

SCIENCE



WORKSHEET

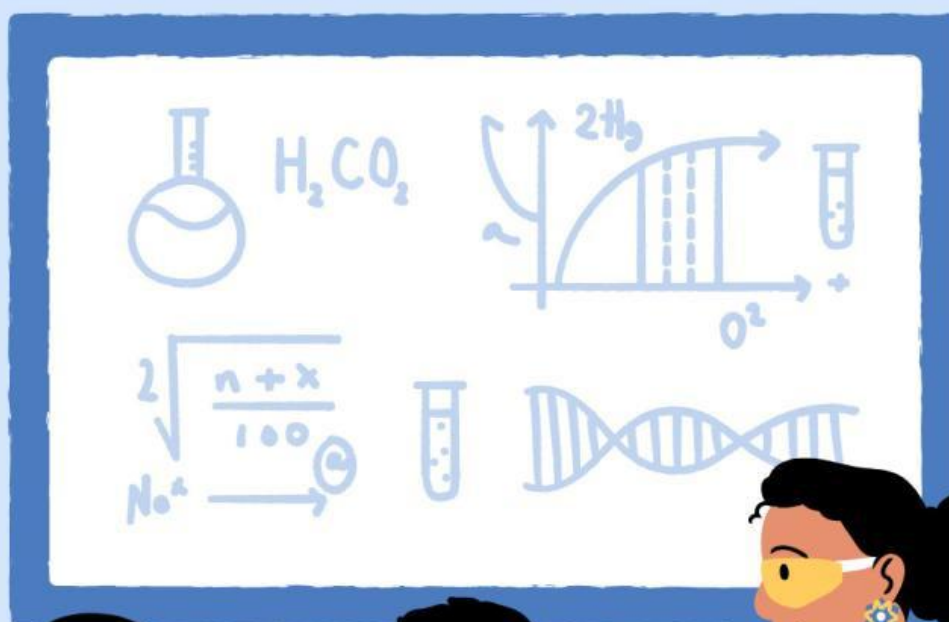
FACTORS AFFECT RATES OF REACTION

NAME :

.....

CLASS :

.....





LEARNING OBJECTIVES

Conduct an experiment on the effect of surface area, temperature, and concentration on the rate of reaction.

INSTRUCTION

1. Write your identity in the identity column
2. Complete the worksheet individually
3. Do an experiment based on the topic given in the group
4. Analyze the data obtained during the experiment
5. Present the result of the experiment in the next meeting.

LEARNING REFERENCE

Jones, M., Freeman, D.F., & Smyth, M. 2020. Cambridge Lower Secondary Science Learner's Book 9. Cambridge University Press.





CONCENTRATION

Problem Formulation

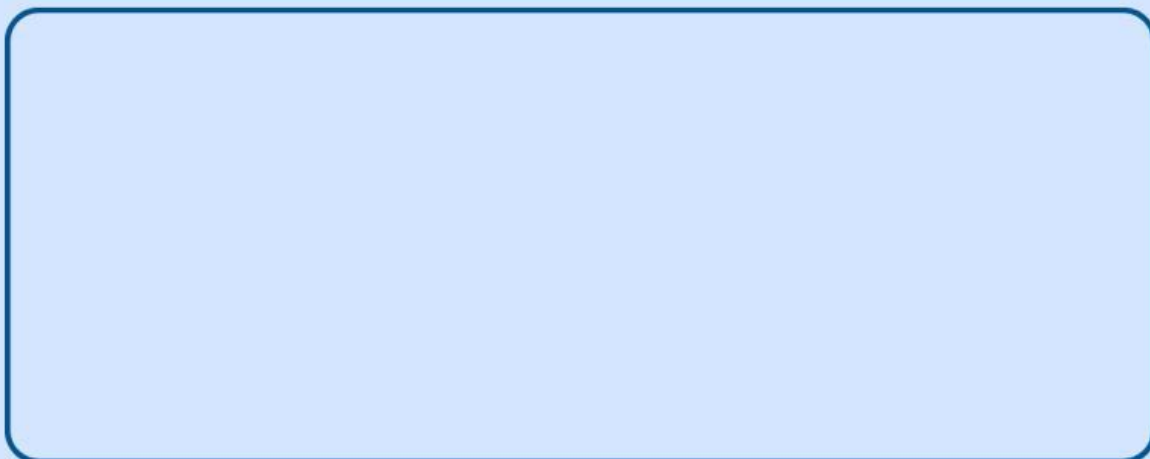
1. How does concentration affect the reaction rate?
2. How does the reaction rate graph compare with different concentrations?

Objective

1. Analyze the effect of concentration on reaction rate.
2. Analyze the difference in reaction rate graphs with different concentrations.

