St. Lucie County Public Schools Chemistry Scope and Sequence 2012-2013

Course: 8th Grade/Comp.Sci.III adv Course Code: 2002110 Quarter: 4

RESOURCES **COMMON CORE** **SCIENCE CENTER** **PACING GUIDE**

Topic(s) of Study: Sun-Earth-Moon Systems & Space Exploration **Bodies of Knowledge:** Earth and Space Science **Big Idea(s):** Earth in Space and Time **Essential Questions:** How are days, years, and seasons related to how Earth moves in space? **(4-1)** How do Earth, the moon, and the sun affect each other? **(4-2)** What causes tides? **(4-3)** What can we learn from space images? **(5-1)** How do people explore space? **(5-2)** How has space exploration affected Florida? **(5-3)**
Vocabulary: (Unit 4) rotation, year, solstice, day season, revolution, equinox, eclipse, satellite, umbra, lunar phase, penumbra, tide, neap tide, tidal range, spring tide(Unit 5) wavelength, electromagnetic spectrum, spectrum, probe, artificial satellite, NASA, launch, spinoff
Common Inquiry Labs: ➢ **SC.8.E.5.9** Seasons Models Fusion Manual pg. 169**(4-1)** ➢ **SC.8.E.5.10** Splitting White Light Fusion Manual pg. 210**(5-2)** ➢ **SC.8.E.5.11** Using Invisible Light Fusion Manual pg. 202**(5-1)** ➢ **SC.8.E.5.12** Florida Economics without NASA pg. 215**(5-3)**

	Technology Links:	
Lab Assistance: *Scientific Methods Skills* *Writing in the Sciences* *Cooperative Learning Activities*	**Science Links:** *Vocabulary Strategies* *Graphic Organizers and Reading Strategies* *Fold Notes* *Rubrics and Integrated Assessments* *Test Taking Strategies*	**Science Fair Assistance:** *Math in Science* *Planning for Science Fair and Competitions* *Lessons for Substitutes*

Teacher's Links to Online Guides:

Above Level On Level Below Level

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NGSSS	Outline of Content (Concept)	Target
SC.8.E.5.9 Explain the impact of objects in space on each other including: 1. The sun on the Earth including seasons and gravitational attraction; 2. The moon on the Earth, including phases, tides, and eclipses, and the relative position of each body (4-1)(4-2)(4-3) **Complexity: High** **SC.8.E.5.10** Assess how technology is essential to science for such purposes as access to outer space and other remote locations, sample collection, measurement, data collection, and storage, computation, and communication of information. (5-1)(5-2) **Complexity: High** **SC.8.E.5.11** Identify and compare characteristics of the electromagnetic spectrum such as wavelength, frequency, use, and hazards and recognize its application to an understanding of planetary images and satellite photography. (5-1) **Complexity: High** **SC.8.E.5.12** Summarize the effects of space exploration on the economy and culture of Florida. (5-3) **Complexity: Moderate** **LA.8.2.2.3** The student will organize information to show understanding or relationships among facts, ideas, and events (e.g., representing key points within text through charting, mapping, paraphrasing, summarizing or comparing/contrasting.(4-3)	**Unit 4 Lesson 1 (E5.9)** **The Earth-Moon-Sun System** **Earth's Days, Years, and Seasons** **Earth's Rotation** 1. Define rotation, and describe Earth's rotation about its axis. 2. Define day, and explain why Earth day is 24 hours long. **Earth's Orbit Around the Sun** 1. Define revolution and year. 2. Identify approximately how many days are in 1 Earth year. **Earth's Tilted Axis and Solar Energy** 1. Describe the tilt of Earth's axis, and how it affects the angle the runs rays strike it. 2. Describe how rays affect temperature in a region. 3. Explain how the tilt of Earth's axis affects hours of daylight. **The Seasons** 1. Explain what causes seasons 2. Describe equinox and solstice. **Unit 4 Lesson 2 (E5.9)** **Moon Phases and Eclipses** **Earth, Moon and Sun** 1. Define gravity 2. Discuss the relationships between Earth, the moon and the sun. 3. Explain why observers see only one side of the moon. **Phases of the Moon** 1. Define lunar phases. 2. Describe the lunar cycle and/or relate the cycle to relative positions of the sun, the moon, and Earth. **Lunar Eclipses** 1. Describe lunar eclipses. **Solar Eclipses** 1. Describe solar eclipses **Unit 4 Lesson 3 (E5.9)** **Earth's Tides** **Tides and Their Causes** 1. Define tides. 2. Explain high and low tide. 3. Explain what causes tides on Earth.	• Explains how the tilt and orbit of the Earth affect its climate by watching various media and having students model the orbit of the earth • Explain with a diagram or 3-D model the reasons for the recurring pattern of moon phases • Diagram and label the Earth and moon during high and low tides • Make predictions about patterns such as moon phases and tides based on collected data by using data tables of actual data • Predict high and low tides for a set of future dates • Describe the relationship between tides on Earth and positions of the Moon, the Sun, and Earth by having students diagram the sun, moon, and earth configuration during spring tide and neap tide • Compare and contrast solar and lunar eclipses by creating a diagram of the sun, moon and earth configuration during both types of eclipses.

