Mohawk Local Schools Physical Science - SCIENCE

Quarter 4 Curriculum Guide

Guiding Principles of the Scientific Inquiry/Learning Cycle:

Evaluate….Engage…Explore…Explain…Extend…Evaluate

Identify ask valid and testable questions
Research books, other resources to gather known information
Plan and Investigate
Use appropriate mathematics, technology tools to gather, interpret data.
Organize, evaluate, interpret observations, measurements, other data
Use evidence, scientific knowledge to develop explanations
Communicate results with graphs charts, tables

Critical Areas of Focus Being Addressed:

- Matter
- Universe
- Scientific Inquiry

Content Statements Addressed and Whether they are Knowledge, Reasoning, Performance Skill, or Product: (DOK1) (DOK2) (DOK3) (DOK4)	Underpinning Targets Corresponding with Standards and Whether they are Knowledge, Reasoning, Performance Skill, or Product: "I can…..", "Students Will Be Able To……."
Bonding and Compounds (DOK 2)	• Compare and contrast ionic bonding with covalent

	bonding. (R) • Show how ions with different charges can form 3-D lattices. (R) • Use the periodic table to predict what formula will result when two elements bond (Groups 1,2, 17, and oxygen). (K) • Define and illustrate Ionic and Covalent bonds. (K) • Name a compound by its chemical formula based on the bonding. (K) • Given a compound's name, determine the formula. (K)
Reactions of Matter (DOK 3)	• Demonstrate that matter is conserved in a balanced chemical equation. (K) • Identify reactants and products of a balanced chemical equation. (K) • Determine if given chemical equations are balanced or not. (K) • Explain that thermal energy can be transferred from the system (exothermic) during a chemical reaction. (R) • Explain that thermal energy can be transferred to the system (endothermic) during a chemical reaction. (R) • Understand that all thermal energy in the system is not large enough to be detected, though it is present. (K) • Understand that the nuclear forces which bind protons and neutrons together are very strong over short distances. (K) • Explain that nuclear reactions involve changes in a nucleus, requiring much more energy than a chemical reaction. (R) • Identify that the stability of a nucleus is a result of a balance of attractive nuclear forces and repulsive electrical forces within the nucleus. (K) • Explore how radioactive isotopes are used in the medical field to kill undesired cells in the body. (PS) • Read a graph of the half-life of any radioisotope and

	interpret time which can be used in radioactive dating. (R) • Explain the difference between nuclear fusion (the process that is responsible for formation of elements and energy in stars) and nuclear fission (the process that splits a larger nucleus into smaller nuclei and releases neutrons). (R)
History of the Universe (DOK 3)	• I know the age of the universe to be 13.7billion years old. (K) • I can list 3 evidences for the big bang. (K) • Recognize that the Big Bang Model is broadly accepted for explaining how the Universe began. (K) • State Hubble's Law and how it provides evidence for the Big Bang. (K) • Provide evidence through technology that the universe is still expanding (x-ray, radio telescope, and computers) that use the electromagnetic spectrum. (R) • Describe how particle accelerators are used to create energies in the early universe and how they are used to make inferences on the big bang and the interior of stars. (PS)
Galaxy Formation (DOK 2)	• Explain the formation of stars from clouds as gravity continued to pull in additional matter. (K) • Classify a galaxy by shape and size. (R) • Describe what makes up a galaxy, held together by gravity. (K) • Provide evidence through technology that the universe is still expanding (x-ray, radio telescope, and computers) that use the electromagnetic spectrum (R)
Stars (DOK 2)	• Describe how lighter elements are fused into heavier ones in stars (K) • Classify a star on the basis of mass, color, size, and luminosity (R) • Understand how to read a Hertzprung-Russell (H-R)

	diagram (R) • Explain why the Sun is considered a main sequence star based on its location on the H-R Diagram. (R) • Predict how a star will evolve. (R) • Explain how and when stars collapse. (R)