A-level Chemistry

CPAC – best practice

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Overview of this session

- Common Practical Assessment Criteria (CPAC).
- Apparatus and techniques.
- Practical work in action – Chemistry.
    - Planning, assessing and tracking.

AQA

Common Practical Assessment Criteria (CPAC)

1. Follows written procedures.
2. Applies investigative approaches and methods when using instruments and equipment.
3. Safely uses a range of practical equipment and materials.
4. Makes and records observations.
5. Researches, references and reports.

CPAC Pen portraits

A series of pen portraits have been written to clarify what is meant by 'not achieved', 'achieved' and 'achieved at a level of competence exceeding the CPAC standard'.

These exemplars have been developed in collaboration between the four Awarding Bodies: AQA, Eduqas, OCR and Pearson.
They are intended for guidance and training purposes, and to give an indication of the standard necessary for each CPAC statement.

Note that, although these pen portraits show (in the most part) CPAC skills in isolation, many practical exercises are likely to involve CPAC strands being assessed in combination.

Apparatus and techniques – AT a to AT l

AT a	Use appropriate apparatus to record a range of measurements (to include: mass, time, volume of liquids and gases, temperature).
AT b	Use water bath or electric heater or sand bath for heating.
AT c	Measure pH using pH charts, or pH meter, or pH probe on a data logger.
AT d	Use laboratory apparatus for a variety of experimental techniques including: • titration, using burette and pipette, • distillation and heating under reflux, including setting up glassware using retort stand and clamps, • qualitative tests for ions and organic functional groups, • filtration, including use of fluted filter paper, or filtration under reduced pressure.
AT l	Measure rates of reaction by at least two different methods, for example: • an initial rate method such as a clock reaction, • a continuous monitoring method.

12 core practical activities

Required activity	Apparatus and technique
1. Make up a volumetric solution and carry out a simple acid-base titration.	a, d, e, f, k
2. Measurement of an enthalpy change.	a, d, k
3. Investigation of how the rate of a reaction changes with temperature.	a, b, k
4. Carry out simple test-tube reactions to identify: • Cations – Group 2, NH4+, • anions – Group 7 (halide ions), OH–, CO32–, SO42–.	d, k
5. Distillation of a product from a reaction.	b, d, k
6. Tests for alcohol, aldehyde, alkene and carboxylic acid.	b, d, k

AQA practical endorsement online training

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Realising potential

What I am looking for when I am assessing each competency is ....

This aide memoire should **not** be used as a tick list. It is designed to help teachers (and advisers when carrying out monitoring visits) in thinking about what they will look for in their students' practical work. Blanks have been left in each section for teachers (and monitors) to add their own criteria. This document should be used **after** completing the endorsement training, available on the AQA website.

Common Practical Assessment Criteria (CPAC)	I am looking for my students to be able to ...
1. Follows written instructions	• follow a set of written instructions that are appropriate to the level of familiarity to equipment or techniques • carry out steps in the correct order • generate a set of data that is expected. This might be close to my own value or that expected from a data trend seen in a secondary source • work independently, in pairs or small groups but they must carry out practical steps • feel confident to seek clarification when carrying out method steps, when either using an unfamiliar set of apparatus or carrying out a new technique • -- • -- • -- • -- • --

http://www.aqa.org.uk/resources/science/as-and-a-level/teach/practicals

Feedback

Prompt feedback to:

- show where there is evidence towards the pass standard
- show if the pass standard has been reached
- give constructive comments to support progress towards (and beyond) the pass standard.

Feedback strategies

Feedback can be:

- written by the teacher
- written by the student following oral feedback from the teacher
- via peer assessment
- by other creative means which help support progress towards the pass standard (and beyond).

CPAC 1

Follows written procedures.

CPAC 1: assessing in a manageable way

AS band 1	Expt – play dough Date 25th Sept	Drag	Connect	R vs L ext	A const	R vs A ext	L const	diam	Area	$A = \pi d^2/4$	graphs	other factors
Megan	✓	✓	✓	✓	✓	✓	✓				✓	
Alex	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Dylan	✓	✓		✓	✓	✓	✓	✓			✓	✓
Sam												
Matthew												
Millie	✓	✓		✓	✓	✓	✓	✓	✓	✓		
Kaitlin	A											
Ethan	✓	✓		✓	✓	✓	✓					
Jonathon	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
Kene	✓	✓	✓	✓	✓	✓	✓				✓	
Isaac	✓	✓	✓	✓	✓	✓	✓	✓			✓	
Orla	✓	✓		✓	✓	✓	✓	✓			✓	
Joe	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Sam	✓	✓ 1·5		✓	✓	✓	✓			✓	✓	✓
Ben	✓	✓	[illegible]	✓	✓	✓	✓				✓	
William	✓	✓	✓	✓	✓	✓					✓	✓
Pretesh	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓
Nathan	✓	✓ [illegible]	✓	✓	✓	✓					✓	

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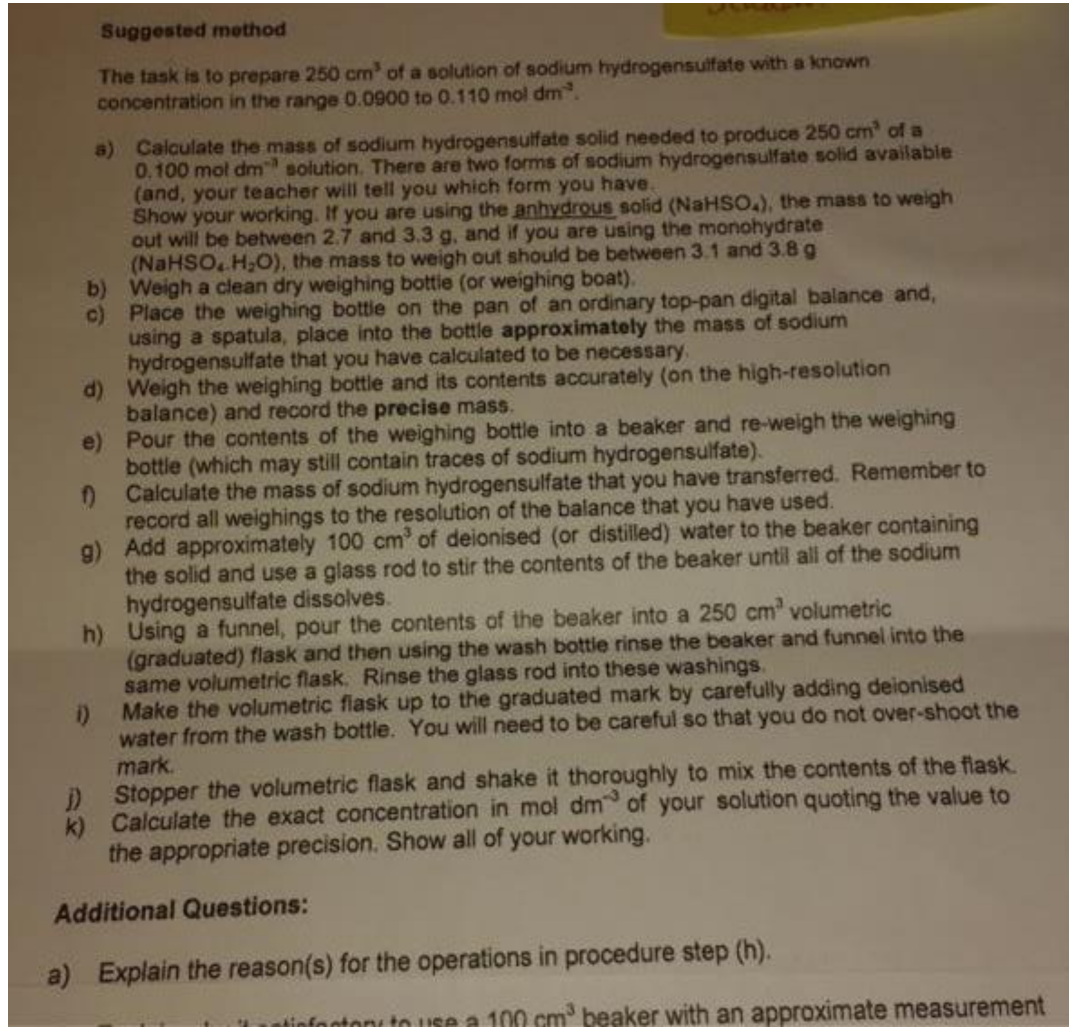
CPAC 1a

Written instructions can be used directly from the handbook content.



Suggested method

The task is to prepare 250 cm^3 of a solution of sodium hydrogensulfate with a known concentration in the range 0.0900 to 0.110 mol dm^{-3}.

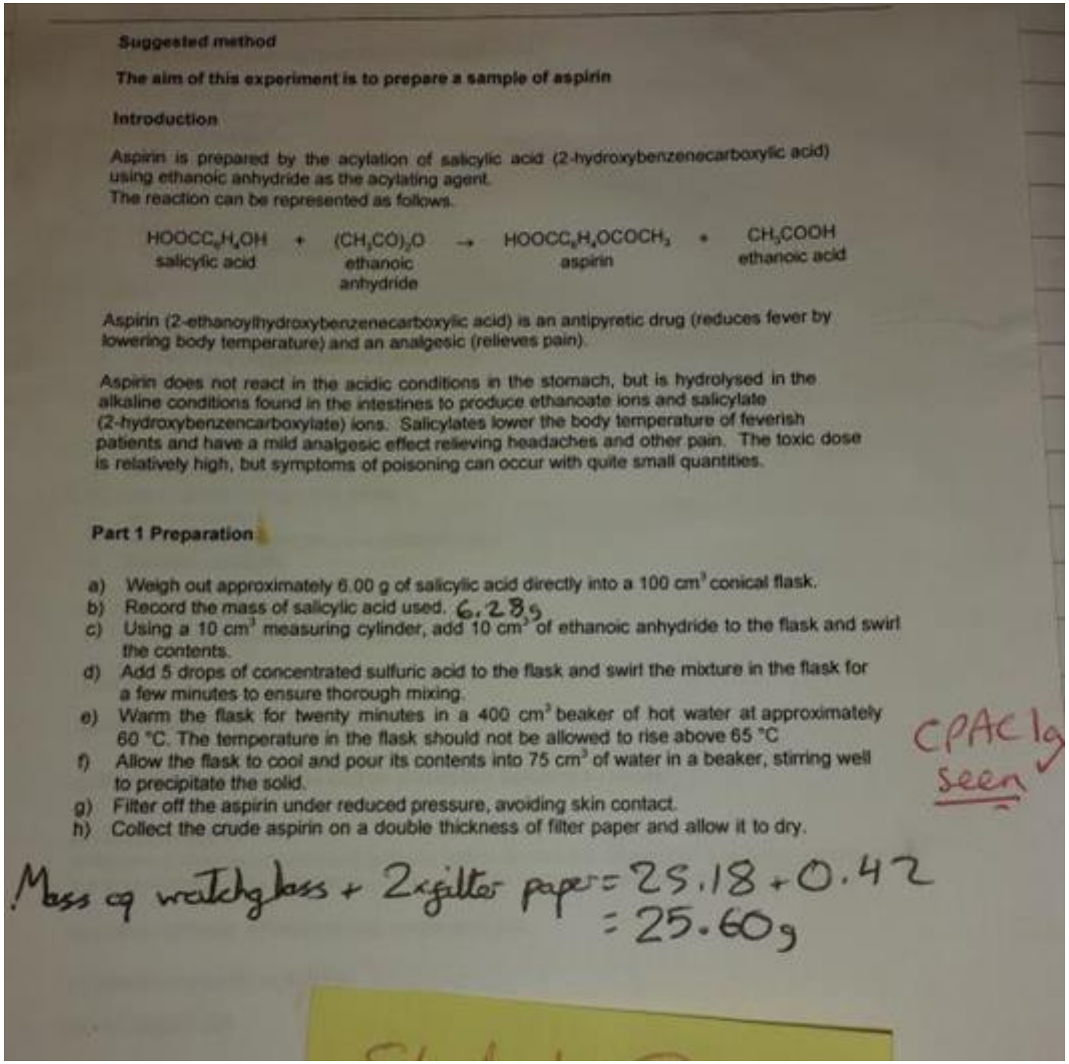
a) Calculate the mass of sodium hydrogensulfate solid needed to produce 250 cm^3 of a 0.100 mol dm^{-3} solution. There are two forms of sodium hydrogensulfate solid available (and, your teacher will tell you which form you have. Show your working. If you are using the anhydrous solid ($NaHSO_4$), the mass to weigh out will be between 2.7 and 3.3 g, and if you are using the monohydrate ($NaHSO_4.H_2O$), the mass to weigh out should be between 3.1 and 3.8 g
b) Weigh a clean dry weighing bottle (or weighing boat).
c) Place the weighing bottle on the pan of an ordinary top-pan digital balance and, using a spatula, place into the bottle **approximately** the mass of sodium hydrogensulfate that you have calculated to be necessary.
d) Weigh the weighing bottle and its contents accurately (on the high-resolution balance) and record the **precise** mass.
e) Pour the contents of the weighing bottle into a beaker and re-weigh the weighing bottle (which may still contain traces of sodium hydrogensulfate).
f) Calculate the mass of sodium hydrogensulfate that you have transferred. Remember to record all weighings to the resolution of the balance that you have used.
g) Add approximately 100 cm^3 of deionised (or distilled) water to the beaker containing the solid and use a glass rod to stir the contents of the beaker until all of the sodium hydrogensulfate dissolves.
h) Using a funnel, pour the contents of the beaker into a 250 cm^3 volumetric (graduated) flask and then using the wash bottle rinse the beaker and funnel into the same volumetric flask. Rinse the glass rod into these washings.
i) Make the volumetric flask up to the graduated mark by carefully adding deionised water from the wash bottle. You will need to be careful so that you do not over-shoot the mark.
j) Stopper the volumetric flask and shake it thoroughly to mix the contents of the flask.
k) Calculate the exact concentration in mol dm^{-3} of your solution quoting the value to the appropriate precision. Show all of your working.

Additional Questions:

a) Explain the reason(s) for the operations in procedure step (h).

… to use a 100 cm^3 beaker with an approximate measurement

CPAC 1a



Suggested method

The aim of this experiment is to prepare a sample of aspirin

Introduction

Aspirin is prepared by the acylation of salicylic acid (2-hydroxybenzenecarboxylic acid) using ethanoic anhydride as the acylating agent.
The reaction can be represented as follows.

$$\underset{\text{salicylic acid}}{HOOCC_6H_4OH} + \underset{\text{ethanoic anhydride}}{(CH_3CO)_2O} \rightarrow \underset{\text{aspirin}}{HOOCC_6H_4OCOCH_3} + \underset{\text{ethanoic acid}}{CH_3COOH}$$

Aspirin (2-ethanoylhydroxybenzenecarboxylic acid) is an antipyretic drug (reduces fever by lowering body temperature) and an analgesic (relieves pain).

Aspirin does not react in the acidic conditions in the stomach, but is hydrolysed in the alkaline conditions found in the intestines to produce ethanoate ions and salicylate (2-hydroxybenzencarboxylate) ions. Salicylates lower the body temperature of feverish patients and have a mild analgesic effect relieving headaches and other pain. The toxic dose is relatively high, but symptoms of poisoning can occur with quite small quantities.

