


<b>W</b>	<b>109 The Scientific Method</b>	
	<b>Objectives</b> 1. Define the scientific method 2. Identify the steps of the scientific method 3. Describe the steps of the scientific method 4. Distinguish between independent and dependent variables 5. Distinguish between observation and conclusion	

A student reacted calcium carbonate  $\text{CaCO}_3$  (marble chips) with hydrochloric acid and observed a gas being produced. She then decides to investigate if increasing the surface area of the marble chips by crushing it into a powder will increase the rate of gas production.

1a. Formulate a hypothesis to investigate how surface area affects the rate of reaction.

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1b. Distinguish between hypothesis and scientific theory.

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2a. Identify the independent variable.

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2b. Identify the dependent variable.

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2c. Identify which variables must be held constant in this experiment.

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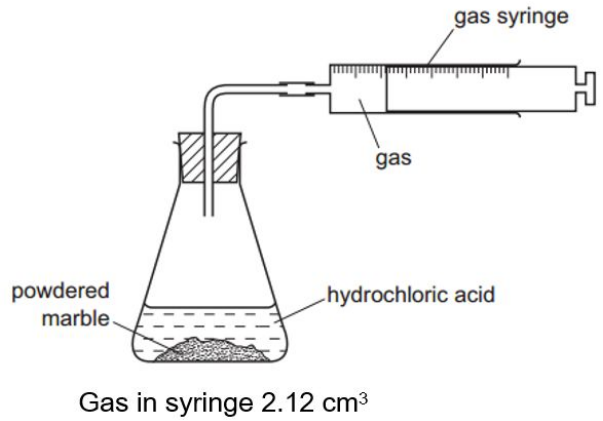
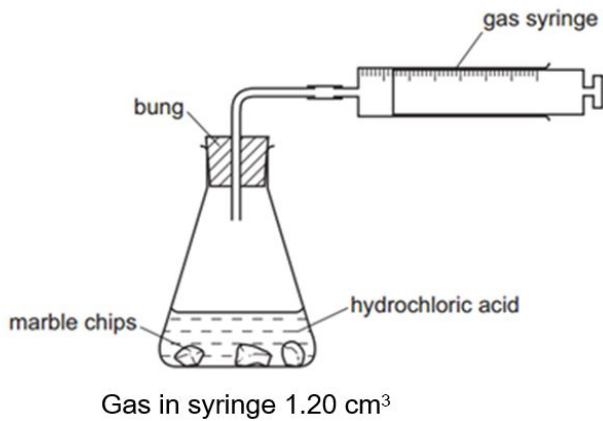


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The diagram below shows the experiment the student conducted after 2 minutes.



3. Distinguish between qualitative and quantitative observation.

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4. Using the diagram above record the data and analysis for this experiment.

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5. Using the observation and analysis write a conclusion for this experiment.

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