

Cambridge AICE Physics

- PS 1 Physical Quantities & Units: Understand the application of standard SI units to various physical measurements. Show an understanding that all physical quantities consist of a numerical magnitude and a unit. Express derived units as products or quotients of the SI base units and use the named units as appropriate
- PS 2 Measurement Techniques: Use techniques for measuring length, volume, angle, mass, time, temperature, and electrical quantities. Use, with the proper degree of accuracy, a ruler, Vernier caliper, micrometer, spring and lever balances, protractor, stopwatch, thermometer, ammeter, voltmeter, galvanometer, and oscilloscope. Assess the uncertainty in a derived quantity.
- PS 3 Kinematics: Understand motion and the principles that describe motion. Define algebraically and graphically the terms displacement, speed, velocity, and acceleration. Solve problems using equations that represent uniformly accelerated motion in a straight line.
- PS 4 Dynamics: Understand how Newton's Laws can be used to explain the motion of objects and apply these laws to real world situations, and use the Conservation of Momentum to explain elastic and inelastic interactions. Show an understanding of the relationship between force and acceleration. Apply the principle of the conservation of momentum to situations described by Newton's third law of motion.
- PS 5 Forces: Understand gravitational, frictional forces, and how forces can establish a condition of linear and rotational equilibrium. Describe the forces on mass in gravitational fields. Show an understanding that when the resultant force and torque are zero, a system is in equilibrium.
- PS 6 Work, Energy, Power: Apply the Conservation of Energy to the movement of objects, relating energy to the concepts of work and power. Understand the relationship between work and energy changes. Define power as work done per unit time, and derive power as the product of force and velocity.
- PS 7 Phases of Matter: Distinguish between the kinetic models of solids, liquids, and gases, emphasizing the processes of melting, boiling and evaporation. Relate the difference in the structures and densities of solids, liquids and gases to simple ideas of the spacing, ordering, and motion of the molecules. Define the term pressure, and use the kinetic model to explain the pressure exerted by gases.
- PS 8 Deformation of Solids: Explain the use of the terms stress, strain, and the Young modulus, relating these to the action of springs and Hooke's Law. Describe the behavior of springs in terms of load, extension, elastic limit, Hooke's Law, and the spring constant. Describe an experiment to determine the Young modulus of a metal in the form of a wire.
- PS 9 Waves: Identify and differentiate wave production, transmission, and behavior. Show an understanding of and use the terms displacement, amplitude, phase difference, period, frequency, wavelength and speed. Determine the frequency of sound using stationary waves.
- PS 10 Superposition: Understand wave interactions in the formation of standing (stationary) waves and interference patterns. Explain the formation of stationary waves using a graphical method, and identify nodes and antinodes. Show an understanding of experiments that demonstrate diffraction and interference.
- PS 11 Electric Fields: Demonstrate the concept of electric field as a field of force per unit of positive charge. Define electric field strength and represent electric field by means of field lines. Describe the effect of a uniform electric field on the motion of charged particles.
- PS 12 Current Electricity: Describe and apply electric phenomena such as current, voltage, resistance, and resistivity. Show an understanding that electric current is the flow of charged particles, and define potential difference. Understand the relationship between resistance and resistivity.
- PS 13 DC Circuits: Students know how to solve problems involving Ohm's Law and Kirchhoff's Laws in series, parallel, and combination circuits. Draw and interpret circuit diagrams containing sources, switches, resistors, ammeters, voltmeters, and any other type of component referred to in the syllabus. Apply Ohm's Law, and Kirchhoff's Laws to series and parallel circuits, then learn how to use these laws with more complex combination circuits.
- PS 14 Nuclear Physics: Understand nuclear structure, nuclear reaction equations, isotopes, and α , β , and γ radioactivity. Determine the products of radioactive decay reactions, using the concepts of conservation of mass and conservation of charge. Show an understanding of the spontaneous and random nature of nuclear decay.

- PS 15 Lab Activities: Develop skills needed to carry out experimental and investigational work. Plot data on a graph and evaluate the relationships between the manipulated and responding variables. Manipulate equipment and measuring devices in a manner that maximizes the accuracy of data gathered.
- PS 16 11-12.RST.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
- PS 17 11-12.RST.2 Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
- PS 18 11-12.RST.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
- PS 19 11-12.RST.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
- PS 20 11-12.WHST.1 Write arguments focused on discipline-specific content.
- Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.
 - Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.
 - Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
 - Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
 - Provide a concluding statement or section that follows from or supports the argument presented.
- PS 21 11-12.WHST.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- PS 22 11-12.WHST.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.