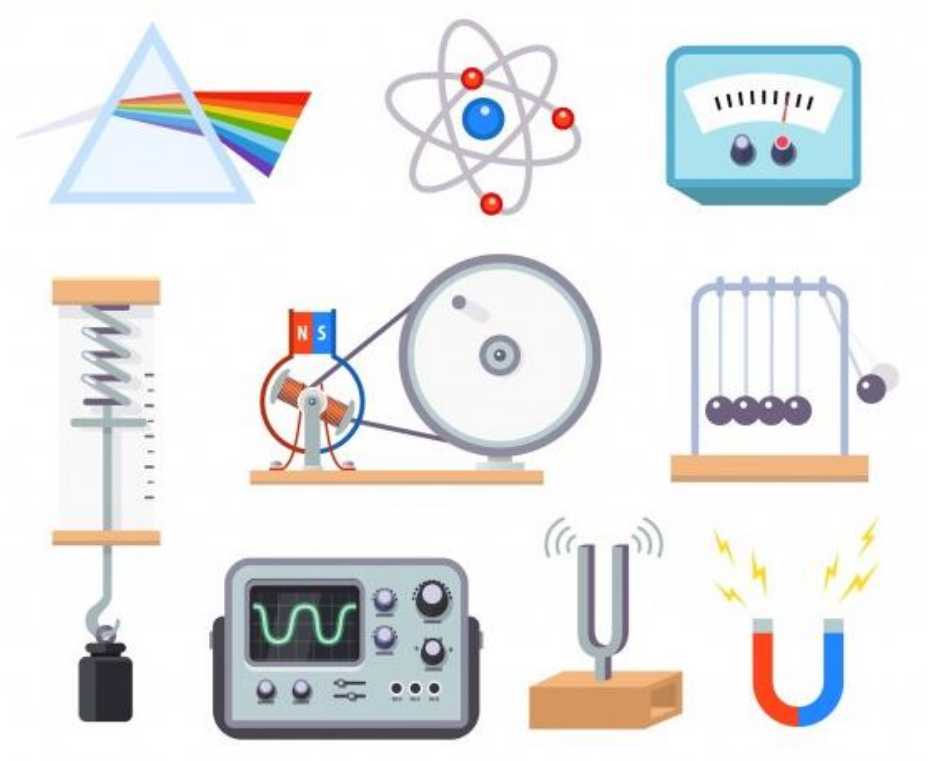
A-level Physics
Summer work
& course information booklet



Name: _____

This booklet has been prepared for you to have the best possible start in A-level Physics. It is very important that you read this booklet carefully over the summer, complete the set work and submit it to Mr Lowe or Ms Bates in your first lesson at the start of the year. This will be the first impression you create and is a real indicator of how seriously you are prepared to be in your studies.

AQA Physics specification at a glance

AS and A-level
1 Measurements and their errors
2 Particles and radiation
3 Waves
4 Mechanics and materials
5 Electricity

A-level only
6 Further mechanics and thermal physics
7 Fields and their consequences
8 Nuclear physics
9 Optional topics. You will study one of these: Astrophysics, Medical physics, Engineering physics, Turning points in physics or Electronics.

