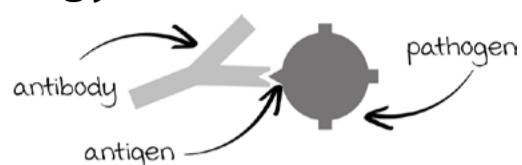
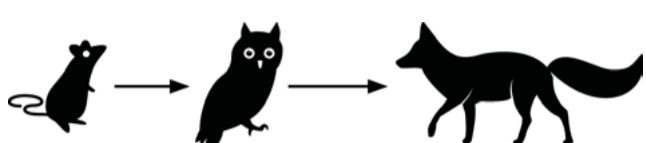


## 2019 Summer Highlights

### Biology



Antibodies made by our immune system recognise and bind to the antigens found on the outside of foreign organisms.



This shows the results are reliable X

This shows the results are repeatable ✓

This shows the results are reproducible ✓

Food chains show the direction energy moves between organisms. Pyramids of biomass show total energy in each level.



Use of the term 'reliability' is not encouraged. 'Repeatability', 'confidence' and 'reproducibility' are more appropriate.

The substrate acts as a key and the enzyme as a lock. The active site is the specific part of the lock the key fits into.

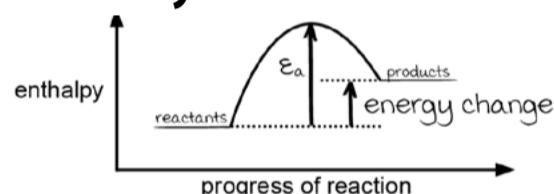
	A	a
A	AA	Aa
a	Aa	aa

Make sure that your capital letters in a Punnett square are much bigger than the lower-case letters.

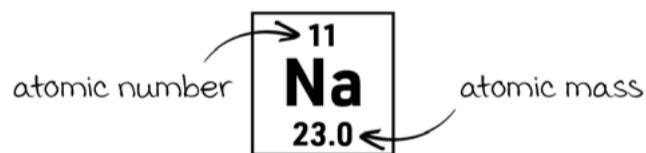


Remember living things are biotic, non-living things are abiotic.

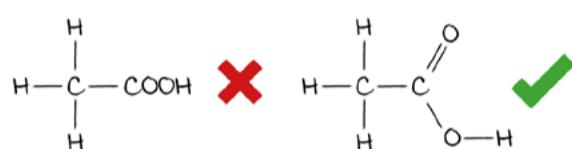
### Chemistry



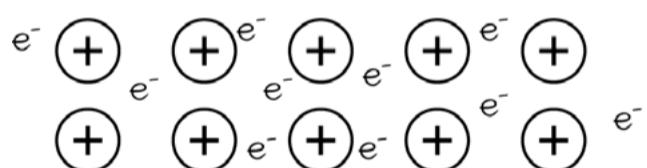
Energy profile diagram arrows are single headed, show direction of energy change and extend to the limits of the change.



Atomic number is the smaller number: the number of protons in an atom. Atomic Mass is the larger number: the mass of an atom.



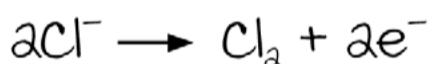
When drawing display formulae show all the bonds in the compound.



When drawing the structure of a metal, draw the delocalised electrons surrounding and in between the metal ions.

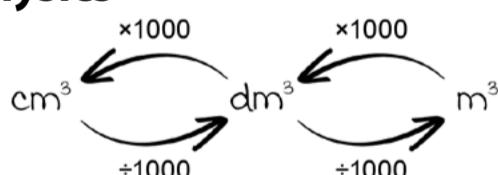


Use capital letters where appropriate when writing chemical symbols. The first letter of an element symbol is always a capital.

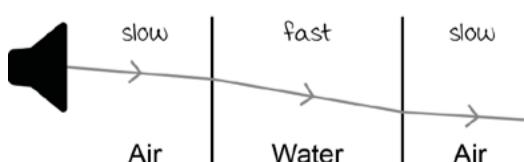


Half equations show you what happens to each ion in the reaction showing the electrons involved.

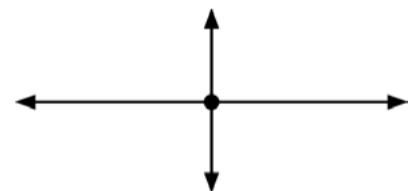
### Physics



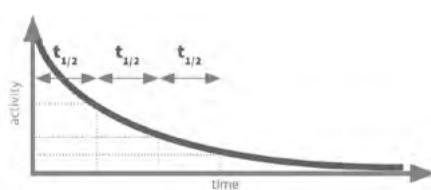
In calculations always check the units and make conversions if needed.