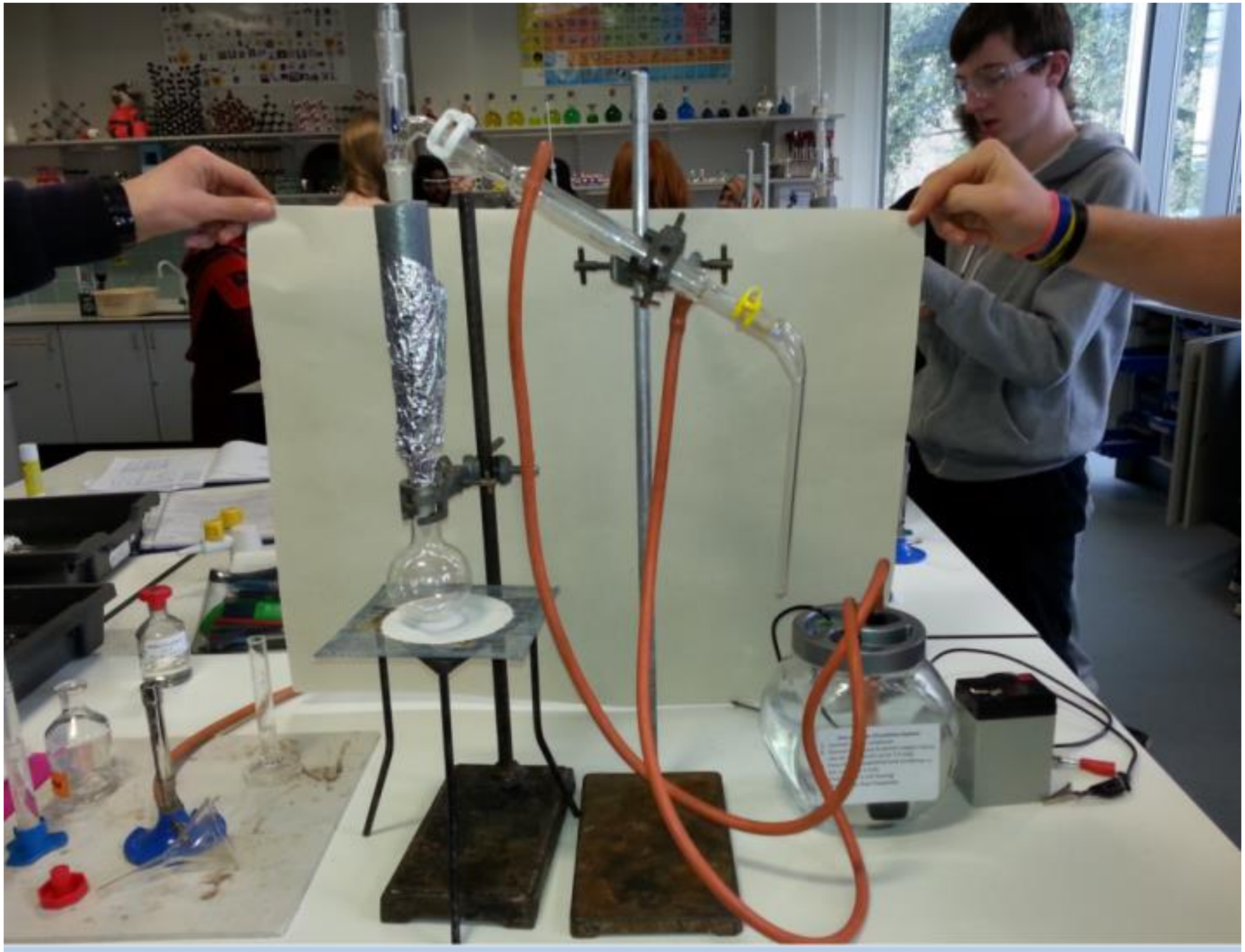
Part 1 Preparation

a) Weigh out approximately 6.00 g of salicylic acid directly into a 100 cm^3 conical flask.
b) Record the mass of salicylic acid used. 6.28g
c) Using a 10 cm^3 measuring cylinder, add 10 cm^3 of ethanoic anhydride to the flask and swirl the contents.
d) Add 5 drops of concentrated sulfuric acid to the flask and swirl the mixture in the flask for a few minutes to ensure thorough mixing.
e) Warm the flask for twenty minutes in a 400 cm^3 beaker of hot water at approximately 60 °C. The temperature in the flask should not be allowed to rise above 65 °C
f) Allow the flask to cool and pour its contents into 75 cm^3 of water in a beaker, stirring well to precipitate the solid.
g) Filter off the aspirin under reduced pressure, avoiding skin contact.
h) Collect the crude aspirin on a double thickness of filter paper and allow it to dry.

CPAC 1a seen ✓

Mass of watch glass + 2x filter paper = 25.18 + 0.42
= 25.60g

CPAC 1 – what would you look for?



AQA

CPAC 1 – any evidence here?

/15

Determination of the Relative Molecular Mass of a Volatile Liquid 06/10/15

$pV = nRT$

Mass of syringe = ~~2.52g~~ 2.64g

Mass of syringe with volatile liquid = ~~2.41g~~ 2.79g

Volume of volatile liquid = ~~0.4cm³~~ ~~0.3ml~~ 0.2ml *✓*

Volume of gas = 72ml

Mass of liquid = 0.15g = 2.79g − 2.64g ~~= 0.15g~~

Pressure = 99600Pa

Temperature of the water bath = 84.5°C = 357.5K *✓*

Molar gas constant = $8.31\ JK^{-1}mol^{-1}$

Number of moles = $\frac{pV}{RT} = \frac{99600Pa \times (7.2\times10^{-5})}{8.31 \times 357.5}$ = 0.00241 *✓*

$= 2.41 \times 10^{-3}$ mol

$\frac{Mass}{Mr}$ = moles

M_r = ~~$\frac{mass}{moles}$~~ ~~Mass~~ → $\frac{mass}{moles}$ = 62.3 *✓*

M_r of liquid

v good!

Propanone C_3H_6O Mr 58 was used.

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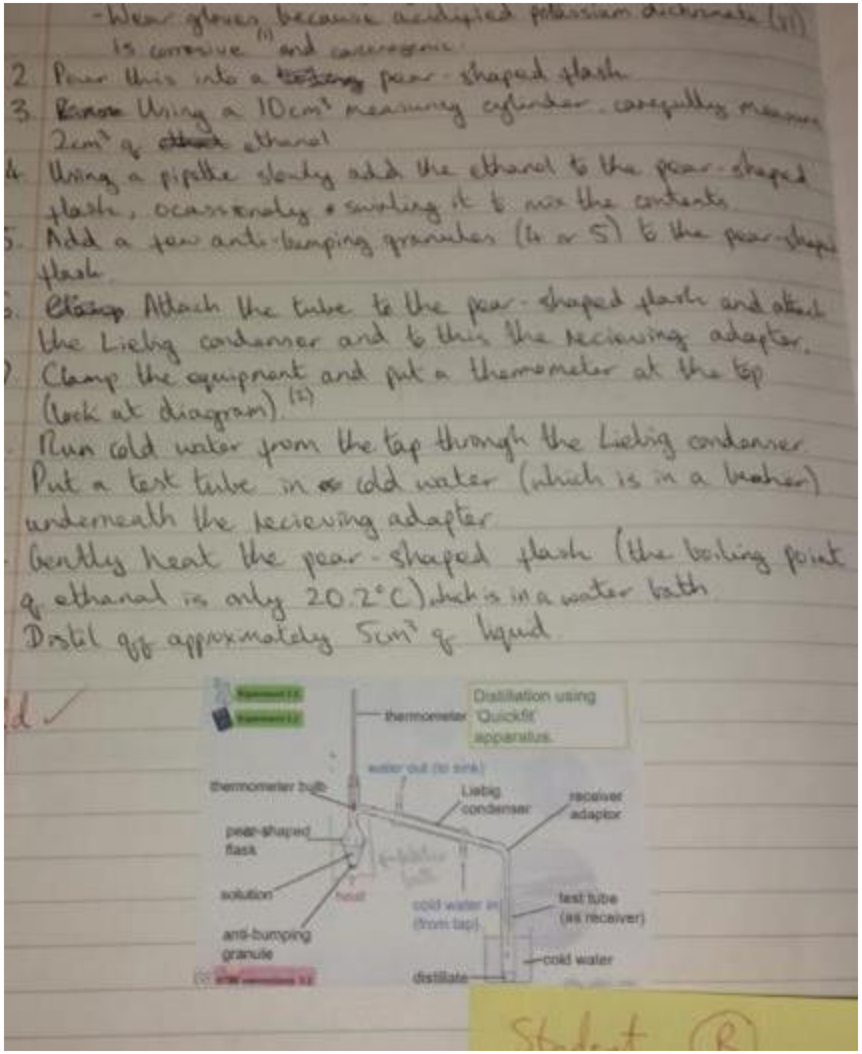
CPAC 2

Applies investigative approaches and methods when using instruments and equipment.

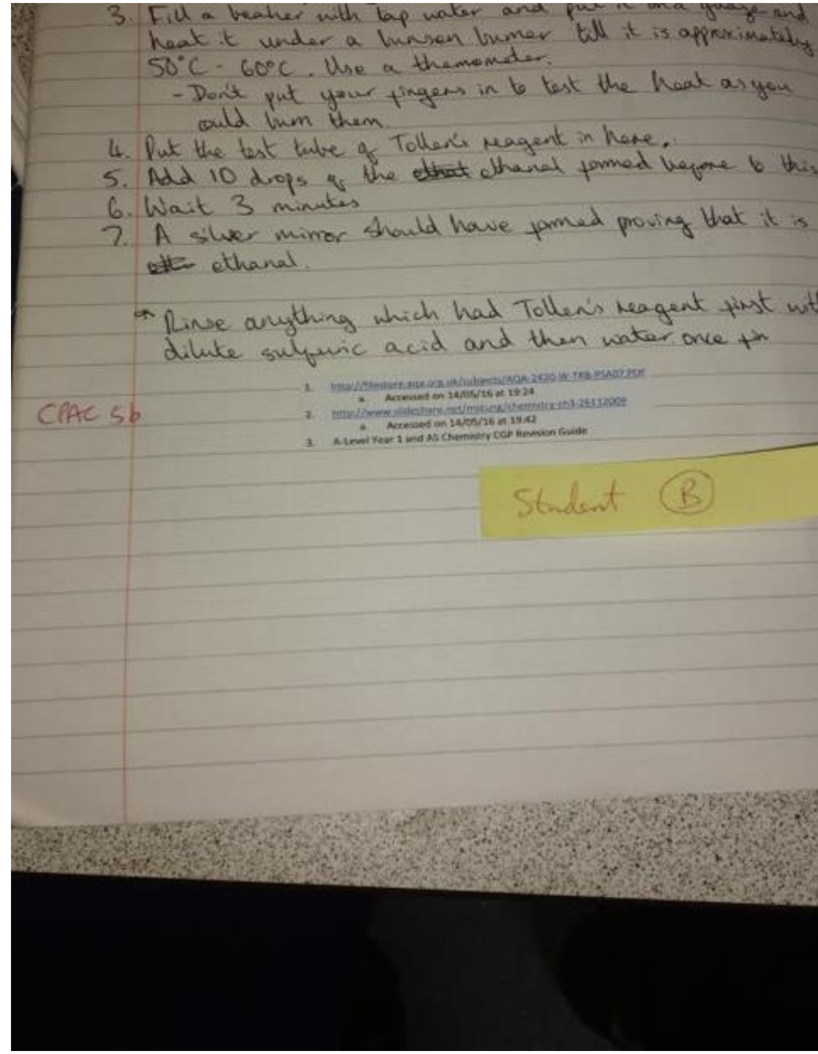
Planning for CPAC 2 assessment

What AQA is looking for.	Use the equipment properly, without much prompting. Work methodically and show ability to multi-task.	Have adapted method/ equipment during the practical and have justified reasons for this.	Have listed the main variables and have explained how control variables will be kept the same.	Have selected the most appropriate equipment and explained reasons for choosing each piece in order to gather accurate results.
CPAC 2: make choices about appropriate element Examples.	Use equipment to measure volumes and time.	At least two adaptations to the method provided, with justifications.	Independent and dependent identified and state how to control two variables.	Chosen equipment with lowest levels of uncertainty and justify.

CPAC 2



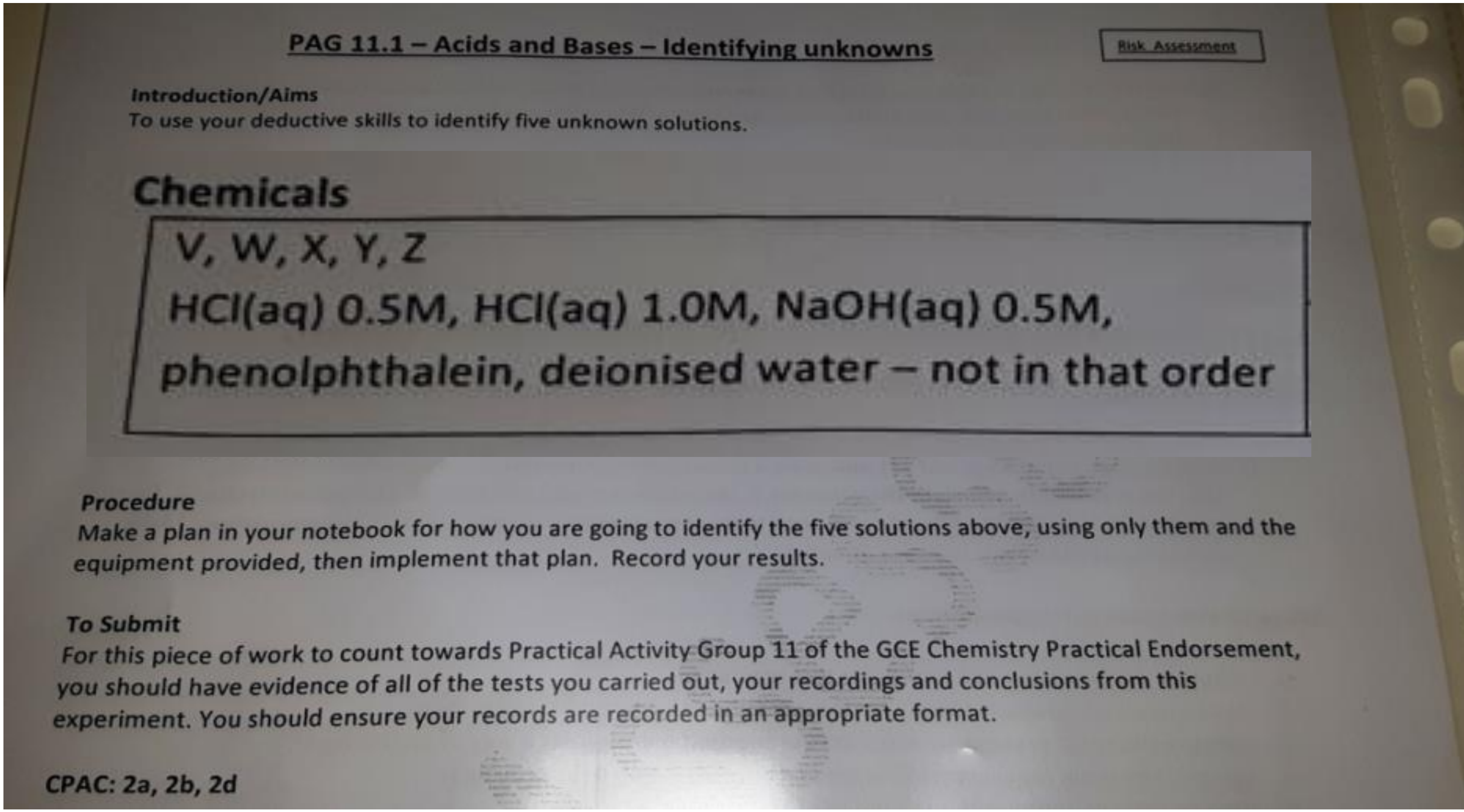
- Wear gloves because acidified potassium dichromate (VI) is corrosive (1) and carcinogenic.
2. Pour this into a pear-shaped flask.
3. Using a 10cm³ measuring cylinder carefully measure 2cm³ of ethanol
4. Using a pipette slowly add the ethanol to the pear-shaped flask, occasionally swirling it to mix the contents.
5. Add a few anti-bumping granules (4 or 5) to the pear-shaped flask
6. Attach the tube to the pear-shaped flask and attach the Liebig condenser and to this the recieving adapter.
7. Clamp the equipment and put a thermometer at the top (look at diagram) (2)
Run cold water from the tap through the Liebig condenser.
Put a test tube in cold water (which is in a beaker) underneath the recieving adapter.
Gently heat the pear-shaped flask (the boiling point of ethanal is only 20.2°C) which is in a water bath.
Distil off approximately 5cm³ of liquid.
Distillation using 'Quickfit' apparatus
thermometer
thermometer bulb
water out (to sink)
Liebig condenser
receiver adaptor
pear-shaped flask
solution
heat
cold water in (from tap)
test tube (as receiver)
anti-bumping granule
cold water
distillate
Student B



3. Fill a beaker with tap water and put it on a gauze and heat it under a bunsen burner till it is approximately 50°C - 60°C. Use a thermometer.
- Don't put your fingers in to test the heat as you could burn them.
4. Put the test tube of Tollen's reagent in here.
5. Add 10 drops of the ethanal formed before to this.
6. Wait 3 minutes
7. A silver mirror should have formed proving that it is ethanal.
* Rinse anything which had Tollen's reagent first with dilute sulfuric acid and then water once it
CPAC 5b
A-Level Year 1 and AS Chemistry CGP Revision Guide
Student B

AQA

CPAC 2 – open ended



PAG 11.1 – Acids and Bases – Identifying unknowns

Risk Assessment

Introduction/Aims

To use your deductive skills to identify five unknown solutions.

