



Scheme of work – Cambridge IGCSE® Physics (0625)

Overview

This scheme of work provides ideas about how to construct and deliver a course. The 2012 and 2013 syllabuses have been broken down into teaching units with suggested teaching activities and learning resources to use in the classroom. The scheme of work suggests teaching approaches, internet sites, references to textbooks and a variety of other ideas. It is not in itself a detailed course description but a teacher wishing to follow it in that way will discover that the entire syllabus is covered. Likewise, teachers who wish to devise other courses conducted in different orders will not find their students disadvantaged provided their courses also cover the syllabus. An attempt has been made to place syllabus items within the unit structure in an order that is both logical and consistent. Where prior knowledge helps the teaching of a particular topic, the section dealing with the prior knowledge comes first. Teachers who wish to use the scheme of work as the basis for their courses are likely to use it one of two ways. One approach is to teach a whole topic at once so that a student might study only electricity for several months followed, by say, mechanics; this is a topic-based approach. Alternatively, the course can be tackled by dealing with the basic parts of each topic first and ensuring that these are understood before returning to teach some subsequent sections of the units. This approach where all topics are regularly dealt with and each subject is taught by repeatedly returning to it each time at a deeper level is commonly called the spiral curriculum approach. Teachers and centres must make their own decisions as to how the course should be structured.

Within the scheme of work, syllabus sections in ordinary print are from the Core Syllabus and sections in **bold** print are from the Supplement (Extended).

Outline

The units within this scheme of work are:

- Unit 1: **Light**
- Unit 2: **Electricity 1**
- Unit 3: **Energy**
- Unit 4: **Mechanics 1**
- Unit 5: **Electromagnetism**
- Unit 6: **Electricity 2**
- Unit 7: **Thermal physics**
- Unit 8: **Mechanics 2**
- Unit 9: **Waves**
- Unit 10: **Atomic physics**
- Unit 11: **Electronics**

Detail of unit structure

Unit 1: Light

- 3.2(a) Reflection
- 3.2(b) Refraction
- 3.2(c) Thin converging lenses
- 3.2(d) Dispersion

Unit 2: Electricity 1

- 4.2(b) Current
- 4.2(c) Electro-motive force
- 4.2(d) Potential difference
- 4.2(e) Resistance
- 4.2(f) Electrical energy

Unit 3: Energy

- 1.6(a) Energy
- 1.6(b) Energy resources
- 2.3(a) Conduction
- 2.3(b) Convection
- 2.3(c) Radiation

Unit 4: Mechanics 1

- 1.1 Length and time
- 1.2 Speed, velocity and acceleration
- 1.3 Mass and weight
- 1.4 Density

Unit 5: Electromagnetism

- 4.1 Simple phenomena of magnetism
- 4.5(a) Electromagnetic induction
- 4.5(b) The a.c. generator
- 4.5(c) Transformer
- 4.5(d) The magnetic effect of a current

- 4.5(e) Force on a current-carrying conductor
- 4.5(f) The d.c. motor

Unit 6: Electricity 2

- 4.2(a) Electric charge
- 4.3(b)(c) Circuit diagrams, series and parallel circuits
- 4.4 Dangers of electricity

Unit 7: Thermal physics

- 2.1(a) States of matter
- 2.1(b) Molecular model
- 2.1(c) Evaporation
- 2.1(d) Pressure changes
- 2.2(a) Thermal expansion of solids, liquids and gases
- 2.2(b) Measurement of temperature
- 2.2(c) Thermal capacity
- 2.2(d) Melting and boiling

Unit 8: Mechanics 2

- 1.5(a) Effects of forces
- 1.5(b) Turning effect
- 1.5(c) Conditions for equilibrium
- 1.5(d) Centre of mass
- 1.5(e) Scalars and vectors
- 1.6(c) Work
- 1.6(d) Power
- 1.7 Pressure

Unit 9: Waves

- 3.1 General properties of waves
- 3.2(e) Electromagnetic spectrum
- 3.3 Sound

Unit 10: Atomic physics

- 5.1(a) Detection of radioactivity
- 5.1(b) Characteristics of the three kinds of emission

- 5.1(c) Radioactive decay
- 5.1(d) Half-life
- 5.1(e) Safety precautions
- 5.2(a) Atomic model
- 5.2(b) Nucleus
- 5.2(c) Isotopes

Unit 11: Electronics

- 4.6(a) Cathode rays
- 4.6(b) Simple treatment of cathode-ray oscilloscope
- 4.3(c) Action and use of circuit components
- 4.3(d) Digital electronics

Teacher support

The up-to-date resource list for the Cambridge IGCSE Physics (0625), which includes a range of endorsed textbooks, can be found on the Cambridge International Examinations website www.cie.org.uk. In addition, the password-protected Teacher Support website at <http://teachers.cie.org.uk> provides access to specimen and past question papers, mark schemes and other support materials. We offer online and face-to-face training; details of forthcoming training opportunities are posted on the website.

