Skills

Communication

Pupils should be given opportunities to:

1. search systematically for, process and analyse information for a specific purpose, including ICT as appropriate
2. communicate logically by speech, writing, drawings, diagrams, charts, tables, bar charts, line graphs, videos and ICT packages using a wide range of scientific vocabulary, terms, symbols and conventions
3. work quantitatively, using appropriate mathematical conventions and using S.I. units appropriate to their work, *e.g. kg, s, N, m, J, w.*

Enquiry

Pupils should be given opportunities to carry out different types of enquiry, *e.g. pattern-seeking, exploring, classifying and identifying, making things, fair testing, using and applying models,* by:

Planning

Pupils decide on the most suitable type of enquiry to carry out and outline the planned approach/method, recognising, deciding upon and justifying each of the following when appropriate:

1. the choice of success criteria
2. predictions using previous knowledge, understanding and preliminary work

Range

Interdependence of organisms

Pupils use and develop their skills, knowledge and understanding by investigating how humans are independent yet rely on other organisms for survival, applying this to life in countries with different levels of economic development.

They should be given opportunities to study:

1. the basic structure and function of some cells, tissues, organs and organ systems and how they support vital life processes
2. how food is used by the body as fuel during respiration and why the components of a balanced diet are needed for good health
3. the beneficial and detrimental effects of some drugs on the organs of the human body and other consequences of their use, *e.g. insulin, steroids, paracetamol, caffeine*
4. the interdependence of organisms and their representation as food webs, pyramids of numbers and simple energy-flow diagrams
5. how and why food webs are affected by environmental factors, *e.g. light intensity, water availability, temperature,* and their fluctuations
6. how human activity affects the global environment, *e.g. acid rain, greenhouse effect,* and the measures taken to minimise any negative effects and monitor them, *e.g. by Earth observation satellites*
7. applications of science, medicine and technology that are used to improve health and the quality of life, including those in countries with different levels of economic development.

3. a range of options as to where and how to find relevant information and ideas
4. when carrying out a fair test, control variables appropriately and identify any variables that cannot readily be controlled
5. the number of observations or measurements that need to be made and their range and values to ensure reliability of evidence
6. the equipment and techniques required for the enquiry
7. any potential hazards in their work.

Developing

Pupils follow the planned approach/method, revise it where necessary, and where appropriate:

1. use a range of apparatus and equipment safely and with skill, taking action to control the risks to themselves and others
2. make sufficient relevant observations and accurate measurements, using ICT as appropriate, to a degree of precision appropriate to the enquiry
3. identify, describe and explain trends, patterns and relationships

The sustainable Earth

Pupils use and develop their skills, knowledge and understanding by investigating the materials in the Earth and its atmosphere and how they can change, and apply this in contemporary contexts.

They should be given opportunities to study:

1. the properties of solids, liquids and gases and how the particle model can be used to explain these properties
2. the physical and chemical properties of some elements, compounds and mixtures and how mixtures can be separated by simple techniques
3. the differences between physical and chemical changes using some common examples
4. investigations into the patterns of behaviour of elements and compounds and their use to describe and predict their behaviour in chemical reactions
5. the properties of sustainable materials and how these are related to their uses in everyday life, *e.g. in the construction and manufacturing industries,* and the importance of sustainability.

4. use scientific prior knowledge to explain links between cause and effect when concluding
5. consider whether there is sufficient information to enable firm conclusions to be drawn, taking account of uncertainties/anomalies
6. identify and assess bias and reliability
7. consider others' views to inform opinions and decisions.

Reflecting

Pupils think about what they have done in order to consolidate their learning and transfer skills, knowledge and understanding to another context by:

1. evaluating how far outcomes reflect success criteria
2. justifying any improvements made to the planned approach/method
3. identifying the learning/thinking strategies they have used
4. linking the learning to dissimilar but familiar situations, within and outside school.

How things work

Pupils should use and develop their skills, knowledge and understanding by investigating the science involved in a range of contemporary devices/machines and evaluate different energy resources and possibilities.

They should be given opportunities to study:

1. the behaviour of current in electrical circuits
2. the conservation of energy and ways in which energy can be stored
3. how familiar devices/machines work by using electricity, light, sound and other energy transfers
4. the forces in devices and their relationship to work done and power
5. how renewable and non-renewable energy resources are used to generate electricity and the implications of decisions made about their use
6. technologies under development, which may lead to more efficient use of energy resources or using them in new ways, *e.g. hydrogen-powered cars, using cooking oil/gasohol, as replacements for diesel/petrol.*