Chemicals

V, W, X, Y, Z

HCl(aq) 0.5M, HCl(aq) 1.0M, NaOH(aq) 0.5M, phenolphthalein, deionised water – not in that order

Procedure

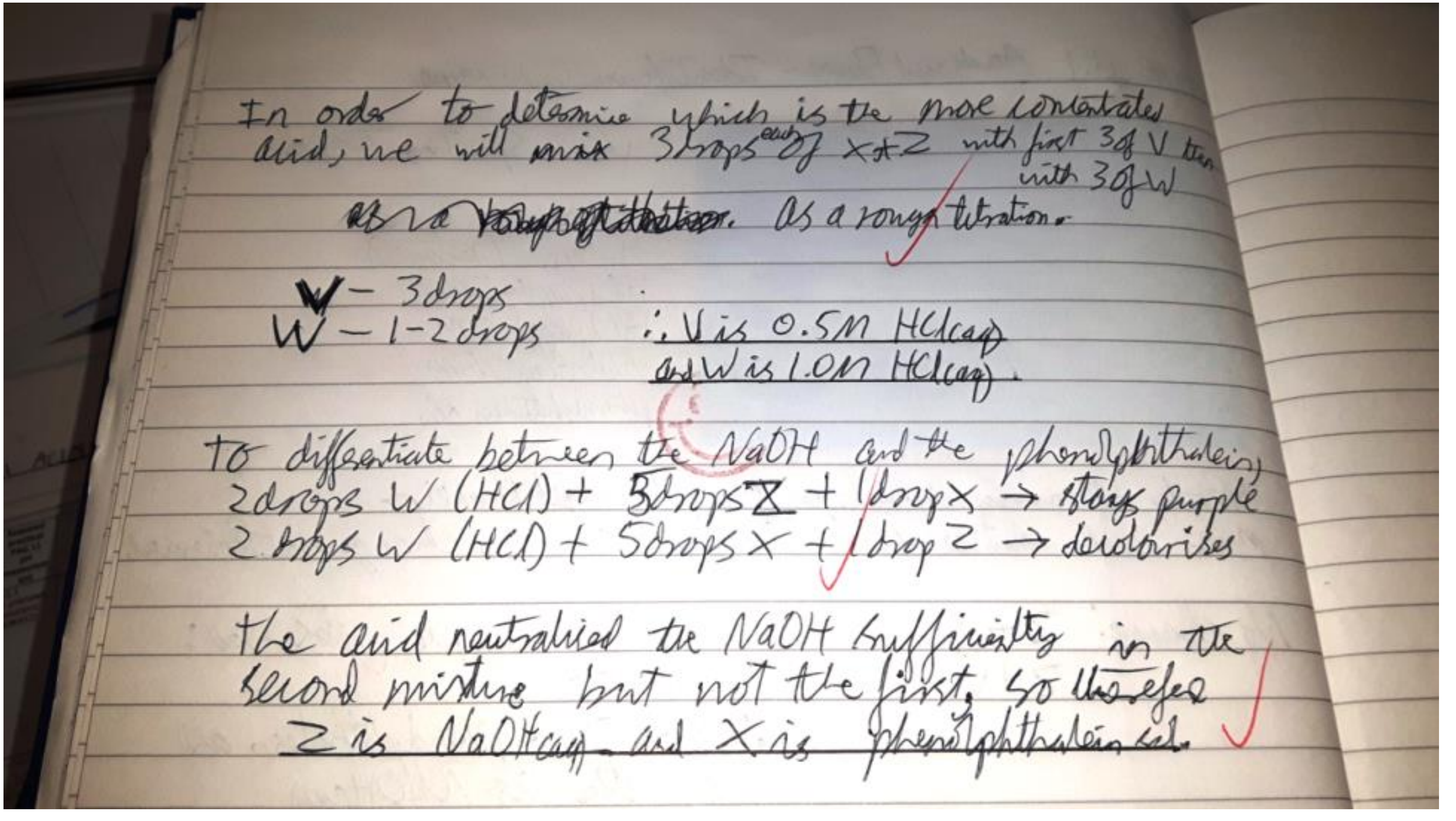
Make a plan in your notebook for how you are going to identify the five solutions above, using only them and the equipment provided, then implement that plan. Record your results.

To Submit

For this piece of work to count towards Practical Activity Group 11 of the GCE Chemistry Practical Endorsement, you should have evidence of all of the tests you carried out, your recordings and conclusions from this experiment. You should ensure your records are recorded in an appropriate format.

CPAC: 2a, 2b, 2d

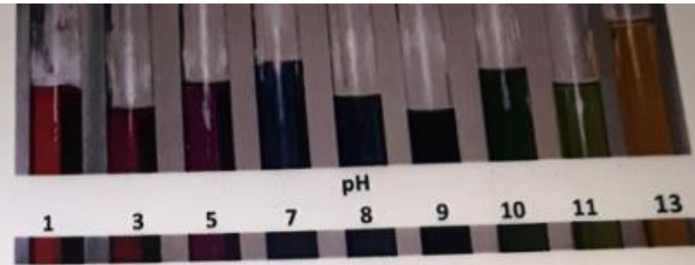
CPAC 2 – evidence for 2a?



CPAC 2

Health & Safety

- Wear safety spectacles.



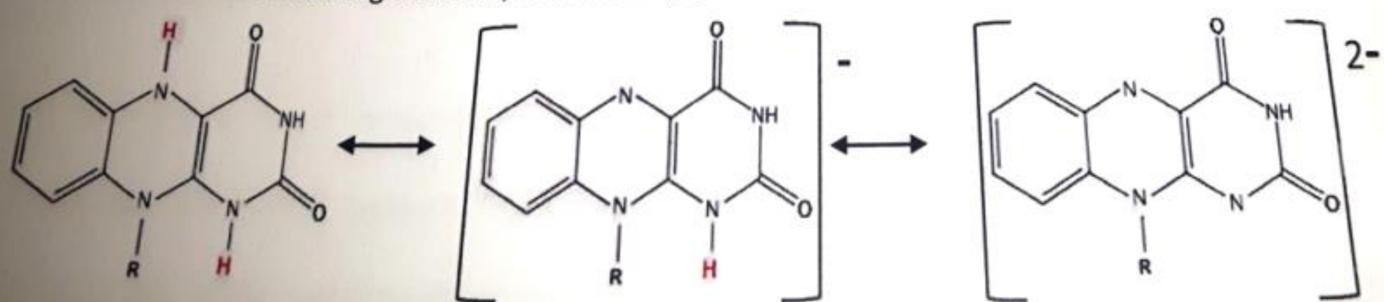
Procedure

1. Fill a 250 cm^3 beaker with chopped cabbage. Place the cabbage in a large beaker and add boiling water to cover the cabbage and boil and stir for 5 mins so the indicator leaches out of the cabbage.
2. Filter or decant to separate the plant material to obtain a red-purple-bluish coloured liquid.
3. This liquid is at about pH 7. (The exact colour you get depends on the pH of the water.)
4. Set up a test tube rack + tubes with a sample of your indicator soln. in each tube.
5. Using your knowledge of acids and bases adjust the pH to get the full colour range for pH 1 – 13, making notes on how you achieved the target pH.

$[H^+]$	Colour
Very high	Red
High	Red-blue
Moderate	Blue
Low	Green-Yellow
Very Low	Yellow

Questions

Anthocyanins are weak organic acids, with the conjugate base structures like the following:



AQA

CPAC 3

Safely uses a range of practical equipment and materials.

CPAC 3: safe use of a range of practical equipment and materials

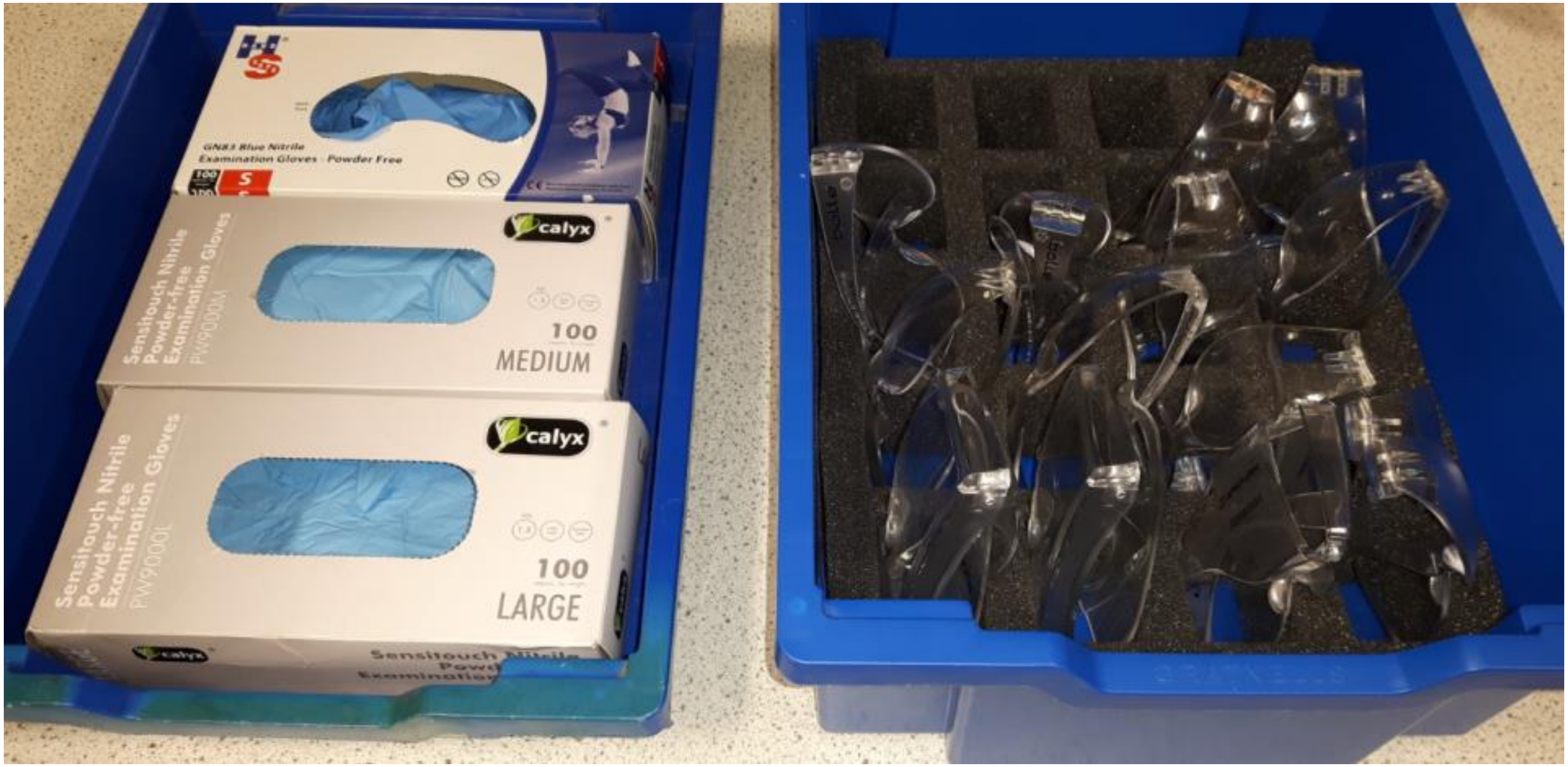
- It is not robust enough to say that students are reaching the pass standard because ‘nothing went wrong’.

- Clear statements outline that students must:
  - identify main hazards and associated risks
  - use appropriate safety equipment and approaches with minimal prompting
  - make adjustments when issues are identified.

CPAC 3


HEALTH HAZARD
It is forbidden
to eat or drink
in this laboratory

CPAC 3


GN83 Blue Nitrile
Examination Gloves · Powder Free
calyx
Sensitouch Nitrile
Powder-free
Examination Gloves
PW9000M
100
MEDIUM
calyx
Sensitouch Nitrile
Powder-free
Examination Gloves
PW9000L
100
LARGE

AQA

CPAC 3

AQA

CPAC 3a – assessing risks: what is expected?

King Edward VII Upper School Chemistry Department – Risk Assessment Form

Title of experiment(s): Hydrolysis of Halogenoalkanes

Lesson #:

Outline of procedures Placing ethanol and silver nitrate into 3 test tubes. Place test tubes into hot water. wait for 2 minutes and allow it to reach equilibrium. keep in water bath + quickly add 3 drops of different halogenoalkanes into each test tube - Shake briefly. At the same time start the stop watch - time until ppt forms.

Hazardous substances / procedure	Nature of the hazards	Control measures (precautions)	Information Source. Full url. + date or page reference.
Silver Nitrate (aq)	Irritant	Wear eye protection at all times. Avoid contact with skin.	www.cleapss.org.uk/attachments/article/0/SSS46.pdf?Secondary/Science/Student%20Safety%20Sheets/ 14/3/16
Ethanol	Highly flammable. Vapour mixtures are explosive. Irritant to eyes	Keep away from naked flame. Wear eye protection at all times.	www.riskassessmentservices.co.uk/HazCom/Ethanol.pdf 14/3/16
1-chlorobutane	Highly flammable vapour mixtures are explosive. Irritant.	keep away from naked flame, no sparks, no smoking. keep in a closed system with ventilation. wear gloves and eye protection at all times to avoid contact with skin or eyes.	www.cdc.gov/niosh/ipcsneng/neng0703.html 14/3/16
1-bromobutane	Flammable. Irritant. Harmful	keep away from naked flame. wear eye protection and gloves to avoid contact with eyes or skin.	https://www.elac.edu/academics/departments/chemistry/chemistrydocuments/docs/B/1-bromobutane.pdf 14/3/16
1-iodobutane	Flammable Harmful Irritant.	keep away from naked flame. wear eye protection and gloves at all times to avoid contact with eyes or skin.	www.cgc.maricopa.edu/Academics/Chemical Safety Data/Documents/Williams/1-Iodobutane%20acros.pdf 14/3/16

Disposal of residues Wash all residues down the sink carefully and rinse out test tubes.

