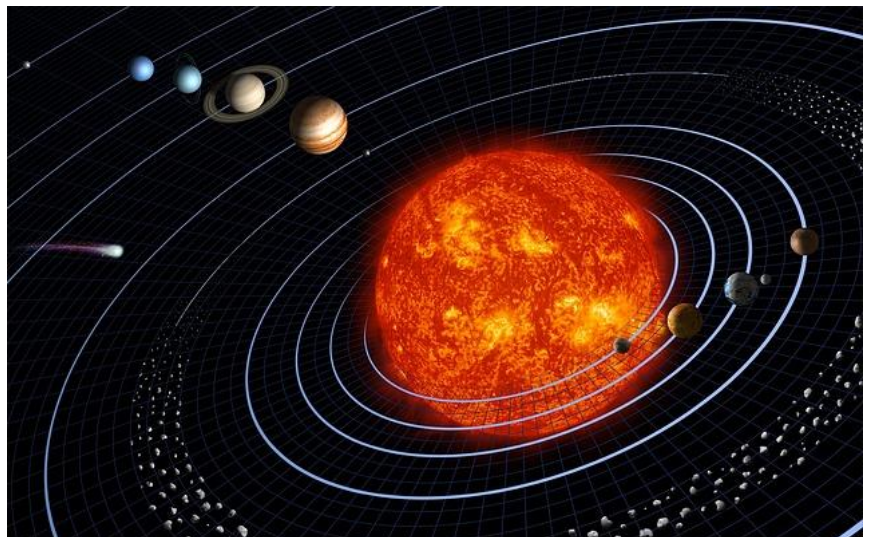
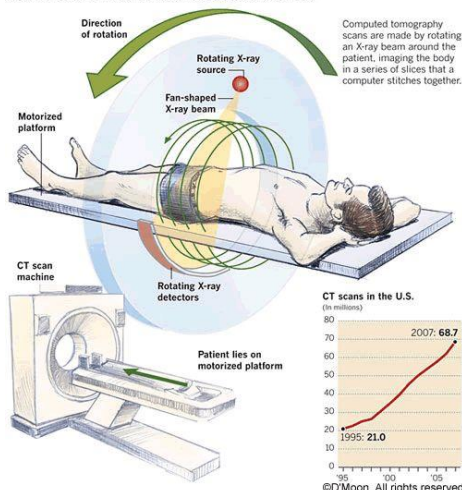


# Morecambe Community High School Physics Department OCR Physics A H156 / H556

## Anatomy of a CT scan

CT scanners give doctors a 3-D view of the body. The images are exquisitely detailed but require a dose of radiation that can be 100 times that of a standard X-ray.



## Why Study A Level Physics

### Have you ever wondered . . .

- Why the universe behaves the way it does?
- How ultrasound can create a picture?
- How fast you would have to travel to fool a speed camera?
- What force would be necessary to stop a formula one car?
- What are CERN looking for?

Physics A Level is one of the most universally accepted qualifications for progression to university. The course content covers the basis of how things work, from the constituent parts of atoms out to the extent of the universe. You will integrate the concepts studied with a range of practical experiments throughout each topic giving the course both an academic and practical focus. You will learn to apply your knowledge of the key concepts to solve problems in a range of different contexts and applications.

### Key features

- OCR Physics A is a well-established course built on many years of experience, covering the knowledge and understanding necessary to progress to STEM degrees and careers.
- Incorporates both Astrophysics and Medical Imaging.
- Physics is one of the top three A Levels in terms of eligibility for degree entry.

A level physics is a good subject to study with any other science subject and/ or maths. Many students have also combined physics with computing and business studies.

### What's included

Development of practical skills in physics

Physical quantities and units

Making measurements and analysing data

Nature of quantities

Motion

Forces in action

Work, energy and power

Materials

Momentum

Charge and current

Energy, power and resistance

Electrical circuits

Waves

Quantum physics

Thermal physics

Circular motion

Oscillations

Gravitational fields

Astrophysics and cosmology

Capacitors

Electric fields

Electromagnetism  
Nuclear and particle physics  
Medical imaging

Emphasis throughout the course is on developing knowledge, competence and confidence in practical skills and problem solving.

### **Where can A Level Physics take me?**

STEM degrees, varieties of Physics, Maths and Engineering.

Advanced apprenticeships in industry, at present aerospace, nuclear power generation and electrical power distribution.

Physics is essential for access to physics and engineering courses. It is highly regarded for other subjects such as medicine, law and economics because of the thinking skills and problem solving involved. .

