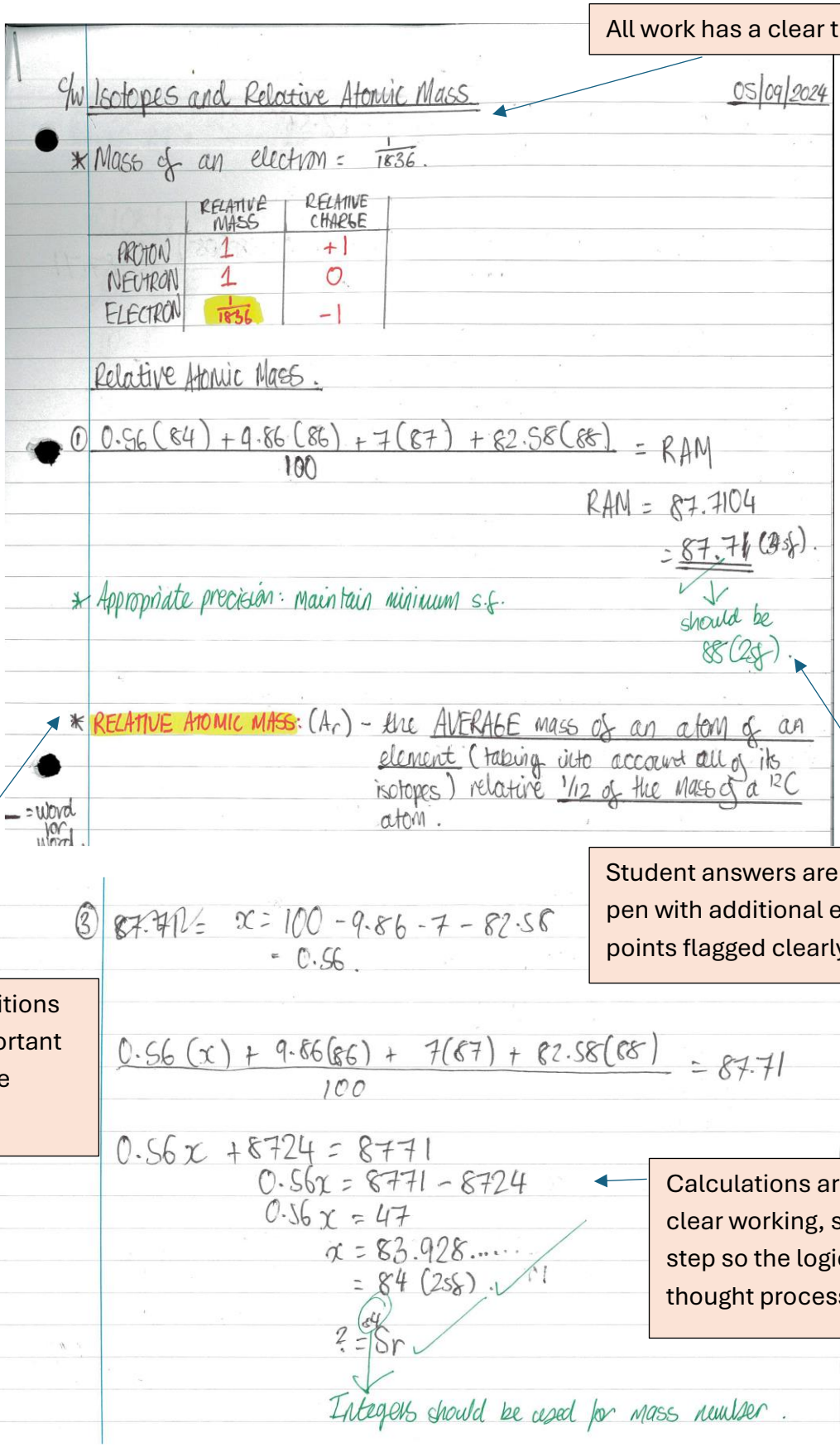
Example Key Stage 5 Student Work – Chemistry

The following gives some examples of the level of work covered in Chemistry at Key Stage 5, including details of how we expect students to set out their work and engage with feedback received. There is a strong correlation between the excellent diligence illustrated and student progress.



c/w Isotopes and Relative Atomic Mass 05/09/2024

* Mass of an electron = $\frac{1}{1836}$.

	RELATIVE MASS	RELATIVE CHARGE
PROTON	1	+1
NEUTRON	1	0
ELECTRON	$\frac{1}{1836}$	-1

Relative Atomic Mass.

① $\frac{0.56(84) + 9.86(86) + 7(87) + 82.58(88)}{100}$ = RAM

RAM = 87.7104

= 87.71 (4sf).

* Appropriate precision: maintain minimum s.f.

should be 88 (2sf).

* RELATIVE ATOMIC MASS: (A_r) - the AVERAGE mass of an atom of an element (taking into account all of its isotopes) relative 1/12 of the mass of a ^{12}C atom.

- = word for word.

③ 87.71 = $\frac{x = 100 - 9.86 - 7 - 82.58}{= 0.56.}$

$\frac{0.56(x) + 9.86(86) + 7(87) + 82.58(88)}{100} = 87.71$

$0.56x + 8724 = 8771$

$0.56x = 8771 - 8724$

$0.56x = 47$

$x = 83.928.....$

$= 84$ (2sf).

