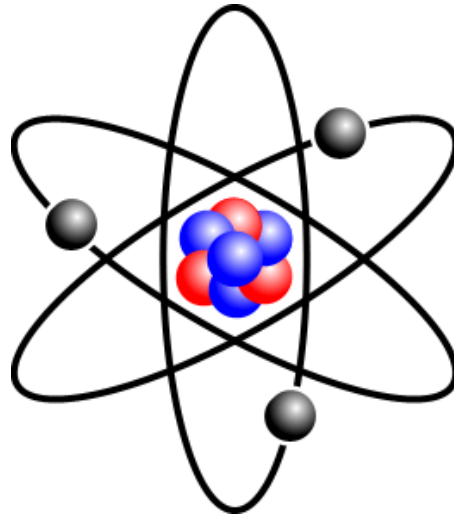


# Welcome to A-Level Physics!



Take a seat.

## The Physics Department:



Mr Hutchins – Head of Physics



Mr Graves



Mr Venn



Mr Rich

## Homework & Prep-time:

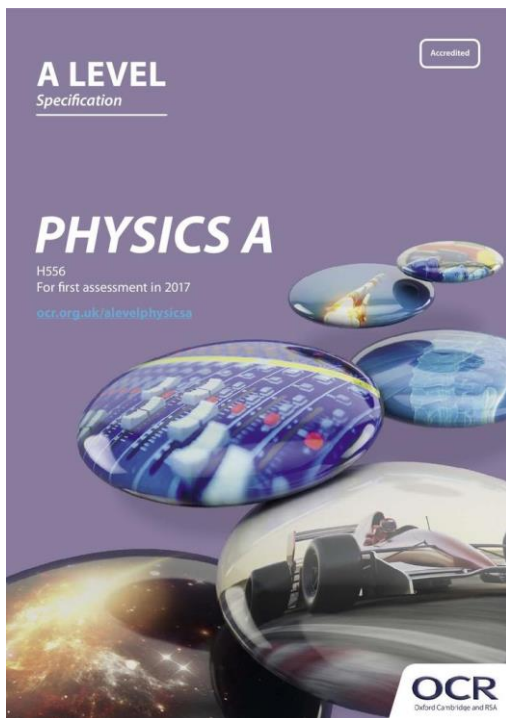
You will be expected to complete **4.5 hours** of homework/prep-time outside of lessons each week. This will include:

- Homework (Teacher A) (1 hr)
- Homework (Teacher B) (1 hr)
- Prep work (1.5 hrs)
- Isaac physics questions (1 hr)

