

INVESTIGATIONS


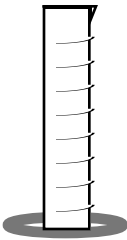







in

SCIENCE

The purpose of this booklet is to improve your ability to;

- **state your investigation's Aim**
- **state relevant variables and controls**
- **measure variables**
- **make a hypothesis (guess)**
- **choose a procedure and apparatus**
- **carry out practical work safely**
- **record results**
- **present results as a graph**
- **look for patterns**
- **describe patterns and come to a conclusion**

VARIABLES : Factors which are important to be aware of in INVESTIGATIONS

MEASUREMENT	MEASURING DEVICE	UNITS & SYMBOLS
<p><u>DISTANCE</u> length breadth height</p>	<p>RULER or METRE STICK</p> 	<p>metre (m.) centimetre (cm.) millimetre (mm.)</p>
<p><u>AREA</u></p>	<p>calculated rectangle area = $l \times b$</p>	<p>square metre (m²) square centimetres (cm²)</p>
<p><u>VOLUME</u> (liquids)</p> 	<p>calculated cube volume = $l \times b \times h$</p> <p>MEASURING CYLINDER</p>	<p>cubic centimetres (cm³) [1cm³ = 1 ml.]</p> <p>millilitres (ml.) litres (l.)</p>
<p><u>TIME</u></p>	<p>STOPCLOCK</p> 	<p>seconds (s.) minutes (min)</p>
<p><u>RATE</u> eg. speed</p>	<p>stopclock & ruler</p>	<p>metre per second (m.s⁻¹) car speed (km.hr⁻¹.)</p>
<p><u>MASS</u></p>	<p>BALANCE</p> 	<p>gram (g.) kilogram (kg.)</p>
<p><u>CONCENTRATION</u></p>	<p>measured using balance & m. cylinder</p>	<p>gram per litre (g.l⁻¹)</p>
<p><u>TEMPERATURE</u></p>	 <p>THERMOMETER</p>	<p>degrees Celsius (°C)</p>
<p><u>VOLTAGE</u></p>	 <p>VOLTMETER</p>	<p>volts (V)</p>
<p><u>CURRENT</u></p>	<p>AMMETER </p>	<p>amps (A)</p>
<p><u>ACIDITY [pH]</u></p>	<p>pH METER, (paper or solution)</p> 	<p>pH number (0 to 14) (colour scale: red / green / blue)</p>
<p><u>LIGHT Intensity</u></p>	<p>LIGHT METER</p> 	<p>Lux or simple letter scale</p>

INVESTIGATION PLANNER

When you carry out a practical investigation in class it must be planned very carefully - think first , DO NOT rush into an experiment. The following steps should always be gone through and always use these headings as your guide.

AIM This is what you are trying to ***find out*** in your experiment.

PROCEDURE Describe briefly ***how*** you would ***carry out*** your investigation.

Safety Describe any ***safety precautions*** that are needed and say why.

Variables & measurements

Variables are parts of the experiment that can ***be changed*** or ***kept constant*** eg. temperature, volume of water, intensity of light, number of things used.

1. Decide which variable you are going to deliberately ***change*** and which variable you expect to ***see changing*** as a result.
2. Decide and record other variables which must be ***controlled*** (ie. kept the same) to make you investigation fair.
3. Make a ***HYPOTHESIS*** (a guess as to what you expect).

Decide how you will observe or measure these variables and what apparatus you will need to measure them with.

At least ***three*** controlled changes should be made and you must try to select a reasonable ***range*** of change.

Remember : In order to increase the reliability of experimental results measurements should be repeated and recorded. Therefore it will improve you investigation if you show several sets of results and also show the calculated ***Average*** result.

APPARATUS List or ***draw a labelled diagram*** of all the apparatus required.

RESULTS Your results must ***always*** be presented in a ***table***. Design a table to show the results of all your experiments - One heading should indicate the variable you are changing and one heading should indicate the variable which it caused to change. Remember to include the ***units*** of measurement.

You will be require to draw a Bar or ***Line graph*** of your results.

CONCLUSION Look at your graph to find any pattern which would allow you to say what happened as you changed one variable. Correct, if necessary, your original hypothesis.