MOHAWK
Local School District
Preparing today's students for tomorrow's challenges

Mohawk Local Schools Physics - SCIENCE

Quarter 3 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:

- Forces, Momentum, and Motion
- Energy
- 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……."
Momentum (DOK 2)	• Use impulse to explain why momentum changes (R) • Vary the time and describe the resulting force and the

	change in momentum (R) • Solve problems using impulse-momentum theorem (R) • Calculate an object's momentum and understand that is in the same direction of motion as the object (R) • Explain how linear momentum is conserved in a closed, isolated system (R) • Identify when momentum is being transferred (K) • Describe the transfer of momentum during an elastic and inelastic and totally inelastic collision (R) • Apply the law of conservation of momentum using real life phenomena and predict the motion of objects after a collision (R)
Elastic Forces (DOK 2)	• Calculate the elastic potential energy, $PE_{sp}=½kx^2$, where k is the spring constant and x is the distance from relaxed length to the stretched or compressed length (R)
Friction Forces (DOK 2)	• Identify and define the two types of friction: static and kinetic (K) • Calculate the force of friction from the normal force and the coefficient of friction (R) • Solve for the coefficient of kinetic and static friction between two surfaces (R) • Use the concept of friction to describe everyday phenomena as well as ways to increase or decrease friction in moving objects (R)
Air Resistance and Drag (DOK 2)	• Define weight, drag, elastic force, thrust, tension, friction, and identify the direction in which they act (K) • Apply the concept of drag and lift to moving through a fluid (gas or liquid), such as a helicopter or a swimmer (R)
Gravitational Potential Energy (DOK 2)	• Analyze the gravitational potential energy of a system in terms of gravitational fields such that the kinetic energies of both change, but neither is acting as the energy source or the receiver (R)

	• Explain that gravitational potential energy is the energy transferred into or out of the gravitational field (R) • Recognize a single mass does not have gravitational potential energy, only systems of attractive masses can have gravitational potential energy (R) • Explain that as two masses that move farther apart, energy is transferred into the field as gravitational potential energy; and when two masses are moved closer together gravitational potential energy is transferred out of the field (R)
Energy in Springs (DOK 2)	• Identify systems where elastic potential energy can be applied (i.e., pole vaulting, springs, rubber bands) (K) • Explain how doing work changes potential, elastic, and kinetic energy (R)
Nuclear Energy (DOK 2)	• Explain and illustrate mass-energy equivalence ($E=mc^2$). (K) • Calculate the energy released in fission and fusion reactions. (R) • Compare and contrast alpha, beta, gamma, and positron emissions. (R) • Predict the products of radioactive decay. (R)
Work and Power (DOK 2)	• Calculate the work done by a force at any angle relative to the displacement using trigonometry (R) • Explain the relationship among work and power and calculate each with correct units (R) • Recognize that when the force and displacement are at right angles no work is done (i.e., circular motion) (R)
Conservation of Energy (DOK 2)	• Use the law of conservation of energy in a closed, isolated system to demonstrate that energy is conserved (R) • Measure the quantities for potential and kinetic energy to confirm how one type of energy can be converted into another (K) • Apply the law of conservation of energy to any system,

	except ones involving mass-energy equivalency (K)