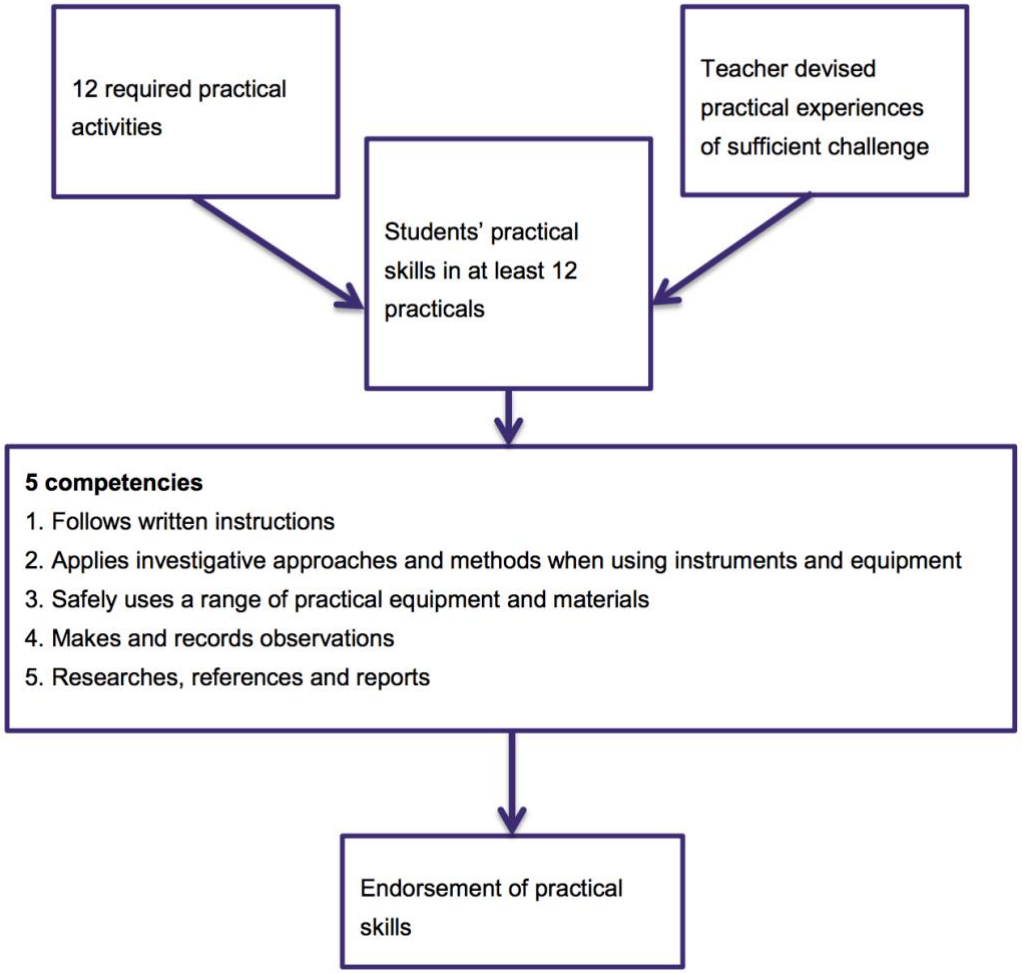
Assessment of AQA Physics

AS-level

Paper 1	+	Paper 2
What's assessed Sections 1–5		What's assessed Sections 1–5
Assessed • written exam: 1 hour 30 minutes • 70 marks • 50% of AS		Assessed • written exam: 1 hour 30 minutes • 70 marks • 50% of AS
Questions 70 marks of short and long answer questions split by topic.		Questions Section A: 20 marks of short and long answer questions on practical skills and data analysis. Section B: 20 marks of short and long answer questions from across all areas of AS content. Section C: 30 multiple choice questions

A-level

Paper 1	Paper 2	Paper 3
What's assessed Sections 1–5 and 6.1 (Periodic motion)	What's assessed Sections 6.2 (Thermal Physics), 7 and 8 Assumed knowledge from sections 1 to 6.1	What's assessed Section A: Compulsory section: Practical skills and data analysis Section B: Optional topic
Assessed • written exam: 2 hours • 85 marks • 34% of A-level	Assessed • written exam: 2 hours • 85 marks • 34% of A-level	Assessed • written exam: 2 hours • 80 marks • 32% of A-level
Questions 60 marks of short and long answer questions and 25 multiple choice questions on content.	Questions 60 marks of short and long answer questions and 25 multiple choice questions on content.	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.



