

Scientific enquiry

Yearly teaching objectives

Year 7 pupils should be taught to:	Year 8 pupils should be taught to:	Year 9 pupils should be taught to:
<ul style="list-style-type: none"> Consider early scientific ideas, including how experimental evidence and creative thinking have been combined to provide scientific explanations. Use scientific knowledge to decide how ideas and questions can be tested; make predictions of possible outcomes. Identify and control the key factors that are relevant to a particular situation. Select and use appropriate equipment, including ICT, to make observations and measurements correctly, e.g. 1 °C or 1 newton. Use repeat measurements to reduce error and check reliability. Present and interpret experimental results through the routine use of tables, bar charts and simple graphs, including line graphs. Describe and explain what their results show when drawing conclusions; begin to relate conclusions to scientific knowledge and understanding. Evaluate the strength of evidence, e.g. in bar charts and graphs; indicate whether increasing the sample would have strengthened the conclusions. 	<ul style="list-style-type: none"> Consider how some early scientific ideas do not match present-day evidence, and describe how new creative thinking has been used to provide a scientific explanation. Identify more than one strategy for investigating questions and recognise that one enquiry might yield stronger evidence than another. Recognise that a range of sources of information or data is required. Use a range of first-hand experience, secondary sources of information and ICT to collect, store and present information in a variety of ways, including the generation of graphs. Use appropriate range, precision and sampling when collecting data during a scientific enquiry, and explain why these and controlled experiments are important. Draw conclusions from their own data and describe how their conclusions are consistent with the evidence obtained, using scientific knowledge and understanding to explain them. Consider whether an enquiry could have been improved to yield stronger evidence (e.g. improving the accuracy or sufficiency of measurements or observations); explain any anomalous results. 	<ul style="list-style-type: none"> Explain how scientific ideas have changed over time; describe some of the positive and negative effects of scientific and technological developments. Select and use a suitable strategy for solving a problem; identify strategies appropriate to different questions, including those in which variables cannot be easily controlled. Carry out preliminary work such as trial runs to help refine predictions and to suggest improvements to the method. Make sufficient systematic and repeated observations and measurements with precision, using an appropriate technique. Select and use appropriate methods for communicating qualitative and quantitative data. Describe patterns in data; use scientific knowledge and understanding to interpret the patterns, make predictions and check reliability. Describe how evidence or the quality of the product supports or does not support a conclusion in their own and others' enquiries; identify the limitations of data in conclusions.

From *Framework for teaching science: Years 7, 8 and 9*, page 25 (DfES ref: 0136/2002)