

A-level physics

An outstanding A-level physics student combines deep conceptual understanding with strong problem-solving skills and disciplined study habits. They don't just memorise equations but understand why they work and can apply them to unfamiliar situations by breaking problems into clear steps, using diagrams, and checking units and realism of answers. They revise consistently using active techniques like past papers and self-testing, and they develop a solid grasp of practical work by understanding methods, uncertainties, and limitations. Precision is key, so they present clear workings, correct units, and concise explanations, especially for longer questions. They are curious beyond the specification, resilient when facing difficult topics, and willing to learn from mistakes by reviewing feedback carefully. Strong organisation, effective exam technique, and good time management also play a crucial role, allowing them to approach exams confidently and perform at a high level.

Summary of course content

The Physics A-Level syllabus is split into three areas:

Paper 1	Paper 2	Paper 3
<u>Electricity</u> <u>Particle physics</u> <u>Mechanics</u>	<u>Fields</u> <u>Nuclear physics</u> <u>Further mechanics</u>	<u>Practical skills</u> <u>Astrophysics</u>

- Each exam paper is $33\frac{1}{3}\%$ of the course, 2hrs long and worth 85 marks.
- Each paper includes a mix of question styles, from short, single-mark questions to multi-step problems.

What you should be doing as an independent learner in your four hours of independent study per week?

Weekly:	• Summary questions at the end of each lesson
Fortnightly:	• Review of recent lessons using the PowerPoints on Teams, learning key terminology, producing revision resources such as mind maps and completing relevant questions from the textbook.
Half termly:	• Revision: As well as completing all questions from the textbook, redo end of unit assessments for each topic. Review recent lessons, learn key processes and produce revision resources, e.g., flashcards, mind maps, posters, etc. • Complete past exam papers https://www.aqa.org.uk/subjects/physics/a-level/physics-7408/assessment-resources

Resources

In addition to those provided for specific tasks by your teacher, resources include:

- AQA A-level Physics student textbook (Oxford Education)
- Past exam papers <https://www.aqa.org.uk/subjects/physics/a-level/physics-7408/assessment-resources>
- Question and answer booklets for each topic

Independent learning overview

Two hours directed by each of your teachers (subject to change):

For each topic:

- read the relevant pages from the textbook and add to your class notes
- create a set of revision cards for each of the worked examples
- complete all summary questions

Y12	Teacher 1	Teacher 2
07.09.26	Enrolment week	Enrolment week
14.09.26	Section 1 Particles and radiation • 1 Matter and radiation 1.1 Inside the atom pg. 4-5	Section 3 Mechanics and materials • 6 Forces in equilibrium 6.1 Vectors and scalars pg. 96-99
21.09.26	1.2 Stable and unstable nuclei pg. 6-7	6.2 Balanced forces pg. 100-102
28.09.26	1.3 Photons pg. 8-9	6.3 The principle of moments pg. 103-104
05.10.26	1.4 Particles and antiparticles pg. 10-12	6.4 More on moments pg. 105-106 6.5 Stability pg. 107-109
12.10.26	1.5 Particle interactions pg. 13-15	6.6 Equilibrium rules pg. 110-113 6.7 Statics calculations pg. 114-115
19.10.26	Practice questions: Chapter 1 pg. 16-17	Practice questions: Chapter 6 pg. 116-117
26.10.26	Half term	
02.11.26	Section 1 Particles and radiation • 2 Quarks and leptons 2.1 The particle zoo pg. 18-19	Section 3 Mechanics and materials • 7 On the move 7.1 Speed and velocity pg. 118-119 7.2 Acceleration pg. 120-121
09.11.26	2.2 Particle sorting pg. 20-21	7.3 Motion along a straight-line pg. 122-124 7.4 Free fall pg. 125-127
16.11.26	2.3 Leptons at work pg. 22-23	7.5 Motion graphs pg. 128-129 7.6 More calculations on motion pg. 130-131
23.11.26	2.4 Quarks and antiquarks pg. 24-25	7.7 Projectile motion 1 pg. 132-133 7.8 projectile motion 2 pg. 134-135
30.11.26	2.5 Conservation rules pg. 26-27	Practice questions: Chapter 7 pg. 136-137
07.12.26	Practice questions: Chapter 2 pg. 28-29	Section 3 Mechanics and materials • 8 Newton's laws of motion 8.1 Force and acceleration pg. 138-140 8.2 Using $F=ma$ pg. 141-143
14.12.26	Section 1 Particles and radiation • 3 Quantum phenomena 3.1 The photoelectric effect pg. 30-31	8.3 Terminal speed pg. 144-145 8.4 On the road pg. 146-148 8.5 Vehicle velocity pg. 149-151
21.12.26	Christmas holidays	
28.12.26	Christmas holidays	
04.01.27	3.2 More about photoelectricity pg. 32-33	Practice questions: Chapter 8 pg. 152-153
11.01.27	3.3 Collisions of electrons with atoms pg. 34-35	Section 3 Mechanics and materials • 9 Force and momentum 9.1 Momentum and impulse pg. 154-157
18.01.27	3.4 Energy levels in atoms pg. 36-38	9.2 Impact forces pg. 158-160 9.3 Conservation of momentum pg. 161-163
25.01.27	3.5 Energy levels and spectra pg. 39-40	9.4 Elastic & inelastic collisions pg. 164-165 9.5 Explosions pg. 166-167
01.02.27	Work experience	
08.02.27	3.6 Wave-particle duality pg. 41-43	Practice questions: Chapter 9 pg. 168-169
15.02.27	Half term	
22.02.27	Practice questions: Chapter 3 pg. 44-45	Section 3 Mechanics and materials • 10 Work, energy and power

