

# High Storrs Sixth Form

## 2024 Bridging Work

**Subject: Physics**

**Name:** \_\_\_\_\_



**HIGH STORRS SCHOOL**

Designed for Success



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Hi,

So you chose Physics, and so you should because it's brilliant. Here are some things to keep you going through summer, some of which we would like returning on your first day so we can check on your skills.

Below is some information about the course and information on the work that you will need to do this summer to make the transition to A-level as smooth as possible.

Welcome to Physics,

The A-level Physics team

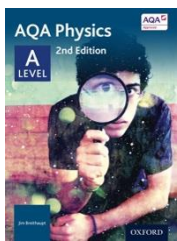


### Specification

We use the AQA A-level Physics specification. You can find, and download, a copy here...

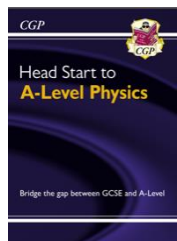
<https://www.aqa.org.uk/subjects/science/as-and-a-level/physics-7407-7408/specification-at-a-glance>

You should always be able to access a copy and should print the subject content to place in your new A-level Physics folder



### Course text book

The course text book will be available to buy through the school's parent pay shop in September



### Head start to physics

You have been given a book that you are expected to work through. It has questions throughout and the answers are in the back so you can mark your own answers. This book will remind you of GCSE knowledge and link it to your future A-level studies. This is particularly important as you may not have revised some areas for your GCSEs this year due to the advanced information. Please make sure you record your scores for each section. We will ask for these scores in September. If you are/were unable to collect the book on Applicants' Day you will be able to collect it from High Storrs School at

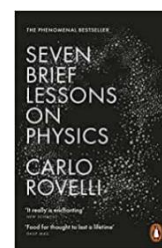
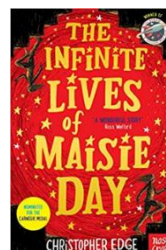
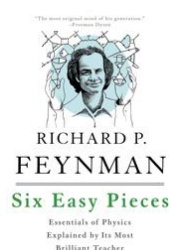
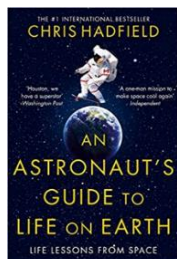
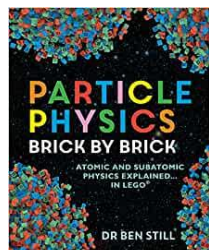
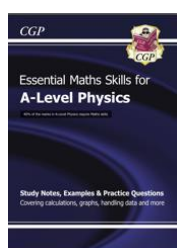
Visitor's Reception.

### Diagnostic assessment

Attached to the file are some tasks that you need to complete so that we can assess some of the skills that you will need for the physics course. Please complete and bring to your first Physics lesson in September.

### Independent study

You may want to read around the physics curriculum. If so these are good books to start with.



TEDx lectures may also be of interest, they are available on YouTube and cover a range of physics topics including; the LHC, black holes, string theory, quantum theory and much more.

**Diagnostic assessment**

Skills	<h1>Prefixes</h1>
N. DWYER	

*In Physics we have to deal with quantities from the very large to the very small. A prefix is something that goes in front of a unit and acts as a multiplier. This sheet will give you practice at converting figures between prefixes.*

Symbol	Name	What it means		How to convert	
P	peta	$10^{15}$	1000000000000000		↓ x1000
T	tera	$10^{12}$	1000000000000	↑ ÷ 1000	↓ x1000
G	giga	$10^9$	1000000000	↑ ÷ 1000	↓ x1000
M	mega	$10^6$	1000000	↑ ÷ 1000	↓ x1000
k	kilo	$10^3$	1000	↑ ÷ 1000	↓ x1000
			1	↑ ÷ 1000	↓ x1000
m	milli	$10^{-3}$	0.001	↑ ÷ 1000	↓ x1000
μ	micro	$10^{-6}$	0.000001	↑ ÷ 1000	↓ x1000
n	nano	$10^{-9}$	0.000000001	↑ ÷ 1000	↓ x1000
p	pico	$10^{-12}$	0.000000000001	↑ ÷ 1000	↓ x1000
f	femto	$10^{-15}$	0.000000000000001	↑ ÷ 1000	

Convert the figures into the prefixes required.