Carried out by

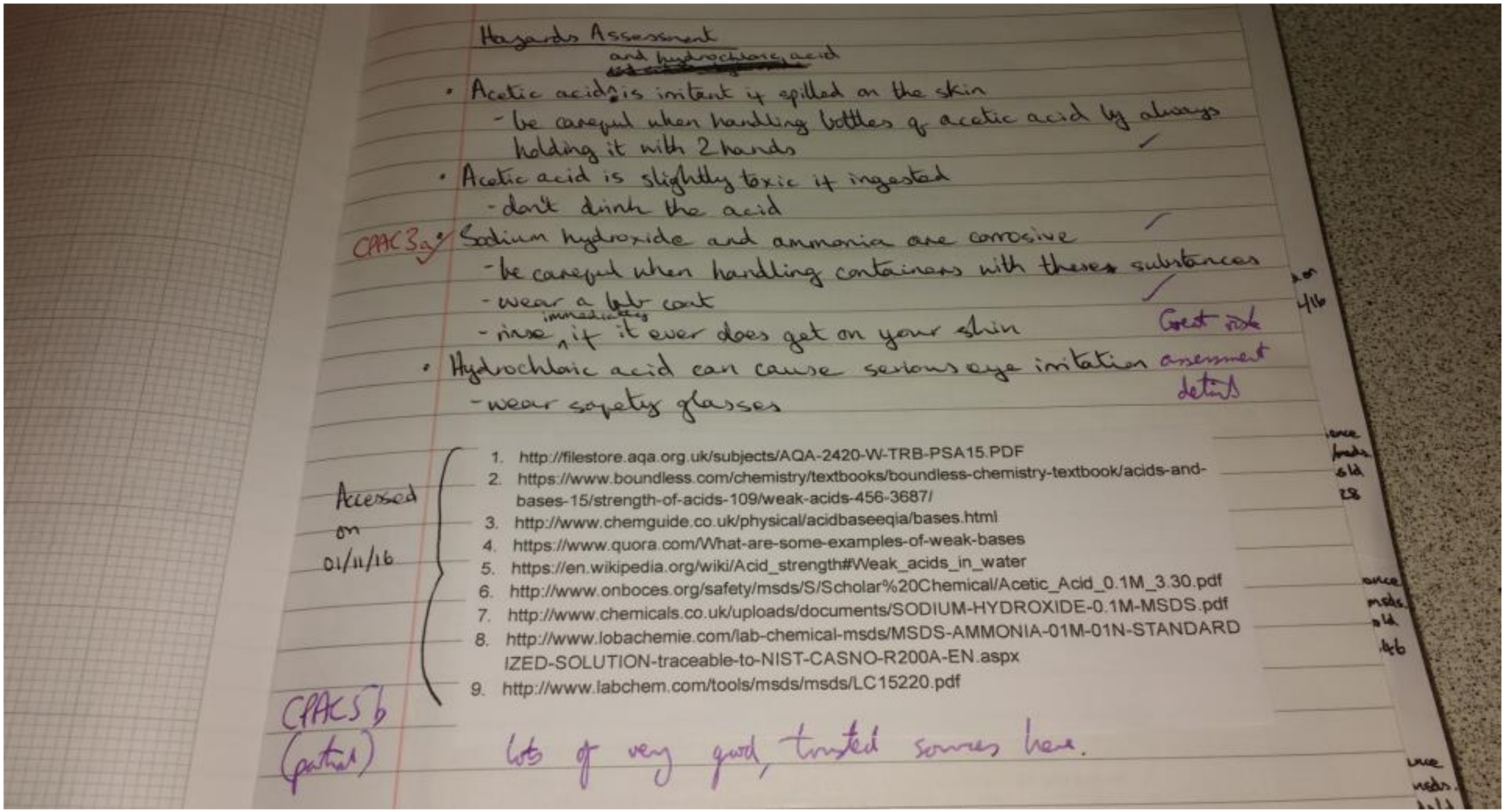
Checked by:

Date: 5/4/16.

AQA

CPAC 3a – written risk assessment

Example with sources, showing some evidence of CPAC 5b too.



CPAC 4

Makes and records observations.

CPAC 4: makes records and observations

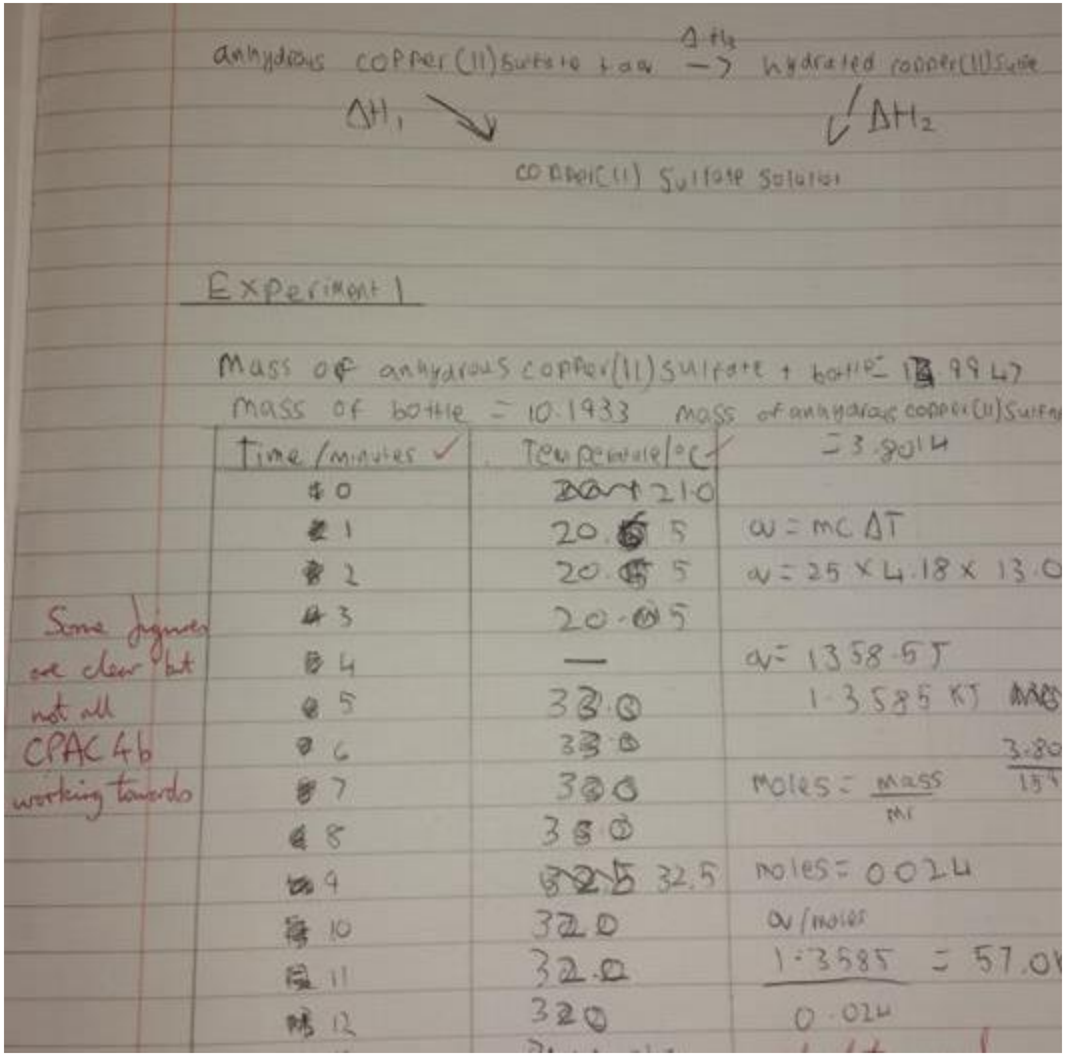
Data can be **qualitative** or **quantitative.**

Note that students must make **accurate**, **relevant** observations.

They are also required to obtain **accurate**, **precise** and **sufficient** data before recording it, **methodically using appropriate units and conventions.**

CPAC 4b

- Give prompt, constructive feedback.
- Indicate whether the pass standard has been reached or if there is some evidence of the pass standard.

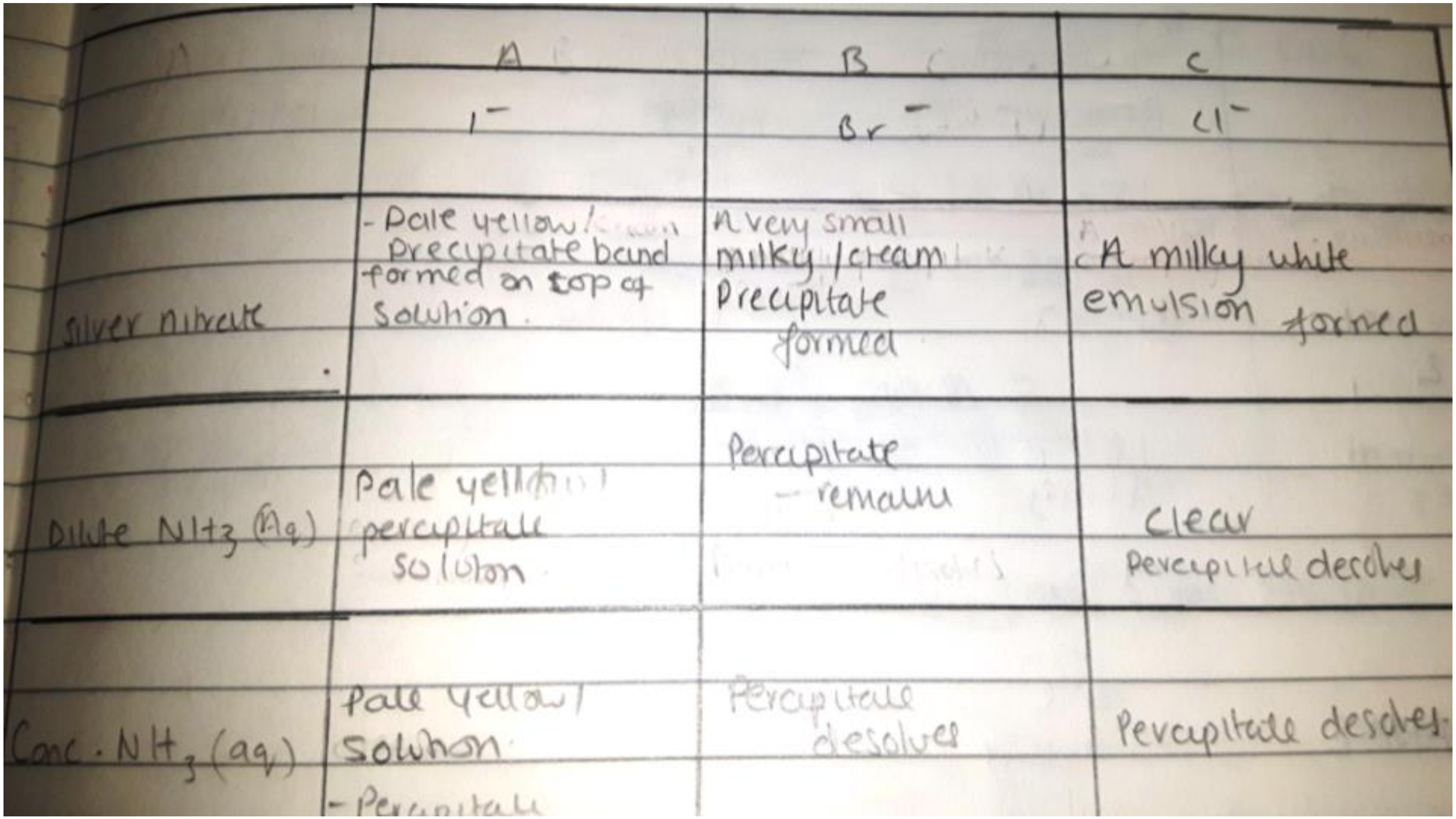


AQA

CPAC 4 – observations: what would one expect to see in a results table?

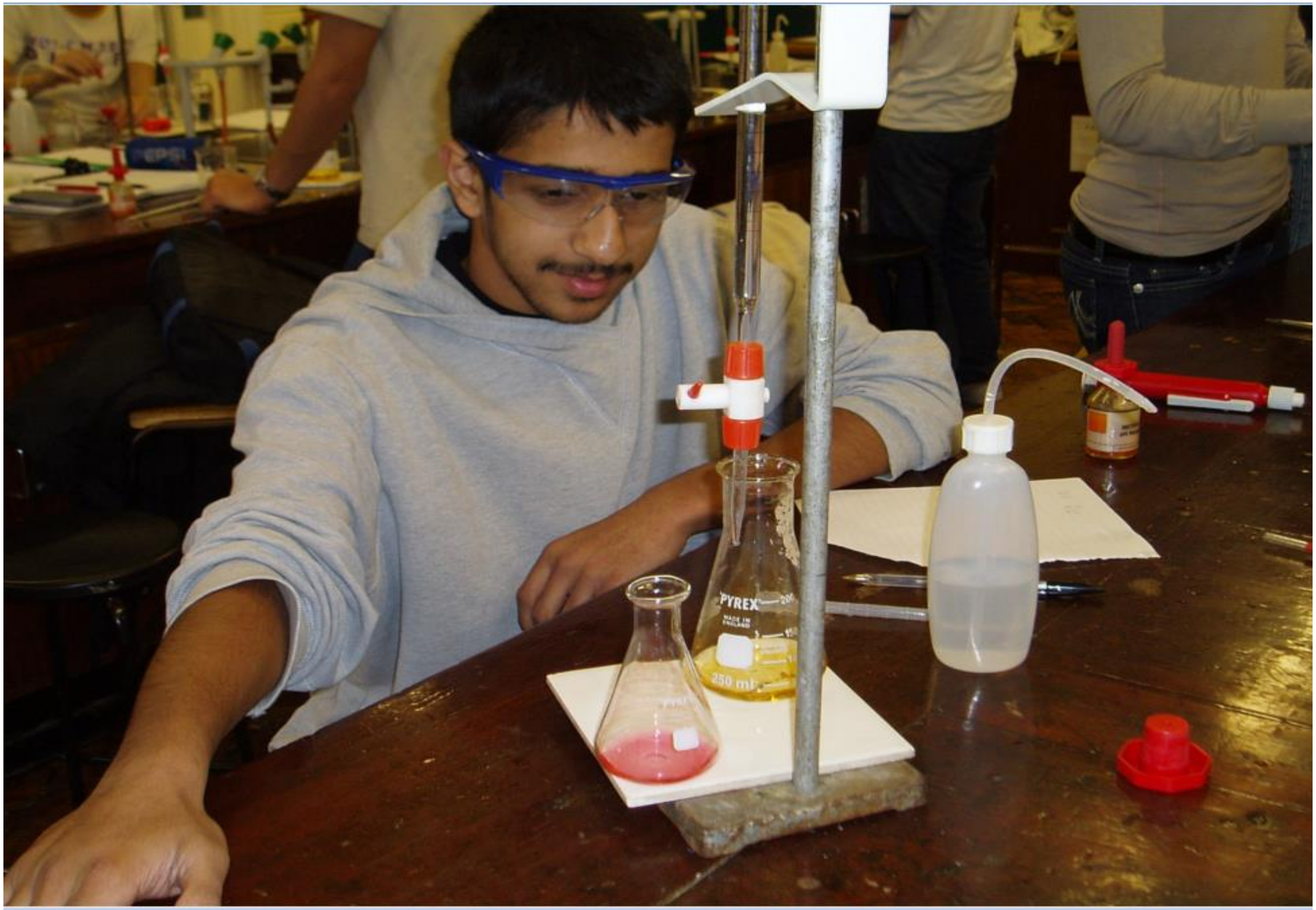
AQA

CPAC 4 – is this a pass?

