics** | http://www.space.com/18527-venus-atmosphere.html | Week 1 Day 3 |
| **Guided online instruction on Jupiter: Facts, Figures, Characteristics** | http://www.space.com/7-jupiter-largest-planet-solar-system.html | Week 1 Day 4 |
| **Quiz – QUIZ – (Mercury, Venus, Jupiter Facts, Figures & Characteristics)** | | Week 1 Day 5 |
| **Guided online instruction on Mars: Facts, Figures, Characteristics** | http://www.space.com/47-mars-the-red-planet-fourth-planet-from-the-sun.html | Week 2 Day 1 |
| **Guided online instruction on Saturn: Facts, Figures, Characteristics** | http://www.space.com/48-saturn-the-solar-systems-major-ring-bearer.html | Week 2 Day 2 |
| **Guided online instruction on Neptune: Facts, Figures, Characteristics** | http://www.space.com/41-neptune-the-other-blue-planet-in-our-solar-system.html | Week 2 Day 3 |
| **Introduction/Lecture- Planet Worksheet** | Worksheet | Week 2 Day 4 |
| **QUIZ – (Mars, Saturn, Neptune : Facts, Figures, Characteristics)** | | Week 2 Day 5 |
| **Guided online instruction on Space Travel Effects on The Brain** | http://www.nasa.gov/pdf/543473main_LS1_Brain-in-Space_C2.pdf | Week 3 Day 1 |
| **Guided online instruction on Space Travel Effects on The Heart** | http://www.nasa.gov/mission_pages/station/research/cciss_feature.html | Week 3 Day 2 |
| **Guided online instruction on Space Travel Effects on The Muscles** | http://spaceflight.nasa.gov/shuttle/archives/sts-95/factsheets/fs1998_09_009jsc.html | Week 3 Day 3 |
| **Guided online instruction on Space Travel Effects on The Digestive System** | http://spaceflight.nasa.gov/living/spacefood/ | Week 3 Day 4 |
| **Guided online instruction on QUIZ (Space Effect on Brain, Heart, Muscles, Digestion)** | | Week 3 Day 5 |
| **Guided online instruction on Space Travel Effects on The Respiratory System** | http://spaceflight.nasa.gov/living/factsheets/breathing3.html | Week 4 Day 1 |
| **Guided online instruction on Space Travel Effects on The Bones** | http://www.nasa.gov/audience/foreducators/postsecondary/features/F_Bones_in_Space.html | Week 4 Day 2 |
| **Guided instruction on Build The Perfect Alien Body Worksheet** | Worksheet | Week 4 Day 3 |
| **Guided instruction on Draw My Alien** | Worksheet | Week 4 Day 4 |

| | | |
|---|---|---|
| **QUIZ (Space Effect on Respiratory & The Bones)** | | Week 4 Day 5 |
| **Guided online instruction on Space Math: Avoiding Comets For Safe Travel** | http://spacemath.gsfc.nasa.gov/Grade67/10Page45.pdf | Week 5 Day 1 |
| **Guided online instruction on Space Math: Weight Effect In Space** | http://spacemath.gsfc.nasa.gov/Grade67/10Page18.pdf | Week 5 Day 2 |
| **Guided online instruction on Space Math: Travel Distance & Time** | http://spacemath.gsfc.nasa.gov/Grade67/10Page2.pdf | Week 5 Day 3 |
| **Guided instruction on Assemble the Final Project** | | Week 5 Day 4 |
| **QUIZ (Space Math – Distance, Time, Weight)** | | Week 5 Day 5 |
| | | |

**Differentiated Instruction Opportunities/Overview:** **Use of internet for applications of use of mathematical data to prove/predict scientific findings, use of art supplies and computer techniques to communicate mathematical results, use physical science and math link.**

**Cross Curricular Opportunities: Math**

| Standard No. | Standard Description | | Resources | Date |
|---|---|---|---|---|
| M.7.EE.2 | Math | Understand how rewriting in different forms can shed light on the problem and how the quantities in it are related. | Textbook, internet, & guided learning | Week 5 |
| M.7.SP.2 | Math | Through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics, students will:<br>• Demonstrate understanding of patterns, relations and functions<br>• Represent and analyze mathematical situations and structures using algebraic symbols<br>• Use mathematical models to represent and understand quantitative relationships<br>Analyze change in various contexts | Textbook, internet, & guided learning | Week 5 |
| VA.O.8.2.15 | Art | Use of the elements of art and principles of design to effectively communicate ideas. | Textbook, internet, guided learning | Week 4 & 5 |

| Science Practice Standards - 8 Progressions | | Check all the Apply |
|---|---|---|
| 1 | Make sense of problems and persevere in solving them. | x |
| 2 | Reason abstractly and quantitatively. | x |
| 3 | Construct viable arguments and critique the reasoning of others. | x |
| 4 | Model with mathematics. | x |
| 5 | Use appropriate tools strategically. | x |
| 6 | Attend to precision. | x |
| 7 | Look for and make use of structure. | x |
| 8 | Look for and express regularity in repeated reasoning | x |

Summary of Unit:

Students will create a fictional alien character that will simulate a humanoid/animal body, while evaluating and taking into consideration the differences gravity, atmosphere, and other environmental factors of the planets will have on the humanoid/animal body. Evaluate, understand and explain the effect that space travel will have on the humanoid/animal body. Use of Math to calculate real-life scenarios that would be present in space to assure safe & efficient movement throughout the galaxy. Through use of textbook, guided learning, handouts, worksheets, and the internet students will master application and calculation when reporting/predicting scientific outcomes to promote better understanding & communication of results, measures & outcomes, with emphasis on reasoning and proof. Cross curricular opportunities in the subjects of Math, & Art with Catholic identity connections through use of religious references when applicable Evaluation will be through the use of homework, quizzes, worksheets, online activities, feedback during guided instruction, and final report of scientific findings on project.