

CURRICULUM MAP
PHYSICS: PRINCIPLES AND PROBLEMS -- 12th GRADE



	September	October	November	December	January
CONTENT	<ul style="list-style-type: none"> • What is Physics? • Mathematical Tools • Describing Motion 	<ul style="list-style-type: none"> • Describing Motion (cont.) • Vectors • Mathematical Model of Motion • Forces 	<ul style="list-style-type: none"> • Forces (cont.) • Forces in Two Dimensions • Universal Gravitation 	<ul style="list-style-type: none"> • Momentum and Its Conservation • Energy, Work & Simple Machines • Energy 	<ul style="list-style-type: none"> • Energy (cont.) • Thermal Energy • Mid-Term Review
SKILLS	<ul style="list-style-type: none"> • Learn to ask questions to examine and solve problems. • Understand and predict outcomes. • Perform calculations with SI units and Scientific Notation. • Understand the need for accuracy and precision when making measurements and reporting data. • Display and evaluate data using graphs. • Describe motion with motion diagrams and incorporating coordinate systems. 	<ul style="list-style-type: none"> • Develop descriptions of motion using vector and scalar quantities. • Demonstrate first step for solving physics problems. • Represent vector quantities graphically and algebraically. • Determine the sum of vectors graphically & algebraically. • Continue study of average & instantaneous velocity and acceleration. • Use graphs and equations to solve problems involving moving objects, including free falling. <p>Use Newton's Law of Motion to solve motion problems.</p>	<ul style="list-style-type: none"> • Determine magnitude and direction of net force determining the motion of an object. • Use Newton's Laws to analyze motion in two dimensions. • Solve problems dealing with projectile and circular motion, and demonstrate understanding of acceleration and torque. • Learn the nature of gravitational force. • Relate Kepler's Law of Planetary Motion to Newton's Laws of Motion. • Describe the orbits of planets and satellites using Law of Universal Gravitation. 	<ul style="list-style-type: none"> • Describe momentum and impulse and apply to the interaction of objects. • Relate Newton's Third Law of Motion to conservation of momentum. • Recognize that work and power describe how energy moves through the environment. • Relate force to work and explain how machines make work easier by changing forces. • Learn that energy is the ability to do something. 	<ul style="list-style-type: none"> • Learn that the total amount of energy in a closed system never changes; energy just changes form. • Define temperature. • Calculate heat transfer. • Distinguish heat from work.
ASSESSMENT	<ul style="list-style-type: none"> • Homework • Test/Quizzes • Lab/ Reports • Supplementary Reading 	<ul style="list-style-type: none"> • Homework • Test/Quizzes • Lab/ Reports • Supplementary reading • Quarterly Exam 	<ul style="list-style-type: none"> • Homework • Test/Quizzes • Lab/ Reports • Supplementary Reading 	<ul style="list-style-type: none"> • Homework • Test/Quizzes • Lab/ Reports • Supplementary Reading 	<ul style="list-style-type: none"> • Homework • Test/Quizzes • Lab/ Reports • Supplementary Reading • Mid-Term Exam
NJ STANDARDS	5.1, 5.2, 5.3, 5.4	5.2, 5.3, 5.7	5.2, 5.3, 5.4, 5.7	5.2, 5.4, 5.1, 5.3, 5.7	5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7

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	3 rd Marking Period			4 th Marking Period	
	February	March	April	May	June
CONTENT	<ul style="list-style-type: none"> Waves and Energy Transfer Sound Light Reflection and Refraction 	<ul style="list-style-type: none"> Reflection & Refraction (cont) Mirrors and Lenses Diffraction and Interference of Light. Static Electricity 	<ul style="list-style-type: none"> Static Electricity (cont.) Electric Fields Current Electricity 	<ul style="list-style-type: none"> Series and Parallel Circuits Magnetic Fields Electromagnetic Induction “District Science Fair” 	<ul style="list-style-type: none"> Electromagnetic Induction (cont.) Electromagnetism Final Exam Review
SKILLS	<ul style="list-style-type: none"> Determine how waves transfer energy. Describe wave reflection and discuss its practical significance. Describe sound in terms of wave phenomena. Discover the principles behind what makes a sound. Understand the fundamentals of light, including its speed, wavelength range and intensity. Describe the interactions between two or more light waves and between light waves and matter. Study how light is bent when it moves from one medium to another. Understand why total internal reflection occurs. 	<ul style="list-style-type: none"> Discover what effects are caused by changes in the index of refraction. Locate real and virtual images produce by plane, concave, and convex mirrors. Recognize causes of aberrations in lenses and mirrors and how these can be minimized. Define diffraction and relate it to the interference of light waves. Describe the operation of a grating spectrometer. Classify electrical charge and analyze how charge interacts with matter. 	<ul style="list-style-type: none"> Infer the rules of how charge pushes and pulls on the world. Distinguish between electric force and electric fields. Understand how grounding is related to charge sharing. Recognized the relationship between conductor shape and electric field strength. Explain energy transfer in circuits. Solve problems involving current, potential difference and resistance. Diagram simple electric circuits. Solve problems involving the use and cost of electric energy. 	<ul style="list-style-type: none"> Distinguish between parallel and series circuits and series-parallel combinations and solve problems dealing with them. Explain the function of fuses circuit breakers, and ground fault interrupters, and describe ammeters and voltmeters. Relate magnetism to electric charge and electricity. Describe how electromagnetism is harnessed to produce mechanical work. Describe how changing magnetic fields can generate electric current and potential difference. 	<ul style="list-style-type: none"> Apply this phenomenon to the construction of generators and transformers. Learn how combined electric and magnetic fields can be used to find the masses of electrons, atoms, and molecules. Explain how electromagnetic waves are created, travel through empty space and are detected.
ASSESSMENT	<ul style="list-style-type: none"> Homework Test/Quizzes Lab/ Reports Supplementary Reading 	<ul style="list-style-type: none"> Homework Test/Quizzes Lab/ Reports Supplementary Reading 	<ul style="list-style-type: none"> Homework Test/Quizzes Lab/ Reports Supplementary reading Quarterly Exam 	<ul style="list-style-type: none"> Homework Test/Quizzes Lab/ Reports Supplementary Reading Science Fair Project 	<ul style="list-style-type: none"> Homework Test/Quizzes Lab/ Reports Supplementary Reading Research Paper Final Exam
NJ STANDARDS	5.1, 5.2, 5.3, 5.7	5.1, 5.2, 5.3, 5.7	5.1, 5.2, 5.7	5.1, 5.2, 5.4, 5.6, 5.7	5.1, 5.2, 5.7, 5.8

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