

Year at a Glance Physics 2020-2021  
**Readiness, Supporting TEKS**



1 <sup>st</sup> Grading Period	2 <sup>nd</sup> Grading Period
<p>Introductions, Get to know you activities, safety protocols, start of school procedures, Capturing Kids Hearts, math review, accuracy and precision (<b>P.1A, 2G, 2J</b>)</p> <p><b>Motion</b></p> <ul style="list-style-type: none"> <li>Graphing motion (<b>P.4A</b>) <ul style="list-style-type: none"> <li>Organization and evaluation of data</li> </ul> </li> <li>Distance and displacement (<b>P.4A &amp; B</b>) <ul style="list-style-type: none"> <li>Scalar/Vectors (simple)</li> <li>Speed and velocity</li> <li>Average/Instantaneous velocity</li> <li>Relative motion</li> <li>Frame of reference</li> </ul> </li> </ul> <p><b>Uniform Acceleration</b></p> <ul style="list-style-type: none"> <li>Acceleration (<b>P.4 A - B</b>)</li> <li>Big 4 (<b>P.4B</b>) <ul style="list-style-type: none"> <li>Algebra review</li> </ul> </li> <li>Free fall (<b>P.4 A - B</b>) <ul style="list-style-type: none"> <li>ADI Introduction lab on Free Fall</li> </ul> </li> <li>Vector components (vocab and conceptual) (<b>P.3E</b>)</li> <li>Projectiles (<b>P.4C</b>)</li> </ul>	<p><b>Uniform Acceleration Continued</b></p> <ul style="list-style-type: none"> <li>Acceleration (<b>P.4 A - B</b>)</li> <li>Big 4 (<b>P.4B</b>) <ul style="list-style-type: none"> <li>Algebra review</li> </ul> </li> <li>Free fall (<b>P.4 A - B</b>) <ul style="list-style-type: none"> <li>ADI Introduction lab on Free Fall</li> </ul> </li> <li>Vector components (vocab and conceptual) (<b>P.3E</b>)</li> <li>Projectiles (<b>P.4C</b>)</li> <li>Possible Project: Students build and launch a catapult/trebuchet (<b>P.4 A - B, P.4C</b>)</li> </ul> <p><b>Forces</b></p> <ul style="list-style-type: none"> <li>Newton's Laws (<b>P.4D</b>)</li> <li>Free Body Diagrams (<b>P.4D</b>)</li> <li>Vector addition and components (conceptual; math uses Pythagorean Theorems) (<b>P.3E</b>)</li> </ul> <p><b>Other Forces</b></p> <ul style="list-style-type: none"> <li>Circular motion and its calculations (<b>P.4C, P.5B</b>) <ul style="list-style-type: none"> <li>Circular acceleration</li> <li>Circular velocity</li> <li>Centrifugal force</li> <li>Torque &amp; formula</li> </ul> </li> <li>Newton's Law of Universal Gravitation (<b>P.5A, P.5B</b>)  Possible Project: Students build a bridge that support a given amount of weight (<b>P.4C, P.4D, P.5A, P.5B</b>)</li> </ul> <p><b>District Semester Exam</b></p>

3 <sup>rd</sup> Grading Period	4 <sup>th</sup> Grading Period
<p><b>Momentum</b></p> <ul style="list-style-type: none"> <li>• Conservation of momentum (P.6D)</li> <li>• Calculating momentum (P.6C)</li> </ul> <p><b>Energy &amp; Thermodynamics</b></p> <ul style="list-style-type: none"> <li>• Work-energy Theorem <math>W=Fd</math> (P.6A)</li> <li>• KE/PE (P.6B)</li> <li>• Calculate mechanical energy (P.6C)</li> <li>• Power (P.6C)</li> <li>• Conservation of energy (P.6D)</li> <li>• Use conservation of energy and conservation of momentum to identify types of collision systems (P.6C, P.6D)</li> <li>• Investigations with Pendulums and Springs to show KE and PE (P.6B)</li> <li>• Four Laws of Thermodynamics (P.6E)</li> <li>• Examples representing 4 laws of thermodynamics (P.6E)</li> <li>• Conduction/Convection/Radiation (P.6E)</li> <li>• Possible Project: Egg Drop- Students build a device to protect an egg from a fall or 3D Cardstock roller coaster for a marble (P.6B, P.6C)</li> </ul> <p><b>Waves: Sound &amp; Optics</b></p> <ul style="list-style-type: none"> <li>• Waves through different types of medium (P.7A)</li> <li>• Wave characteristics (P.7B)</li> <li>• Calculations: frequency, wave speed, wavelength (P.7B)</li> <li>• Transverse vs Longitudinal (P.7C)</li> <li>• Wave behaviors (P.7D) <ul style="list-style-type: none"> <li>• Resonance</li> <li>• Doppler Effect</li> <li>• Interference</li> <li>• Reflection- mirrors (P.7E)</li> <li>• Refraction –convex lenses (P.7E)</li> <li>• Diffraction</li> </ul> </li> <li>• Scientist: Snellius – Snell’s law concept only; do not do the math calculations (P.3C)</li> </ul>	<p><b>Waves: Sound &amp; Optics (continued)</b></p> <p><b>Electricity &amp; Magnetism</b></p> <ul style="list-style-type: none"> <li>• What is electromagnetic force (P.5A)</li> <li>• Electric/magnetic fields in devices (P.5A)</li> <li>• Examples of electric/magnetic fields and forces in real life (P.5D)</li> <li>• Conductors/Insulators (P.5E)</li> <li>• Calculate electric force between objects based upon charges and distances between centers (P.5C)</li> <li>• <math>V=IR</math> (P.5F)</li> <li>• Project: Students will build a 3-D model containing parallel and series circuits (P.5F)</li> <li>• Calculations (P.5F)</li> </ul> <p><b>Atomic &amp; Nuclear</b></p> <ul style="list-style-type: none"> <li>• Photoelectric (P.8A)</li> <li>• Dual nature (P.8A)</li> <li>• Double Slit Experiment (P.8A)</li> <li>• Compare emission spectra (P.8B)</li> <li>• Effects of strong/weak forces (P.5A)</li> <li>• Calculate and apply Mass-Energy Equivalence (P.8C)</li> <li>• Research examples of nuclear disasters to explain causality of the nuclear phenomena in play (P.8D)</li> <li>• Examples of applications of atomic, nuclear and quantum phenomena: nuclear stability, fission, fusion, radiation therapy, diagnostic imaging, semiconductors, superconductors, solar cells, nuclear power (P.8D)</li> </ul> <p><b>Review/Semester Exam/Final Project</b></p>

- Possible Project: Students build a musical instrument, get in a group, create and play a song (**P.7B, P.7D**)

Process standards are taught throughout the entire year.