Y12 Course Plan 23-24			Teacher A (4 hours)								Teacher B (5 hours)								
Week Comm.	Wk No.	Sch Wk	Section	Lesson Topic	Hwk (1h)	Ass.	IP (1h)	Prep. (1.5h)	TBT	Prac.	Section	Lesson Topic	Hwk (1h)	Ass.	IP (1h)	Prep. (1.5h)	TBT	Prac.	
04/09/23*	1	A	2.1	Entrance test	Y	Ent. test	Y				4.1	Introduction/marking summer work	Y			4.1.3			
11/09/23	2	B		Recap/assessment lesson	Y			2.1.5				Electric charge and current	Y	4.1 KH	Y				
18/09/23	3	A		Physical quantities and units	Y		Y		2.1			Electron drift velocity	Y	4.1 KT			Rev		
25/09/23	4	B		Systematic errors and random errors	Y			2.2.3				Recap/assessment lesson	Y		Y			4.1	
02/10/23	5	A		Precision and accuracy	Y		Y		2.2			Recap/assessment lesson	Y						
09/10/23	6	B		Absolute and percentage uncertainties	Y	2 KH			Rev			Recap/assessment lesson	Y		Y				
16/10/23	7	A		Graphical treatment of uncertainties	Y	2 KH	Y					Recap/assessment lesson	Y				4.2.7	4.2	PAG 3.2
			3.1	Scalar and vector calculations	Y		Y			Definitions in kinematics	Y							PAG 3.1	
				Resolving vectors	Y						Effect of temperature on resistivity	Y							
<b>Half-Term</b>																			
30/10/23	8	B	3.2	Graphs of motion	Y			3.1.4			4.3	Electrical power	Y	4.2 KH	Y				
06/11/23	9	A		Constant acceleration equations	Y		Y					Cost of electrical energy	Y	4.2 KH			Rev		
13/11/23	10	B		Free fall and projectile motion	Y							Recap/assessment lesson	Y	4.2 KH					
20/11/23	11	A		Measurement of g	Y			3.1.6		PAG 1.1		Recap/assessment lesson	Y		Y				
27/11/23	12	B		Practical lesson	Y	3.1 KH	Y					Kirchoff's first and second laws	Y					4.3.4	
04/12/23	13	A		Car stopping distances	Y	3.1 KH			Rev			Series circuits	Y						
11/12/23	14	B		Recap/assessment lesson	Y	3.1 KH						Parallel circuits	Y		Y			4.3	PAG 4.1
18/12/23	15	A	Recap/assessment lesson	Y	3.1 KH	Y				The potential divider	Y								
			3.2	Force and the newton	Y		Y			Practical lesson	Y				4.3.7		PAG 4.3		
				Dynamics	Y						Internal resistance	Y		Y					
			3.2	Drag and terminal velocity	Y			3.2.5		Practical lesson	Y	4.3 KH	Y						
				Practical lesson	Y						Circuit analysis 1	Y	4.3 KH						
			3.2	Equilibrium	Y		Y		3.1	Practical lesson	Y	4.3 KH							
				Turning forces	Y						Circuit analysis 2	Y	4.3 KH						
			3.2	Recap/assessment lesson	Y					Recap/assessment lesson	Y	4.3 KH				Rev			
				Recap/assessment lesson	Y						Recap/assessment lesson	Y	4.3 KH						
<b>Christmas Holiday</b>																			
08/01/24	16	B	3.3	Centre of mass	Y			3.2.8			4.4	Recap/assessment lesson	Y		Y				
15/01/24	17	A		Density	Y		Y					Wave motion	Y						
22/01/24	18	B		Pressure	Y	3.2 KH						Wave terminology	Y				4.4.3		PAG 5.3
29/01/24	19	A		Recap/assessment lesson	Y	3.2 KH			Rev			Practical lesson	Y		Y				
30/01/24	20	B		Recap/assessment lesson	Y	3.2 KH						Common properties of waves	Y						
05/02/24	21	A		Work and the joule	Y		Y		3.2			Electromagnetic waves	Y				4.4.7		
12/02/24	22	B		Conservation of energy	Y							Polarisation	Y		Y				
			3.3	Potential and kinetic energy	Y			3.3.5		Practical lesson	Y						PAG 6.3		
				Power and the watt	Y						Refraction of light	Y	4.4 KH			4.4.9			
			3.3	Efficiency	Y	3.3 KH	Y			Recap/assessment lesson	Y	4.4 KH					PAG 6.2		
				Recap/assessment lesson	Y	3.3 KH			Rev		Recap/assessment lesson	Y		Y					
			3.3	Recap/assessment lesson	Y	3.3 KH				Recap/assessment lesson	Y								
				Recap/assessment lesson	Y	3.3 KH					Interference	Y							
<b>Half-Term</b>																			
26/02/24	23	A	3.4	Deformation of materials	Y		Y		3.3		4.5	Young's double-slit experiment	Y			4.4.12			
04/03/24	24	B		Hooke's law	Y			3.4.4		PAG 2.1		Diffraction gratings	Y		Y		4.4		PAG 5.1
11/03/24	25	A		Young's Modulus	Y							Practical lesson	Y						
18/03/24	26	B		Practical lesson	Y	3.4 KH	Y		3.4	PAG 2.2		Stationary waves	Y				Rev		
25/03/24*	27	A		Categorisation of materials	Y	3.4 KH						Stationary wave experiments	Y						
				3.4	Recap/assessment lesson	Y	3.4 KH		Rev			Stationary longitudinal waves	Y	4.4 KH	Y				PAG 5.2
					Recap/assessment lesson	Y	3.4 KH						Recap/assessment lesson	Y					
			3.5	Recap/assessment lesson	Y		Y			Recap/assessment lesson	Y					4.5.2			
				Newton's laws of motion	Y						The photon	Y							
<b>Easter Holiday</b>																			
15/04/24*	28	B	3.5	Momentum	Y			3.5.4			4.5	Practical lesson	Y		Y		4.5	PAG 6.1	
22/04/24	29	A		Momentum, force and impulse	Y	3.5 KH	Y		3.5			The electronvolt	Y	4.5 KH			4.5.5		
29/04/24	30	B		Elastic and inelastic collisions	Y	3.5 KH			Rev			Photoelectric effect 1	Y	4.5 KH					
			3.5	Recap/assessment lesson	Y	3.5 KH				Recap/assessment lesson	Y	4.5 KH	Y						
				Recap/assessment lesson	Y	3.5 KH					Wave-particle duality	Y	4.5 KH						
			3.5	Recap/assessment lesson	Y					Recap/assessment lesson	Y								
				Recap/assessment lesson	Y						Recap/assessment lesson	Y							