		10.1 Work and energy pg. 170-172 10.2 Kinetic and potential energy pg. 173-174
01.03.27	Section 1 Summary & Practice questions pg. 46- 49	10.3 Power pg. 175-176 10.4 Energy and efficiency pg. 177-181 Practice questions: Chapter 10 pg. 182-183
08.03.27	Section 2 Waves and optics • 4 Waves 4.1 Waves and vibrations pg. 52-53	Section 3 Mechanics and materials • 11 Materials 11.1 Density pg. 184-185 11.2 Springs pg. 186-188
15.03.27	4.2 Measuring waves pg. 54-55	11.4 Deformation of solids pg. 189-191 11.5 More about stress and strain pg. 192-193
22.03.27	4.3 Wave properties 1 pg. 56-57	Practice questions: Chapter 11 pg. 194-195
29.03.27	Easter holidays	
05.04.27	Easter holidays	
12.04.27	4.4 Wave properties 2 pg. 58-59	Section 3 Summary & Practice Qs pg. 196-199
19.04.27	4.5 Stationary and progressive waves pg. 60-61	Section 4 Electricity • 12 Electric current 12.1 Current and charge pg. 202-203
26.04.27	4.6 More about stationary waves pg. 62-63	12.2 Potential difference and power pg. 204-205
03.05.27	4.7 Using an oscilloscope pg. 64-65	12.3 Resistance pg. 206-208
10.05.27	Practice questions: Chapter 4 pg. 66-67	12.4 Components & characteristics pg. 209-211
17.05.27	Section 2 Waves and optics • 5 Optics 5.1 Refraction of light pg. 68-69	Practice questions: Chapter 12 pg. 212-213
24.05.27	5.2 Refraction pg. 70-72	Section 4 Electricity • 13 Direct current circuits 13.1 Circuit rules pg. 214-216
31.05.27	Half term	
07.06.27	5.3 Total internal reflection pg. 73-75	13.2 More about resistance pg. 217-219
14.06.27	5.4 Double split interference pg. 76-78	13.3 Electromotive force & resistance pg. 220-222
21.06.27	5.5 More about interference pg. 79-81	13.4 More circuit calculations pg. 223-225
28.06.27	5.6 Diffraction pg. 82-84	13.5 The potential divider pg. 226-227
05.07.27	5.7 The diffraction grating pg. 85-87	Practice questions: Chapter 13 pg. 228-229
12.07.27	Practice questions: Chapter 5 pg. 88-89	Section 4 Summary & Practice Qs pg. 230-233
19.07.27	Section 2 Summary & Practice questions pg. 90-93	Further practice Qs: multiple choice pg. 234-241

