Physics

Scope and Sequence\*

(\*) The following scope and sequence addresses the main concepts and skills to be taught during the course of the school year; however, for a more detailed pacing on what and when skills and concepts will be taught, please refer to the grade level “Pacing Guide.”

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| **SCOPE AND SEQUENCE** | | |
| **Unit/Topic/Skill** | **Suggested Time Frame** | **Notes** |
| Safety and Skills:   * Lab Safety & Equipment * Measurement & Graphing: observations (qualitative, quantitative), problem solving | 1 week | Marking period 1 |
| Kinematics:   * Constant Velocity: distance, displacement, velocity, dot diagrams, P-t graph, V-t graph * Constant Acceleration: acceleration, p-t and v-t and a-t graphs, free fall, kinematics equations * General Ed: Conceptual introduction to 2D motion (if time) Honors: 2D motion: vectors, horizontal and angled projectiles | 6 weeks |  |
| Dynamics:  Types of forces (normal, tension), force diagram (Free-body diagram - FBD), Newton’s Laws, Friction,  Law of Universal Gravitation, gravitational field, astronomy applications  Honors: 2D dynamics: resolving forces, inclined planes | 4 weeks | Marking Period 2 |
| Circular Motion & Rotational Motion:  Circular motion, Astronomy (Kepler, Newton),  Angular motion, Torque, Moment of Inertia, Center of Mass |  | Honors Physics only (optional) |
| Impulse & Momentum:  Momentum, impulse, Conservation of momentum (1D), bar charts | 3 weeks |  |
| Work & Energy:  KE, work-energy theorem, PE, energy bar charts, Harmonic motion, springs (Hooke’s Law), pendulums, Conservation of energy, Power | 4 weeks | Marking Period 3 |
| Electricity:   * Electrostatics: Electric force, Coulomb’s Law, Electric fields, Electric potential difference (voltage) * Circuits (if time): Ohm’s Law, resistance, current, voltage, schematics, Circuits (series & parallel), Combined circuits, safety devices, Power & appliances | 5 weeks |  |
| Magnetism:  Magnetic fields, Electromagnets, Magnetic force (wires & particles), Righthand rules, Electromagnetic induction, motors & generators | 4 weeks | Marking Period 4 |
| Waves, Sound, Light:  Wave characteristics & behavior, resonance, standing waves, sound, Doppler effect, light behavior, color, reflection, refraction, mirrors (plane & curved), lenses | 6 weeks |  |
| Global Challenge:  Option: See cost of appliance activity in Electricity unit, part B. | 1 week | Marking Period 3 or 4  Possible timing: Integrate into appropriate unit; end of year |