

AP Physics B - Core Concept Cheat Sheet

01: Introduction to AP Physics B

Key Terms

- **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.
- **Multiple Choice Tip:** As there is no calculator allowed during the multiple-choice section of the exam, you need to get comfortable with doing simple calculations without a calculator!
- **Free Response Tip:** Show all your work in the free response section. The readers or graders of the exam are not allowed to assume that you know something...make it clear that you know it by showing it! Show the equation you're going to use. Show the numbers plugged into the equation. Give your answer, including units and the correct significant figures!
- **Newton's Laws:** Isaac Newton developed 3 laws:
 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), Newton's Second Law: The acceleration of an object is directly proportional to the net force and inversely proportional to the mass, and Newton's Third Law: For every force, there is an equal and opposite force.
- **Wave Motion:** A wave is a periodic disturbance through which the sound or water wave travels. Waves can lead to reflection, refraction, interference and dispersion. Examples of waves include: sound waves, radio waves, ocean surface waves, and seismic waves in earthquakes.
- **Optics:** The study of the behaviour and properties of light is known as optics. Optic equipment includes: mirrors, lenses, telescopes, lasers and fiber optics. When light breaks into its component parts, it's known as diffraction. The reflection of light can occur from glossy surfaces, such as a mirror, or diffuse from surfaces, such as glossy paint.
- **Photoelectric Effect:** The photoelectric effect was discovered by Heinrich Hertz and later explained by Albert Einstein. The photoelectric effect is the emission of electrons from matter (either metal or non-metal) in response to the absorption of electromagnetic radiation, such as light.

Scope of the Exam

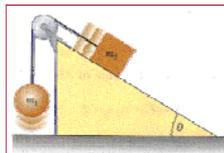


When the exam is prepared, it is understood that, due to variations in teaching style, each student will not know everything on the subject. Therefore, the questions are written over each topic and, as such, the examiners do not expect any one student to know all the answers.

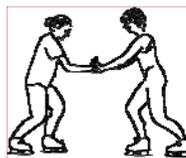
The exam is divided into a multiple-choice and a free response section. The multiple-choice questions are designed to test concepts and applications. The basic definitions and principles of physics will be included. Included in the exam packet is a table of information and equations.

Newton's Laws

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).

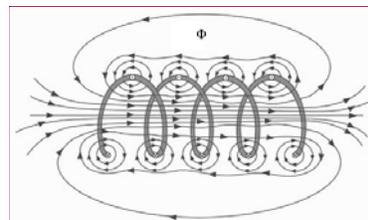


Newton's Second Law: The acceleration of an object is directly proportional to the net force and inversely proportional to the mass.



Newton's Third Law: For every force, there is an equal and opposite force.

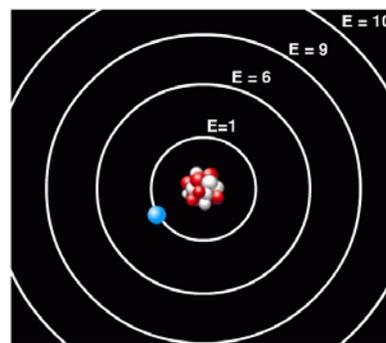
Electromagnetism



Electromagnetism is the study of an electromagnetic field, which exerts a force on particles – electric charge.

Magnetic flux (quantity of magnetism) = $\Phi B A \cos\theta$

Atomic Physics



The study of atoms in isolated systems and the atomic nucleus is known as Atomic Physics. Within multi-electron atoms, such as helium, there can be different energy levels for its electrons and these can be described with an atomic energy level diagram. Electrons can be in a ground state or, under the right conditions, an excited state.