Exam board/syllabus:

OCR Physics A (H556)



Content is split into six teaching modules:

- Module 1 – Development of practical skills in physics
- Module 2 – Foundations of physics
- Module 3 – Forces and motion
- Module 4 – Electrons, waves and photons
- Module 5 – Newtonian world and astrophysics
- Module 6 – Particles and medical physics

Component 01 assesses content from modules 1, 2, 3 and 5.

Component 02 assesses content from modules 1, 2, 4 and 6.

Component 03 assesses content from all modules (1 to 6).

Modelling physics (01)

100 marks

2 hours 15 minutes

written paper

**37%**  
of total  
A level

Exploring physics (02)

100 marks

2 hours 15 minutes

written paper

**37%**  
of total  
A level

Unified physics (03)

70 marks

1 hour 30 minutes

written paper

**26%**  
of total  
A level

Practical endorsement in physics

(04)\*

(non exam assessment)

**Reported separately**  
(see Section 5h)

## Monitoring:

You will all be given an ALPS target grade at the start of the year.

We will expect you to be consistently achieving *no less than* one grade below your target grade on Key Homeworks and Key Tests.

Additional support will be provided to students who fall below this standard (PASS).

# PHYSICISTS!



## GOING TO PASS?

Physics After School Sessions

Tuesdays, 15:15-16:15, 121

## Trips:

CERN (March/April)

Physics at Work (every September)

Cambridge Physics Lectures (6 per year)