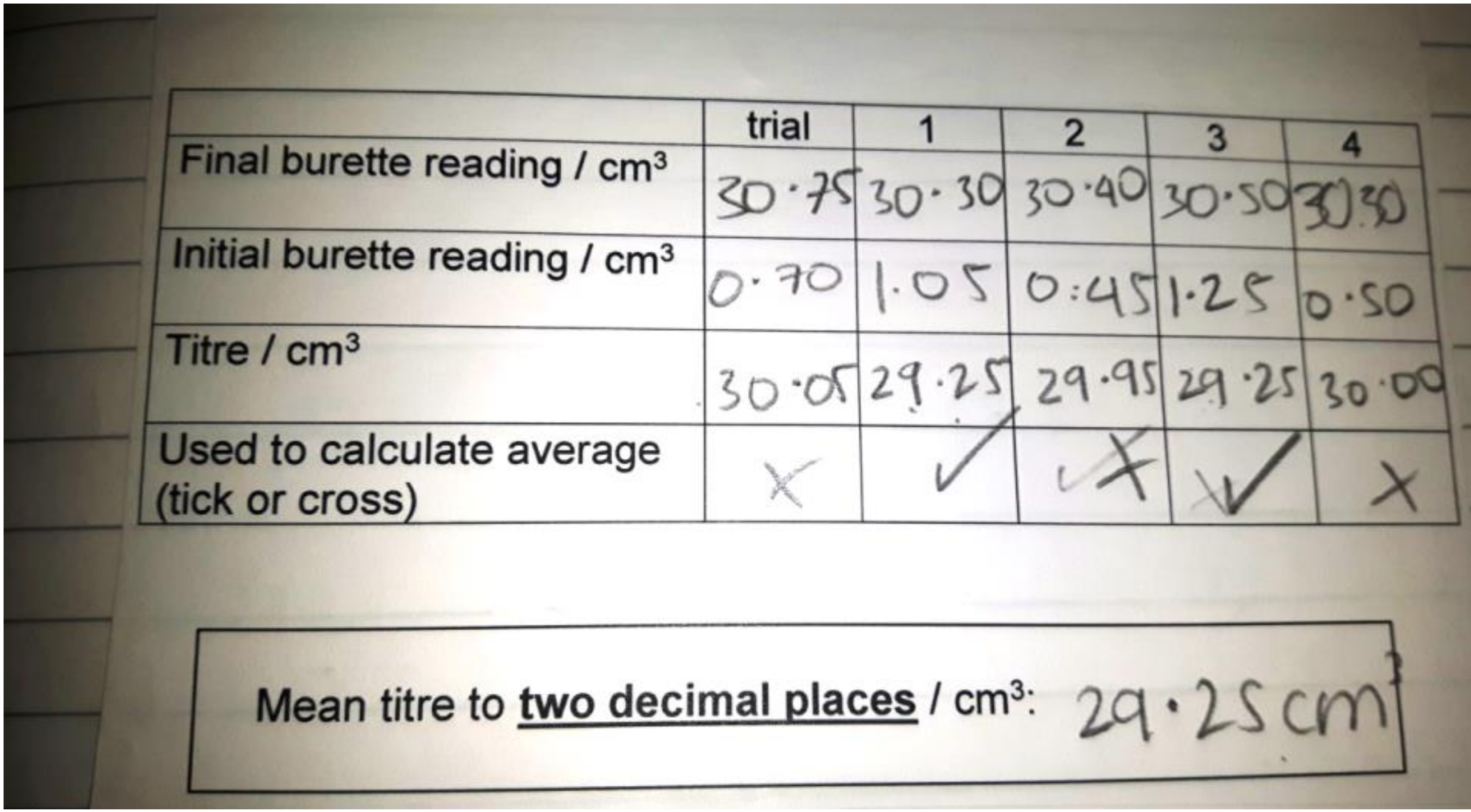


AQA

CPAC 4 – issues?



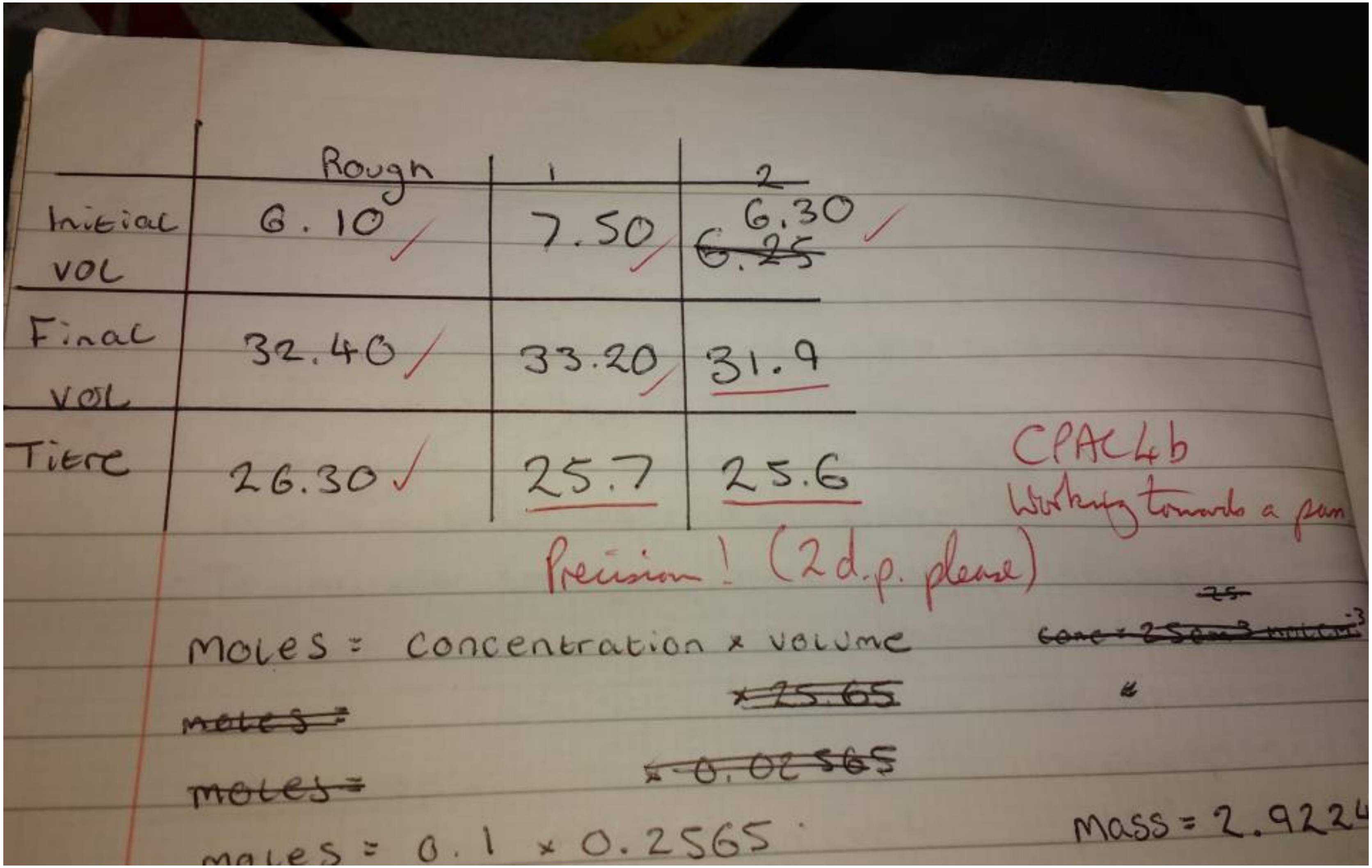
CPAC 4 – is this a pass?



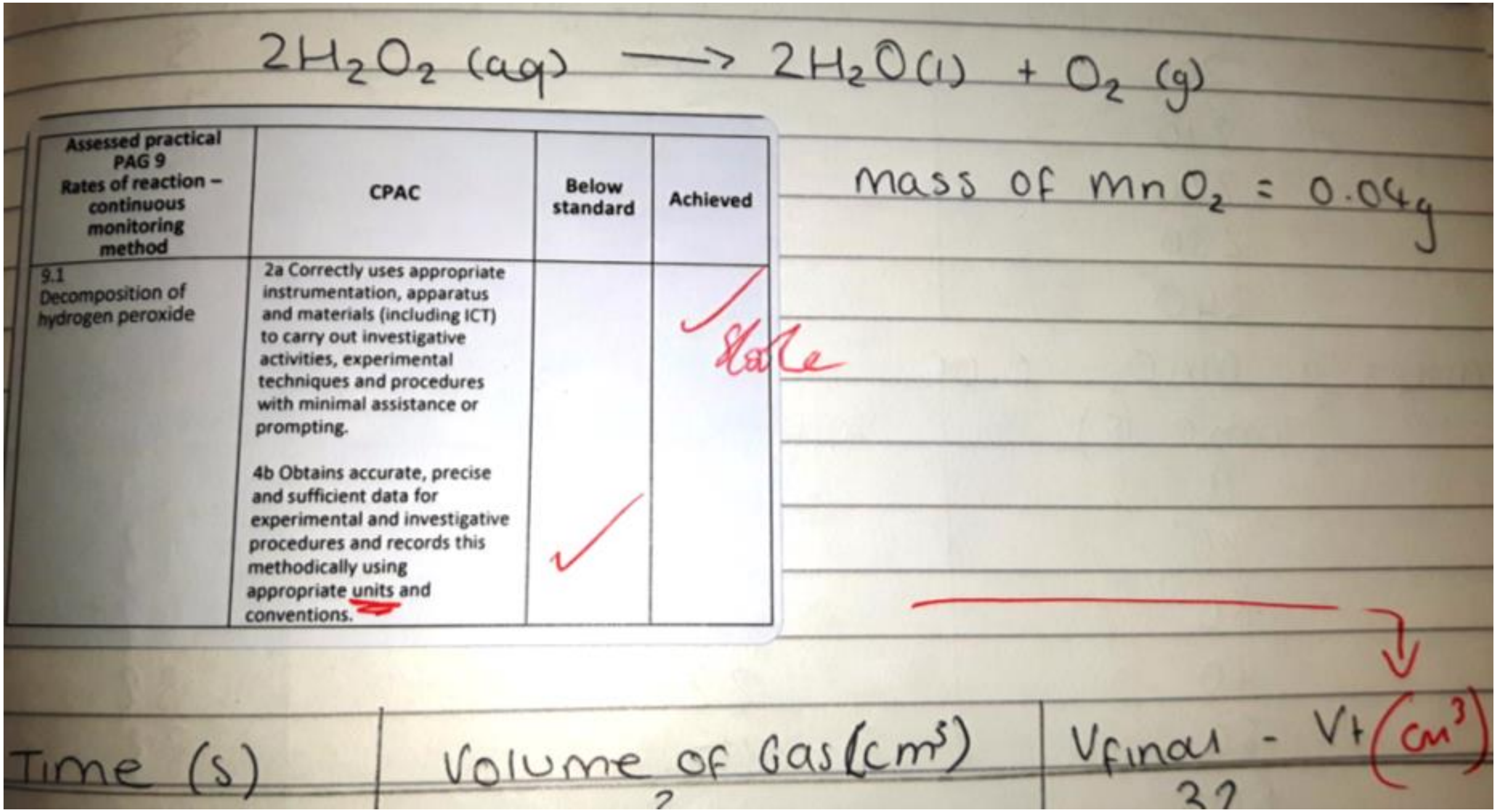
	trial	1	2	3	4
Final burette reading / cm^3	30·75	30·30	30·40	30·50	30·30
Initial burette reading / cm^3	0·70	1·05	0·45	1·25	0·50
Titre / cm^3	30·05	29·25	29·95	29·25	30·00
Used to calculate average (tick or cross)	✗	✓	✓✗	✗✓	✗

Mean titre to **two decimal places** / cm^3: 29·25 cm^3

CPAC 4 – feedback



CPAC 4 – feedback



$$2H_2O_2\,(aq) \longrightarrow 2H_2O\,(l) + O_2\,(g)$$

mass of MnO_2 = 0.04g

Assessed practical PAG 9 Rates of reaction – continuous monitoring method	CPAC	Below standard	Achieved
9.1 Decomposition of hydrogen peroxide	2a Correctly uses appropriate instrumentation, apparatus and materials (including ICT) to carry out investigative activities, experimental techniques and procedures with minimal assistance or prompting.		✓
	4b Obtains accurate, precise and sufficient data for experimental and investigative procedures and records this methodically using appropriate units and conventions.	✓	

Time (s)	Volume of Gas (cm^3)	$V_{final} - V_t$ (cm^3)

CPAC 5

Researches, references and reports.

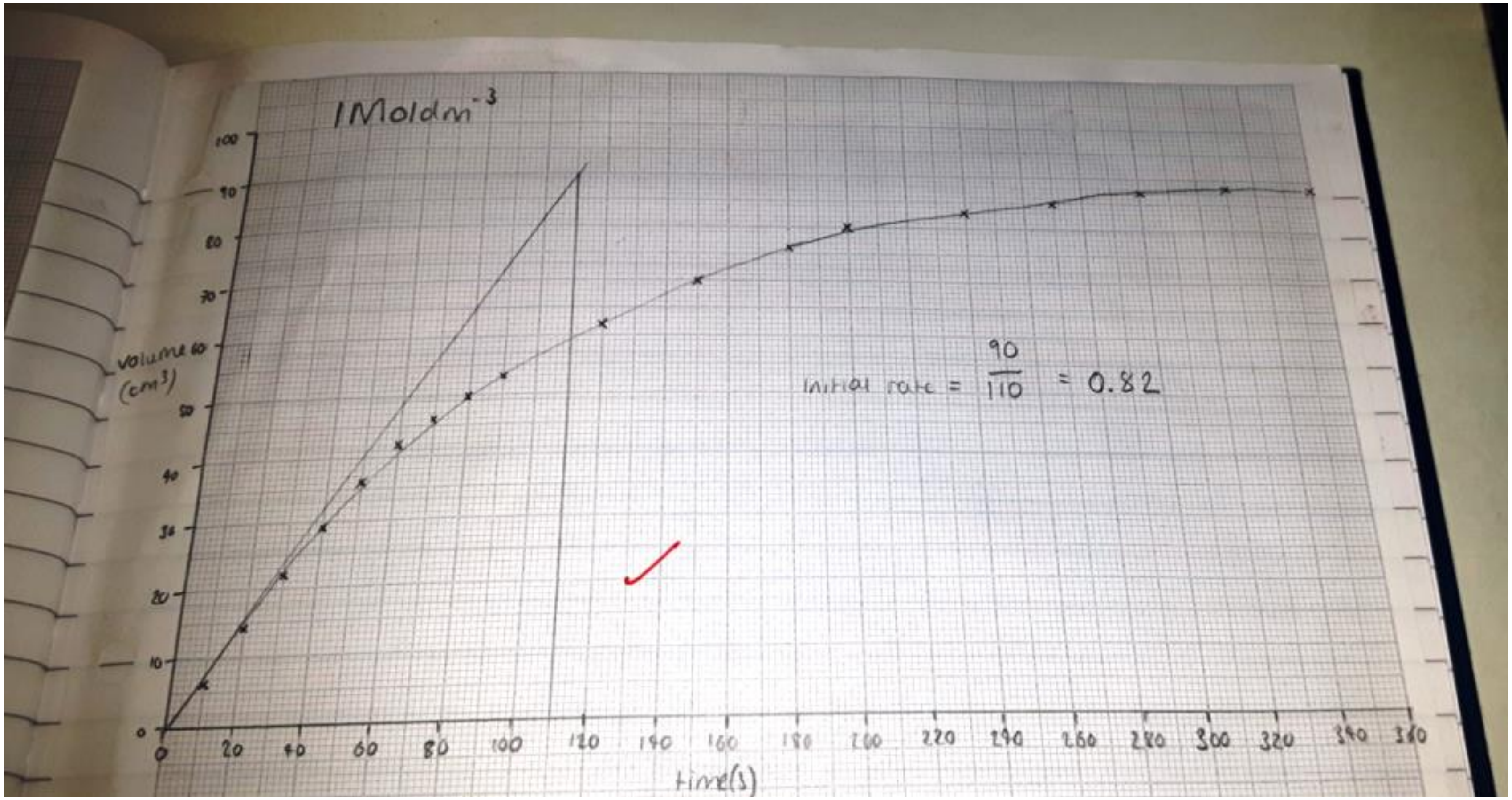
CPAC 5: researches, references and reports

