

BIG IDEAS:

- 1. All **Matter** In the universe is made of very small particles
- 2. Objects can affect other objects at a distance (Electromagnets).
- 3. Changing the movement of an object requires a net **Force** to be acting on it
- 4. The total amount of **Energy** in the universe is always the same but can be transferred from one energy store to another
- 5. The composition of the **Earth** and its atmosphere and the processes occurring within them shape the Earth's surface and its climate
- 6. Our **Solar System** is a very small part of one of billions of galaxies in the universe
- 7. **Organisms** are organised on a cellular basis and have a finite lifespan
- 8. **Organisms** require a supply of energy and materials for which they often depend on, or compete with, other organisms (Ecosystems)
- 9. **Genetic** information is passed down from one generation of organisms to another
- 10. The diversity of organisms, living and extinct, is the result of **Evolution**
- 11. Science is about finding the causes of phenomena in the **Natural world**
- 12. Scientific explanations, **Theories and Models** are those that best fit the evidence available at a particular time
- 13. The knowledge produced by science is used in engineering and technologies to create **Products**
- 14. **Applications** of science often have ethical, social, economic and political implications_[11-14 The Scientific process]
- **OUR PYRAMID BIG IDEAS** 1. Physical world 2. Biological world 3. Chemical world 4. Macro and Micro World 5. The Scientific Process

YEAR 5
BEING A SCIENTIST 12 13 14
 Know the laboratory safety rules and procedures. Know some basic laboratory equipment and how to use it. Use the scientific method to investigate and work safely. **Ethics, reasoning, consequences**
FORCES 2 3 4 5 6
 Know the effect of gravity on objects. Describe the effects of air resistance, water resistance and friction. Describe force magnifiers (levers, pulleys and gears)
EARTH AND SPACE 3 5 6
 Explain the movement of the Earth and other planets in the solar system relative to the sun, and the movement of the moon relative to the Earth. Describe the sun, moon and Earth as approximately spherical bodies. Explain day and night and the apparent movement of the sun across the sky using the idea of Earth's rotation. **Faith, feelings, values, reflection**
PROPERTIES AND MATERIALS 1 5 13 14
 Compare and group everyday materials on the basis of their properties. Know the uses of everyday materials. **Ethics, consequences**
ANIMALS AND HUMANS 7 8 9 10 11
 Describe the changes as humans develop to old age. **Feelings, values, diversity**
LIFECYCLES 7 9 10 11
 Describe the difference in the lifecycles of a mammal, an amphibian, an insect and a bird. Understand the life processes of reproduction in some plants and animals. **Respect, reflection**

YEAR 6
EVOLUTION AND INHERITANCE 7 8 9 10 11
 Use the basis ideas of inheritance, variation and adaptation to describe how living things have changed over time and evolved. Describe how fossils are formed and provide evidence for evolution. **Ethics, reflection, values**
ELECTRICITY 2 3 4 12 13 14
 To be able to use simple apparatus to construct and control a series circuit and describe how the circuit may be affected when changes are made to it. Use circuit symbols **Rights**
LIGHT 4 6 12 14
 Light from light sources or reflected light travels in straight lines and enters our eyes. Explain how we see objects and the formation, size and shape of shadows. **Faith, rights**
ANIMALS AND HUMANS 7 8 9 10 11
 Name, locate and describe the functions of the digestive, musculoskeletal and circulatory systems and describe and compare different reproductive processes and life cycles in animals. Describe the effects of diet, exercise, drugs and lifestyle on how their bodies function. **Feelings, values, diversity, ethics**
CLASSIFICATION 7 10 11 12 14
 Use the observable features of plants, animals and micro-organisms to group, classify and identify them into broad groups, using keys or in other ways. **Diversity**
MATERIALS 1 5 13
 Identify and describe what happens when dissolving occurs in everyday situations. Describe how to separate mixtures and solutions into their components. Identify reversible and irreversible changes. **Ethical use, sustainability, rights**

