Science Department Competencies and Assessments

8th Grade Science/Earth & Space Science

Course description: 8th grade Earth & Space Science concepts such as characteristics of our universe and solar system, and how the Earth, Moon and Sun interact are discussed. Concepts such as layers of the Earth, plate tectonics, rocks and minerals and how geological processes shape the Earth's surface, rocks and minerals are discussed. Physical Science concepts related to chemistry such as conservation of matter and energy will be discussed. Characteristics of matter and how it is organized, the nature of energy and energy transformations are introduced. Science skills such as identifying and safely working with laboratory equipment, using formulas to understand relationships between variables will be introduced. Students will be exposed to increments of new material along with continued emphasis on previously learned skills.

Course Power Standards	**Assessment Tools**
I. Students will demonstrate the nature of science and conduct scientific inquiry in a safe manner. *Students will demonstrate the ability to:* a. Execute steps of scientific inquiry to engage in the problem-solving and decision making processes. b. Demonstrate their ability to identify and safely use laboratory equipment. c. Solve problems and establish relationships between independent and dependent variables while conducting experiments. d. Use the SI system of measurement. e. Make and interpret graphs to show and analyze relationships between variables. f. Working collaboratively in a group or individually design and construct a model to scale.	• Quizzes/ Tests • Homework/ Class work • Lab Safety Unit labs & test • Scientific Method Unit labs& test • Independent Scientific Investigation • Lab Report • Graphing of Data • Metric System Unit labs & test
II. Students will identify the nature of matter; classify the properties of matter and describe how changes matter. *Students will demonstrate their ability to:* a. Define, observe, and describe how matter is classified, and the physical and chemical properties of matter. b. Differentiate between mass, volume and density. c. Describe and apply the Law of Conservation of Matter and Energy. d. Describe the states/phases of matter and describe the processes that matter undergoes in changing from one state to another. e. Identify chemical and physical changes of matter including the processes of changing state and why it occurs. f. Describe the nature of mixtures (including solutions), how mixtures are formed, and the ways to separate mixtures.	• Quizzes/ Tests • Homework/Class work • Mass, Volume and Density lab • Chemical and Physical Changes • Extreme energy • Conservation of Mass lab

Course Power Standards	Assessment Tools
III. Students will understand that matter can be put in motion and will be able to interpret matter in motion to solve equations. Students will describe forces that are required for objects to move. *Students will demonstrate their ability to:* a. Define motion and establish a reference point for comparing, describing and measuring motion. b. Define velocity and acceleration and compare, measure, and analyze the motion of objects c. Utilize graphs to analyze and describe objects in motion. d. Define force, describe the difference between balanced and unbalanced forces e. Identify forces as the cause of motion. f. Describe the nature of gravity and distinguish between mass and weight. g. Understand and apply Newton's Laws of Motion.	• Quizzes • Homework • Class work • Tests • Graphing of motion • Motion Lab
IV. Students will differentiate the relationship between the nature of energy and between types and forms of energy. *Students will demonstrate their ability to:* a. Describe the nature of energy. b. Describe the Law of Conservation of Energy and how energy is converted. c. Distinguish between potential and kinetic energy. d. Describe the five types of energy and energy transformations. e. Compare and contrast the waves of the electromagnetic spectrum.	• Quizzes/ Tests • Homework/Class work • Kinetic and Potential energy lab • Extreme energy
V. Students will demonstrate the positional relationships between or among the Earth, Sun, Moon, and categorize their distinct parts. *Students will demonstrate their ability to:* a. Explain how changes in positions of the Earth, Moon and Sun affect Earth. b. Describe objects such as asteroids, comets and meteoroids move, their characteristics, and effect on planets. c. Compare and contrast planets based on size, composition, location, orbital movement, atmosphere or surface features. d. Describe how Earth is unique in its ability to sustain life, explaining the requirements needed. e. Identify the characteristic of the Sun and explain how they affect Earth. f. Understand how technology has increased our knowledge of the universe and our solar system. g. Understand that the universe is comprised of billions of galaxies, each containing billions of stars, and the distance between galaxies and stars are vast.	• Quizzes/ Tests • Homework/Class work • Planet project • Crater lab

Course Power Standards	**Assessment Tools**
VI. Students will interpret how the Earth and Earth materials have developed through constant change processes. *Students will demonstrate their ability to:* a. Describe the layers of the Earth. b. Explain that Earth's crust/lithosphere is made of plates that move caused by convection currents. c. Compare and contrast seismic waves. d. Explain how Earth events, abruptly and over time, can change Earth's surface. e. Differentiate between the three types of rocks, identify their characteristics. f. Describe the processes of the rock cycle and that rocks change from one type to another.	• Quizzes/Tests • Homework/Class work • Cut-Away Earth project • Heat transfer labs • Earthquakes and volcano movies • Fault lab • Rock cycle activities
VII. Students will analyze how weather and climate impacts Earth. *Students will demonstrate their ability to:* a. Identify composition and characteristics of Earth's atmosphere. b. Explain how differential heating of the atmosphere and surface creates wind, weather and climactic patterns. c. Identify and describe the processes of the water cycle and how weathering and erosion of Earth's surface is affected. d. Identify and describe the impact certain factors have on climate.	• Quizzes/Tests • Homework/Class work • Does Air have Mass? • Wind activities • Forecast the weather • Adopt a city, climate project • Water cycle game/Puzzle • Guest Speaker