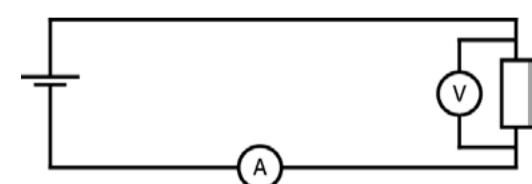
Sound waves move faster in denser mediums. e.g. Sound waves move faster in water than in air.



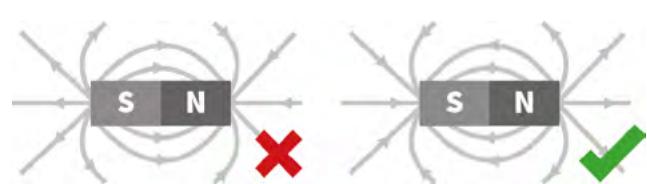
A free body diagram is the scientific way to show the forces acting on an object. Length and position of arrows matters.



The half-life of a radioactive source is the time taken for half its nuclei to decay and can be found using an activity-time graph.



In circuit diagrams components must be connected and in the correct position. Ammeter in series, voltmeter in parallel.

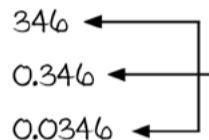


When drawing magnetic field lines, the arrows go from the north pole to the south pole and should not overlap.

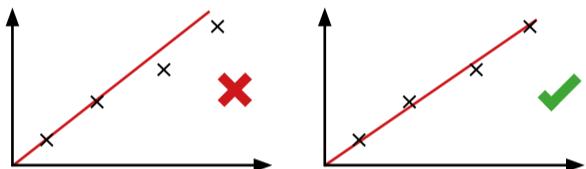
## 2019 Summer Highlights

Your answer:  A  B

If changing an MCQ answer, completely cross out the wrong letter and write the correct one anew. Use upper-case letters only.

 3 significant figures

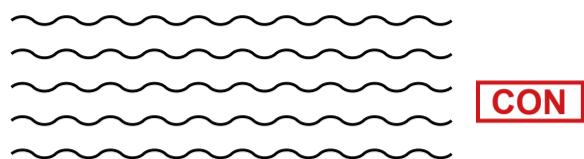
Make sure you give answers to the number of significant figures asked for after performing calculations.



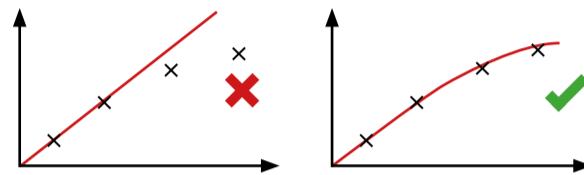
Lines of best fit should cover all points and have a fair distribution of points above and below the line.

 precise      imprecise

Remember that precision is the closeness of agreement between different results. It is not the same as accuracy.



Longer answers don't always lead to more marks. If correct responses are contradicted, marks can be lost.



Lines of best fit can be straight or curved. They don't have to extend to the axes or origin if not appropriate.

a.  X  
 b.  ✓  
 c.  X

For MCQs, if you don't know the answer try eliminating options by annotating. Don't leave MCQ answers blank!

 accurate      inaccurate

Accuracy is a measure of how close a result is to the true value.

Hydrocarbons contain carbon and hydrogen 

Hydrocarbons contain carbon and hydrogen only 

Use precise terminology, so your answer shows the whole picture.

The value of A is greater than that of B

When a question asks you to make a comparison, make sure you clearly describe differences and/or similarities.



0.34564524 

0.346 

It's always more accurate to round once, for the final answer, and work with unrounded values on the calculator.

Answer: ~~1008~~  -504 

Cross out answers if you need to change them. Trying to correct an answer by writing over it can make it unclear.

$$\frac{4.10}{202} = 0.0203 \text{ mol} \quad \frac{4.91}{94} = 0.0522 \text{ mol}$$

percentage yield = 38.89%  **ECF**

Show clear working for calculations. Error carried forward may mean a response still gains marks if a mistake is made.

Answer: ~~65000~~ 

Answer: ~~6.5 \times 10^4~~ 

You need to be able to convert results between decimal form and standard form (e.g.  $a \times 10^n$ ).

What would make the results more accurate?

Doing more repeats 

Repeats improve precision of the set of measurements, and not their accuracy.

The candidate exemplar materials for the 2019 GCSE Science papers can be found on Interchange.

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