

## PACING GUIDE FOR PHYSICS

### Each quarter will also include labs on specific topics

**1<sup>st</sup> nine weeks:** We will start with some very important concepts in order to be successful in this course.

#### **STANDARDS ADDRESSED: PHYS PS2.1,2.2 PHYS PS 2.12,2.13, PHYS PS 2.4**

- Basic math Skills review: Students will review conversions, significant figures, scientific notations.
- Motion in one dimension: Investigate and evaluate the graphical and mathematical relationship of one-dimensional kinematic parameters with position, direction of motion, and time.
- Motion in two dimensions: Students will derive a relationship between scalar and vector, students will be taught giving examples of vectors in different directions and then show their negative vectors.
- Forces and Laws of Motion: Students will understand kinematics describing motion of an object without concept of force. Students will learn to resolve vectors into components.

### 2nd nine weeks:

#### **STANDARDS ADDRESSED: PHYS PS1.1, 3.3 PHYS PS2.11,3.4 PHYS PS2.14**

- Work and Energy: Students will learn to identify and calculate different types of energy and their transformation (thermal, kinetic, potential, including magnetic and electrical potential energies) from one form to another in a system.
- Momentum and Collision: Students will develop and apply the impulse-momentum theorem along with scientific and engineering ideas to design, evaluate and refine a device that minimizes the force on an object during a collision (helmet, parachute)
- Circular motion: Students will learn about tangential speed, centripetal acceleration, and centripetal force. They will plan and investigate and provide evidence that a constant force perpendicular to an object motion is required for uniform acceleration.

### 3rd nine weeks:

#### **STANDARDS ADDRESSED: PHYS PS 3.2 PHYS PS 3.5 PHYS PS 3.7**

- Heat: Students will investigate conduction, convection, and radiation as a mechanism for the transfer of thermal energy
- Thermodynamics: Students will investigate and evaluate the laws of

thermodynamics and use them to describe internal energy, heat and work.

- Electric forces and fields: Students will communicate ideas to describe how forces at a distance are explained by fields (gravitational, electric and magnetic) permeating space. Students must be able to explain how energy is contained within the field and how energy changes when objects generating and interacting with the field change their relative positions.
- **4<sup>th</sup> nine weeks**  
**STANDARDS ADDRESSED : PHYS PS 4.1,PS 4.2,PS 4.4**
- Vibrations and Waves: Students will know wave parameters like amplitude, period and velocity as well as how these quantities are defined in cases of longitudinal and transverse waves.
- Sound waves: Students will learn about medium and propagation of waves.
- Light and Reflection: Students will learn about different types of mirrors, mirror equation, reflection of light and compare their uses in daily lives.