## Year 12 (AS Level) Teaching Order

Teacher 1		Teacher 2	
<b>Autumn Term</b>			
<b>Throughout the course</b>		Module 1 Development of practical skills in physics	
<b>1<sup>st</sup> Half Term</b>	Introduction; equations and standard form from module 2 Module 3.1 Motion		Introduction; measurements and units from module 2 Module 4.1 Charge and current Module 4.2 Energy, power and resistance
<b>2<sup>nd</sup> Half Term</b>	Module 3.2 Forces in action		Module 4.3 Electrical Circuits
<b>Spring Term</b>			
<b>1<sup>st</sup> Half Term</b>	Module 3.3 Work, energy and power Module 3.4 Materials Module 3.5 Newton's laws of motion		Module 4.4.1 Wave motion Module 4.4.3 Superposition
<b>2<sup>nd</sup> Half Term</b>	Module 4.4.2 Electromagnetic waves		Module 4.4.4 Stationary waves
<b>Summer Term</b>			
<b>1<sup>st</sup> Half Term</b>	Module 4.5 Quantum Physics Revision		Module 4.3 Recap of electricity Revision
<b>Exam period</b>			
<b>2<sup>nd</sup> Half Term</b>	Introduction to nuclear and particle physics from A level 6.4.1 & 3		Astrophysics and cosmology from A level section 5.5

## Year 13: A2 Physics Teaching order 2016-17

Timeline	Teacher SCH UNIT 5 Newton world and Astrophysics	notes	Teacher PFE UNIT 6 Particle and medical physics	notes
Autumn 1	<p><b>Simple Harmonic and circular Motion</b> 5.3.1- SHM 5.3.2- Energy in SHM 5.3.3- damping</p> <p><b>Gravity and Astro Physics</b> 5.4.1, 5.4.2 gravity forces -5.4.3 gravity and orbits</p>	<p>-remaining section of topic PAG10.3 - forced vibrations, damping and energy in SHM systems <b>ILP PAG12.1</b></p>	<p><b>Capacitors</b></p> <p><b>Electric Fields</b> 6.2.1 Charges 6.2.2 Coulomb's Law 6.2.3 Uniform fields 6.2.4 Electrical potential energy</p>	-remaining sections of topic
Autumn2	<p>5.4.4- gravitational energy 5.5.1 stars 5.5.2 EM radiation from stars</p>		<p><b>Electromagnetism</b> 6.3.1 Magnetic Fields 6.3.2 Motion of charged particles 6.3.3 Electromagnetism</p>	<b>ILP PAG12.2</b>
Spring 1	<p>5.5.3 Cosmology</p> <p><b>Thermal Physics</b> 5.1.1, 5.1.2 kinetic theory and temperature</p>		<p><b>Nuclear/ Particle physics</b> 6.4.1 The atom 6.4.2 Fundamental particles 6.4.3 radioactivity 6.4.4 fission and fusion</p>	<b>ILP PAG12.3</b>
Spring 2	<p>5.1.3 changes of state , specific heat capacity</p> <p>5.1.4 ideal gases</p>	<b>ILP- past papers</b>	<p><b>Medical Imaging</b> 6.5.1 X rays 6.5.2 Diagnostic methods 6.5.3 Ultrasound 6.5.4</p>	<b>ILP- past papers</b>
Summer 1	Revision		Revision	

# Physics A: Course Content

## PHYSICS A – AS (H156) / A LEVEL (H556)

<b>Module 1 – Development of practical skills in physics</b>	
Skills of planning, implementing, analysis and evaluation	
<b>Module 2 – Foundations of Physics</b>	
Includes: <ul style="list-style-type: none"><li>• Physical quantities and units</li><li>• Making measurements and analysing data</li><li>• Nature of quantities.</li></ul>	
<b>Module 3 – Forces and motion</b>	<b>Module 4 – Electrons, waves and photons</b>
Includes: <ul style="list-style-type: none"><li>• Motion</li><li>• Forces in action</li><li>• Work, energy and power</li><li>• Materials</li><li>• Newton’s laws of motion and momentum.</li></ul>	Includes: <ul style="list-style-type: none"><li>• Charge and current</li><li>• Energy, power and resistance</li><li>• Electrical circuits</li><li>• Waves</li><li>• Quantum physics.</li></ul>
<b>Module 5 – Newtonian world and astrophysics (A level only)</b>	<b>Module 6 – Particles and medical physics (A level only)</b>
Includes: <ul style="list-style-type: none"><li>• Thermal physics</li><li>• Circular motion</li><li>• Oscillations</li><li>• Gravitational fields</li><li>• Astrophysics.</li></ul>	Includes: <ul style="list-style-type: none"><li>• Capacitors</li><li>• Electric fields</li><li>• Electromagnetism</li><li>• Nuclear and particle physics</li><li>• Medical imaging.</li></ul>

## PLC

The PLC sheets will be provided by your teachers and will be kept in your folders.