CPAC 5 is being evidenced as soon as students begin to **process their raw data.**

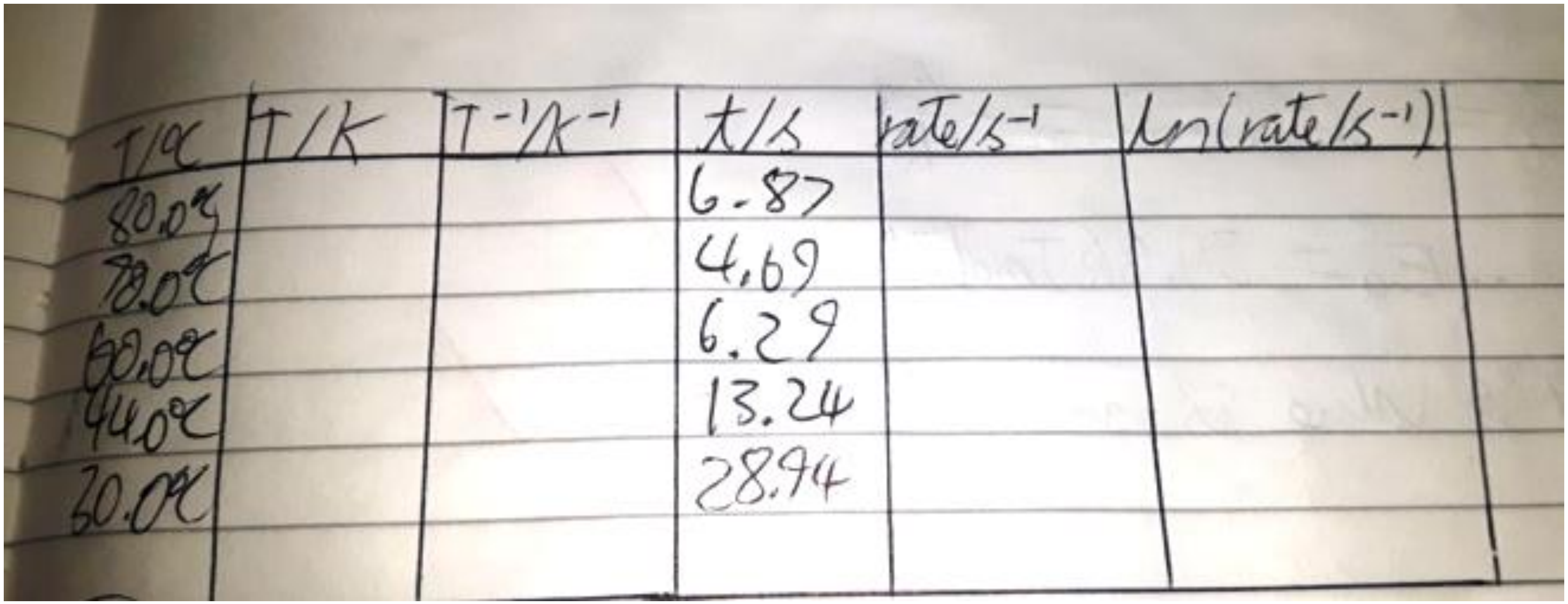
Research must be used to **inform further practical work** or to support **a conclusion** being made.

It may also be used well to **evaluate a practical** method;
to inform adjustments for next time.

CPAC 5 – plotting a graph 'old skool' and calculating a gradient

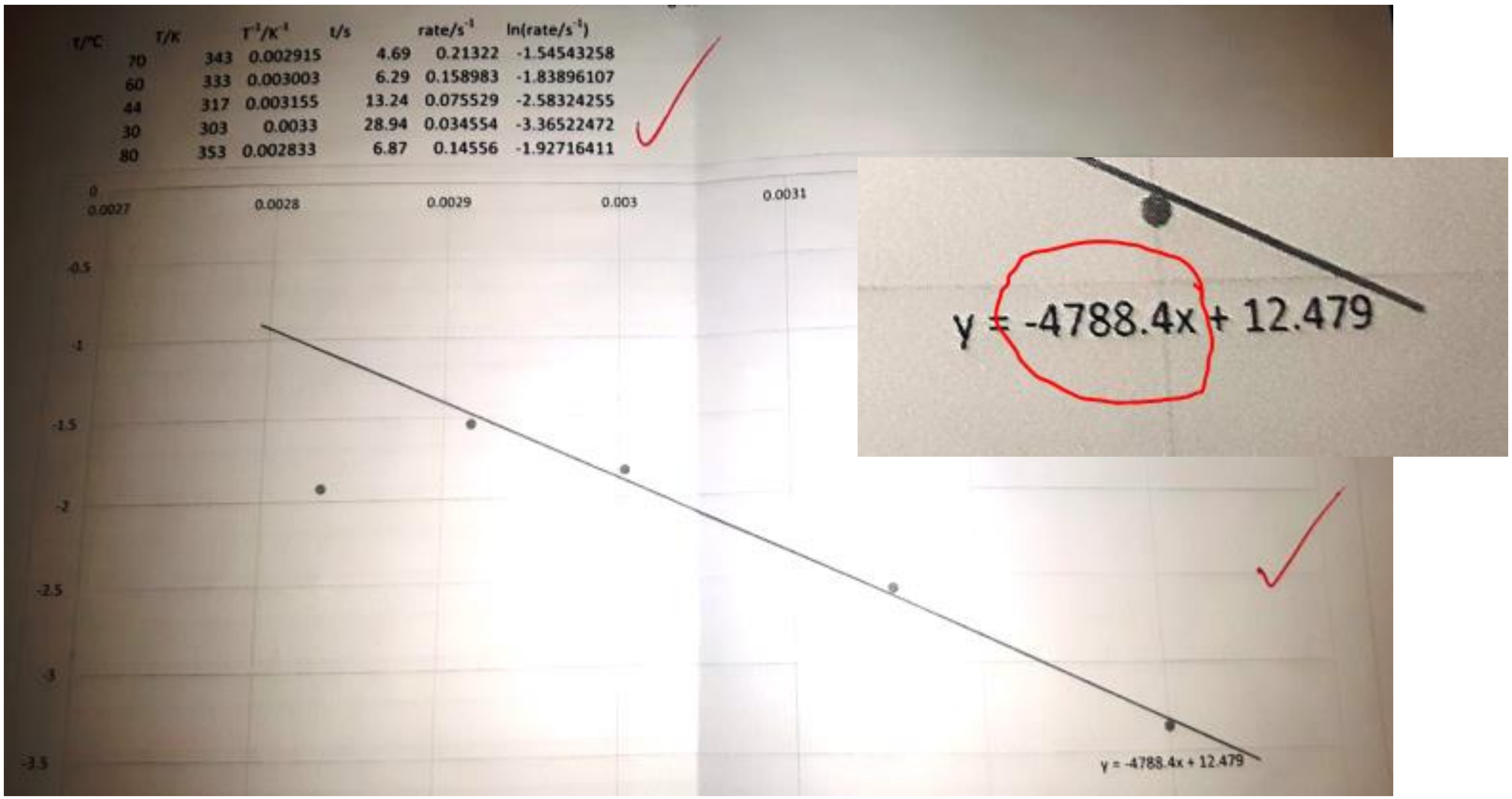


CPAC 5 – Arrhenius: using excel to plot ln(rate) vs 1/T

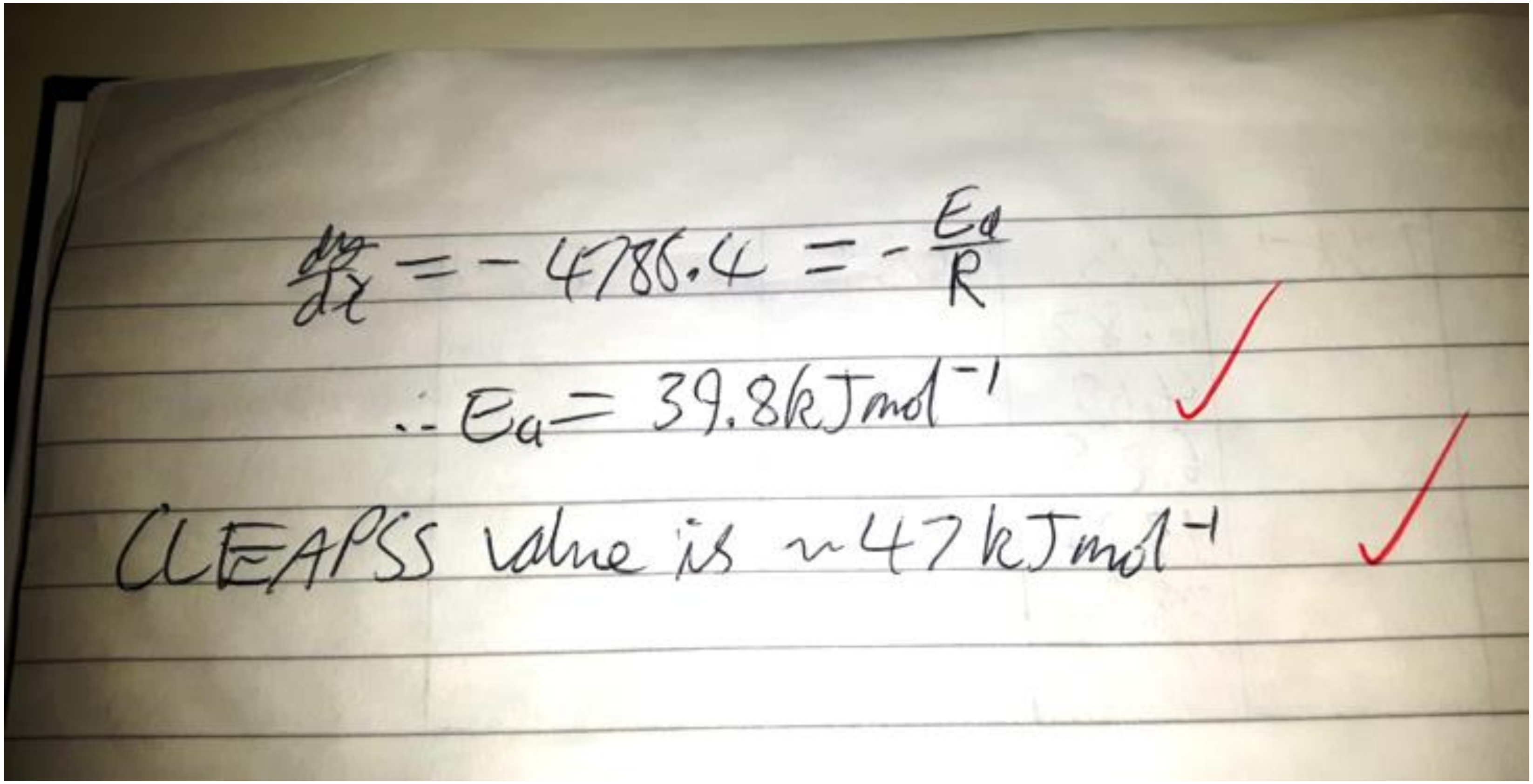


T/°C	T/K	T^{-1}/K^{-1}	t/s	rate/s^{-1}	ln(rate/s^{-1})
80.0°C			6.87		
78.0°C			4.69		
60.0°C			6.29		
44.0°C			13.24		
30.0°C			28.94		

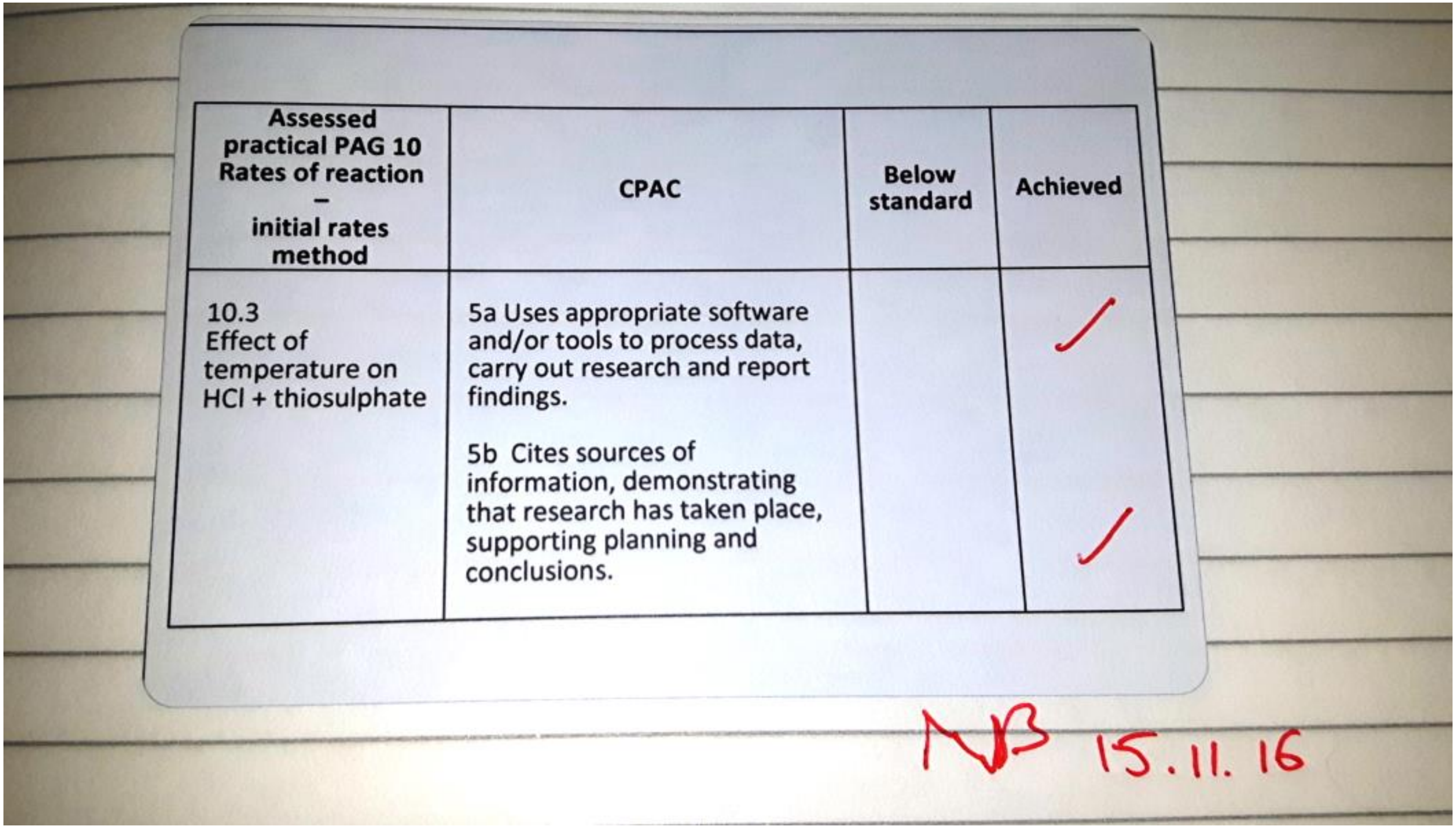
CPAC 5 – Arrhenius: using excel to plot ln(rate) vs 1/T



