1: Determine the concentration of a glucose solution

Time: 1 h

Evaluated criteria: C (experimentation)

Objective: To find the concentration of a glucose solution using a graph plotted by you.

Background information: Glucose is a reducing sugar which converters the purple colour of potassium permanganate to a colourless solution of manganese ions. Different concentrations of glucose will take different times to decolour a certain potassium permanganate solution.

Materials:
Several different glucose solutions (6 different concentrations, only two are known)
3 beakers of 50 mL
Sulfuric acid 1M
Potassium permanganate solution 0.4 g/L
Chronometer

Method:
1. Some of you will be given an unknown glucose solution, others a known solution.
2. Add 10 mL of the solution given to you to the 3 small beakers prepared in front of you.
3. Add 5 mL of 1M sulfuric acid to each beaker and move it gently.
4. Add 1 mL of potassium permanganate to the **first beaker** and move it gently, making a swirling movement. Time how long it takes for the colour to disappear. Repeat this with the other 3 beakers.
5. Collect all data in a table and make sure to add the data of the other groups too (maybe by using Drive).
7. Calculate the average and the SD for each solution.
8. Draw a graph with a line of best fit and error bars.

9. Using the line of best fit, find the concentration of the unknown solutions.

Data process:
Present the raw data and the processed data in a table.
Draw a graph with the SD and lines of best fit (trend lines).

Conclusion and evaluation:
Use your data process to conclude and explain which concentration the unknown solutions had. Evaluate the method and analyse the strengths and weaknesses of the experiment. Propose some improvements.