Equipmer

- An A
- File d
- Lined

- Pens, pencils, 30cm ruler, rubber
- A scientific calculator
- Data booklet (provided)
- Topic Question booklets (provided)

Recommended resources

- There is no requirement to purchase a textbook or revision book, though some students find them a useful resource to have at home or with them in lessons. We hold a few copies of the CGP AS-level and A-level textbooks in school. We recommend the Oxford AQA A-level physics books. Approved course textbooks
    - https://www.aqabookshop.co.uk/product-category/a-level/science-a-level/physics-a-level/
- Homework booklets of practice questions including past exam questions (provided)
- This is a link to the Head Start to A-level physics book if you'd like to review and extend your GCSE physics work through a few key notes and practice questions and answers
    - https://www.cgpbooks.co.uk/secondary-books/as-and-a-level/science/physics/pbr72-head-start-to-a-level-physics-with
- St John's Resources: This link to the St. John's Student area and is a one-stop place where you can find full text homework booklets, lesson power points, revision links and links to the AQA course information, past papers and mark schemes.
    - https://excaliburacademiestrust.sharepoint.com/sites/STJ_Subjects_PH/Key%20Stage%205/Forms/AllItems.aspx
- There are also further resources on Padlet: https://padlet.com/MsEBates/4sm5lkfixnyp

Physics summer work – Task 1 (no need to hand in)

- Use the link to learn about The Worlds Roundest Object (and why it exists) this will link to the Measurements and Errors topic.
- Watch the video, answer the Think questions, follow the Dig Deeper links if your interest is piques and then Discuss what you think in the forum if you're happy to read and share your opinions: https://ed.ted.com/best_of_web/i8Hauh7D#watch

Physics summer work – Task 2 (no need to hand in)

- Use the Online transition guide for AQA Physics to review your GCSE work.
- This is a very large document and there is no expectation to complete all of the tasks, but, there are some very useful introductory notes to help you to become familiar with the new content.
- Read through, digest the new information and attempt a number of the questions within the document, then check your answers.
  http://fdslive.oup.com/www.oup.com/oxed/secondary/science/Science_AQA_A_Level_Physics_Topic_Support.pdf

Physics summer work - Task 3 (hand in answers)

- Complete the transition baseline on the next few pages as best you can using your current knowledge.

A Level Physics Transition Baseline

40 Marks – 40 Minutes

A single piece of graph paper is required for the completion of the assessment.

You may use a calculator.

Question Number	Topic	Score
1	Symbols and Prefixes	/3
2	Standard Form	/4
3	Re-arranging Equations	/3
4	Atomic Structure	/3
5	Recording Data	/3
6	Graphing	/4
7	Forces and Motion	/10
8	Electrical Circuits	/5
9	Waves	/5
		Total /40

Q1 Complete the following table:

Unit prefix	Meaning
k (kilo)	x 1000
	X 0.000001
M (mega)	
N (nano)	

[3]

Q2

a) Write the following numbers into standard form.

i. 0.012

ii. 120000

iii. 0.00000012

[3]

b) Complete the following calculations and right your answers to an appropriate number of significant figures.

i. 2.1 X 0.15

ii. 0.345 ÷ 0.114

[4]

Q3 Re-arrange the following equations to make R the subject of the equation.

a) $\boldsymbol{Q = WERTY}$

b) $\boldsymbol{Q^2 = WR^2}$

c) $\boldsymbol{Q = W - RT^2}$

[3]

Q4 Name the 3 particles (from GCSE) that make up an atom.

…… **[1]**

a) Which one of the above particles is not found in the nucleus of an atom?

…… **[1]**

b) Which of the above particles will be found in varying quantities in the nuclei of isotopes of the same element?

