External Assessment Report 2012

Subject (s)	**Chemistry**
Level (s)	**Intermediate 1**

The statistics used in this report are pre-appeal.

This report provides information on the performance of candidates which it is hoped will be useful to teachers/lecturers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding. It would be helpful to read this report in conjunction with the published question papers and marking instructions for the examination.

Comments on candidate performance

General comments

The number of centres presenting candidates for Intermediate 1 Chemistry slightly declined, with a continued turnover of centres — 7 new centres and 24 returning centres. However, the total number of candidates for this examination increased by 184.

As in previous years most candidates presented for this examination appear to come from an S4 cohort, approximately 89%, with 5% of candidates from S3 and 6% from S5/6 and FE colleges.

The 2012 paper closely followed the pattern of question types seen in recent years, and assessed candidates' knowledge across all Units and performance criteria.

It is encouraging to see that the vast majority of candidates attempted all questions.

Candidates generally performed well and there was evidence that improvements have been made in specific areas such as definitions and chemical tests.

Problem solving questions were particularly well done.

Feedback suggests that this paper was testing but fair and accessible to all candidates.

Areas in which candidates performed well

Section A

Question 1: Most candidates could identify what is always produced when a chemical reaction takes place.

Question 2: Most candidates could link the use and mass of a catalyst to the speed of the reaction.

Question 3: Most candidates could identify the bonding in a water molecule.

Question 4: Most candidates could identify compounds which correctly link solubility in water and conductivity when molten.

Question 6: Most candidates could identify the solution which measures pH.

Question 7: Most candidates could identify the formation of lather/scum when hard water is shaken with cleaning chemicals.

Question 8: Most candidates could identify how chemicals remove grease and oil stains.

Question 9: Most candidates could identify natural fibres.

Question 10: Most candidates could identify the treatment used on fabrics used to make nightdresses.

Question 12: Most candidates could identify the gases that react inside a car engine.

Question 14: Most candidates could identify that spraying water on a fire will lower the temperature of the fuel.

Question 17: Most candidates could correctly draw a conclusion from the graph.

Question 18: Most candidates could identify which graph represents an enzyme working at different temperatures.

Question 20: Most candidates could identify that drugs alter the way in which the body works.

Section B

Question 1 (a): Most candidates could state the elements present in lithium carbonate>

Question 1 (b): Most candidates could write the word equation for magnesium reacting with oxygen to make magnesium oxide.

Question 2 (a): Most candidates could identify that mercury is a liquid metal.

Question 2 (b): Most candidates could state that the hazard symbol for mercury shows that it is poisonous/toxic.

Question 3 (a): Most candidates could categorise the given substances as acids or alkalis.

Question 3 (b) (ii): Most candidates could state that the pH of an acid will increase when calcium carbonate is added.

Question 4 (b): Most candidates could write the symbol for silicon.

Question 4 (c): Most candidates could use their Data Book to state a property of aluminium.

Question 5 (a): Most candidates could state that the solution which turned milky was lime water.

Question 5 (b): Most candidates could state that the time for the reaction would decrease if the temperature was increased by using hot water.

Question 5 (c): Most candidates could state why it is important to have vitamins in our diet.

Question 6 (a): Most candidates could state that rusting would decrease the strength of an iron bridge.

Question 6 (b): Most candidates could state one method which could be used to protect the iron bridge from rusting.

Question 6 (c): Most candidates could state that the salt in sea water increases the rate of rusting.

Question 7 (a): Most candidates could state the aim of the PPA ‘Reactions of Metals with Acid’.

Question 7 (b): Most candidates could state another factor which was kept the same during the PPA ‘Reactions of Metals with Acid’.

Question 8 (c): Most candidates could use the information in the table to correctly label the pie chart.

Question 9 (a): Most candidates could name the two substances taken in by plants to make their own food.

Question 9 (b) (i): Most candidates could draw a conclusion linking the number of bubbles of oxygen produced and the distance the plant was from the lamp.

Question 9 (b) (ii): Most candidates could predict the number of bubbles produced when the lamp was a specific distance from the plant.

Question 9 (c): Most candidates could state the test for oxygen.

Question 10 (a): Most candidates could identify the part of the plant that takes in nitrate compounds.

Question 11 (b): Most candidates could use the information in the table to state that the tuna bagel and glass of milk will provide more protein than the protein shake.

Question 11 (c): Most candidates could write the formula for glycine from the molecule.

Question 12 (a): Most candidates could use the information in the table to draw a graph.

Areas which candidates found demanding

Section A

Question 5: Most candidates could not identify the formula for dinitrogen tetroxide. The common wrong answer was N_2O_3.

Question 11: Most candidates could not identify a combustion reaction as one in which oxygen is used up. The common wrong answer was photosynthesis.

Question 13: Most candidates could not identify styrene as a monomer.

