Science

Knowledge and Investigative Focus

Investigative Foci

Where investigative foci are identified these provide a teaching focus for the unit. Other foci will be touched upon and explored but the foci is explicitly taught and highlighted for children.

- Hypotheses (KS2)
- Observation
- Ask Questions
- Testing (fair or comparative)
- Variables
- Recording
- Measuring
- Conclusions & Explanations
- Report & Present Findings
- Identify differences, similarities, and changes
- Causal Relationships

KS1

Science Block: Seasonal Changes (biology) Year A	
Knowledge	**Investigative Focus**
• Observe the apparent movement of the Sun during the day. • Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies.	• Ask Questions • Observation • Report and present findings • Identify differences, similarities, and changes
Science Block: Living Things – Humans (biology) Year A	
Knowledge	**Investigative Focus**
• Identify, name, draw and label the basic parts of the human body and say which parts of the body is associated with which sense. • Observe and name a variety of sources of sound, noticing that we hear with our ears. (Physics) • Observe and name a variety of sources of light, including electric lights, flames and the Sun, explaining that we see things because light travels from them to our eyes. (Physics) • Identify how humans resemble their parents in many features.	• Testing • Variables • Conclusions & Explanations • Observation
Science Block: Living Things – Plants (biology) Year A	
Knowledge	**Investigative Focus**
• Name a variety of common plants, including garden plants, wild plants and trees and those classified as deciduous and evergreen. • Describe the basic structure of a variety of common flowering plants, including roots, stem/trunk, leaves and flowers. • Describe how seeds and bulb grow into mature plants. • Find and describe how plants need water, light and suitable temperature to grow and stay healthy.	• Observation • Ask questions • Recording • Measuring

Science Block: Push & Pull (physics) Year A	
Knowledge	**Investigative Focus**
• Describe how things move, using simple comparisons such as faster and slower. • Compare how different things move.	• Variables • Causal relationships • Testing (fair or comparative) • Report and present findings
Science Block: Seasons (biology)Year B	
Knowledge	**Investigative Focus**
• Know the apparent movement of the Sun during the day. • Know the changes across the four seasons. • Describe weather associated with the seasons and how day length varies.	• Identify differences, similarities, and changes • Observation • Measuring • Recording
Science Block: Animals (biology) Year B	
Knowledge	**Investigative Focus**
• Identify and name a variety of common animals that are birds, fish, amphibians, reptiles, mammals and invertebrates. • Identify and name a variety of common animals that are carnivores, herbivores and omnivores • Describe and compare the structure of a variety of common animals (birds, fish, amphibians, reptiles, mammals and invertebrates, including pets). • Identify name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. • Notice that animals, including humans, have offspring which grow into adults. • Investigate and describe the basic needs of animals, including humans, for survival (water, food and air). • Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene. • Describe and compare the structure of a variety of common animals.	• Report & Present Findings • Identify differences, similarities, and changes • Observation
Science Block: Everyday Materials (chemistry) Year B	
Knowledge	**Investigative Focus**
• Distinguish between an object and the material from which it is made. • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock. • Describe the simple physical properties of a variety of everyday materials. • Compare and group together a variety of everyday materials on the basis of their simple physical properties. • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	• Ask Questions • Recording • Measuring • Causal relationships

• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick/rock, and paper/cardboard for particular uses.	
Science Block: Electrical Circuits (Physics) Year B	
Knowledge	**Investigative Focus**
• Identify common appliances that run on electricity. • Construct a simple series electrical circuit	• Recording • Variables • Testing (fair or comparative)

Lower KS2

Science Block: Changing States of Matter (chemistry) Year A	
Block Content	**Investigative Focus**
• Compare and group materials together, according to whether they are solids, liquids or gases. • Observe that some materials change state when they are heated or cooled, and measure the temperature at which this happens in degrees Celsius (°C), building on their teaching in mathematics. • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	• Hypotheses • Measuring • Identify similarities, difference and changes • Conclusions and explanations
Science Block: Sound (physics) Year A	
Knowledge	**Investigative Focus**
• identify how sounds are made, associating some of them with something vibrating • recognise that vibrations from sounds travel through a medium to the ear • find patterns between the pitch of a sound and features of the object that produced it • find patterns between the volume of a sound and the strength of the vibrations that produced it. • recognise that sounds get fainter as the distance from the sound source increases	• Ask questions • Variables • Causal relationships • Testing (fair or comparative)
Science Block: Rocks (chemistry) Year A	
Knowledge	**Investigative Focus**
• Compare and group together different kinds of rocks on the basis of their simple, physical properties • Relate the simple physical properties of some rocks to their formation (igneous or sedimentary). • Describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock. • Recognise that soils are made from rocks and organic matter.	• Observation • Identify differences, similarities, and changes • Conclusions & Explanations
Science Block: Light (physics) Year A	
Knowledge	**Investigative Focus**
• Recognise that they need light in order to see things and that dark is the absence of light.	• Observation • Measuring • Recording

