Mohawk Local Schools Physical Science - SCIENCE

Quarter 2 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:

- Energy and Waves
- 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……."
Conservation of Energy (DOK 3)	• Draw diagrams to indicate that energy radiates out in all directions from a source. (K) • Identify that the units for energy and work are the Joule

	(K) • Demonstrate that Kinetic Energy can be calculated mathematically using the formula $E_k=½mv^2$. (K) • Demonstrate that Potential Energy can be calculated mathematically using the formula $E_g=mgh$. (K) • Apply the transfer of energy, while conserving energy, in everyday situations such as a car traveling down an incline. (PS) • Calculate work (W) using the following formula: $W=F\Delta x$ (K) • Create a pie or bar graph that shows the transformation of energy in a scenario. (R) • Demonstrate the ability to complete equations for work, kinetic energy, and potential energy and tie them with the law of conservation of energy to solve problems. (R) • Identify that during an energy transformation, some energy is transferred to thermal energy; which is more spread out and less useful for doing work. (R)
Transfer and Transformation of Energy (DOK 3)	• Draw diagrams to indicate that energy radiates out in all directions from a source. (K) • Identify that the units for energy and work are the Joule (J) (K) • Demonstrate that Kinetic Energy can be calculated mathematically using the formula $E_k=½mv^2$. (K) • Demonstrate that Potential Energy can be calculated mathematically using the formula $E_g=mgh$. (K) • Apply the transfer of energy, while conserving energy, in everyday situations such as a car traveling down an incline. (PS) • Calculate work (W) using the following formula: $W=F\Delta x$ (K) • Create a pie or bar graph that shows the transformation of energy in a scenario. (R)

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Waves (DOK 2)	• Explain that waves are a transfer of energy in a variety of forms (thermal, light, sound…). (R) • Describe waves by their speed, wavelength, frequency, and amplitude. (R) • Explain the physical properties of waves (reflection, superposition, diffraction, refraction, and constructive and destructive interference). (R) • Demonstrate understanding of Radiant Energy and the electromagnetic spectrum by providing examples, i.e.: microwaves, visible, gamma. (R) • Compare the relative energy, frequency, and wavelength of radio, visible light, ultraviolet, and x-rays. (R) • Explain that the speed of all forms of radiant energy is the same and requires no medium, much faster than the speed of sound (a mechanical wave). (R) • Explain that Radiant Energy exhibits behaviors such as transmission, reflection, refraction, absorption, superposition, and diffraction depending on the nature of the medium. (R) • Understand that when Radiant Energy is absorbed in an opaque medium that object will increase in thermal energy. (R) • Demonstrate understanding of the Doppler Effect through a diagram (R)
Thermal Energy (DOK 2)	• Explain how particles in matter move relative to their temperature. (R)

	• Explain that thermal conductivity depends on the rate at which thermal energy transfers from one end of a material to another. (R) • Understand that the rate that thermal energy is absorbed is dependent upon the physical properties of that object. (R) • Demonstrate understanding of thermal equilibrium with a phase diagram (R)
Electricity (DOK 2)	• Explain conductors, insulators and resistors in terms of how electrons move within a substance. (R) • Identify that current is measured in amperes with the units of one coulomb charge per second. (K) • Explain that a power source supplies the electrons already in a circuit with electrical potential energy. (R) • Demonstrate through a diagram that a chemical reaction in a battery is responsible for the flow of electrons. (R) • Construct a variety of circuits, measuring the voltage and current (R) • Explain that current will increase as the potential difference increases or as resistance decreases. (R)