Hypothesis

State the hypothesis for this experiment!



Tools

- 2 Beaker glass 100 mL
- 2 Stopwatches
- 1 Measuring cylinder 10 mL
- 2 pieces of Paper
- 1 marker
- Tissue

Materials

- 30 mL Sodium Thiosulphate solution 0.1 M
- 20 mL Hydrochloric Acid 1 M
- 30 mL Distilled Water





Steps for attempt 1

1. Prepare tools and materials
2. Draw X in a paper, put it on the table
3. Measure 20 mL of sodium thiosulfate with a measuring cylinder
4. Dilute 20 mL of sodium thiosulfate with 10 mL of distilled water in a beaker glass
5. Measure 10 mL of sodium thiosulfate with a measuring cylinder
6. Pour 10 mL of Hydrochloric acid into the beaker glass
7. Start the stopwatch and stop when the X on the paper is no longer visible
8. Record the time taken until the X is no longer visible.



Steps for attempt 2

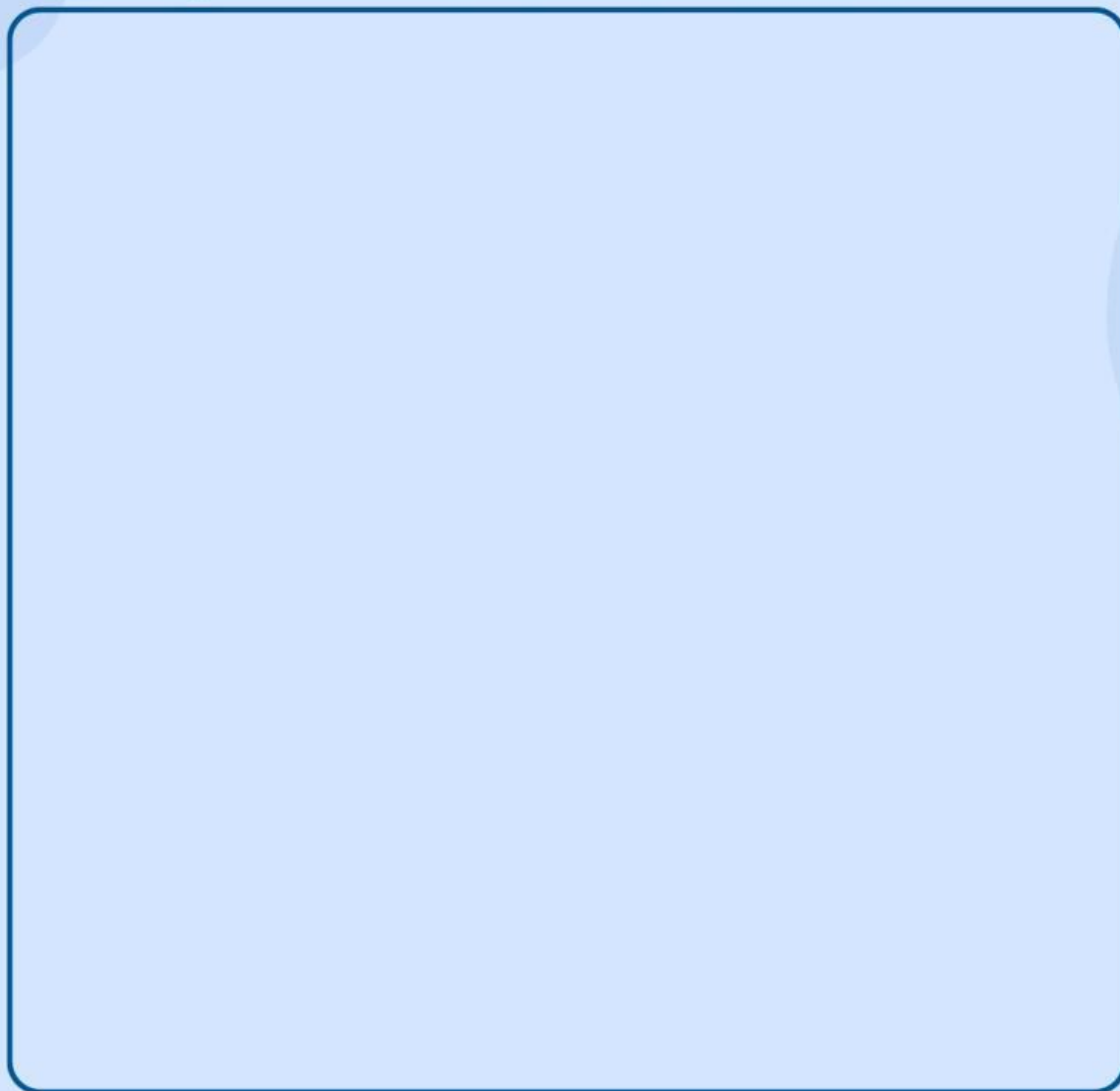
1. Prepare tools and materials
2. Draw X in a paper, put it on the table
3. Measure 20 mL of sodium thiosulfate with a measuring cylinder
4. Dilute 10 mL of sodium thiosulfate with 20 mL of distilled water
5. Measure 10 mL of sodium thiosulfate with a measuring cylinder
6. Pour 10 mL of Hydrochloric acid into the beaker glass
7. Start the stopwatch and stop when the X on the paper is no longer visible
8. Record the time taken until the X is no longer visible.





