

IPS STANDARD VS. HONORS PROGRAM COMPARISON
Forces & Motion/Mechanics Unit

Standard IPS (6-7 weeks)	Honors IPS (7 weeks)
<p>Newton's Laws of Motion</p> <p>1st Law: Inertia Understand how mass affects inertia Apply content to real life situations</p> <p>2nd Law: $F=ma$ Understand speed, acceleration, velocity Calculate: speed, average speed, acceleration, velocity, force, mass Understand mass vs. weight vs. force Convert between kilograms – pounds – Newtons Acceleration due to gravity Free fall and terminal velocity</p> <p>3rd Law: Action-reaction pairs Identify action-reaction pairs Apply content</p> <p>Quiz on Newton's Laws of Motion: multiple choice, short answers, few mathematical calculations (more conceptual knowledge)</p> <p>Energy Potential vs. kinetic energy Conservation of energy Energy transfers Understand differences between work and power Calculate: potential energy, kinetic energy, work</p> <p>Simple Machines What are some simple machines and how would they be used in different situations? How simple machines can make work easier Understand how work, force, and distance change when using simple machines</p> <p>Unit Exam: mostly multiple choice, few short answer, few mathematical calculations</p>	<p>Newton's Laws of Motion</p> <p>1st Law: Inertia Understand how mass affects inertia Apply content to real life situations</p> <p>2nd Law: $F=ma$ Understand speed, acceleration, velocity Calculate: speed, average speed, acceleration, velocity, force, mass Understand mass vs. weight vs. force Convert between kilograms – pounds – Newtons Acceleration due to gravity Free fall and terminal velocity Calculations: distance of free fall, instantaneous speed</p> <p>3rd Law: Action-reaction pairs Identify action-reaction pairs Apply content</p> <p>Quiz on Newton's Laws of Motion: fewer multiple choice, more short answer, and heavy mathematical component</p> <p>Momentum and Impulse Understand, apply, and calculate $p=mv$ Understand, apply, and calculate $I=ft$ Conservation of momentum (be able to apply and calculate)</p> <p>Energy Potential vs. kinetic energy Conservation of energy Calculate potential and kinetic energy of a system Understand differences between work and power Calculate work and power Understand how work, power, time, force are all related. How does changing one affect or not affect the others?</p> <p>Simple Machines What are some simple machines and how would they be used in different situations? Calculate work and force using simple machines Calculate ideal mechanical advantage of simple machines Understand how work, force, and distance change when using simple machines</p> <p>Unit Exam: multiple choice, more short answer, and heavy mathematical component</p> <p>Additional reading with class discussion and on-line discussion board submission: "How Fermi Would Have Fixed It" by Hans Christian Von Baeyer</p>