CPAC 5 – gradient calculated by excel, used to get Ea



CPAC 5 – feedback

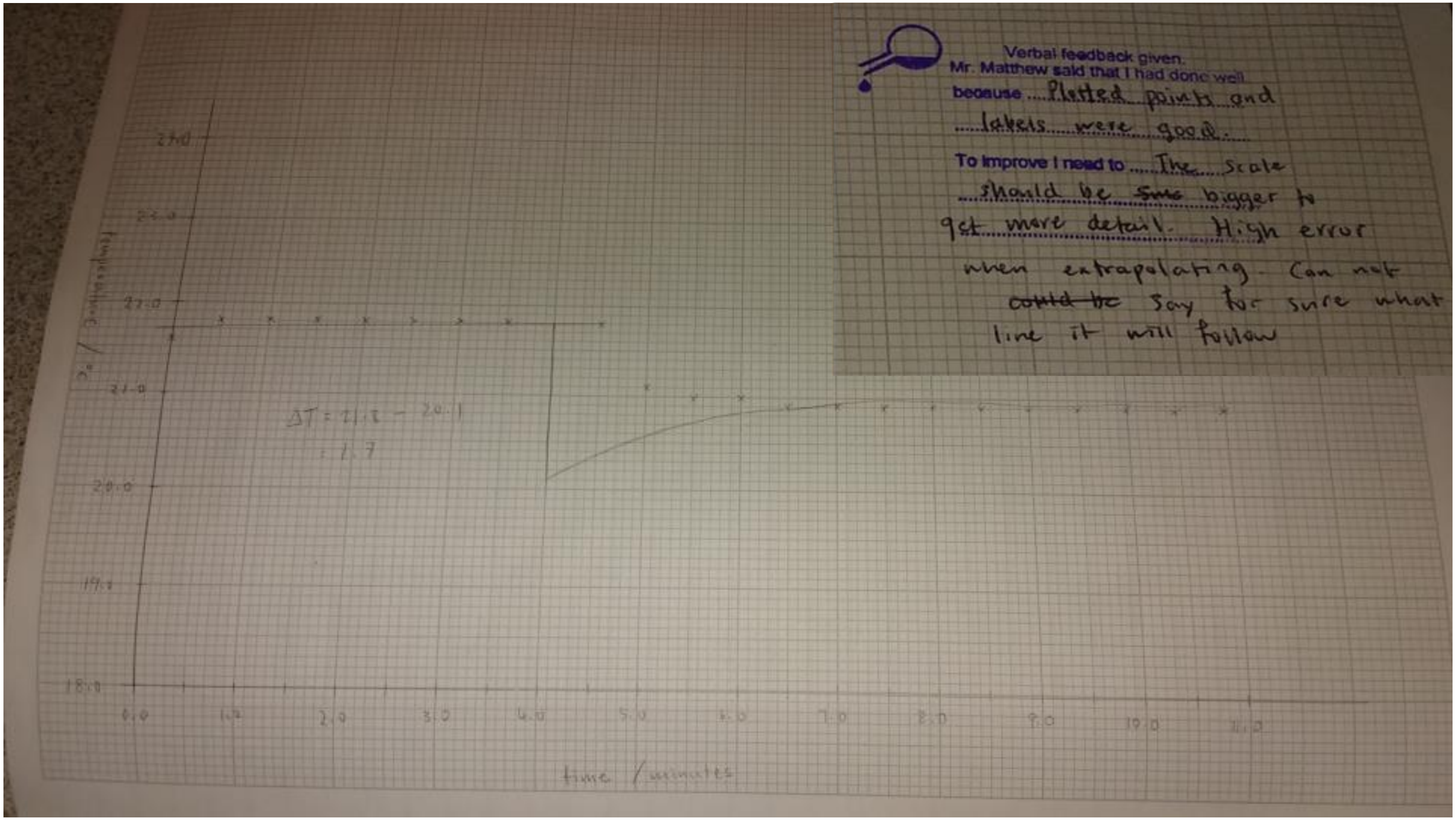


Assessed practical PAG 10 Rates of reaction – initial rates method	CPAC	Below standard	Achieved
10.3 Effect of temperature on HCl + thiosulphate	5a Uses appropriate software and/or tools to process data, carry out research and report findings. 5b Cites sources of information, demonstrating that research has taken place, supporting planning and conclusions.		✓ ✓

NB 15.11.16

AQA

CPAC 5a – student records details of oral feedback

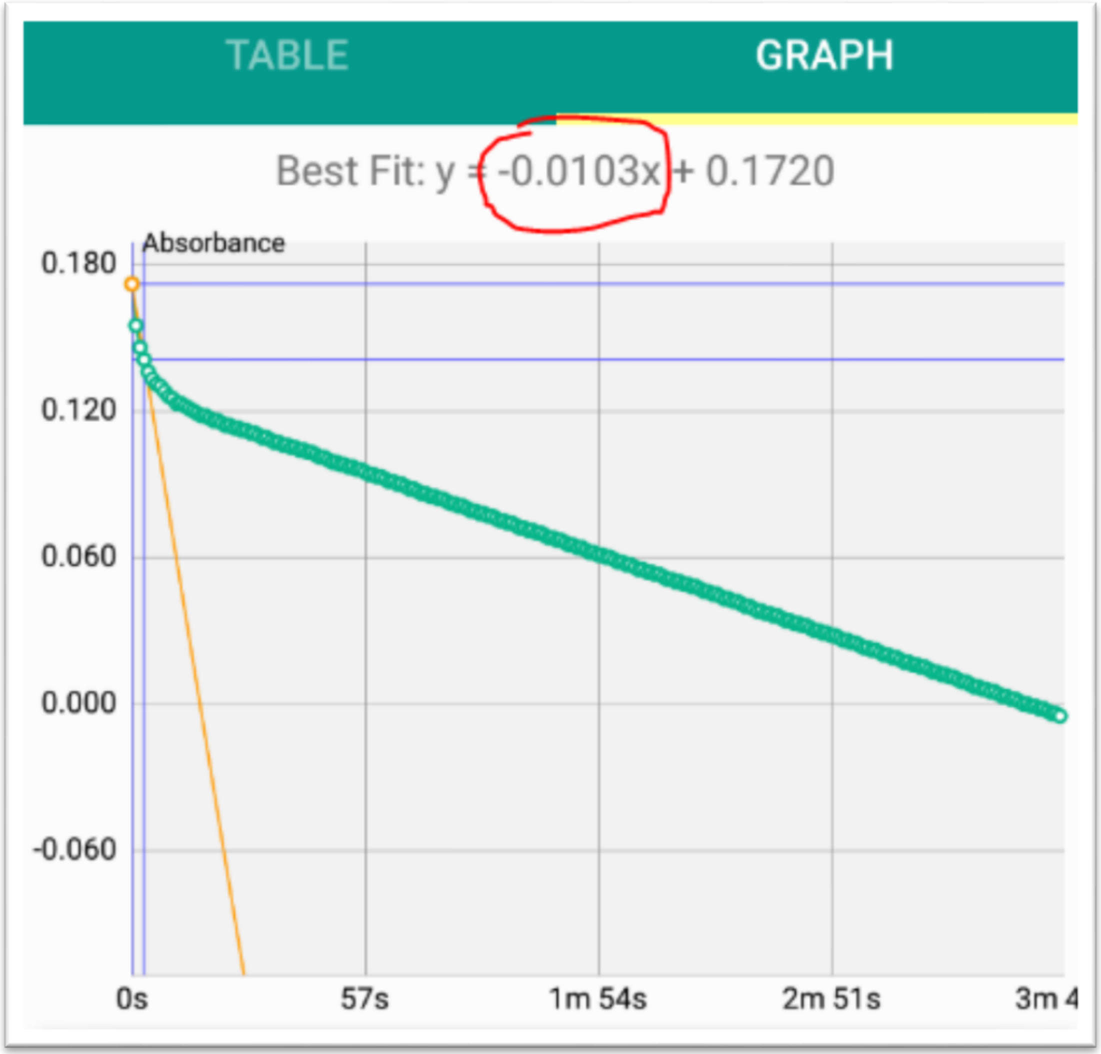


AQA

CPAC 5 – student mobiles: bluetooth colorimeters

AQA

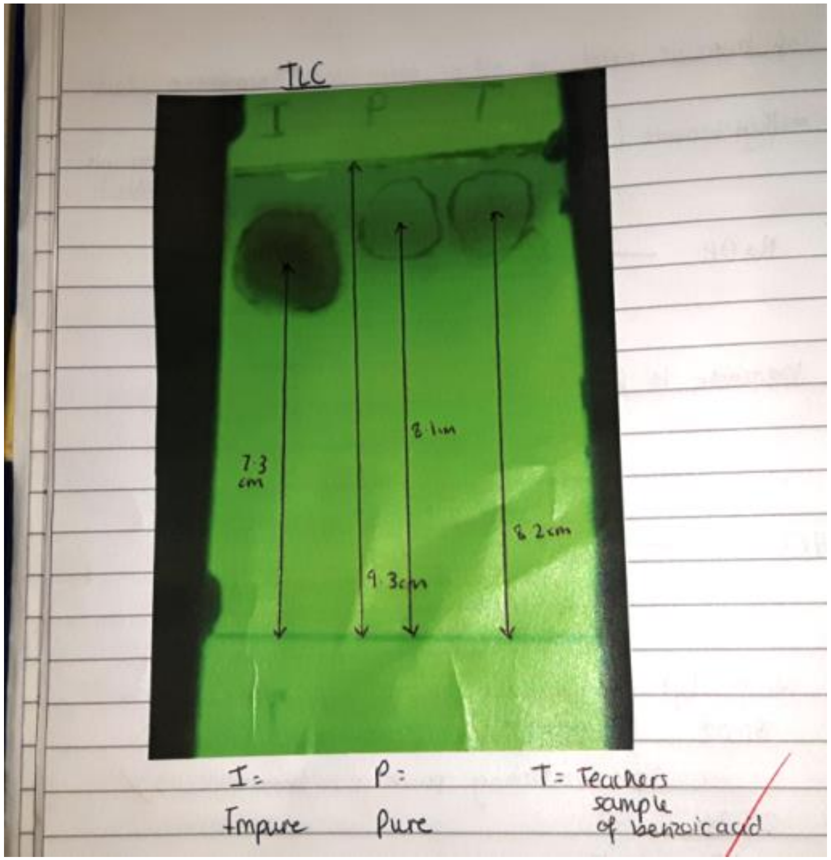
CPAC 5 – gradient calculated on screen: rate, hence order and rate equation

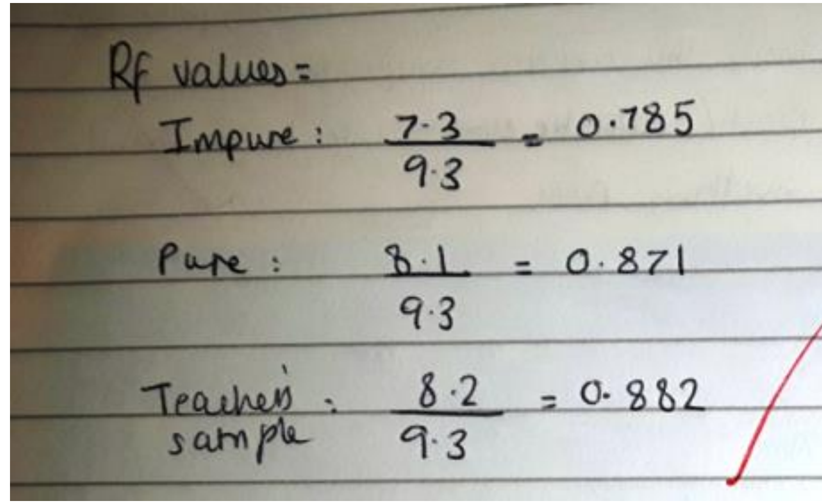


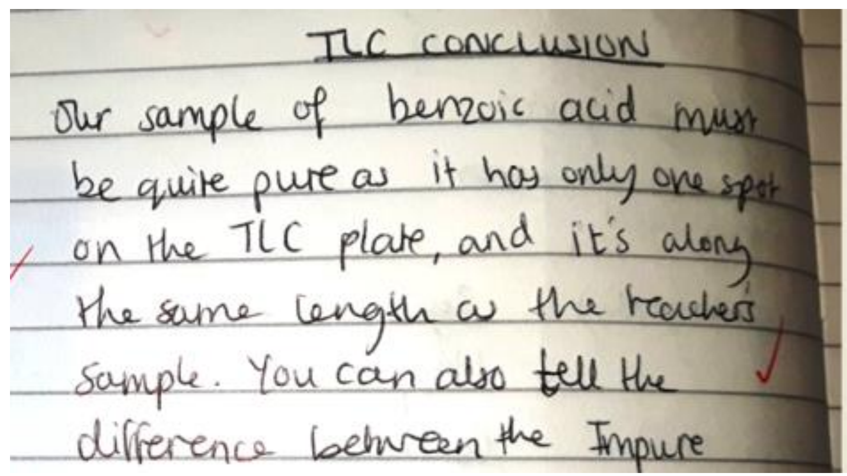
$y = mx + c$

Initial rate

CPAC 5 – using a mobile phone to conduct Rf analysis







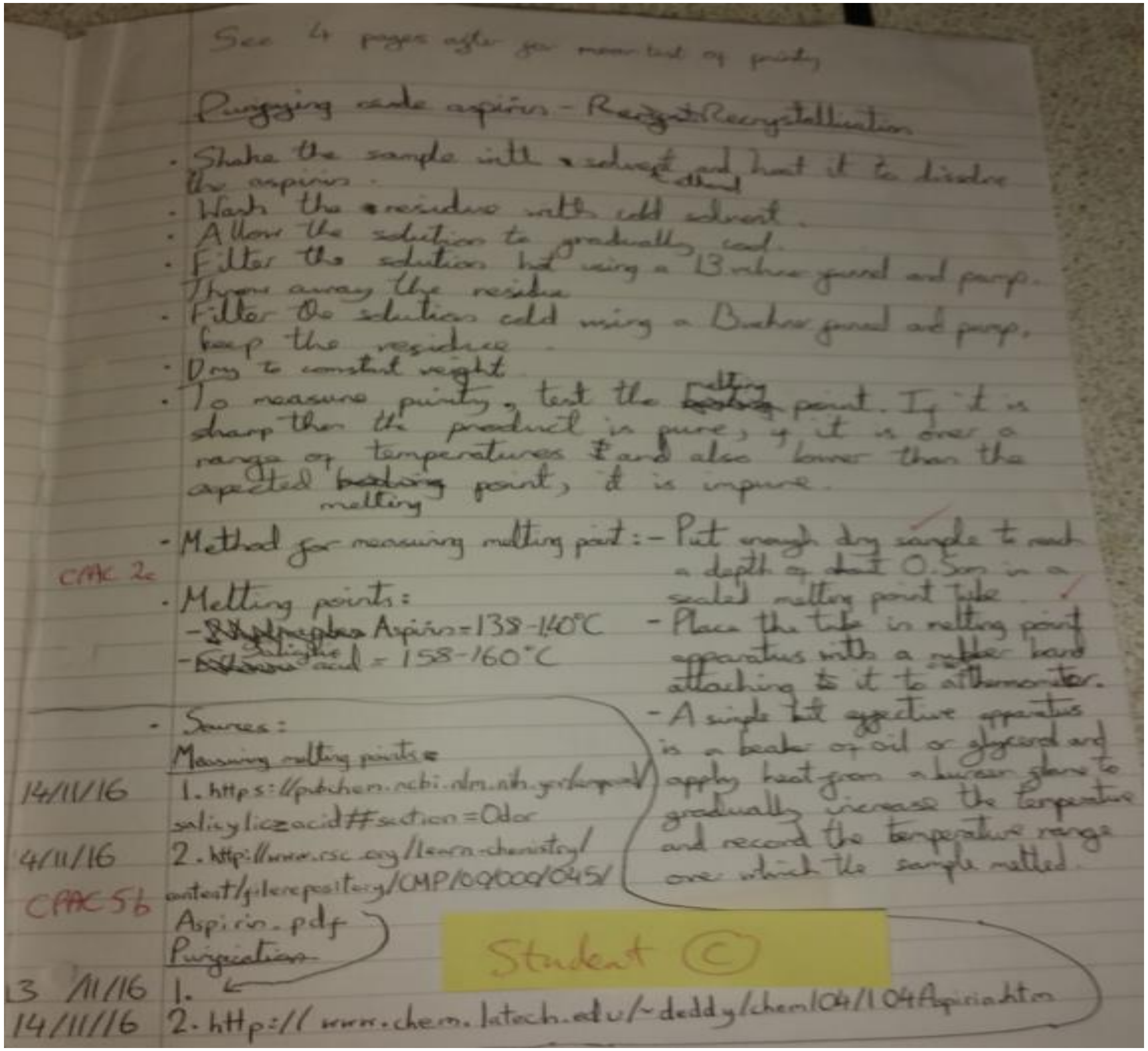
AQA

CPAC 5 – referencing: is this good enough?

