Holy Family Catholic

School

Physics Induction

Booklet 2026

You're studying A-level Physics, congratulations!

Studying physics after your GCSEs really develops your practical and mathematical skills. If you enjoy experimenting in the lab, you'll love it.

At first, you may find the jump in demand from GCSE a little daunting, but if you follow the tips and advice in this guide, you'll soon adapt.

We recommend you keep this somewhere safe, as you may like to refer to the information inside throughout your studies.

Why study A-level Physics?

Physicists explore the fundamental nature of almost everything we know of. They study everything from the fundamental particles that build matter, to the galaxies that make up the universe itself. Join them to enter a world deep beneath the surface of normal human experience.

Even if you don't decide to work in physics, studying it still develops useful and transferable skills for other careers. You'll develop research, problem solving and analytical skills, alongside teamwork and communication. Universities and businesses regard all these very highly.

Possible degree options

According to bestcourse4me.com the top seven degree courses taken by students who have A-level Physics are:

- Mathematics
- Physics
- Mechanical engineering
- Computer Science
- Civil engineering
- Economics
- Business.

For more details, go to bestcourse4me.com or UCAS.

Which career appeals to you?

Studying Physics at A-level or degree level opens up all sorts of career opportunities.

- Geophysicist/field seismologist
- Healthcare scientist, medical physics
- Higher education lecturer or secondary school teacher
- Radiation protection practitioner
- Research scientist (physical sciences)
- Scientific laboratory technician
- Meteorologist
- Structural or Acoustic engineer
- Product/process development scientist
- Systems developer
- Technical author.

You can also move into engineering, astrophysics, chemical physics, nanotechnology, renewable energy and more. With physics, the opportunities are endless.

Course Overview

The course you will be following is the new AQA specification, with course codes 7408. The full details of the specification can be found on the AQA website.

Core content

1 Measurements and their errors

2 Particles and radiation

3 Waves

4 Mechanics and materials

5 Electricity

6 Further mechanics and thermal physics

7 Fields and their consequences

8 Nuclear physics

Options

9 Astrophysics

10 Medical physics

11 Engineering physics

12 Turning points in physics

13 Electronics

Particle physics (Section 1) will be the only area which is completely new; the rest you will have seen many times, at GCSE and earlier. At A-Level, we get into much more detail and complexity on the topics you have encountered previously, and start to use more advanced mathematics, techniques, and equipment to delve deeper into the physics behind lots of interesting phenomena.

Assessment Overview

Paper 1

What's assessed
Sections 1 to 5 and 6.1 (Periodic motion)

Assessed
- written exam: 2 hours
- 85 marks
- 34% of A-level

Questions
60 marks of short and long answer questions and 25 multiple choice questions on content.

Paper 2

What's assessed
Sections 6.2 (Thermal Physics), 7 and 8

Assumed knowledge from sections 1 to 6.1

Assessed
- written exam: 2 hours
- 85 marks
- 34% of A-level

Questions
60 marks of short and long answer questions and 25 multiple choice questions on content.

Paper 3

What's assessed
Section A Compulsory section: Practical skills and data analysis

Section B: Students enter for **one** of sections 9, 10, 11, 12 or 13

Assessed
- written exam: 2 hours
- 80 marks
- 32% of A-level

Questions
45 marks of short and long answer questions on practical experiments and data analysis.

35 marks of short and long answer questions on optional topic.

Resources to help

The AQA website
AQA Physics webpages are aimed at teachers, but you may find them useful too. Information includes:
• The specification – this explains exactly what you need to learn for your exams.
• Practice exam papers
• Lists of command words and subject specific vocabulary – so you understand the words to use in exams
• Practical handbooks explain the practical work you need to know
• Past papers from the old specification.
• Math Skills Support.

Institute of Physics (IOP)
The IOP does everything from research like that taking place at CERN to lobbying MPs. You'll find lots of handy resources on their website at:
iop.org/tailored/students/

The 'Student Room'
Join the A-level Physics Forums and share thoughts and ideas with other students if you're stuck with your homework. Just be very careful not to share any details about your assessments, there are serious consequences if you're caught cheating. Visit thestudentroom.co.uk

Textbooks
AQA approved textbooks are published by Collins, Hodder and Oxford University Press. Textbooks from other publishers will also be suitable, but you'll need to double check that the content and formula symbols they use match our specification.

