Mohawk Local Schools Physics – 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:

- Motion
- Forces, Momentum, and Motion
- 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……."
Projectile Motion (DOK 3)	• Analyze the vertical and horizontal components of a projectile's velocity as two vectors that are independent

	of each other (PS) • Solve problems involving the range, time, initial height, and velocity of a horizontally launched projectile (R)
Forces in two dimensions (DOK 3)	• Draw a force vector to scale from a reference point on a coordinate system (i.e., 10N at 37°) (R) • Solve for the components of a vector using trigonometry (PS) • Add multiple vectors acting at a single point using trigonometry to find the resultant (K) • Solve problems involving inclined planes (i.e., components of an object's weight on an inclined plane or the speed of an object moving down an inclined plane such as a skier) (PS) • Find the equilibrant of an object with multiple forces acting on it (R) • Draw a free body diagram of force vectors acting on an object moving in a circle, indicating that the centripetal force keeps the object moving in a circle and points towards the center (K) • Identify that the centripetal force is the net force that causes an acceleration, indicated by a change in direction (K) • Predict the motion of an object moving in a circle if the centripetal force is removed (R) • Solve problems for centripetal acceleration of an object using the velocity and radius (K) • Use Newton's 2nd Law to solve for the centripetal force of an object (R)
Newton's Laws (DOK 3)	• Distinguish between field forces and contact forces (R) • Understand the origin of contact forces, such as friction, and the normal force are the result of forces between charged particles (K) • Draw free body diagrams with arrows representing force vectors to the appropriate size to visualize the net

	force (R) • Explain the concept of inertia in terms of real world examples (i.e., objects shifting in cars as they turn a corner) (PS) • Use Newton's second law to solve complex problems with forces that must themselves be quantified such as gravity and friction (PS) • Discern weight from mass and apply the difference to objects moving in a vertical direction, such as an elevator (R) • Solve complex problems that involve systems of many objects that move together as one using all three of Newton's laws (i.e., net force of a person in an elevator) (PS) • Use the normal force and net force to solve problems (R) • Explain why objects fall at the same rate using Newton's 2nd Law in the absence of air resistance (R) • Predict how a fluid will act by applying Newton's 3rd Law (R) • Quantify forces in a fluid using Newton's 2nd Law (R)
Gravitational forces and Fields (DOK 3)	• Compare the relative strength of the four fundamental forces and recognize that gravity is the weakest of the four (PS) • Solve problems involving the question for gravitational force between two objects using Newton's Law of Universal Gravitation (R) • Use the force of gravity to predict the path of an orbiting object (R) • Identify the properties of the gravitational fields (i.e., the gravitational field is present even if there is no other object interacting with it; or the direction in which the field acts) (K)