Resources

Cambridge IGCSE Physics web page:

www.cie.org.uk/qualifications/academic/middlesec/igcse/subject?assdef_id=879

Cambridge Students – University of Cambridge International Examinations:

www.cambridgestudents.org.uk/subjectpages/physics/

Sang, D. *Cambridge IGCSE Physics Coursebook with CD-ROM*

ISBN: 9780521757737

Cambridge IGCSE Physics (0625) Past Paper Questions – a list of Past Paper questions is attached to each unit of this scheme of work.

www.lightwave.soton.ac.uk/experiments/periscope/periscope.html

www.youtube.com/watch?v=BI56CcLkzzc

www.phys.virginia.edu/Education/outreach

www.physicsclassroom.com/Class/refrn/U14L5a.html

www.phy.ntnu.edu.tw/ntnujava/index.php?topic=48

www.phy.ntnu.edu.tw/java/shadow/shadow.html

www.mistupid.com/science/prism.htm

www.galaxy.net/~k12/electric/index.shtml

www.engr.uky.edu/~qedney/courses/ee468/expmnt/vdg.html

www.wonderhowto.com/how-to-experiment-with-van-de-graaff-generator-272678/
www.youtube.com/watch?v=RxcOXj9Udjc
www.mos.org/sln/toe/tennisballs.html
www.sciencestage.com/v/591/electric-power-formula-ohm's-law.html
www.littleshop.physics.colostate.edu/
www.altenergy.org/
www.ergon.com.au/
www.youtube.com/watch?v=pusKIK1L5To
www.youtube.com/watch?v=eMGqkOTJCN0:
www.coolcosmos.ipac.caltech.edu/cosmic_classroom/light_lessons/thermal/transfer.html
www.edumedia-sciences.com/en/a639-thermal-convection
www.science.hq.nasa.gov/kids/imagers/ems/infrared.html
www.youtube.com/watch?v=WP2XwBhmAk
www.fearofphysics.com/Xva/xva
www.nasaexplores.com/
www.driveandstayalive.com/info%20section/stopping-distances.htm#stop-dist_table-for-dry-road
www.school.discovery.com/lessonplans/
www.regentsprep.org/Regents/physics/phys01/terminal/default.htm
www.curtin.edu.au/curtin/dept/phys-sci/gravity/index2.htm
www.ee.umd.edu/~taylor/frame1.htm
www.school.discovery.com/lessonplans/
www.ndt-ed.org/EducationResources/HighSchool/Electricity/electroinduction.htm
www.regentsprep.org/regents/physics/phys03/dinduction/default.htm
www.youtube.com/watch?v=KGTZPTnZBFE
www.bbc.co.uk/schools/gcsebitesize/science/add_ocr/electric_circuits/mainsproducedrev1.shtml
www.pbs.org/wgbh/amex/edison/sfeature/acdc_insideacgenerator.html
www.energyquest.ca.gov/how_it_works/transformer.html
www.youtube.com/watch?v=VucsoEhB0NA
www.bbc.co.uk/schools/gcsebitesize/science/ocr_gateway/living_future/5_magnetic_field1.shtml
www.youtube.com/watch?v=JUZC679CwKs
www.bbc.co.uk/learningzone/clips/the-3d-magnetic-field-of-a-bar-magnet/287.html
www.youtube.com/watch?v=14SmN_7EcGY
www.youtube.com/watch?v=Xi7o8cMPI0E
www.howstuffworks.com/motor.htm
www.practicalphysics.org/go/Experiment_334.html
www.sciencemadesimple.com/static.html
www.amasci.com/emotor/sticky.html
www.sciencemadesimple.com/static.html
www.amasci.com/emotor/sticky.html
www.eskimo.com/~billb/emotor/stmiscon.html
www.eskimo.com/~billb/redgreen.html

www.education.leeds.ac.uk/research/cssme/ElecCircuitsScheme.pdf
www.jersey.uoregon.edu/vlab/Voltage/
www.youtube.com/watch?v=Ym1a9_aXEv8
www.video.google.com/videoplay?docid=-5242394503257451479
www.phys.virginia.edu/classes/109N/more_stuff/Applets/
www.school.discovery.com/lessonplans/
www.jersey.uoregon.edu/vlab/Piston/index.html
www.youtube.com/watch?v=AX5eVxxQgPc
www.teams.lacoe.edu/documentation/classrooms/gary/heat/activities/mystery/Mystery.html
www.matter.org.uk/schools/content/hookeslaw/index.html
www.youtube.com/watch?v=oFiXtcXRpVE
www.school.discovery.com/lessonplans/programs/bridges/index.html
www.youtube.com/watch?v=hqDhW8HkOQ8&feature=related
www.mos.org/leonardo
www.tutor4physics.com/examplesworkdone.htm
www.hyperphysics.phy-astr.gsu.edu/hbase/work.html
www.tap.iop.org/mechanics/work_energy_power/index.html
www.members.aol.com/nicholashl/waves/movingwaves.html
www.hyperphysics.phy-astr.gsu.edu/hbase/wavrel.html
www.gcse.com/waves/vfl.htm
www.schooltube.com/video/6ea0d020a582f8d6b1c1/The-Electromagnetic-Spectrum
www.youtube.com/watch?v=Uz11z0u_700
www.vimeo.com/16996376
www.colorado.edu/physics/2000/index.pl
www.enm.bris.ac.uk/
www.youtube.com/watch?v=usHtqr0_HXU
www.youtube.com/watch?v=HISCwV8d5qM
www.aip.org/history/curie/contents.htm
www.colorado.edu/physics/2000/index.pl
www.youtube.com/watch?v=fToMbj3Xz2c
www.youtube.com/watch?v=PYn8vFmyGPM
www.youtube.com/watch?v=Tp2M9ndGG0
www.accessexcellence.org/AE/AEC/CC/historical_background.html
www.library.thinkquest.org/3471/medical_imaging.html
www.phy.ntnu.edu.tw/~hwang/oscilloscope/oscilloscope.html
www.allaboutcircuits.com/vol_3/chpt_3/4.html

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