Revision guides
These are great if you want a quick overview of the course when you're revising for your exams. Remember to use other tools as well, as these aren't detailed enough on their own.

YouTube
YouTube has thousands of Physics videos. Just be careful to look at who produced the video and why because some videos distort the facts. Check the author, date and comments – these help indicate whether the clip is reliable. If in doubt, ask your teacher.

Magazines
Focus, New Scientist or Philip Allan updates can help you put the physics you're learning in context.

Physics A-Level Learning Agreement

Expectations of Student	Expectations of Staff
Maintain a notes folder organized by specification point, as outlined in the Year Plan provided to them.	Teach lessons, set and mark work as outlined in the Year Plan they will provide to students at the start of the course.
To treat practical work as a core part of the course and approach it with the same significance given to theory.	Embed practical work wherever possible through each unit of work including, and exceeding, the endorsed practicals.
To complete and self-assess all independent work in a unit of work from the supplied mark schemes and enter marks into the tracking spreadsheets on Google Drive. This will be submitted during the assessment at the end of each unit, to be reviewed. All work to be retained in a Work Folder.	To create a pack of independent work for each topic. To mark the end of unit assessments, lab write ups and main assessments only. There is no expectation of teachers to mark exercise books, notes, or independent learning packs. Do folder checks on Work Folders to ensure self-assessed work has been completed and corrected.
To write any and all practical work into your lab book, including rough work. Lab book to be maintained in accordance with department policy outlined therein. To complete any pre-lab tasks when set, including, but not limited to, research, in advance of practical work. Where this has not been completed or is unsatisfactory, students may not be allowed to conduct the relevant experiment.	To provide formative feedback to students, verbally or written, on how to build the skills needed to meet the CPAC. To indicate to students when practical work will take place. Student research of practical techniques and methodology is a CPAC requirement, but the teacher will provide detailed additional resources on the endorsed practicals to prepare for the exams.

To correct all assessments within a week of their return. To re-sit any assessments falling below target within a fortnight of their return. To complete all personal intervention tasks set in light of these assessments before resitting the	To set one closed-book assessment per unit, within a week of the completion of teaching it. To enter fine data from all main assessments into the PLC tracker.

To check school email at least once every 24 hours, and respond within this timeframe if needed.	To respond to any emails within 24 hours, excluding weekends and school holidays.
To maintain a dialogue regarding aspirations, destinations and course feedback with the KS5 science team.	To provide appropriate enrichment activities and opportunities to students.
To attend all lessons, on time (within 10 minutes for p2/4 where crossing sites). When absent, make all reasonable efforts to catch up on missed work. Where possible, in advance.	To attend all lessons, on time (as per students). To make contact with students in the event of an absence and provide them with work to do. To only cancel lessons under circumstances where GCSE lessons would be canceled.
To use Google Drive to access resources, and share resources with your peers.	To share resources on Google Drive.
To provide constructive feedback when requested on KS5 teaching	To adapt teaching, where appropriate, in light of student feedback.

General Information

Questions

If you have any questions direct them to **ejohnson@hfcsw.uk**

Absences

If you will not be attending school your parent/carer must contact:

Sixth Form Admin on **0208 509 4268** by **8.40am** on the day of absence

You must also contact your teacher before the lesson and catch up on any missed work - an absence on the day work was set does not mean you don't have to do the work.

Practical Endorsement

The course has a heavy focus on practical work. Over the two year A Level there are 12 'endorsed practicals' – experiments which you must complete to pass the course. You must demonstrate competency against 5 criteria called CPAC (Combined Practical Assessment Criteria).

The five CPAC criteria are as follows:

1. Follows Written Procedures
2. Applies investigative approaches and methods when using instruments and equipment
3. Safely uses a range practical equipment and materials
4. Makes and records observations
5. References, researches, and reports.

You will have ample opportunity to master these five criteria over the course of the two years. This aspect of the course is simply pass or fail. It does not contribute to your final A Level grade. You will be expected to maintain a **Lab Book.** The usage and maintenance of this lab book will be explained to you by your teacher at the start of the year, and an overview will be contained inside the lab book itself.