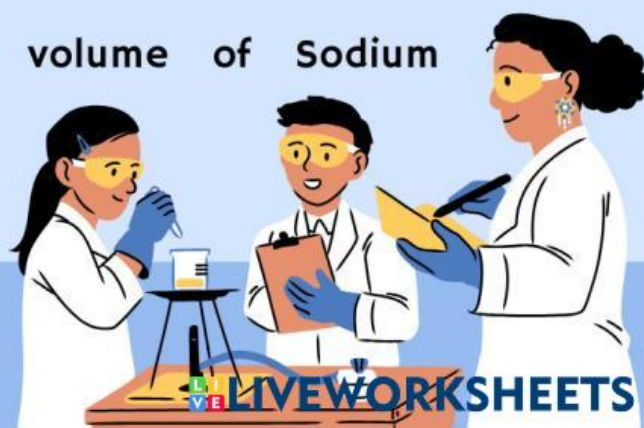
Diagram Experiment

Draw diagram for the steps of the experiment!



Variables

- **Manipulated Variable** : the concentration of sodium thiosulphate
- **Response Variable** : the time taken until the X is no longer visible
- **Controlled Variable** : the volume of Sodium thiosulphate and HCl





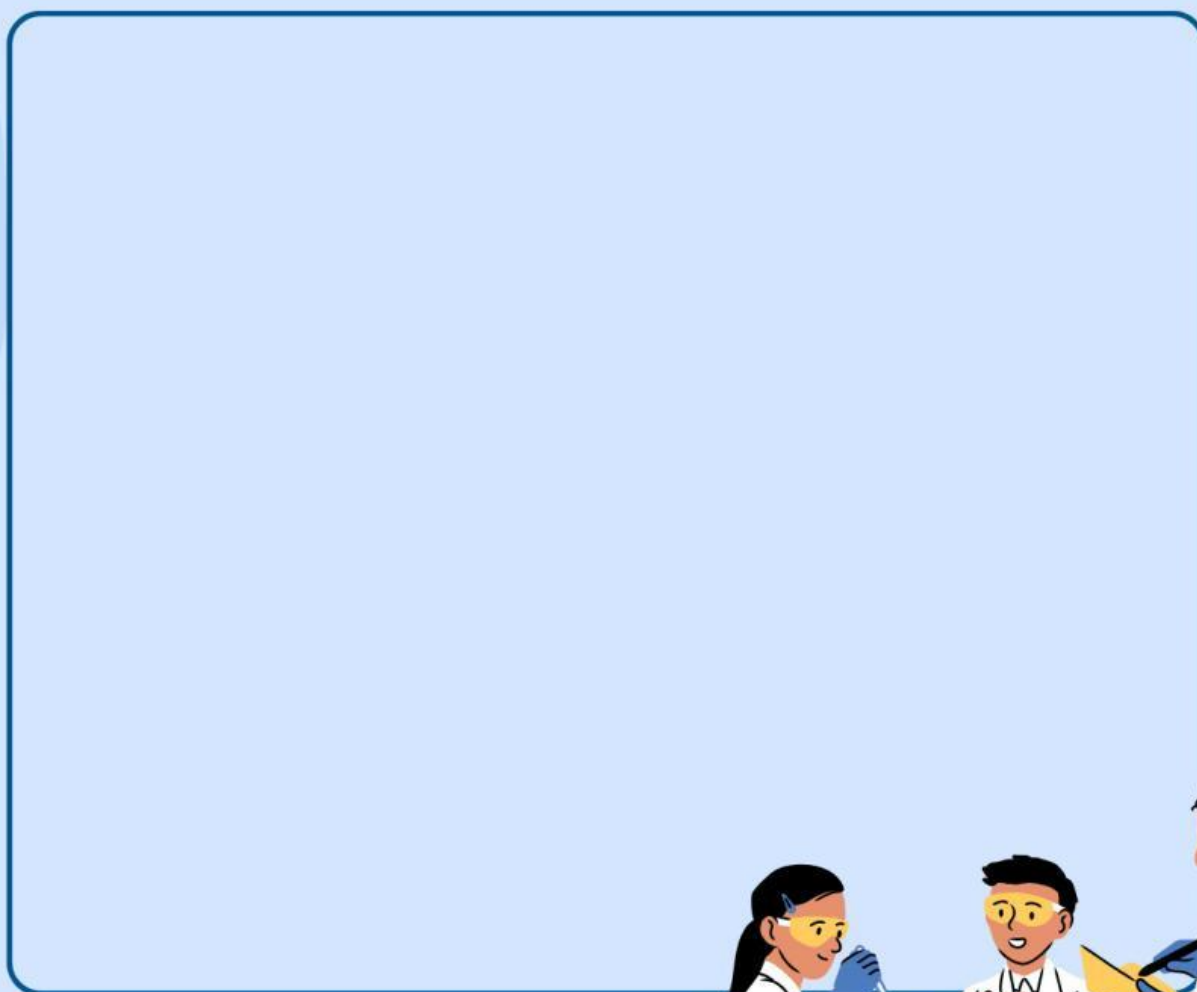
Data

