

Which Antacid Remedy Is the Most Effective In Dealing with Excess Stomach Acid?

LEARNING OUTCOMES:

- This project enables students to learn about The purpose of antacid remedies.
- To discuss and put forward suggestions as to how best to carry out the experimental work.
- To identify variables and controls and put them in place so that their experimental work produces valid results.
- Design and write up the procedure for each experiment.
- Working as part of a team.
- Analysis results based on scientific and experimental evidence.

Your task:
Design experiments to measure the effectiveness of different antacids.



Use technology where at all possible!

CURRICULUM CONTENT:

Neutralisation (consolidation of concept), titrations, use of pH sensors and data logging, quantitative analysis of results.



Did you know?

- Amount of stomach acid varies with time of day and with meal time.
- On average there is roughly 700 ml of acid in the stomach at any one time.
- The same effects of excess stomach acid (Heartburn) occur when all the acid in your stomach is neutralized.



OBJECTIVES

- This set of activities allows students to work together as a team to investigate which antacid remedy is the most effective in treating excess stomach acid.
- It involves researching what the word effective means in the context of antacid remedies, is it the fastest acting remedy, is it the one which neutralises the most acid? Or is it the remedy which results in the greatest pH change?
- It allows students to design and carry out experiments to determine which the most effective antacid remedy is.
- Students get the opportunity to compile and analysis their results and then put forward a scientific argument to justify their choice.
- To reinforce the role that acids and bases play in our everyday lives and shows that by knowing the Chemistry of a common medical problem it becomes easier to deal with.

Part A

Measure the pH vs. Time when the minimum dosage is added to stomach conditions.



Does doubling the dosage half the time required for neutralisation?

What is the final pH at the end point?

Part B

Measure the volume of the acid neutralised by the minimum dosage.



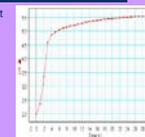
Does doubling the dosage neutralise double the acid?

Time factor Graph

Product	Final pH	Time taken to reach final pH
Milk of Magnesia	9.7	13 seconds
Gaviscon liquid	6.6	4 seconds
Gaviscon tablet	6.4	10 seconds
Rennie	5.6	20 seconds

Rennie pH scale

- It took 20 seconds for it to reach its highest pH
- As shown in the graph =>



Double tablets results table

Product	Acid neutralized with minimum dosage	Acid neutralized with double dosage
Milk of Magnesia	28.0ml	55.8ml
Gaviscon tablet	6.9ml	13.5ml
Gaviscon liquid	6.2ml	12.3ml
Rennie	32.5ml	64.8ml

Results of pH range

Product	Starting pH	pH after Minimum dosage	pH after Maximum dosage
Gaviscon liquid	3.3	7	7.3
Milk of Magnesia	3.3	9.4	9.8
Rennie	3.3	6.4	6.4
Gaviscon tablets	3.3	4.3	7.3