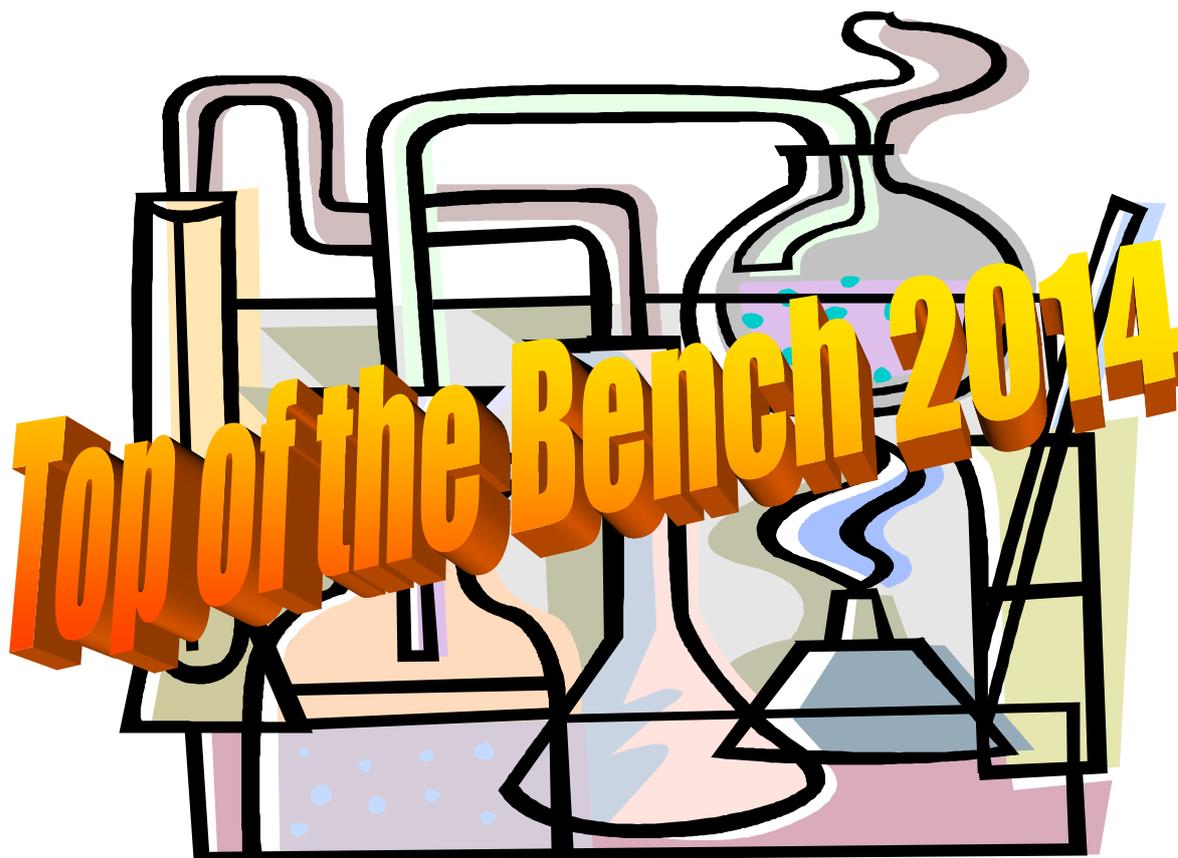




**Mid Scotland Section**



**FORTH VALLEY COLLEGE, FALKIRK CAMPUS**

**THURSDAY 13<sup>th</sup> NOVEMBER 2014**

**18:30**



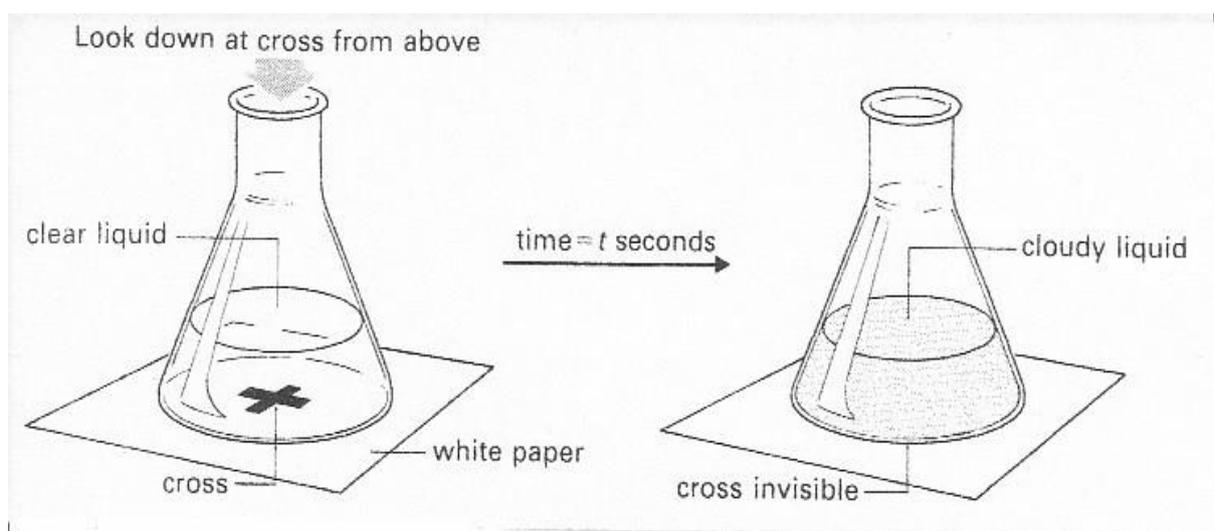
Name of School: \_\_\_\_\_

## Introduction

Sodium thiosulphate solution reacts with hydrochloric acid to produce a precipitate of sulphur.



The amount of creamy yellow precipitate of sulphur steadily increases and the time taken for a certain amount of sulphur to form can be used to indicate the rate of reaction.



In the diagram above, the time is measured from the instant the acid is added to the thiosulphate solution in the flask until enough sulphur is formed to make the cross disappear.

You are going to work in pairs to investigate two factors which affect the rate of this reaction.

**Pair 1 (S2 + S3)** - You will be investigating the effect of concentration on the rate of reaction.

**Pair 2 (S3 + S4)** - You will be investigating the effect of temperature on the rate of reaction.

Name of School: \_\_\_\_\_

Safe use **MUST** be made of all  
laboratory equipment.

In order to ensure compliance with  
safe working practices, teachers will  
be on hand to supervise all  
experimental activity.

Name of School: \_\_\_\_\_

**General information for all teams.**

1. The following Safety Laboratory Wear must be worn at ALL times in your designated area: Lab. Coat [buttoned] Safety Spectacles/Goggles Protective Gloves

2. You will be given 1hour 30 minutes to complete the work.

3. Each member of the team must be seen to actively participate in the work.

4. Each pair will be awarded points using the following criteria;

i. Team working 10 points

ii. Safe working including tidiness. 10 points

iii. Planning/organisation of experimental activities to minimise experimental error. 10 points

iv. Overall presentation of results. 10 points

v. Experimental results including number of experiments and tabulation. 20 points

vi. Graph including labelling, scaling, accurate plotting and best fit line. 20 points

vii. Experimental accuracy (from data extracted from graph) 20 points

