

Science

Essential Characteristics of Scientists

- The ability to think independently and raise questions about working scientifically and the knowledge and skills that it brings.
- Confidence and competence in the full range of practical skills, initiative in, for example, planning and carrying out scientific investigations.
- Excellent scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings.
- High levels of originality, imagination or innovation in the application of skills.
- The ability to undertake practical work in a variety of contexts, including fieldwork.
- A passion for science and its application in past, present and future technologies.



Science Coverage Y6

Working Scientifically

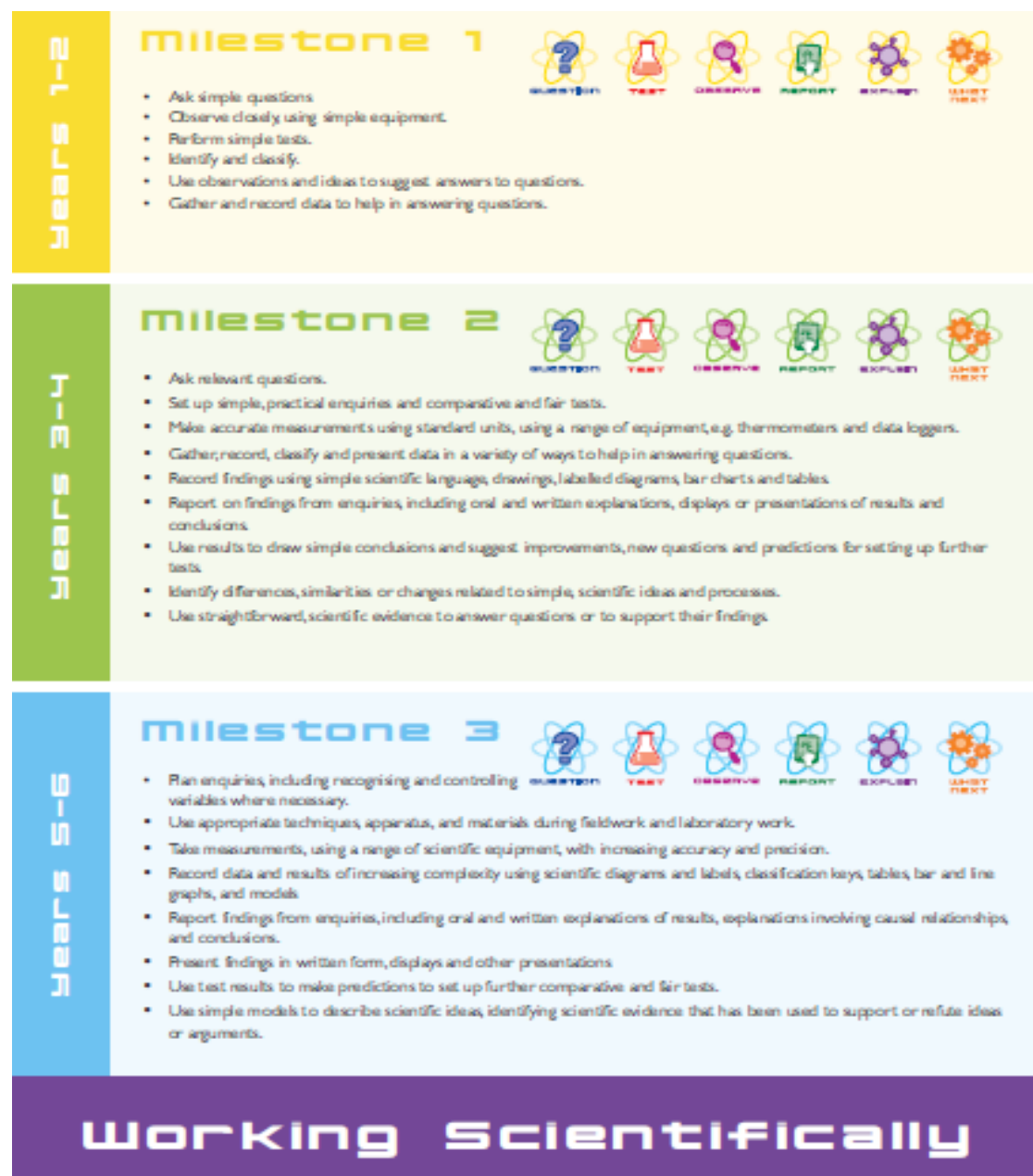
This is the first '**Key Threshold Concept**' within which pupils will develop The Essential Characteristics outlined above.

In this document the '**Key Threshold Concepts**' are in red font.

The Essential Characteristics above are broken down into a progression of descriptors at three 'Milestones' (the end of Year 2, Year 4 and Yr 6).

For The Working Scientifically Key Threshold Concept, the Milestone Descriptors are developed alongside the coverage identified below for the remaining 10 Key Threshold Concepts. These are the skills that are the key to scientific thinking and opportunities to develop them should be considered in all science planning.

Teachers should follow the progression of teaching '**Working Scientifically**' scientific skills that is outlined in THE ESSENTIALS CURRICULUM (see poster), recording which skills have been planned into which topics by using the Science Unit Assessment Grid template. The expectation is that each of the scientific skills for the age appropriate milestone will have been covered in depth at least once in every scientific topic listed below.



'Key Threshold Concepts'	CYCLE A			CYCLE B			CYCLE C		
Milestone Descriptors	AUT 19	SPR 20	SUM 20	AUT 20	SPR 21	SUM 21	AUT 21	SPR 22	SUM 22
Investigate Living Things									
Sc6/2.1a describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals		✓							
Sc6/2.1b give reasons for classifying plants and animals based on specific characteristics.		✓							
Understand Animals and Humans									
Sc6/2.2a identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood		✓							
Sc6/2.2b recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function		✓							
Sc6/2.2c describe the ways in which nutrients and water are transported within animals, including humans.		✓							
Understand Evolution and Inheritance									
Sc6/2.3a recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago			✓						
Sc6/3.2b recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents			✓						
Sc6/2.3c identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.			✓						

'Key Threshold Concepts'	CYCLE A			CYCLE B			CYCLE C		
Milestone Descriptors	AUT 19	SPR 20	SUM 20	AUT 20	SPR 21	SUM 21	AUT 21	SPR 22	SUM 22
Investigate Light and Seeing									
Sc6/4.1a recognise that light appears to travel in straight lines	✓								
Sc6/4.1b use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye	✓								
Sc6/4.1c explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes	✓								
Sc6/4.1d use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	✓								
Understand Electrical Circuits									
Sc6/4.2a associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit	✓								
Sc6/4.2b compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches	✓								
Sc6/4.2c use recognised symbols when representing a simple circuit in a diagram.	✓								