	Tidal Range 1. Define tidal range, spring tide and neap tide. 2. Explain the alignment of the Earth, the moon, and the sun that causes a spring tide. 3. Explain the alignment of Earth, the moon, and the sun that causes a neap tide. **Tidal Cycles** 1. Explain how Earth's rotation and the revolution of the moon around Earth affect the timing of Earth's tides. **<u>Unit 5 Lesson 1 (E5.10, E5.11)</u>** **<u>Images from Space</u>** **The Electromagnetic Spectrum** 1. Describe the electromagnetic spectrum and its parts. 2. Explain how they are related in terms of wavelength, frequency, and energy. **Observing and Detecting Electromagnetic Radiation** 1. Describe how telescopes and detectors are used in space science 2. Describe how people can make observations from a distance. **Using Images from Space** 1. Compare images taken from space with other types of information. 2. Give examples of the uses of images from space of Earth and of other objects. **<u>Unit 5 Lesson 2 (E5.10)</u>** **<u>Technology for Space Exploration</u>** **Human Exploration of Space** 1. Explain how people travel to and from outer space. 2. Analyze the limits of human space exploration. **Robotic Exploration of Space** 1. Explain how people observe places that are hard to visit. 2. Describe how technology helps humans collect data. **Observing Earth from Above** 1. Describe types of Earth observations from orbit.	• Identify the specialized work involved in the science of astronomy while examining the common characteristics it shares with all science disciplines by creating a flow chart of the specialized work that the astronomer would do versus what other scientists would do. • Utilizes various instruments astronomers use to detect different wavelengths in the electromagneticspectrum (e.g.,spectrometer, satellites, telescopes) • Describe the purpose of various space probes, such as Hubble, Pathfinder, or the Mars Rovers, and the International Space Station then compare and contrast and include the advantages and disadvantages of each. • Describe how new discoveries in space are changing our ideas about the solar system and the universe by exploring the electromagnetic spectrum, wavelength, frequency, etc. and analyzing how that affects our understanding of the universe.

	2. Describe how technology helps people observe Earth by collecting data. **Communication and Other Space Technology.** 1. Explain why satellites are useful. **Unit 5 Lesson 3 (E5.12)** **Space Exploration and Florida** **Overview of the U.S. Space Program** 1. Explain what NASA stands for and identify approximately how long NASA has been in existence. **Florida Geography and the Space Program** 1. Describe NASA sites 2. Explain why Cape Canaveral/Merritt Island is a launch site. **Economic Impact on Florida** 1. Describe the impact of space exploration on Florida's economy. 2. Define spinoff. **Cultural Impact on Florida** 1. Describe the impact aerospace has had on Florida.	• Draw conclusions on how the use of technology helps to understand expansion theory of the Universe and its origin by analyzing the red shift and other supporting evidence of the expansion theory. • Identify and describe several jobs that computers perform in space exploration in a collaborative class effort. • Describe how space exploration has affected the economy and culture of Florida by having students predict what life would be like without space exploration. • Research and present the various uses of space exploration technology both on Earth and in outer space.