Total points per pair 100 points

**Total possible points per team 200 points**

5. The winner will be the team with most points.

6. In the event of a tie, then, the team with the best safety mark and/or presentation mark will be deemed the winners.

7. After the practical work, refreshments will be provided in room 206 while the judges complete the marking and adding up the points.

8. The scores will be presented sequentially by area until the final scores are calculated in order to identify the winners.

9. The presentation of the Top of the Bench Trophy and prizes will take place in room 206 around 8.45pm.

Name of School: \_\_\_\_\_

## Apparatus and equipment

- ❖ All essential laboratory safety wear including laboratory coats, safety glasses/goggles and protective gloves.
- ❖ 4 x Glass conical flasks 250ml
- ❖ 2 x Measuring cylinders 50ml
- ❖ 2 x Graduated syringes 5ml
- ❖ 250ml bottle of hydrochloric acid  $2\text{m dm}^{-3}$
- ❖ 250ml bottle of sodium thiosulphate solution  $50\text{g dm}^{-3}$
- ❖ 500ml bottle deionised water
- ❖ Stopwatch
- ❖ Laminated white paper with printed X
- ❖ Graph paper
- ❖ Pencil, rubber, ruler
- ❖ Paper towels
- ❖ Access to fume cupboard
- ❖ Supply of pure water available from the container by the sink.

Additional solution for effect of concentration experiment;

- ❖ 250 ml bottle of sodium thiosulphate solution labelled "concentration unknown"

Additional equipment for effect of temperature experiment;

- ❖ Hotplate
- ❖ Thermometer

Name of School: \_\_\_\_\_

## Specific Team Tasks

### **S3/S4 Pair**

- a) To investigate the effect of Temperature on Reaction Rate
- b) To predict the rate of reaction at 10°C
- c) To find what temperature rise doubles the reaction rate

### **S2/S3 Pair**

- a) To investigate the effect of Concentration on Reaction Rate
- b) To find the concentration of the unknown thiosulphate solution

## The Report

You have been given a laboratory report book to write up your experimental work. The set of pages gives ample space to include all of your experimental results.