

01: Introduction to AP Physics

AP Physics Key Terms	AP Physics 1
<ul style="list-style-type: none"> • AP Physics: Advanced Placement (AP) Physics is a College General Physics course offered to high school students. An exam is taken at the end to obtain a college credit. • AP Physics Courses: There are four AP Physics courses and exams – two are taught as in a full-year curriculum and the other two in one-semester each. The exams are given in May of each year. • AP Physics 1: This is an algebra-based one year course in high school (equivalent to 1st semester general physics in college). • AP Physics 2: This is an algebra-based one year course in high school (equivalent to 2nd semester general physics in college). • AP Physics C - Mechanics: It's a calculus-based one semester course in high school (equivalent to one-semester introductory college course). • AP Physics C – Electricity & Magnetism: It's a calculus-based one semester course in high school (equivalent to one-semester introductory college course). • AP Physics Exam: The AP Physics exam is given each May. You score from a 1 (lowest) to a 5 (highest). Each college determines how much credit is given for each score in each subject. Check the colleges you're interested in—it varies between schools and even within the same school for different AP subjects. 	<ul style="list-style-type: none"> • AP Physics 1: It consists of two equally weighted sections – multiple choice and free response, each 90 minutes. This exam is 3 hours long. Section I is multiple choice which counts for 50% of your AP score with 50 questions in 90 minutes. There are two question types: discrete multiple choices, and multi-correct items. Section II is free response which also counts for half of your score. There are five questions in total, one in experimental design, one in quantitative or qualitative translation and three short answers. • Physics 1 Topics: The Physics 1 covers the following topics: classical mechanics, electricity part 1, waves and sound. It is an introductory algebra-based course with no prior physics requirement. Algebra with trigonometry is the math pre-requisite for this course. • Kinematics: Kinematics is the branch of classical mechanics that includes a mathematical description of motion without any reference to the force that cause the motion. • Newton's Laws: These describe the relationship between forces acting on an object and the motion of that object. Newton's First Law: Every object continues in a state of rest, or uniform motion in a straight line, unless it is acted upon by an outside force (inertia). The Second Law: The acceleration of an object is directly proportional to the net force and inversely proportional to the mass. The Third Law: For every force, there is an equal and opposite force. • Work: The amount of energy transferred by a force through a distance. • Kinetic Energy: The energy an object possesses because of its motion. • Power: The rate at which work is performed for a given time. • Electrostatics: Electrostatics is the study of stationary, or slowly moving, electric charges. • Wave: A periodic disturbance through which the sound or water wave travels.
<p style="text-align: center;">Scope of the Exam</p> <ul style="list-style-type: none"> • Topical Scope: The test is written so that it covers every topic. They are aware that teachers often vary in which topics they include in their course—both at the HS and college level. Therefore, they do not expect you to know everything. • Question Types: The AP Physics exam is made up of two types of questions: multiple choice and free response. • Multiple Choices: These questions test conceptual understanding and must be completed timely. There may be information contained in a paragraph, table or figure for each question and there are 4 possible answer choices. • Free Response: These questions may ask for a written response, interpretation of a result or to derive an expression based on the information presented. 	<p style="text-align: center;">AP Physics 2</p> <ul style="list-style-type: none"> • AP Physics 2: It consists of two equally weighted sections – multiple choice and free response, each 90 minutes. This exam is 3 hours long. Section I is multiple choice which counts for 50% of your AP score with 50 questions in 90 minutes. There are two question types: discrete multiple choices and multi-correct items. Section II is free response which also counts for half of your score. There are four questions in total, one in experimental design, one in quantitative or qualitative translation and two short answers. • Physics 2 Topics: The Physics 2 covers the following topics: Thermodynamics, ideal gases, kinetics, electricity part 2, magnetism, fluid mechanics, optics, atomic and nuclear physics. One must complete Physics 1 before taking the 2 • Thermodynamics: The study of heat and temperature and their relation to energy and work. • Fluid Mechanics: The study of how fluids (including liquids and gases) move and forces that acts on them. • Electromagnetism: The study of an electromagnetic field, which exerts a force on particles – electric charge. • Geometric Optics: It deals with how light moves and where it goes such as reflection and refraction (by prism, lens, mirror). • Physical Optics: It deals with the nature of light itself such as diffraction, interference and polarization (via grating etc.). • Atomic Physics: The study of the structure of atoms, including the energy levels of the electrons circling around the nucleus of the atom. • Nuclear Physics: The study of the interactions of atomic nuclei.
<p style="text-align: center;">Re-designed Course</p> <ul style="list-style-type: none"> • Balanced Design: The course requirements consist of contents and practices. It adapts a balanced approach of inquiry-based learning and conceptual reasoning. The revised AP Physics 1 and 2 together give two full years of high school study for a traditional one-year college course. • Rapid Learning Course: The scope of this course centers around seven big ideas. Each big idea is defined by a set of mini ideas with learning objectives and essential knowledge items. There are 24 chapters in this course. It consists of 24 core tutorials, 24 problem drills and 24 review sheets. • Seven Big Ideas: These seven big ideas make up all the units of this course, including objects and systems with mass and charge, gravitational and electromagnetic fields and forces, interactions between systems, mass, energy, charge, momentum conservation laws, mechanical, light, sound, and electromagnetic waves, and finally quantum mechanics including atomic and nuclear physics. • Course Layout: The algebra-based Physics 1&2 is a 2-in-1 combo course, geared towards for students in life science. The calculus-based Physics C Mechanics and E&M is also a 2-in-1 course, geared towards students in physical science and engineering. Physics 1 is the 1st semester of general physics and Physics 2 is the 2nd semester of general physics at college level. It takes two years of AP Physics in high school to cover one year content in college. 	

How to Use This Cheat Sheet: These are the keys related this topic. Try to read through it carefully twice then write it out on a blank sheet of paper. Review it again before the exams.