**National 5 Open Ended Questions**

* Each open ended question is worth three marks.
* The most important message is to write as much correct information as you can that relates to the question! Make sure you have answered the question!
* Don’t be put off by the model answers – they were written by someone who has been teaching a long time! Just do your best and try to write at least three points of correct information!
* Each correct statement you make will be awarded a mark. Wrong information will **not** be penalised. However, if you write down a correct answer and then contradict it with wrong information then you will not get the mark for the correct piece of information.

**Marking Guidance**

Responses will be marked according to the following criteria:

The learner has shown **no understanding** of the chemistry involved. 0 marks

The learner has shown a **limited understanding** of the chemistry involved. 1 mark

The learner has shown a **reasonable understanding** of the chemistry involved. 2 marks

The learner has shown a **good understanding** of the chemistry involved. 3 marks

* **There will be two open ended questions in your exam**.

Examples

1. Two bottles containing different white crystals have lost their labels. The Science teacher says that one of them contains potassium chloride and the other glucose **(C6H12O6).**

Using your knowledge of chemistry, describe how you would decide which bottle is which.

1. A new element was discovered. Using your knowledge of chemistry explain how you would decide if the element belonged in group 1, group 7 or group 0.
2. Using your knowledge of chemistry describe how 4 metals could be placed in order of reactivity.
3. Using your knowledge of chemistry describe how you could distinguish between ethanoic acid and hydrochloric acid.
4. Describe how you could distinguish between copper sulphate and calcium sulphate.
5. Using your knowledge of chemistry describe how you could prepare the salt calcium sulphate.
6. Titanium(IV) chloride is a colourless liquid at room temperature. Using your knowledge of chemistry explain the type of bonding found in titanium chloride.
7. The next question comes from the 2014 SQA question paper;

A student reacted acidified potassium permanganate solution with oxalic acid C2H2O4.

2MnO4-(aq) + C2H2O4(aq) + 6H+(aq) 🡪 2Mn2+(aq) + 10CO2(g) + 8H2O(l)

Using your knowledge of Chemistry describe how a pupil could have determined the rate of reaction.

1. The next question comes from the 2014 SQA question paper;

In the film Dante peak, a family trapped by a red hot lava escape by crossing a large lake in a boat made from aluminium. The volcano releases heat and the gases hydrogen chloride, sulfur dioxide and sulfur trioxide into the water. While crossing the lake, holes begin to appear in the bottom of the boat. Just after the family leave the boat, on the other side of the lake, the boat sinks.

Using your knowledge of chemistry, comment on whenever or not the events described in the film could take place.