? = Sr

Integers should be used for mass number.

All work has a clear title and date

Student answers are checked in green pen with additional exam technique points flagged clearly

Key term definitions and other important key phrases are emphasised.

Calculations are laid out with clear working, showing each step so the logic in their thought process is clear.

Core practicals are written up in detail with clear results tables.

C/W CPAC 3: The effect of temperature on rate

Aim: investigate the effect of temperature on rate of reaction, whilst controlling other factors such as concentration, ~~and so~~

RESULTS:

START TEMPERATURE (°C)	END TEMPERATURE (°C)	AVG. TEMPERATURE (°C)	TIME (s)	$\frac{1000}{t}$ (s^{-1})
18	18	18	123.80	8.08
20	20	20	105.42	9.49
35	35	35	46.27	21.61
40	40	40	36.74	27.22
45	45	45	26.51	37.72
50	50	50	19.00	52.63
55	55	55	15.69	63.73.

GRAPH:

See attached graph paper.

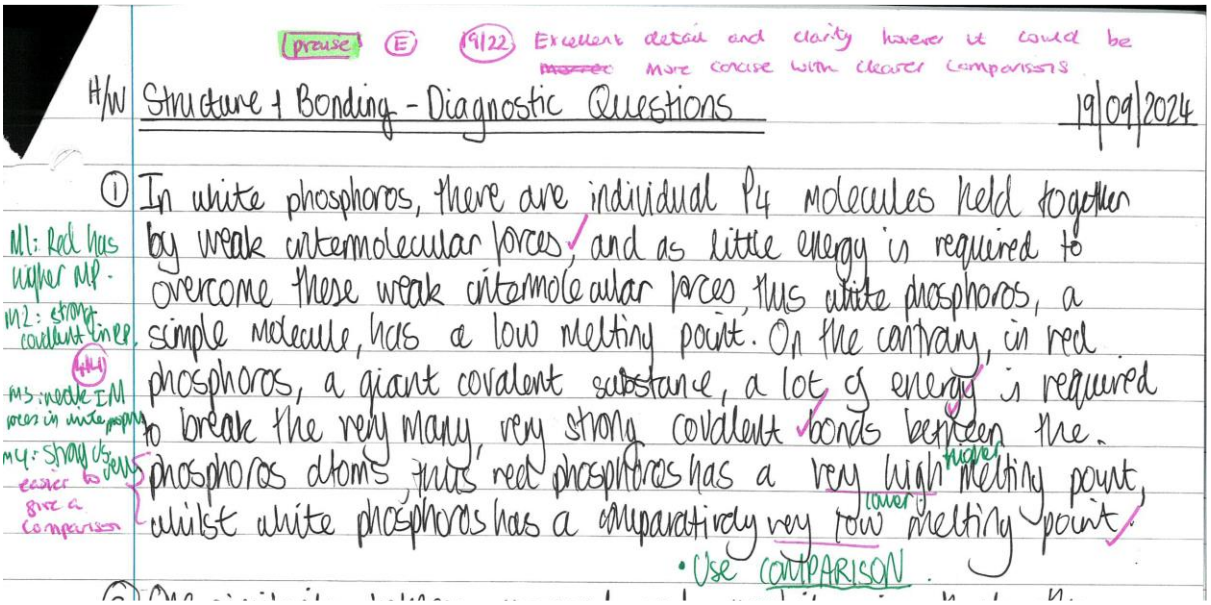
Follow-up questions to practical work are completed in detail.

QUESTIONS:

① As temperature increases, $\frac{1000}{t}$ also increases at a non-linear, exponentially increasing rate. Thus, as temperature increases, time taken for the cross to disappear decreases at a non-linear, exponentially decreasing rate.

② As temperature increases, the kinetic energy of the reactant particles increases such that they collide with more energy and collide more frequently. A small ~~change~~ increase in temperature here causes a much larger increase in the number of particles that have $E \geq E_A$, as seen through the shift in the Maxwell-Boltzmann Distribution, as at higher temperatures the curve shifts to the right and becomes flatter, thus the area to the right of the E_A line increases significantly. Thus, as a small ~~change~~ increase in temperature causes a large increase in the frequency of

Students engage with teacher marking, writing detailed corrections in green pen using hints from the teacher marking.


precise E 9/22 Excellent detail and clarity however it could be ~~more~~ More concise with clearer comparisons

H/W Structure + Bonding - Diagnostic Questions 19/09/2024

① In white phosphoros, there are individual P_4 molecules held together by weak intermolecular forces, and as little energy is required to overcome these weak intermolecular forces, thus white phosphoros, a simple molecule, has a low melting point. On the contrary, in red phosphoros, a giant covalent substance, a lot of energy is required to break the very many, very strong covalent bonds between the phosphoros atoms, thus red phosphoros has a very high (higher) melting point, whilst white phosphoros has a comparatively very low (lower) melting point.

• Use COMPARISON.

M1: Red has higher MP.
M2: strong covalent bonds
M3: weak IM forces in white phosphoros
M4: Strong vs weak easier to give a comparison

Students reflect and routinely record advice or feedback on how they can improve for next time.

GENERAL:

* Be precise - not just "high" and "low" - use "higher" or "lower".
* Think about definitions of key terms in question.
* Be concise where possible.