…… **[1]**

Q5

a) Complete the following table

Voltage (__)	_____ (A)		
	Repeat 1	Repeat 2	Average
2	0.23	0.26	0.25
4	0.46	0.53	
6	0.69	0.78	0.74
8	0.92	1.04	0.98
10	1.15	1.30	1.23

[3]

Q6

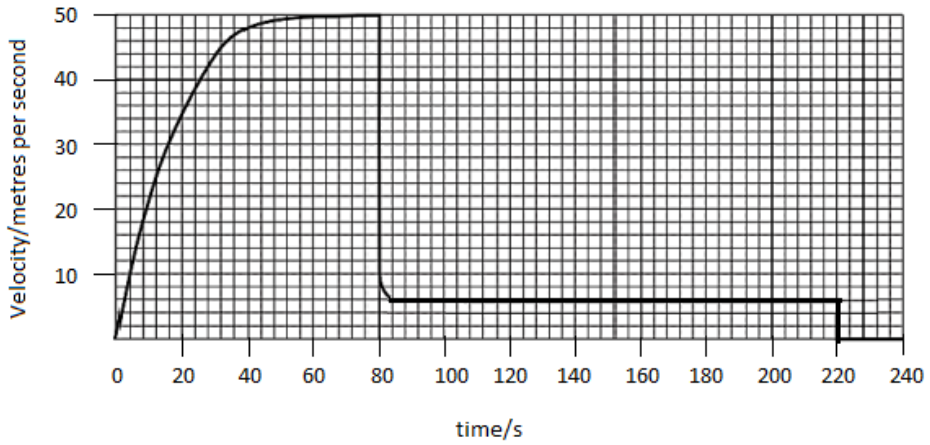
a) Use your piece of graph paper to plot a graph of Current (x-axis) against Voltage (y-axis) drawing a line of best fit through your data points.

[4]

b) Find the gradient of your line of best fit

[3]

Q7 The graph below shows the journey of a skydiver after they have left the plane.



a) Explain the shape of the graph commenting on how and why the forces have changed.

[6]

b) Calculate the distance travelled whilst at the second terminal velocity.

[2]

c) Calculate the **average** acceleration in the first 20 seconds.

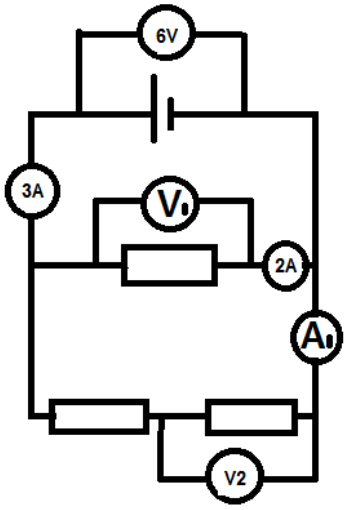
[2]

Q8

a) Draw a circuit diagram to show how the resistance of a filament bulb could be measured using an ammeter and a voltmeter.

[2]

b) Look at the circuit diagram below. All of the resistors are identical.

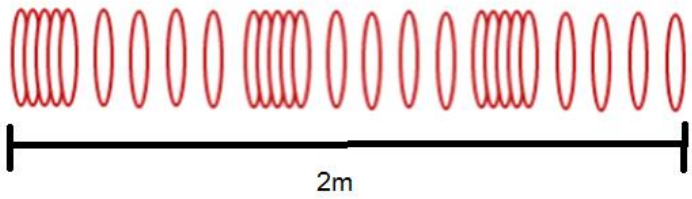


Write the missing values of current and potential difference:

i. V1 =
ii. V2 =
iii. A1 =

[3]

Q9 The diagram below shows a diagram of 3 complete longitudinal wave oscillations on a slinky:



a) State the wavelength of the wave shown

…… **[1]**

b) Label a complete wavelength on the diagram above with the correct symbol used for wavelength in GCSE and A Level Physics

[1]

c) If the above wave had a frequency of 5Hz how long would it take an individual hoop to complete 1 full oscillation?

[1]

d) Calculate the speed of the wave

$$\boldsymbol{wavespeed = frequency \times wavelength}$$

Wave speed = _____ Unit _____[2]