Guest lecturers

Cambridge Physics Experience



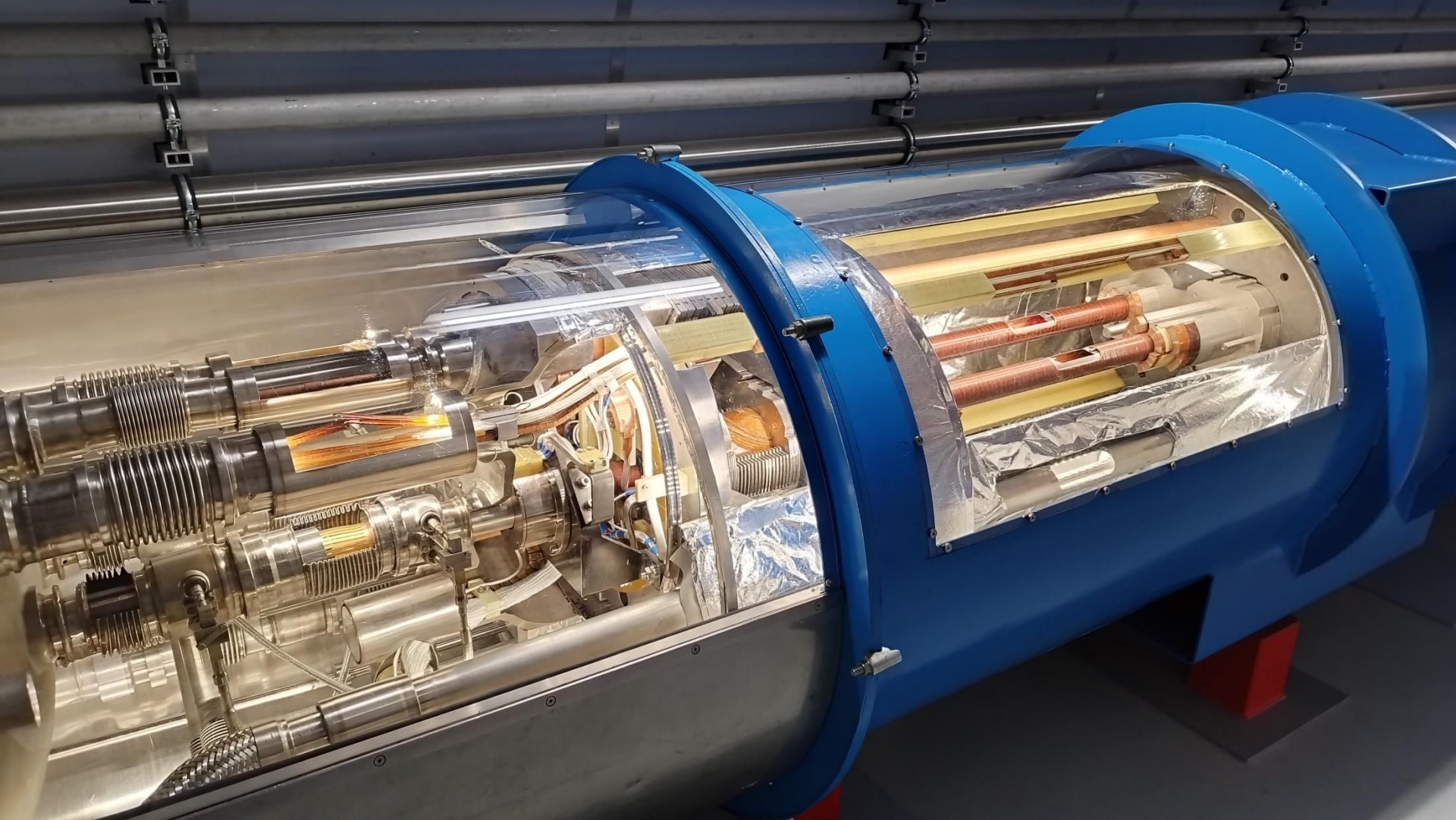


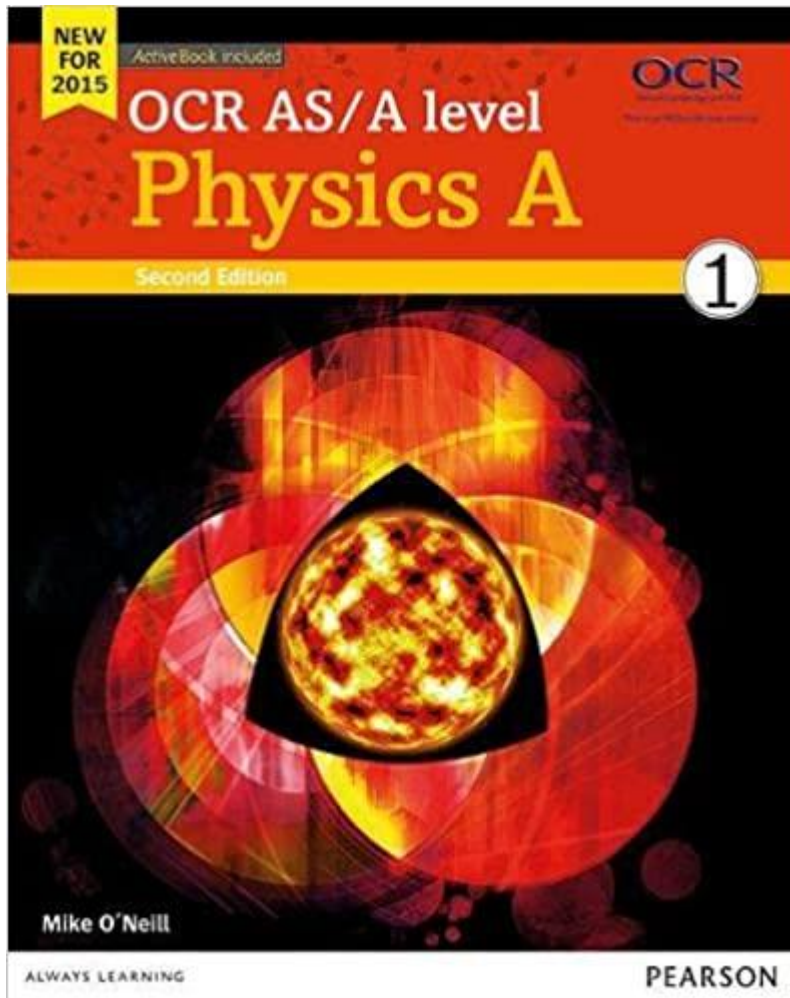












We will expect you to get yourself a copy of the course textbook.

Amazon: £29.60 new or from £9.16 second hand

## **Things to bring to every Physics lesson!**

Textbook

Scientific Calculator

Your Folder

Ruler & Protractor

## **Good Physics students.....**

- come and ask for help when they are stuck
- ask their teachers to explain something in a different way
- complete their work on time
- work hardest on the things they find hard
- are proactive not reactive
- TAKE RESPONSIBILITY FOR THEIR LEARNING

## **Bad Physics students.....**

- Leave things unfinished if they can't do it
- Ignore problems and don't ask for help
- Miss deadlines and have poor quality work
- Don't do any self-study
- DON'T TAKE RESPONSIBILITY FOR THEIR LEARNING

Please take a copy of the summer work.

Complete it over the holidays and hand it in to your physics teacher in your **first** physics lesson in September.

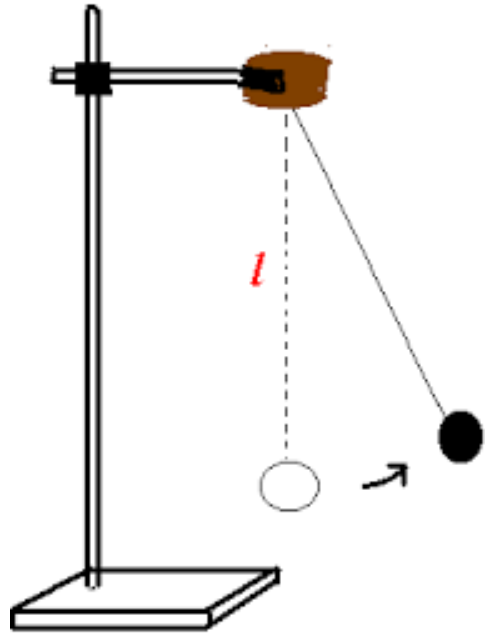
It contains some mathematical tasks designed to test your competence in some of the basic skills you will need for the physics course.

### Entrance Test:

This will feel similar to the summer work. It is designed to check that you have the basic knowledge and skills in order to be successful on the course.



Questions?



### Experiment:

You are going to use a simple pendulum to measure the gravitational field strength of the Earth.

### Method:

1. Set up your pendulum as shown in the diagram.
2. Time the pendulum for 10 swings, for a length of your choice.
3. Repeat for at least 5 more lengths.

$$T = 2\pi \sqrt{\frac{L}{g}}$$

T = period of the pendulum (s)

L = length of the pendulum (m)

g = gravitational field strength (N/kg)

### Analysis:

1. Calculate the period (T) (time for **one** swing) for each length.
2. Calculate the period<sup>2</sup> (T<sup>2</sup>) for each length.
3. Plot a graph of T<sup>2</sup> (y-axis) against L (x-axis). Draw a straight line of best fit.
4. Calculate the gradient of your graph.
5. To calculate the Earth's gravitational field strength, divide  $4\pi^2$  by your gradient. ( $g = 4\pi^2/\text{gradient}$ )
6. The Earth's gravitational field is 9.81 N/kg. How far away was your answer, as a percentage of the accepted value?