



Substantive and Disciplinary Knowledge In Science



Substantive knowledge (knowledge of the products of science, such as concepts, laws, theories and models). This is referred to as scientific knowledge and conceptual understanding in the national curriculum. It is organised into the following four areas:

- Biology: Living things and their environment; Reproduction, inheritance and evolution
- Chemistry: States of matter; Materials (properties and changes)
- Physics: Energy; Forces
- Earth Science: Earth and space

Disciplinary knowledge (knowledge of how scientific knowledge is generated and grows). This is specified in the 'working scientifically' sections of the national curriculum and it includes knowing how to carry out practical procedures. Disciplinary knowledge should not be taught as a stand-alone unit of work. It should be embedded within the substantive content of biology, chemistry and physics. The disciplinary knowledge builds progressively to enable children to work scientifically and covers the following aspects:

- Methods used to answer questions
- Using apparatus and techniques
- Data analysis
- Using evidence to develop explanations