s	ms	μs	ns	ps
134.6				
96.21				
0.773				

m	km	mm	Mm	Gm
12873				
0.295				
57.23				

kg	Mg	mg	g	Gg
94.76				
0.000765				
823.46				

A	mA	μA	nA	kA
0.000000678				
3.56				
0.00092				

# Standard form worksheet

## Mathematics for A-level Science

### Practice your understanding

Convert the following numbers into standard form:

- |               |                |
|---------------|----------------|
| 1. 32 000     | 5. 9 230 000   |
| 2. 0.0006     | 6. 0.000 040 5 |
| 3. 104 000    | 7. 0.002 019   |
| 4. 18 200 000 | 8. 30 200      |

Convert the following numbers from standard form into decimal notation:

- |                          |                          |
|--------------------------|--------------------------|
| 9. $3.26 \times 10^4$    | 13. $8 \times 10^{-6}$   |
| 10. $8.4 \times 10^{-3}$ | 14. $1.3 \times 10^8$    |
| 11. $7.29 \times 10^7$   | 15. $2.3 \times 10^{-4}$ |
| 12. $1.26 \times 10^2$   | 16. $5.001 \times 10^6$  |

17. Using the formula  $\text{Circumference} = 2 \times 3.14 \times \text{radius}$ , and given that the mean radius of the Earth is 6 378 000 m, calculate the approximate circumference of the Earth leaving your answer in standard form to two significant figures.

18. There are 86 400 seconds in a day. Calculate the number of seconds in a year leaving your answer in standard form to two significant figures.

19. The current world population is approximately  $7.4 \times 10^9$  people. The United Kingdom population accounts for 0.88% of the total world population. Using this information, approximate the number of people living in the United Kingdom leaving your answer as a decimal number.

Skills	<h1>Significant Figures</h1>
N. DWYER	

*For each value state how many significant figures it is stated to.*

Value	Sig Figs	Value	Sig Figs	Value	Sig Figs	Value	Sig Figs
2		1066		1800.45		0.07	
2.0		82.42		$2.483 \times 10^4$		69324.8	
2.00		750000		2.483		0.0063	
0.136		310		5906.4291		$9.81 \times 10^4$	
0.34		$3.10 \times 10^2$		200000		6717	
54.1		$3.1 \times 10^2$		12.711		0.91	

*Add the values below then write the answer to the appropriate number of significant figures*

Value 1	Value 2	Value 3	Total Value	Total to correct sig figs
51.4	1.67	3.23		
7146	-32.54	12.8		
20.8	18.72	0.851		
1.4693	10.18	-1.062		
9.07	0.56	3.14		
739762	26017	2.058		
8.15	0.002	106		
132.303	4.123	53800		
152	0.8	0.55		
0.1142	4922388	132000		

*Multiply the values below then write the answer to the appropriate number of significant figures*

Value 1	Value 2	Total Value	Total to correct sig figs
0.91	1.23		
8.764	7.63		
2.6	31.7		
937	40.01		
0.722	634.23		

*Divide value1 by value 2 then write the answer to the appropriate number of significant figures*

Value 1	Value 2	Total Value	Total to correct sig figs
5.3	748		
3781	6.434		
$91 \times 10^2$	180		
5.56	$22 \times 10^{-3}$		
3.142	8.314		

# Units worksheet

## Mathematics for A-level Science

### Practice your understanding

Convert the following numbers into metres:

1. 3 km

2. 20 cm

3. 2.3 mm

4. 550 nm

5. 5.1  $\mu\text{m}$

6. 13.7 Gm

7. 0.0025 km

8. 1.001 km

Simplify the following units:

9.  $\text{cm} \times \text{cm}$

10.  $\text{km}^2 \times \text{km}$

11.  $\text{nm}^2 \times \text{nm}^{-1}$

12.  $\frac{\text{kg m}}{\text{m}}$

13.  $\frac{\text{cm}^3}{\text{cm}}$

14.  $\frac{\text{kg cm}^3}{\text{cm}}$

15.  $\frac{\text{cm}}{\text{cm}^2}$

16.  $\frac{\text{g cm}^2}{\text{cm}^{-1}}$

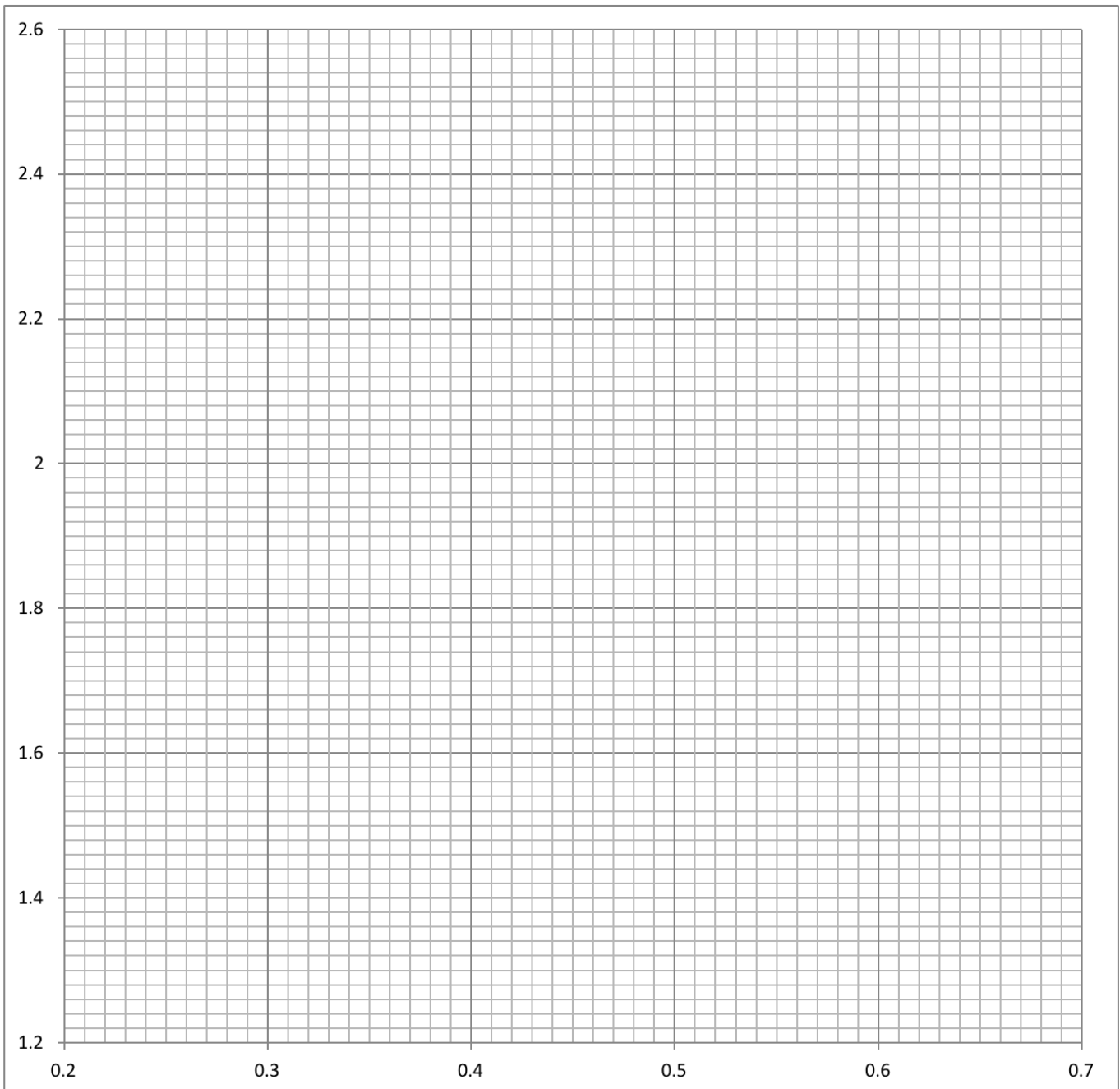
17. Concrete has a density of  $2400 \text{ kg m}^{-3}$ . What volume of concrete would have a mass of 96 kg?

18. What would this volume be in a)  $\text{dm}^3$  and b)  $\text{cm}^3$

Skills	<h1 style="margin: 0;">Points Plotting</h1>
N. DWYER	

*You are going to practice plotting points on a graph. Add lines of best fit where necessary.*

x axis	y axis	x axis	y axis	x axis	y axis
0.44	2.44	0.34	1.75	0.67	2.12
0.27	1.39	0.49	1.99	0.58	1.64
0.39	2.13	0.26	2.22	0.65	2.52
0.62	1.23	0.31	2.49	0.29	1.92
0.37	1.52	0.52	2.36	0.45	1.47
0.22	2.56	0.61	2.23	0.53	1.27
0.42	1.84	0.64	1.83	0.24	1.71
0.48	1.70	0.55	2.15	0.67	1.45



# Gradients

Calculate the gradients of the graphs below.