Question 15: Most candidates could not identify the false statement about pesticides — that they kill weeds.

Question 16: Most candidates could not identify a plant which does not have a root nodule — carrots.

Question 19: Most candidates could not identify a drink which was made by fermentation followed by distillation — rum (40% alcohol)

Section B

Question 2 (c): Most candidates could not use the given formula to calculate the level of mercury. The common wrong answer was to give the correct working but get the answer 10 — arithmetic error or incorrect use of calculator.

Question 3 (b) (i): Most candidates could not name the salt produced when calcium carbonate reacted with hydrochloric acid. The common wrong answers were calcium carbonate and calcium hydroxide.

Question 4 (a): Most candidates could not give the definition of a thermoplastic. The common wrong answer was to say that it could be re-shaped with no mention of heat or melting.

Question 6 (d): Most candidates could not name a metal which when attached to iron would prevent iron from rusting. The common wrong answers were silver, mercury, gold and sodium.

Question 7 (c): Most candidates could not name the gas produced when zinc reacts with hydrochloric acid. The common wrong answers were carbon dioxide and zinc chloride.

Question 8 (a): Most candidates could not state the definition of renewable. The common wrong answer was to describe recycling or reusing.

Question 8 (b): Most candidates could not state what was made when a hydrocarbon burns. The common wrong answer was hydrogen and carbon. This would suggest that candidates did not read the question and assumed they were being asked to name the elements in a hydrocarbon.

Question 9 (b) (iii): Most candidates could not name a piece of equipment that could measure the volume of oxygen produced.

Question 10 (b): Most candidates could not state that harvesting crops lowers the levels of nitrogen in the soil

Question 10 (c): Most candidates could not state that calcium phosphate was not suitable as a fertiliser as it was insoluble as per the PPA.

Question 10 (d): Most candidates could not give an example of environmental problem caused by overuse of nitrate fertilisers. The common wrong answer was to state that plants or crops would die.

Question 11 (a): Most candidates could not state what proteins were used for. The common wrong answers were growth, repair and energy.

Question 12 (b): Most candidates could not say why methanol should not be used in mouthwash. The common wrong answer was ‘children would get drunk’.

Question 12 (c): Most candidates could not say why mouthwash contains sodium fluoride.

Advice to centres for preparation of future candidates

General

Centres should stress to candidates that they should read the entire introduction to a question before attempting the question.

Centres should stress to candidates that they will require a calculator and that they should always show their working as there are opportunities for partial marks.

Centres should stress to candidates that approximately 4 marks in the paper will come from PPAs and these questions directly relate to activities that have been carried out during the PPA. The marking of these questions follows the PPA marking instructions and guidance. Candidates should be aware that a PPA questions may be found in the body of another questions.

Centres are also advised to encourage both staff and pupils to access SQA’s website to make use of the available examination papers and marking instructions.

Statistical information: update on Courses

Intermediate 1

Number of resulted entries in 2011	2,986

Number of resulted entries in 2012	3,157

Statistical information: performance of candidates

Distribution of Course awards including grade boundaries

Distribution of Course awards	%	Cum. %	Number of candidates	Lowest mark
Maximum Mark 60				
A	23.7%	23.7%	747	42
B	26.8%	50.5%	847	36
C	26.1%	76.6%	824	30
D	9.3%	85.9%	294	27
No award	14.1%	100.0%	445	-

General commentary on grade boundaries

While SQA aims to set examinations and create marking instructions which will allow a competent candidate to score a minimum of 50% of the available marks (the notional C boundary) and a well prepared, very competent candidate to score at least 70% of the available marks (the notional A boundary), it is very challenging to get the standard on target every year, in every subject at every level.

Each year SQA therefore holds a grade boundary meeting for each subject at each level where it brings together all the information available (statistical and judgemental). The Principal Assessor and SQA Qualifications Manager meet with the relevant SQA Business Manager and Statistician to discuss the evidence and make decisions. The meetings are chaired by members of the management team at SQA.

The grade boundaries can be adjusted downwards if there is evidence that the exam is more challenging than usual, allowing the pass rate to be unaffected by this circumstance.

The grade boundaries can be adjusted upwards if there is evidence that the exam is less challenging than usual, allowing the pass rate to be unaffected by this circumstance.

Where standards are comparable to previous years, similar grade boundaries are maintained.

An exam paper at a particular level in a subject in one year tends to have a marginally different set of grade boundaries from exam papers in that subject at that level in other years. This is because the particular questions, and the mix of questions, are different. This is also the case for exams set in centres. If SQA has already altered a boundary in a particular year in, say, Higher Chemistry this does not mean that centres should necessarily alter boundaries in their prelim exam in Higher Chemistry. The two are not that closely related as they do not contain identical questions.

SQA's main aim is to be fair to candidates across all subjects and all levels and maintain comparable standards across the years, even as Arrangements evolve and change.