• Notice that light is reflected from surfaces. • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • Recognise that shadows are formed when the light from a light source is blocked by a solid object. • Find patterns in the way that the size of shadows change.	• Report and present findings
Science Block: Electricity (physics) Year B	
Knowledge	**Investigative Focus**
• identify common appliances that run on electricity • construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery • recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • recognise some common conductors and insulators, and associate metals with being good conductors.	• Hypothesising • Testing (fair and comparative – planning our own) • Variables • Causal relationships
Science Block: Forces and Magnets (physics) Year B	
Knowledge	**Investigative Focus**
• compare how things move on different surfaces • notice that some forces need contact between 2 objects, but magnetic forces can act at a distance • know how magnets attract or repel each other and attract some materials and not others • compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials • describe magnets as having 2 poles • predict whether 2 magnets will attract or repel each other, depending on which poles are facing	• Observation • Testing (fair and comparative) • Variables • Conclusions and Explanations
Science Block: Animals Including Humans (biology) Year B	
Knowledge	**Investigative Focus**
• Identify that animals, including humans, need the right types and amounts of nutrition, that they cannot make their own food and they get nutrition from what they eat. • Construct and interpret a variety of food chains, identifying producers, predators and prey. • Identify that humans and some animals have skeletons and muscles for support, protection and movement. • Describe the simple functions of the basic parts of the digestive system in humans. • Identify the different types of teeth in humans and their simple functions.	• Ask questions • Identify differences, similarities and changes • Report and present findings

Science Block: Plants, Living Things & Habitats (biology) Year B	
Knowledge	**Investigative Focus**
• Identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers. • Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. • Investigate the way in which water is transported within plants. • Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. • Recognise that living things can be grouped in a variety of ways. • Explore and use classification keys. • Recognise that environments can change and that this can sometimes pose dangers to specific habitats.	• Observation • Testing • Variables • Recording • Measuring

Upper KS2

Science Block: Forces & Magnets (physics) Year A	
Knowledge	**Investigative Focus**
Magnets • Describe magnets as having two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing. **Forces** • Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. • Identify the effect of drag forces, such as air resistance, water resistance and friction that act between moving surfaces. • Describe, in terms of drag forces, why moving objects that are not driven tend to slow down. • Understand that force and motion can be transferred through mechanical devices such as gears, pulleys, levers and springs. • Understand that some mechanisms including levers, pulleys and gears, allow a smaller force to have a greater effect.	• Hypotheses (KS2) • Testing (fair or comparative) • Measuring • Causal Relationships
Science Block: Properties of materials & changes (chemistry) Year A	
Knowledge	**Investigative Focus**
Chemistry • Compare and group together everyday materials based on evidence from comparative and fair tests, including their hardness, solubility, conductivity (electrical and thermal), and response to magnets. • Understand how some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution. • Use knowledge of solids, liquids and gases to decide how mixtures might be	• Variables • Recording • Conclusions & Explanations • Identify similarities, differences and changes

separated, including through filtering, sieving and evaporating. • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. • Demonstrate that dissolving, mixing and changes of state are reversible changes. • Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning, oxidisation and the action of acid on bicarbonate of soda.	
Science Block: Animals including Humans (biology) Year A	
Knowledge	**Investigative Focus**
To Understand animals and humans • Describe the changes as humans develop to old age. • Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. • Recognise the importance of diet, exercise, drugs and lifestyle on the way the human body functions. • Describe the ways in which nutrients and water are transported within animals, including humans	• Observation • Conclusions & Explanations • Report & Present Findings • Causal Relationships • Measuring
Science Block: Electricity (physics) Year A	
Knowledge	**Investigative Focus**
• **To understand electrical circuits** • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. • 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. • Use recognised symbols when representing a simple circuit in a diagram.	• Hypotheses (KS2) • Testing (fair or comparative) • Variables • Report & Present Findings
Science Block: Earth & Space (physics) Year B	
Knowledge	**Investigative Focus**
Earth and Space • describe the movement of the Earth and other planets relative to the sun in the solar system • describe the movement of the moon relative to the Earth • describe the sun, Earth and moon as approximately spherical bodies • use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	• Observation • Ask Questions • Conclusions & Explanations • Identify differences, similarities, and changes
Science Block: Light (physics) Year B	
Knowledge	**Investigative Focus**
• To understand light and seeing • Understand that light appears to travel in straight lines.	• Hypotheses (KS2) • Testing (fair or comparative) • Variables • Recording

• Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eyes. • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them, and to predict the size of shadows when the position of the light source changes. • 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.	
Science Block: Living Things (biology) Year B	
Knowledge	**Investigative Focus**
• To investigate living things • Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. • Describe the life process of reproduction in some plants and animals. • Describe how living things are classified into broad groups according to common observable characteristics. • Give reasons for classifying plants and animals based on specific characteristics.	• Observation • Conclusions & Explanations • Report & Present Findings • Identify differences, similarities, and changes
Science Block: Evolution & Inheritance (biology) Year B	
Knowledge	**Investigative Focus**
To understand evolution and inheritance • Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. • Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to	• Observation • Ask Questions • Report & Present Findings • Identify differences, similarities, and changes