## Expectations

In order to achieve your potential in physics, there are a number of key areas which you must put in place. These include:-

- ❖ Personal organisation. You will need to bring a pen, pencil, ruler and calculator to each lesson. Your teacher will also use the textbook in lessons so you will need to bring this as well.
- ❖ Time management. You need to organise your time so that reading, revision and homework tasks are completed by the required time.
- ❖ The type of homework tasks which are set include reading, revision, questions from textbooks, past exam papers etc. Year 12 will have approximately 3 to 4 hours of homework per week. Year 13 will have 5 to 6 hours of independent learning / homework a week.
- ❖ Safe and responsible conduct during practical lessons and full cooperation with safety procedures.
- ❖ You will need to be determined, focused and willing to put in the time and effort to learn and understand the different topics.

## Help and Support from Teachers

Year 12 – Mr Chapman and Mr Lentell

Year 13 – Mr Chapman and Mrs Palin

- This can start now if you wish. It is no secret that there is a big jump in the demand and level of work from GCSE. If you wish to do some preparation for the AS course, you can purchase a booklet entitled, 'Head Start to AS level Physics', which will make the jump easier to manage.
- The physics department has a tradition of being available to help sixth formers when they are either stuck with homework, or just want some extra support.
- You will be provided with textbooks at the beginning of the course.

## Specification

<http://www.ocr.org.uk/Images/171726-specification-accredited-a-level-gce-physics-a-h556.pdf>

# PHYSICS A: ASSESSMENT OVERVIEW

## AS LEVEL PHYSICS A (H156) – FIRST EXAM JUNE 2016

Paper		Marks	Duration	Weighting
Paper 1	<b>Breadth in physics</b> Content – Modules 1, 2, 3, 4	70	1 hr 30 mins	50%
	Section A – Multiple choice	20		
	Section B – Structured questions, covering theory and practical skills	50		
Paper 2	<b>Depth in physics</b> Content – Modules 1, 2, 3, 4	70	1 hr 30 mins	50%
	Structured questions and extended response questions covering theory and practical skills	70		

## A LEVEL PHYSICS A (H556) – FIRST EXAM JUNE 2017

Paper		Marks	Duration	Weighting
Paper 1	<b>Modelling physics</b> Content – Modules 1, 2, 3, 5	100	2 hr 15 mins	37%
	Section A – Multiple choice	15		
	Section B – Structured questions, covering theory and practical skills	85		
Paper 2	<b>Exploring physics</b> Content – Modules 1, 2, 4, 6	100	2 hr 15 mins	37%
	Section A – Multiple choice	15		
	Section B – Structured questions, covering theory and practical skills	85		
Paper 3	<b>Unified physics</b> Content – all modules	70	1 hr 30 mins	26%
	Structured questions and extended response questions covering theory and practical skills	70		
Non-exam assessment	<b>Practical endorsement for physics</b>	Pass/Fail	Non-exam assessment	Reported separately
	See pages 28-29. Teacher-assessed component common to Physics A and Physics B (Advancing Physics). Candidates complete a minimum of 12 practical activities to demonstrate practical competence. Performance reported separately to the A Level grade. Moderation details still to be confirmed by Ofqual at the time of going to press	Reported separately		



## Useful Websites

There are hundreds out there! Here are a few.

[www.ocr.org.uk](http://www.ocr.org.uk) [www.rsc.org.uk](http://www.rsc.org.uk)  
<http://www.cyberphysics.co.uk/index.html>

## Literacy

See glossary at the back of the AS and the A2 text book for all keywords and definitions.

## Independent Learning Projects

Autumn 1

Practical Endorsement GCE Physics  
PAG12: Research Report  
12.1 Materials Presentation  
**STUDENT**

Autumn 2

Practical Endorsement GCE Physics  
PAG12: Research Report  
12.2 Research report

Spring 1

Practical Endorsement GCE Physics  
PAG12: Research Report  
12.3 Documenting How Science Works  
**STUDENT**

PAG 12.1 Module 5 materials presentation. research  
PAG 12.2 research and written report  
PAG 12.3 how science work- research and written presentation

PAG 12.2 and 12.3 will be jointly administered by both teachers, who will each act as tutors for half the members of the group to assess the suitability of the task and monitor progress with the work.

This project will be run as a poster presentation where students research and complete a detailed report in the form of a poster which they present in a conference.

This will take place during VI form enrichment time (Wednesday period 5 during the second half of the spring term. The audience will considered of students, teachers and visiting students/ lecturers from Lancaster University.

There will also be exam questions set.