Control measures (precautions)	Information Source. Full url. + date or page reference.
Wear safety goggles, and avoid skin contact and inhalation. Wash hands after use.	https://www.sciencelab.com/msds.php?msdsId=9927606 21/11/16
Wear safety goggles. Should not be harmful at this concentration. Wash hands if skin contact occurs.	www.avantormaterials.com/Documents/MSDS/USA/SAP/00036277.PDF 21/11/16
Avoid inhalation. Wear safety goggles. Reacted products should be poured into Sodium carbonate solution before safe disposal to limit gas release.	https://kessheffield.sch.sharepoint.com/learning/science/ALevelChemistry/Y12/20Documents/[illegible]Level/20Year/2012%20Practicals/PAG%2010.3%20Hazcard%20Na2SO3%20-%2095c.pdf https://isolab.ess.washington.edu/isolab/images/documents/msds_sds/sulfur-dioxide.pdf

AQA

CPAC 5 – referencing: is this good enough?



CPAC 5 – referencing: is this good enough?

Student C

24/11/16 Measuring purity: True melting point of aspirin = ~~138-140°C~~ 134-136°C

Melting point 1 = 124-128°C

Melting point 2 = 126-128°C

- From my results, I can see that the melting point ranges that I recorded were ~~significantly~~ significantly lower than the true melting point range.
- An impure product would have a larger range over which it melts and would have a lower melting point compared with the true melting point range. Therefore, I can conclude that my product must contain some impurities and so if I were to do this experiment again, I would carry out recrystallisation thoroughly and carefully to purify my crude aspirin to a higher level of purity which would give me a more accurate melting point range.

CPAC 5b (for sources) (to conclusion)

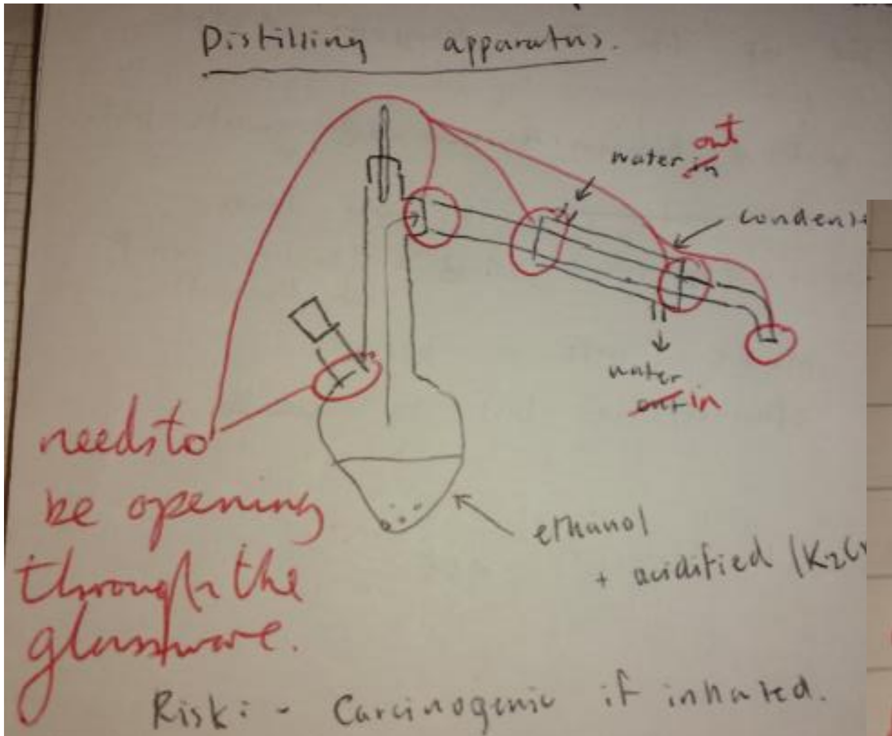
Examples of good practice

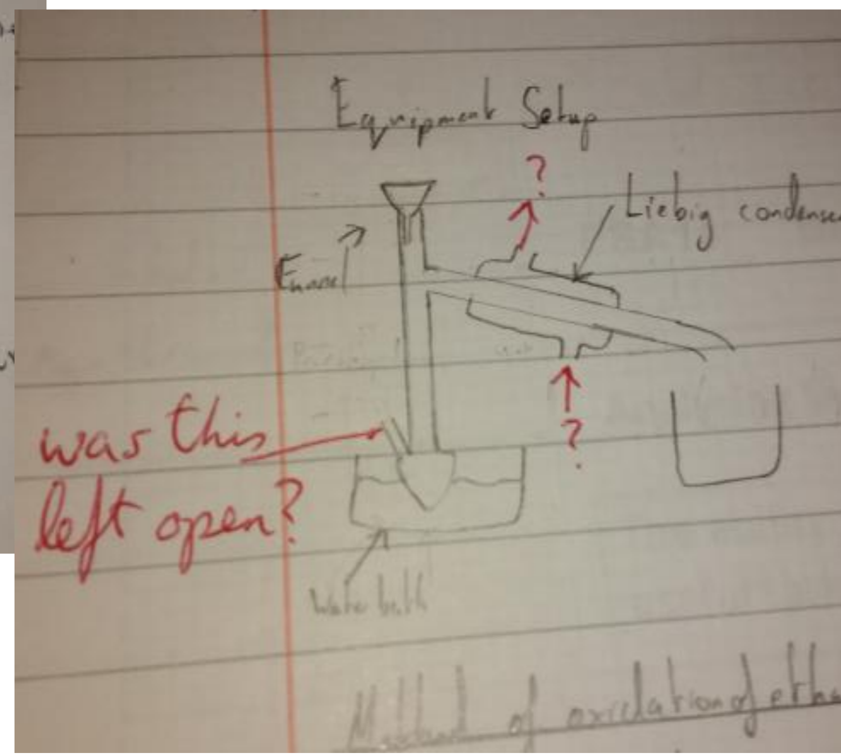
1. Assessment grid per student.

10b Preparation of a pure organic liquid			Date:
Apparatus and Techniques (AT)			
Code	Description	Technique used:	
b	Use water bath or electric heater or sand bath for heating		
d	Use laboratory apparatus for a variety of experimental techniques		
g	Purify a liquid product, including use of a separating funnel		
k	Safely and carefully handle solids and liquids, including corrosive, irritant, flammable and toxic substances		
Targetted Common Practical Assessment Criteria			
Code	Description	Evidenced by	Standard achieved:
1	Correctly follows instructions to carry out experimental techniques or procedures.	observation	
3a	Identifies hazards and assesses risks associated with these hazards, making safety adjustments as necessary, when carrying out experimental techniques and procedures in the lab or field.	uses hazcards to identify risks	
3b	Uses appropriate safety equipment and approaches to minimise risks with minimal prompting.	teacher observation and questionning	
Targets from practical			

Examples of good practice

2. Apparatus drawing.

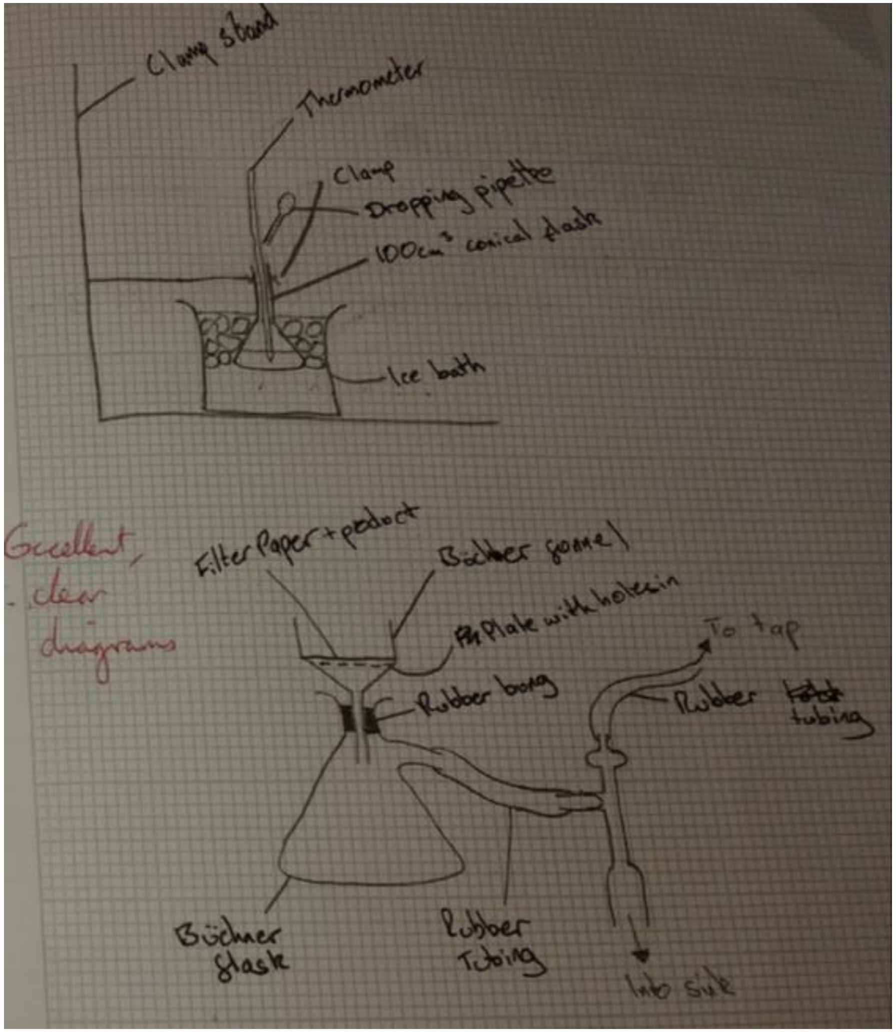




Examples of good practice

Apparatus drawing (continued).

No need for straight lines in apparatus diagrams. They simply need to show correct apparatus set-up that would work.



Electrochemical cell

What CPAC assessment opportunities here?

Monitoring visits

The visits are:

1. To quality assure for provision of CPAC practical skills (via the 12 Core Practicals as a minimum).
2. To quality assure the judgement of the pass standard by teachers in each centre.
3. To offer coaching and advice to develop the capacity of every centre to do (even) better.

All exam boards share the provision of the monitoring visits to centres offering A-levels in Chemistry, Physics and/or Biology.

Monitoring visit

- Teacher records – online training, planning, tracking of CPAC assessments.
- Conversations with staff and students.
- Lab books.
- Observed lesson to ‘moderate’ CPAC judgments.
- Mixture of CPD for centre and quality assurance to ensure robust reporting of practical endorsement.

A-level practical sciences

Timeline for the new practicals

The monitoring of the practical endorsement for science A-levels for first teaching September 2015 is changing. We've summarised the main dates for you to keep in mind.

Sep 15
- Catherine Witter, Lead Practical Adviser joins AQA's team
- Updated Practical handbooks available
- JCQ wrote to schools with practical registration information

Oct 15
- Free online practical endorsement training live on the AQA website **aqa.org.uk/science-practical-training**

Nov 15
- 1 Nov: deadline for returning JCQ practical registration information

Jan 16 to Apr 16
- First wave of practical advisory visits to schools take place*

May 16 to Jul 16
- Repeat advisory visits to schools take place (if needed)

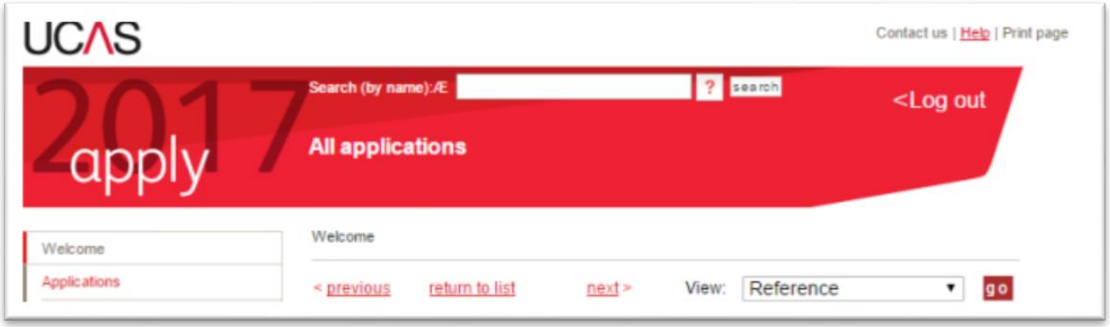
Sep 16 to Jan 17
- Second wave of practical advisory visits to schools take place*

Feb 17 to Jul 17
- Repeat advisory visits to schools take place (if needed)

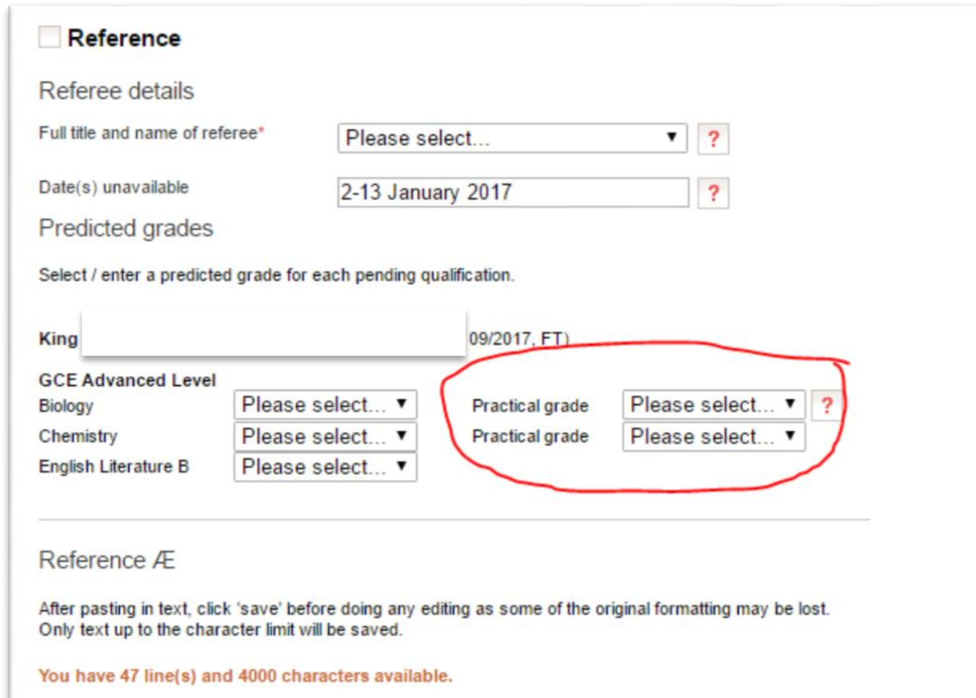
May 17
- Schools report students' Pass/non-classified in the endorsement to exam boards

AQA

A-level practical sciences



Currently, centres are predicting practical endorsement grades



Your turn to

ask the questions …

Thank you

For qualification information, resources and support, please visit

aqa.org.uk/science