YEAR 7
CELLS AND ORGANISATION 7 9 11 Identify the principle features of a cheek cell and describe their function. **cooperation, ethics, reasoning**
MIXTURES AND SEPARATION 1 5 13
 Devise ways to separate mixtures, based on their properties.
ENERGY 4 12 13 14
 Compare the running costs of fluorescent and filament light bulbs.
Rights, ethics, cooperation, sustainability, responsibility, respect, consequences
REPRODUCTION 7 9 10 11
 Relate advice to pregnant women to ideas about transfer of substances to the embryo. **Ethics, consequences, responsibility, community.**
ACIDS AND ALKALIS 1 11 13 14
 Devise an enquiry to work out how well indigestion tablets work.
Cooperation
CURRENT AND ELECTRICITY 2 3 4 12 13 14
 Compare and explain current flow in different parts of a parallel circuit.
Rights, ethics, cooperation, sustainability, responsibility, respect, consequences
FORCES 3 5 6 14
 Speed, calculating speed, drawing a graph.
 Gravity, know that mass and weight are different but related.
 Know the forces acting on an object and their size and direction. To be able to investigate pressure. Formula for pressure.
ECOSYSTEMS 7 8 10 11
 Use a model to investigate the impact of changes in a population of one organism on others in the ecosystem. **Ethics, animal rights, sustainability**
PARTICLE MODEL 1 12 14
 Relate the features of the particle model to properties of materials in different states. **Faith, reflection, reasoning**
ATOMS, ELEMENTS AND COMPOUNDS 1 12 14
 Compare the properties of elements with the properties of a compound formed from them
SOUND 4 14
 Relate changes of shape in an oscilloscope trace to changes in pitch and volume. Relate the impact of different types of waves on living cells to their frequency and the energy carried by the wave. Use the wave model to explain observations of the reflection, absorption and transmission of waves.

YEAR 8
FOOD AND NUTRITION 4 11
 Evaluate how well a model represents key features of the digestive system. **Sustainability, ethics**
COMBUSTION 4 11
 Investigate the contribution that natural and chemical processes make to our carbon dioxide emissions.
Sustainability, deforestation, consequences, values
PLANTS AND REPRODUCTION 11
 Use models to evaluate the features of various types of seed dispersal.
PERIODIC TABLE 12
 Sort elements according to their chemical data and relate this to their position in the periodic table.
LIGHT 4 6 12 14
 Use ray diagrams to model how light passes through transparent materials. Use the wave model to explain observations of the reflection, absorption and transmission of waves. **Faith, rights**
BREATHING AND RESPIRATION 4 7 11
 Investigate a claim linking height to lung volume. Use data from investigating fermentation with yeast to explore respiration. **Feelings, faith, values**
ENERGY TRANSFERS 4 5 6 12 13 14
 Explain the energy transfers in a hand crank torch. Explain how an electric motor works. Investigate heat loss, conduction, convection and radiation.
UNICELLULAR ORGANISMS 7 8 10 11
 Know the life processes. Describe the differences between bacteria, fungi and viruses. Describe how microbes are used in food and drink. Describe aerobic and anaerobic respiration. Apply knowledge of how microbes are spread to avoid disease. **Ethics, cooperation, tolerance, respect**
MATERIALS 1 11 13 14
 Describe some properties of metals and non metals. Describe how alloys make metals more useful. **Sustainability, consequences**
FORCES 3 5 6 14
 Investigate variables that affect the speed of a toy car rolling down a slope. Explain the way in which an astronaut's weight varies on a journey to the moon. Investigate factors that affect the size of frictional or drag forces.
PLANT GROWTH 7 8 9 10 11
 Use lab tests on variegated leaves to show that chlorophyll is essential for photosynthesis. **Ethics**
REACTIVITY 1 4 5 13 14
 Use experimental results to suggest an order of reactivity of various metals. Investigate a phenomenon that relies on endothermic or exothermic reaction. Investigate changes in mass for chemical and physical processes. Predict the method used for extracting metal based on its position in the reactivity series.
ELECTROMAGNETS 2
 Compare voltage drop across resistors and calculate resistance. Compare and explain current flow in different parts of a parallel circuit. Investigate varying the strength of an electromagnet. Explore magnetic field patterns.