Assessment and Accreditation

The A Level is a linear course. This means that our expectation is that you will study for 2 years, and sit public exams **only** at the end of year 2.

There are three 2-hour exams at the end of the A Level, and these are the only exams which contribute to your final grade. There is no coursework component, and you will not sit any public exams at the end of year 1.

To maintain accurate data on your progress through the course, you will also sit the following assessments:

- End of chapter assessments at the end of each chapter's teaching and practical work
- 6 formal internal assessments during year 1
- 6 formal internal assessments during year 2

Holy Family Catholic School Curriculum Overview Year 12 – Physics (A Level)

	Curriculum Content	Suggested Reading or Extension Activities
Half Term 1 (Sept-Oct)	**3.1 Measurements and their errors** Content in this section is a continuing study for a student of physics. A working knowledge of the specified fundamental (base) units of measurement is vital. Likewise, practical work in the subject needs to be underpinned by an awareness of the nature of measurement errors and of their numerical treatment. The ability to carry through reasonable estimations is a skill that is required throughout the course and beyond. **3.2.1 Particles and radiation** This section introduces students both to the fundamental properties of matter, and to electromagnetic radiation. Through a study of these topics, students become aware of the way ideas develop and evolve in physics. They will appreciate the importance of international collaboration in the development of new experiments and theories in this area of fundamental research.	Notes, questions and answers: https://www.physicsandmathstutor.com/physics-revision/a-level-aqa/measurements-and-errors/ Map of the standard model: https://www.quantamagazine.org/a-new-map-of-the-standard-model-of-particle-physics-20201022/ For current investigations: https://home.cern/science/physics/standard-model Lectures: The Feynman Lectures (www.feynmanlectures.caltech.edu) The Trouble with Physics: The Rise of String Theory, the Fall of a Science and What Comes Next (Paperback) by Lee Smolin (Author)
Half Term 2 (Nov-Dec)	**3.2.2 Electromagnetic radiation and quantum phenomena** Students will use their knowledge of the particle zoo to begin to appreciate quantum phenomena. We begin to dive into the world of quantum mechanics, where nothing is quite what it seems. **3.3.1 Waves** GCSE studies of wave phenomena are extended through a development of knowledge of the characteristics, properties, and applications of traveling waves and stationary waves. Topics treated include refraction, diffraction, superposition and interference.	Photoelectric effect online simulation: https://phet.colorado.edu/sims/cheerpj/photoelectric/latest/photoelectric.html?simulation=photoelectric The Quantum Handshake, Entanglement, Nonlocality and Transactions (Paperback) John G. Cramer (Author) Online course: https://www.physicsclassroom.com/class/waves

Half Term 3 (Jan-Feb)	**3.3.2 Refraction, diffraction and interference** This section builds on the understanding of the nature of light and wave properties to interpret optical applications and provide qualitative detail about the famous Young's Double Slit. **3.4 Mechanics and materials** Vectors and their treatment are introduced followed by development of the student's knowledge and understanding of forces, energy and momentum. The section continues with a study of materials considered in terms of their bulk properties and tensile strength.	Online wave simulations: https://phet.colorado.edu/sims/html/wave-interference/latest/wave-interference_en.html Modern Optics Simplified (Hardcover) Robert D Guenther (Author) Watch: https://www.youtube.com/watch?v=LrxaieZNa00
Half Term 4 (Feb-Mar)	**3.5 Electricity** This section builds on and develops earlier study of these phenomena from GCSE. It provides opportunities for the development of practical skills at an early stage in the course and lays the groundwork for later study of the many electrical applications that are important to society.	Electronic Devices and Circuit Theory (Paperback) Robert L.Boylestad (Author)
Half Term 5 (Apr-May)	**3.6.1 Further mechanics (A-level only)** The earlier study of mechanics is further advanced through a consideration of circular motion and simple harmonic motion (the harmonic oscillator).	Watch: https://www.youtube.com/watch?v=y2FmgoOht7Y&t=27s
Half Term 6 (Jun-Jul)	**Revision and Exam practice**	