Y13	Teacher 1	Teacher 2
07.09.26	Enrolment week	Enrolment week
14.09.26	Section 7 Fields • 21 Gravitational fields 21.1 Gravitational field strength pg. 338-339	Section 6 Further mechanics & thermal physics • 17 Motion in a circle 17.1 Uniform circular motion pg. 274-275
21.09.26	21.2 Gravitational potential pg.340-342 21.3 Newton's law of gravitation pg. 343-345	17.2 Centripetal acceleration pg. 276-277 17.3 On the road pg. 278-279
28.09.26	21.4 Planetary fields pg. 346-350	17.4 At the fairground pg. 280-281
05.10.26	21.5 satellite motion pg. 351-353	Practice questions: Chapter 17 pg. 282-285
12.10.26	Practice questions: Chapter 21 pg. 354-357	Section 6 Further mechanics & thermal physics • 18 Simple harmonic motion 18.1 Oscillations pg. 286-287
19.10.26	Section 7 Fields • 22 Electric fields 22.1 Field patterns pg. 358-361	18.2 Simple harmonic motion pg. 288-289 18.3 More about sine waves pg. 290-291 18.4 Application of harmonic motion pg. 292- 295
26.10.26	Half term	
02.11.26	22.2 Electric field strength pg. 362-365 22.3 Electric potential pg. 366-368	18.5 Energy & simple harmonic motion pg. 296-298 18.6 Forced vibrations & resonance pg. 299-301
09.11.26	22.4 Coulomb's law pg. 369-371	Practice questions: Chapter 18 pg. 302-305
16.11.26	22.5 Point charges pg. 372-374 22.6 Comparing fields pg. 375	Section 6 Further mechanics & thermal physics • 19 Thermal physics 19.1 Internal energy & temperature pg. 306-309
23.11.26	Practice questions: Chapter 22 pg. 376-379	19.2 Specific heat capacity pg. 310-312 19.3 Change of state pg. 313-315
30.11.26	Section 7 Fields • 23 Capacitors 23.1 Capacitance pg. 380-381 23.2 Energy stored in a capacitor pg. 382-383	Practice questions: Chapter 19 pg. 316-317
07.12.26	23.3 Charging/discharging pg. 384-387 23.4 Dielectrics pg. 388-391	Section 6 Further mechanics & thermal physics • 20 Gases 20.1 Experimental gas laws pg. 318-319
14.12.26	Practice questions: Chapter 23 pg. 392-395	20.2 The ideal gas law pg. 320-322 20.3 The kinetic theory of gas pg. 323-326
21.12.26	Christmas holidays	
28.12.26	Christmas holidays	
04.01.27	Section 7 Fields • 24 Magnetic fields 24.1 Current-carrying conductors pg. 396-399	Practice questions: Chapter 20 pg. 327-329 Section 6 Summary & Practice Qs pg. 330-335
11.01.27	24.2 Moving charges in magnetic field pg. 400-402	Section 8 Nuclear physics • 26 Radioactivity 26.1 The discovery of the nucleus pg. 438-440
18.01.27	24.3 Charged particles in circular orbit pg. 403-405	26.2 The properties of radiation pg. 441-445
25.01.27	Practice questions: Chapter 24 pg. 406-409	26.3 More about radiation pg. 446-448
01.02.27	Section 7 Fields • 25 Electromagnetic induction 25.1 Generating electricity pg. 410-412	26.4 The dangers of radioactivity pg. 449-451
08.02.27	25.2 The laws of EM induction pg. 413-416 25.3 The ac generator pg. 417-419	26.5 Radioactive decay pg. 452-454
15.02.27	Half term	
22.02.27	25.4 Alternating current and power pg. 420-422 25.5 Transformers pg. 423-425	26.6 The theory of radioactive decay pg. 455-457
01.03.27	Practice questions: Chapter 25 pg. 426-429	26.7 Radioactive isotopes in use pg. 458-461
08.03.27	Section 7 Summary & Practice Qs pg. 430-435	26.8 More about decay modes pg. 462-465
15.03.27	Section 9 Astrophysics	26.9 Nuclear radius pg. 466-467

	• Use AS and A2 Physics revision guide Optical telescopes pg. 142-144	
22.03.27	Non-Optical telescopes pg. 145-147	Practice questions: Chapter 26 pg. 468-471
29.03.27	Easter holidays	
05.04.27	Easter holidays	
12.04.27	Distances and magnitudes pg. 148-149	Section 8 Nuclear physics • 27 Nuclear energy 27.1 Energy and mass pg. 472-474
19.04.27	Stars as black bodies pg. 150-151	27.2 binding energy pg. 475-477
26.04.27	Spectral classes & the H-R diagram pg.152-153	27.3 Fission and fusion pg. 478-480
03.05.27	Stellar evolution pg. 154-155	27.4 The thermal nuclear reactor pg. 481-484
10.05.27	Doppler effect and Redshift pg. 156-157	Practice questions: Chapter 27 pg. 485-487 Section 8 Summary & Practice Qs pg. 488-493
17.05.27	The Big Bang Model of the Universe pg. 158-159	Further practice questions pg. 494-501
24.05.27	Revision: Past exam papers https://www.aqa.org.uk/subjects/physics/a-level/physics-7408/assessment-resources	Revision: Past exam papers https://www.aqa.org.uk/subjects/physics/a-level/physics-7408/assessment-resources
31.05.27	Half term	
07.06.27	Revision: Past exam papers https://www.aqa.org.uk/subjects/physics/a-level/physics-7408/assessment-resources	Revision: Past exam papers https://www.aqa.org.uk/subjects/physics/a-level/physics-7408/assessment-resources
14.06.27	Revision: Past exam papers https://www.aqa.org.uk/subjects/physics/a-level/physics-7408/assessment-resources	Revision: Past exam papers https://www.aqa.org.uk/subjects/physics/a-level/physics-7408/assessment-resources
21.06.27	Revision: Past exam papers https://www.aqa.org.uk/subjects/physics/a-level/physics-7408/assessment-resources	Revision: Past exam papers https://www.aqa.org.uk/subjects/physics/a-level/physics-7408/assessment-resources
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