Combined science Homework Year 10 into 11

In your final exams, you will be given exam questions on the required practicals so you need to understand what they are.

Overall, there are twenty one required practicals that you need to know.

To be well prepared you need to have a thorough understanding of each one, so the earlier you start learning about them, the better you will do in your GCSE Science subjects.

A key point is to understand the independent variable, the dependent variable and the control variables for each required practical.

During this year you will have carried out or have had demonstrated to you, approximately half of the required practicals and these are:

Biology

- Microscopy
- Osmosis
- Enzymes
- Food tests
- Photosynthesis

Chemistry

- Making salts
- Electrolysis
- Temperature changes

Physics

- Specific heat capacity
- Resistance
- I-V characteristics
- Density

Your Homework

Use your checklists in your books (B1, C1 and P1) and watch videos on free science lessons.co.uk relating to the required practicals covered this year.

Write a full method for each one, which includes describing the variables.

Learn about each required practical ready for an exam question on them.

How will you be assessed on this homework?

You will sit a progress check (6 mark question) in the first two weeks of September on this topic.

Useful links:

This is information from the exam board about the required practicals.

https://filestore.aqa.org.uk/resources/science/AQA-8464-8465-PRACTICALS-HB.PDF

Microscopy

https://www.youtube.com/watch?v=jBVxo5T-ZQM

Osmosis
https://www.youtube.com/watch?v=ef2Ts2AKhq8

Enzymes
http://freesciencelessons.co.uk/required-practical-effect-of-ph-on-amylase/

Food tests
http://freesciencelessons.co.uk/required-practical-food%20tests/

Photosynthesis

https://www.youtube.com/watch?v=cBCKedXdFeE

Chemistry

Making salts
https://www.youtube.com/watch?v=9GH95172Js8

Electrolysis
https://www.youtube.com/watch?v=ukbtTTG1Kew

Temperature changes
https://www.youtube.com/watch?v=rdI7xEq4Ew8

Physics

Specific heat capacity
https://www.youtube.com/watch?v=HAPmwu7byGM

Resistance
https://www.youtube.com/watch?v=YsZeZotYVag

I-V characteristics

https://www.youtube.com/watch?v=A1SyKvdHoqY

Density

https://www.youtube.com/watch?v=ScXOp8Zph28

Other useful information to learn

If you make some flip-it resources or post-it resources for things you need to learn by heart, you will be taking the pressure off yourself later on.

continuous data
data that can take any value

correlation
an apparent link or relationship between two factors

gradient (of a straight line graph)
a measure of the slope of a straight line on a graph

line of best fit
a straight line that represents the general trend of data. An equal number of data points should be above and below the line of best fit

mean
the arithmetical average of a series of numbers

median
the middle value of a list of numbers

order of magnitude
a comparison of the size of values. Two values are the same order of magnitude if their difference in size is small in comparison to other values being compared

percentage
a number expressed as a fraction of 100

qualitative data
data that is descriptive or categorical

quantitative data
data that is numerical or a measurement

ratio
a way of comparing two or more quantities, showing how many times one quantity is contained within the other

SI system of units
a system of units for physical quantities that are considered the standard units

significant figures (s.f.)
the important digits within a number. All non-zero digits are significant. Zeros may be significant if followed by another non-zero digit

standard form
a way of displaying large and small numbers

tangent
a straight line drawn to touch a point on a curve so it has the same gradient as the curve at that point

Equation number	Word equation	Symbol equation
1	weight = mass × gravitational field strength *g*	$W = mg$
2	work done = force × distance along the line of action of the force	$W = Fs$
3	force applied to a spring = spring constant × extension	$F = ke$
4	moment of a force = force × distance normal to direction of force	$M = Fd$
5	$pressure = \frac{force\ normal\ to\ a\ surface}{area\ of\ that\ surface}$	$p = \frac{F}{A}$
6	distance travelled = speed × time	$s = vt$
7	$acceleration = \frac{change\ in\ velocity}{time\ taken}$	$a = \frac{\Delta v}{t}$
8	resultant force = mass × acceleration	$F = ma$
9 HT	momentum = mass × velocity	$p = mv$
10	kinetic energy = 0.5 × mass × (speed)^2	$E_k = \frac{1}{2}mv^2$
11	gravitational potential energy = mass × gravitational field strength (*g*) × height	$E_p = mgh$
12	$power = \frac{energy\ transferred}{time}$	$P = \frac{E}{t}$
13	$power = \frac{work\ done}{time}$	$P = \frac{W}{t}$
14	$efficiecy = \frac{useful\ output\ energy\ transfer}{total\ input\ energy\ transfer}$	
15	$efficiecy = \frac{total\ power\ output}{total\ power\ input}$	
16	wave speed = frequency × wavelength	$v = f\lambda$
17	charge flow = current × time	$Q = It$
18	potential difference = current × resistance	$V = IR$
19	power = potential difference × current	$P = VI$

20	power = (current)^2 × resistance	$P = I^2 R$
21	energy transferred = power × time	$E = P\,t$
22	energy transferred = charge flow × potential difference	$E = Q\,V$
23	$density = \frac{mass}{volume}$	$\rho = \frac{m}{V}$

GCSE Science / Physics

Physics Equations and Units

Symbol	Quantity	Unit	*Unit name*
F	(resultant) force	**N**	*newtons*
W	weight		
M	moment of a force	**N m**	*newton metres*
g	gravitational field strength	**N/kg**	*newtons per kilogram*
m	mass	**kg**	*kilograms*
v	velocity/speed OR wave speed	**m/s**	*metres per second*
p	momentum	**kg m/s**	*kilograms metres per second*
a	acceleration	**m/s^2**	*metres per second squared*
t	time	**s**	*seconds*
T	period		
f	frequency	**Hz**	*hertz*
k	spring constant	**N/m**	*newtons per metre*
e	extension	**m**	*metres*
s	distance		
h	height		
l	length		
λ	wavelength		

A	area	**m^2**	*metres squared*
p	pressure	**N/m^2** **Pa**	*newtons per metre squared* *OR pascals*
V	volume	**m^3**	*metres cubed*
ρ	density	**kg/m^3**	*kilograms per metre cubed*
W	work done	**J**	*joules*
E	energy transferred		
E_e	elastic potential energy		
E_k	kinetic energy		
E_p	(gravitational) potential energy		
P	power	**W**	*watts*
c	specific heat capacity	**J/kg°C**	*joules per kilogram degrees celsius*
L	specific latent heat	**J/kg**	*joules per kilogram*
	efficiency	**% or decimal**	
Q	charge	**C**	*coulombs*
I	current	**A**	*amps*
V	potential difference (voltage)	**V**	*volts*
R	resistance	**Ω**	*ohms*
B	magnetic flux density	**T**	*tesla*

Remember:

- Most units are upper case (e.g. T, J, N, A…) – you must write them like this, you won't get the mark if you use lower case for these.
- Work done is another way of saying energy transferred.