Examples of Home Learning Tasks	Completion of all classwork CPAC lab reports Research based tasks Exam style questions Online learning platforms
Assessment Tasks, Methods & Frequency	Progress tests Diagnostic/synoptic exams End of topic tests Mock exams
Equipment that Students Need	Basic stationary: pens (black and green), pencil, ruler, rubber, folder to store class hand-outs Specificic equipment: scientific calculator, protractor Lab coats will be provided for practicals

Parent / Carers can help their child by:	• Joining the 'Google Classroom' to enable discussion about their learning and homework requirements. • Ensuring their child is fully equipped at the beginning of the academic year • Attending 'Parents Evenings'.
Ueful Websites	https://www.aqa.org.uk/subjects/science/as-and-a-level/physics-7407-7408 https://www.physicsandmathstutor.com/ https://www.physicsonline.com https://www.focuselearning.co.uk/

Extra-Curricular Activities & Career Opportunities	• Sutton Trust Summer School Programmes • UCL lectures: https://www.ucl.ac.uk/physics-astronomy/outreach/science-centre-lectures • Funding and bursaries: https://www.ogdentrust.com/

Who Can I Contact?	Head/Deputy Head of Science	Mr Thrasivoulou/Ms Johnson
	KS5 Science Coordinator	Mr Yohannes
	Teachers of Year 12 Physics	Ms Johnson/Mr Zitzen

Holy Family Catholic School Curriculum Overview Year 13 – Physics (A Level)

	Curriculum Content	Suggested Reading or Extension Activities
Half Term 1 (Sept-Oct)	**3.6.2 Thermal physics (A-level only)** A further section allows the thermal properties of materials, the properties and nature of ideal gasses, and the molecular kinetic theory to be studied in depth .	Complete the questions: https://www.theonlinephysicstutor.com/thermal.html Watch and learn the conditions and derivation of the molecular kinetic gas equation: https://www.youtube.com/watch?v=So5WfmQBHWQ We Need to Talk About Kelvin: What Everyday Things Tell Us About the Universe (Hardcover) by Marcus Chown (Author)
Half Term 2 (Nov-Dec)	**3.7 Fields and their consequences (A-level only)** The concept of field is one of the great unifying ideas in physics. The ideas of gravitation, electrostatics and magnetic field theory are developed within the topic to emphasize this unification. Many ideas from mechanics and electricity from earlier in the course support this and are further developed. Practical applications considered include: planetary and satellite orbits, capacitance and capacitors, their charge and discharge through resistors, and electromagnetic induction. These topics have considerable impact on modern society. **3.7.2 Gravitational Fields** **3.7.3 Electric Fields** **3.7.4 Capacitors** An in depth look at an electric device that allows us to store charge. Mathematical applications of exponential growth and decay to underpin the understandings of charging and discharging as well as for the next topic - nuclear physics.	Complete the questions: https://www.physicsandmathstutor.com/physics-revision/a-level-aqa/fields/ Watch and take notes: https://www.youtube.com/watch?v=o0yfYTtR6go The Theory of the Electromagnetic Field (Paperback) David M. Cook (Author)
Half Term 3 (Jan-Feb)	**3.7.4 Magnetic Fields** **3.8 Nuclear Physics** This section builds on the work of Particles and radiation to link the properties of the nucleus to the production of nuclear power through the characteristics of the nucleus, the properties of unstable nuclei, and the link between energy and mass. Students should become aware of the physics that underpins nuclear energy production and also of the impact that it can have on society.	The Making Of The Atomic Bomb (Paperback) Richard Rhodes (Author)
Half Term 4 (Feb-Mar)	**3.9 Astrophysics**	Astrophysics for People in a Hurry (Paperback) Neil deGrasse Tyson
Half Term 5 (Apr-May)	**Revision and consolidation**	
Half Term 6 (Jun-Jul)	**A-level Examinations**	

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Extra-Curricular Activities & Career Opportunities	• Sutton Trust Summer School Programmes • UCL lectures: https://www.ucl.ac.uk/physics-astronomy/outreach/science-centre-lectures • Funding and bursaries: https://www.ogdentrust.com/

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