Table 1. Rates of reactions result data

No.	Natrium Thiosulphate (mL)	Distilled water (mL)	Hydrochloric Acid (mL)	Concentration of Natrium Thiosulphate	Time (s)
1					
2					

Analysis

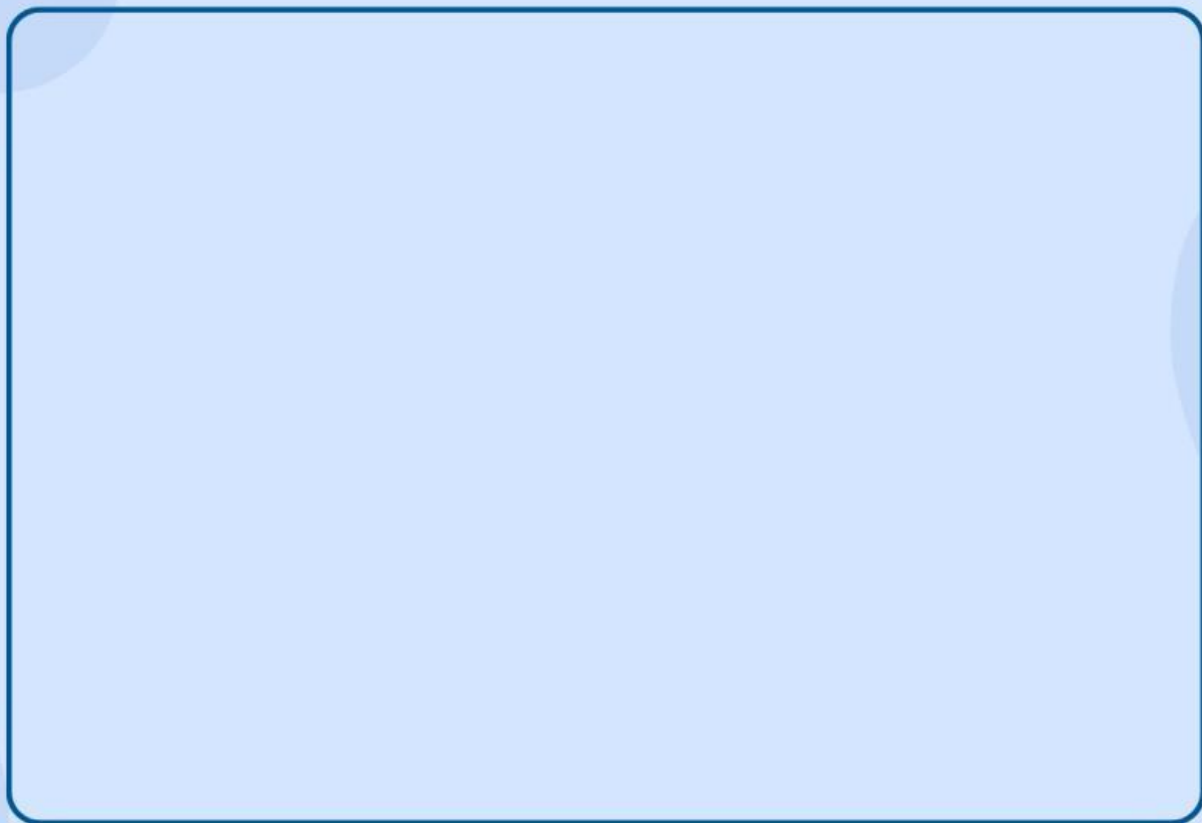
Explain the data obtained and the factors that influence these results





Graph

Plot a graph of the temperature versus time!



Conclusion

Conclude your experiment!

