

## Science Inquiry Skills

Knowledge	Application
<p>Scientific methods enable systematic investigation to obtain measurable evidence.</p>	<p>Deconstruct the parts of a problem to determine the most appropriate method for investigation.</p> <p>Design investigations, including:</p> <ul style="list-style-type: none"> <li>◆ hypothesis or inquiry question</li> <li>◆ types of variables               <ul style="list-style-type: none"> <li>– dependent</li> <li>– independent</li> <li>– factors held constant (how and why they are controlled)</li> <li>– factors that may not be able to be controlled (and why not)</li> </ul> </li> <li>◆ materials required</li> <li>◆ the procedure to be followed</li> <li>◆ the type and amount of data to be collected</li> </ul> <p>identification of ethical and safety considerations.</p>
<p>Obtaining meaningful data depends on conducting investigations using appropriate procedures and safe, ethical working practices.</p>	<p>Conduct investigations, including:</p> <ul style="list-style-type: none"> <li>◆ selection and safe use of appropriate materials, apparatus, and equipment</li> <li>◆ collection of appropriate primary or secondary data (numerical, visual, descriptive)</li> <li>◆ individual and collaborative work.</li> </ul>
<p>Results of investigations are represented in a well-organised way to allow them to be interpreted.</p>	<p>Represent results of investigations in appropriate ways, including:</p> <ul style="list-style-type: none"> <li>◆ use of appropriate SI units, symbols</li> <li>◆ construction of appropriately labelled tables</li> <li>◆ drawing of graphs: linear, non-linear, lines of best fit</li> <li>◆ use of significant figures.</li> </ul>
<p>Scientific information can be presented using different types of symbols and representations.</p>	<p>Select, use, and interpret appropriate representations, including:</p> <ul style="list-style-type: none"> <li>◆ mathematical relationships, including direct or inverse proportion and exponential relationships</li> <li>◆ diagrams and multi-image representations</li> <li>◆ formulae</li> </ul> <p>to explain concepts, solve problems, and make predictions.</p>
<p>Analysis of the results of investigations allows them to be interpreted in a meaningful way.</p>	<p>Analyse data, including:</p> <ul style="list-style-type: none"> <li>◆ multi-image representations</li> <li>◆ identification and discussion of trends, patterns, and relationships</li> <li>◆ interpolation or extrapolation through the axes where appropriate</li> <li>◆ selection and use of evidence and scientific understanding to make and justify conclusions.</li> </ul>
<p>Critical evaluation of procedures and outcomes can determine the meaningfulness of conclusions.</p>	<p>Evaluate the procedures and results to identify sources of uncertainty, including:</p> <ul style="list-style-type: none"> <li>◆ random and systematic errors</li> <li>◆ replication</li> <li>◆ sample size</li> <li>◆ accuracy</li> <li>◆ reliability</li> <li>◆ precision</li> <li>◆ validity</li> <li>◆ effective control of variables.</li> </ul> <p>Discuss the impact that sources of uncertainty have on experimental results. Recognise the limitations of conclusions.</p>
<p>Effective scientific communication is clear and concise.</p>	<p>Communicate to specific audiences and for specific purposes using:</p> <ul style="list-style-type: none"> <li>◆ appropriate language</li> <li>◆ terminology</li> <li>◆ conventions.</li> </ul>