

SCHEME OF WORK

DEPARTMENT: Physics

COURSE: PHB

Tutor B

LEVEL: A level Year 2

BOARD: AQA

CODE: 7408

Notes

Textbook references are from AQA Physics – Breithaupt. The assignments column serves as a guide only; students may find this useful as a source of additional practice questions, or to assist with catching up on work missed. Supporting experimental work will be supervised by tutor A and consist of introductory experiments, individual experiments completed on a 'circus' basis and more investigatory exercises. Practical work embodies the content of section 3.1 'Measurements and their errors'

WEEK	ROUTE THROUGH THE SPECIFICATION BY TOPIC or UNIT	LEARNING AND TEACHING ACTIVITIES (Highlighting differentiation)	ASSIGNMENTS	EDUCATIONAL RESOURCES USED (Type and Location)
S1 - 4	<p>Summer half term taster work <u>3.6.2 Thermal Physics</u> Internal energy and temperature, Temperature scales, Specific heat capacity, Change of state, Latent heat.</p>	<p>Teacher explanation Question and answer Problem solving Experiments: Measurement of specific heat capacity for various metals; Measurement of specific heat capacity of water: Measurement of specific latent heat of fusion of ice & vaporisation of water</p>	<p>Text P. 198 – 207, P. 198 – 207 Summary Qu. P. 201, 204, 207 Exam Qu. P. 208 – 209 Practical reports</p>	<p>Demonstration apparatus; textbooks; problem books; Lab apparatus; reference worksheets / GO</p>
1 – 2	<p>Autumn term Pre-summer taster work topic test and review.</p>		<p>Tests</p>	<p>Test papers</p>

2 – 7	Boyle's law, Charles' law, Pressure law, the ideal gas equation, Kinetic theory of an ideal gas.	Teacher explanation Question and answer Problem solving Experiments: Boyle's Law; Charles' Law, Pressure Law	Text P. 210 – 218 Summary Qu. P. 211, 214, 218 Exam Qu. P. 219 – 221 Practical reports	Demonstration apparatus; textbooks; problem books; Lab apparatus; reference worksheets / GO
8 - 12	<u>3.8.1 Radioactivity</u> The discovery of the nucleus, Properties of radiation, Inverse square law, Decay equations, N - Z curves, Radioactive series, Safety aspects, Radioactive decay law, Activity, Half-life, Decay constant, Applications.	Teacher explanation Question and answer Problem solving Related experiment: Inverse square law for gamma radiation, Inverse square law with lamp and LDR	Text P. 148 – 175 Summary Qu. P. 150, 155, 158, 161, 164, 167, 171, 175	Demonstration apparatus; textbooks; problem books; video Lab apparatus; reference worksheets / Godalming Online
13 - 16	<u>3.8.1 Nuclear Energy</u> Energy and mass, Mass defect, Binding energy, Nuclear stability, Fission, Fusion, the thermal nuclear reactor.	Teacher explanation Question and answer Problem solving	Text P. 182 – 194 Summary Qu. P. 184, 187, 190, 194	textbooks; problem books; video
17 – 18	<u>3.7.5.5 Alternating currents</u> Sinusoidal voltages and currents, root mean square, peak and peak-to-peak values. The oscilloscope. Use of an oscilloscope as a dc and ac voltmeter, to measure time intervals and frequencies and to display ac waveforms.	Teacher explanation Question and answer Problem solving Experiment: Use of signal generator and CRO.	N.b. This section is covered in the old AS textbook Text P. 74 – 79 Summary Qu. P. 76, 79 Exam Qu. P. 80 - 81 Practical reports	Demonstration apparatus; textbooks; problem books Lab apparatus; reference worksheets / GO
19	Overview of option topics.	Teacher explanation	Selection of option topic	Presentations, GO
10 - 26	<u>Option Topic</u> Either <u>3.9 Astrophysics</u> Lenses and optical telescopes, Non optical telescopes, Classification of stars, Black body radiation, the Hertzsprung – Russell diagram, Supernovae, Neutron stars, Black holes, Cosmology, the Doppler effect,	Independent study using GO with lead lectures and tutorial support Related Experiment: Measurement of focal length of a lens	Assignments and questions on GO	GO, PowerPoint presentations, textbooks, videos, applets Lab apparatus; reference worksheets / GO

<p>Hubble's law, exoplanets.</p> <p>Or <u>3.10 Medical Physics</u> Physics of the eye, Physics of the ear, Biological measurement, ECG, Ultrasound, Endoscopes, MRI, X – rays, CT Scanner, Radionuclide imaging, Radiotherapy and radioactive implants.</p> <p>Or <u>3.11 Engineering Physics</u> Rotational dynamics, Moment of inertia, Angular velocity and acceleration, Torque, Angular momentum, Thermodynamics and Engines, First law of thermodynamics, The $p - V$ diagram, Engine cycles, Second Law and engines, Reversed heat engines</p> <p>Or <u>3.12 Turning Points in Physics</u> The discovery of the Electron, Wave Particle Duality, Electron microscopes, Electromagnetic waves, Photoelectricity, The Michelson-Morley experiment, Einstein's theory of special relativity, Time dilation, Length contraction, Mass and energy</p> <p>Or <u>3.13 Electronics</u> MOSFET, Zener diode, Photodiode, Hall effect sensor, Analogue and digital signals, LC resonance filters, The ideal operational amplifier, Inverting amplifier, Non-inverting amplifier, Summing amplifier, Real operational amplifiers, Combinational logic, Sequential logic, Astables, Principles of communication systems, Transmission media, Time-division multiplexing, Amplitude (AM) and frequency modulation (FM) techniques</p>			
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27 - 30	Revision of first year topics.		AS textbook Exam Qu. P. 82 - 87 Exam Qu. P. 208 - 215	Revision handbooks / past questions
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