

GRADE 10 PHYSICS 2 FRAMEWORK

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INTRODUCTION

This is an elective class normally taken in the 10th Grade by students who intent to follow a career in which Physics would be an essential component of their preparation. In this class, the student will be prepared to be successful in the SAT Physics subject test and in further advanced study of Physics in 11th and 12th Grades.

THEMES AND CONTENT

- Mechanics – Kinematics; dynamics; momentum and impulse; work and energy; circular motion and rotation; gravitation; Vibrations.
- Electricity and Magnetism – Electric fields, forces and potentials; electric circuits; magnetic fields and forces.
- Waves - General wave properties; Reflection and refraction of light; Polarization, diffraction and interference of light; Ray optics
- Thermal Physics - Heat, temperature and thermodynamics; Gases and kinetic theory.
- Modern Physics - Quantum Phenomena; Atomic Physics; Nuclear and Particle Physics; Special Relativity.

MATHEMATICS REQUIREMENTS

Perform the basic arithmetic functions: addition, subtraction, multiplication and division.

Carry out calculations involving means, decimals, fractions, percentages, ratios, approximations and reciprocals.

Carry out manipulations with trigonometric functions.

Use standard scientific notation.
Use direct and inverse proportion.
Solve simple algebraic equations.
Solve linear simultaneous equations.
Solve vector problems graphically and algebraically.
Plot graphs (with suitable scales and axes) including two variables that show linear and non-linear relationships.
Interpret graphs, including the significance of gradients, changes in gradients, intercepts and areas.
Draw lines (either curves or linear) of best fit on a scatter plot graph.
Interpret data presented in various forms (for example, bar charts, histograms and pie charts).

SCIENCE NOTEBOOK EXPECTATIONS

- Science notebooks are an independent responsibility of the student.
- Students are expected to keep an organized notebook with notes from class, work done at home and data collected during labs.

SCIENTIFIC WRITING EXPECTATIONS

- Students are expected to present raw and processed data using an Excel spreadsheet.
 - Processed data includes, but is not limited to: converting units, performing calculations, doing averages, rounding, plotting data, adding trendlines, interpreting data from graphs and trendlines, and discussing quality of data and results.

Use of a Calculator

- Students are expected to use a graphic calculator both in class and during assessments (while there is no specific model which is not allowed at this level, there are calculators which are recommended and the list can be made available to students upon request).

SCIENCE LABORATORY SAFETY EXPECTATIONS

Students will be expected to learn and to follow the expectations for safe and appropriate practices during laboratory activity, as shown on the “Science Laboratory Safety” document.

See link below:

https://www.caislisbon.org/uploaded/Curriculum_links/Science/Science_lab_safety_High_School.pdf

INFORMATION TECHNOLOGY EXPECTATIONS

Students will be expected to use a variety of digital tools according to grade level expectations stated in CAISL’s Research and Information Technology Integration Scope and Sequence.

See link below:

https://www.caislisbon.org/uploaded/Curriculum_links/2019-2020/IT_Skills_Scope_and_Sequence_by_Grade.pdf