
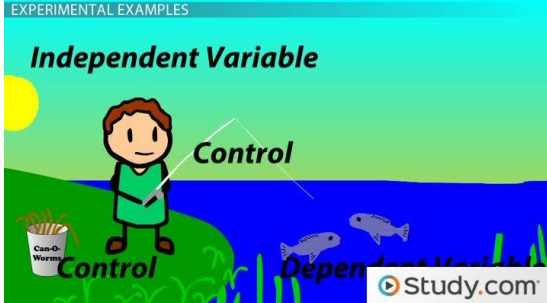
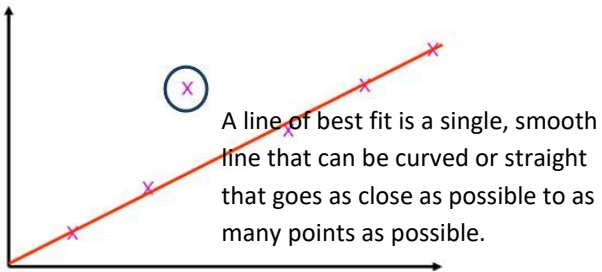
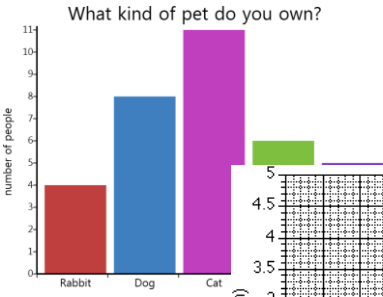
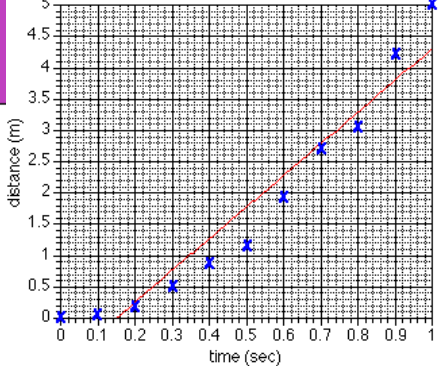
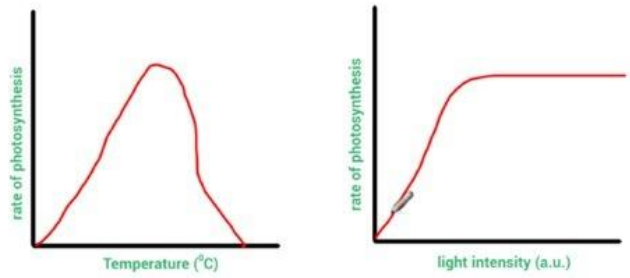


Knowledge Companion for How Science Works

1. Lab safety	2. Variables	3. Repeatability
Key ideas:		Key ideas
		
Key words	Key words	Key words
<p>Goggles: always wear a pair of goggles when completing practicals – this includes setting up and clearing away.</p> <p>Aprons: always wear an apron when completing practicals – this includes setting up and clearing away.</p> <p>Hair: tie any long hair up, ensuring it is out the way of flame and chemicals.</p> <p>Bags and blazers: hang these up out the way so they are not a trip hazard and do not get damaged by chemicals or flame.</p> <p>Spillages: wash your hands and report any spillages to the teacher.</p> <p>Breakages: report any breakages to your teacher – do not pick up broken glass yourself.</p>	<p>Independent variable: what you change in the experiment, normally 5 different measurements in equal intervals.</p> <p>Dependent variable: what you observe or measure in an experiment.</p> <p>Control variable: what you will keep the same to make it a fair and valid test.</p> <p>Fair test: keeping all your control variables the same and making sure it is valid.</p> <p>Valid: does the data you collected actually answer the original question?</p>	<p>Anomaly: a result that does not fit the pattern.</p> <p>Repeatability: allows you to check for anomalies and see if the results are similar.</p> <p>Reproducibility: another group completes the practical (maybe using different measurements but the same type of variables) and the pattern is similar.</p>
Action required:	Action required:	Action required:

4. Calculating means and other averages	5. Tables and graphs	6. Analysing results																													
<p>Key ideas</p> <p>Independent variable, including units</p> <p>Dependent variable, including units</p> <table border="1" data-bbox="165 341 757 571"> <thead> <tr> <th rowspan="2">Concentration of mouthwash (%)</th> <th colspan="4">Diameter of clear area around mouthwash disc (mm)</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> </tr> <tr> <td>20</td> <td>2</td> <td>4</td> <td>3</td> <td>3</td> </tr> <tr> <td>40</td> <td>4</td> <td>6</td> <td>5</td> <td>5</td> </tr> <tr> <td>60</td> <td>10</td> <td>2</td> <td>12</td> <td>11</td> </tr> </tbody> </table> <p>Each interval recorded in ascending order</p>	Concentration of mouthwash (%)	Diameter of clear area around mouthwash disc (mm)				1	2	3	Average	0	1	1	1	1	20	2	4	3	3	40	4	6	5	5	60	10	2	12	11	<p>Key ideas:</p> <p>What kind of pet do you own?</p>  <p>Dependent variable, including units</p>  <p>Independent variable, including units</p>	<p>Key ideas:</p>  <p>Once a certain temperature is reached, the rate of photosynthesis starts to drop until at a set temperature photosynthesis can no longer take place.</p> <p>As you increase the light intensity, the rate of photosynthesis increases until you reach a certain level of light where the rate of photosynthesis levels off.</p>
Concentration of mouthwash (%)		Diameter of clear area around mouthwash disc (mm)																													
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<p>Mean – first, check to see if any anomalies and ignore these. Secondly, add each piece of data together for that interval (horizontal on the table), leaving out anomalies. Thirdly, divide the sum by the number of pieces of data you have (not including the anomalies).</p> <p>Median – order your results into numerical order and then it is the middle value.</p> <p>Mode – This is the most common number in your results.</p> <p>Range – the value when you take your largest result and take away the smallest result.</p>	<p>Tables: always draw a table with your independent variable in the first column. Then in your dependent variable on the right hand side, include repeats and a mean.</p> <p>Bar graph: used when the independent variable is in categories, e.g. eye colour.</p> <p>Line graph: used when the independent variable is continuous, e.g. height. The line of best fit does not have to go through 0,0 – it should be as close as possible to as many points as possible.</p> <p>Draw tables and graphs with a pencil and ruler</p>	<p>Trend: what pattern is being shown in the data (graph or table). You need to pick out 2 or 3 bits of data to prove your pattern.</p> <p>Levels off: on a graph where the line of best fit becomes horizontal or on a table where the data doesn't change much.</p> <p>Steady increase: the graph appears as a straight line with a gradient. On a table, the results will go up in roughly equal quantities each time.</p> <p>Sometimes a graph returns back to the same value as the start – you need to look carefully at the dependent variable for reasons why.</p>																													
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