Physics

Curriculum Structure

This curriculum consists of compulsory and elective parts. The compulsory part covers a range of content that enables students to develop understanding of fundamental principles and concepts in physics, and scientific process skills. The following topics: "Heat and Gases", "Force and Motion", "Wave Motion", "Electricity and Magnetism" and "Radioactivity and Nuclear Energy" should be included.

The content of the compulsory part consists of two components, core and extension. The core is the basic component for all students whereas the extension component is generally more cognitively demanding. For some students, it will be more beneficial, less stressful and more effective to concentrate on the core component, so that more time is available for them to master basic concepts and principles; for others the challenges provided by the extension component may provide a higher degree of achievement. A good school-based physics curriculum should have an in-built flexibility to cater for the abilities of students, so that a balance between the quantity and quality of learning may be achieved. However, certain knowledge in the extension component must be introduced to prepare students better for the topics in the elective part.

To cater for the diverse interests, abilities and needs of students, an elective part is included in the curriculum. The elective part aims to provide in-depth treatment of some of the compulsory topics, an extension of certain areas of study, or a synthesis of knowledge, understanding and skills in a particular context. Topics suggested in the elective part are: "Astronomy and Space Science", "Atomic World", "Energy and Use of Energy" and "Medical Physics".

To facilitate the integration of knowledge and skills, students are required to conduct an investigative study relevant to the curriculum. A proportion of the lesson time will be allocated to this study.

Suggested Time Allocation

Compulsory part (Total 184 hours)		Suggested lesson time (hours)
I. Heat and Gases	a. Temperature, heat and internal energy* b. Transfer processes* c. Change of state* d. Gases	23
II. Force and Motion	a. Position and movement* b. Force and motion* c. Projectile motion* d. Work, energy and power* e. Momentum* f. Uniform circular motion g. Gravitation	50
III. Wave Motion	a. Nature and properties of waves* b. Light* c. Sound*	47
IV. Electricity and Magnetism	a. Electrostatics* b. Circuits and domestic electricity* c. Electromagnetism*	48
V. Radioactivity and Nuclear Energy	a. Radiation and radioactivity b. Atomic model c. Nuclear energy	16
	Subtotal:	**184**

Elective part (Total 50 hours, any 2 out of 4)		Suggested lesson time (hours)
VI. Astronomy and Space Science	a. The universe as seen in different scales b. Astronomy through history c. Orbital motions under gravity d. Stars and the universe	25
VII. Atomic World	a. Rutherford's atomic model b. Photoelectric effect c. Bohr's atomic model of hydrogen d. Particles or waves e. Probing into nano scale	25
VIII. Energy and Use of Energy	a. Electricity at home b. Energy efficiency in building and transportation c. Renewable and non-renewable energy sources	25
IX. Medical Physics	a. Making sense of the eye and the ear b. Medical imaging using non-ionizing radiation c. Medical imaging using ionizing radiation	25
	Subtotal:	**50**

MODE OF ASSESSMENT

The public assessment of Physics consists of a public examination component and a school-based assessment component as outlined in the following table:

Component			Weighting	Duration
Public Examination	Paper 1	Questions set on Compulsory Part	60%	2 hours 30 minutes
	Paper 2	Questions set on Elective Part	20%	1 hour
School-based Assessment (SBA)			20%	

Public Examination

Paper 1 comprises two sections A and B. Section A consists of multiple-choice questions and carries 21% of the subject mark. Section B includes short questions, structured questions and an essay question, and it carries 39% of the subject mark. Candidates have to attempt **all** questions in Paper 1.

Paper 2 contains multiple-choice questions and structured questions set on each of the four elective topics of the curriculum, and questions on each elective carry 10% of the subject mark. Candidates are to attempt questions from any **two** of the four electives.

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