



TELFORD JUNIOR SCHOOL – SCIENCE CURRICULUM



KEY CONCEPTS	YEAR 3	YEAR 4	YEAR 5	YEAR 6
<p>Scientific Knowledge</p>	<p><u>Plants</u></p> <p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>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</p> <p>Investigate the way in which water is transported within plants</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p> <p><u>Rocks</u></p> <p>Compare and group together different kinds of rocks on the</p>	<p><u>Electricity</u></p> <p>Identify common appliances that run on electricity.</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</p> <p>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.</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p>	<p><u>Earth and Space</u></p> <p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>Describe the movement of the Moon relative to the Earth.</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies.</p> <p>Use the idea of the Earth’s rotation to explain day and night, and the apparent movement of the sun across the sky.</p> <p><u>Forces</u></p> <p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p>	<p><u>Living things and habitats</u></p> <p>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</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p> <p><u>Animals inc humans</u></p> <p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p>



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	<p>basis of their appearance and simple physical properties</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock</p> <p>Recognise that soils are made from rocks and organic matter</p> <p><u>Forces & Magnets</u></p> <p>Compare how things move on different surfaces</p> <p>Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance</p> <p>Observe how magnets attract or repel each other and attract some materials and not others</p> <p>Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and</p>	<p><u>Sound</u></p> <p>Identify how sounds are made, associating some of them with something vibrating.</p> <p>Recognise that vibrations from sounds travel through a medium to the ear.</p> <p>Find patterns between the pitch of a sound and features of the object that produced it.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Recognise that sounds get fainter as the distance from the sound source increases.</p> <p><u>States of Matter</u></p> <p>Compare and group materials together, according to whether they are solids, liquids or gases.</p>	<p>Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.</p> <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.</p> <p><u>Living things including humans and their habitats</u></p> <p>Describe the life process of reproduction in some plants and animals.</p> <p>Describe the changes as humans develop to old age.</p> <p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p><u>Properties of materials</u></p> <p>Compare and group together everyday materials on the basis of their properties,</p>	<p><u>Electricity</u></p> <p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</p> <p>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.</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p> <p><u>Evolution</u></p> <p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>Recognise that living things produce offspring of the same</p>
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	<p>identify some magnetic materials</p> <p>Describe magnets as having 2 poles</p> <p>Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.</p> <p><u>Animals including humans.</u></p> <p>Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p> <p><u>Light</u></p> <p>Recognise that they need light in order to see things and that dark is the absence of light</p>	<p>Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> <p><u>Animals inc humans.</u></p> <p>Describe the simple functions of the basic parts of the digestive system in humans.</p> <p>Identify the different types of teeth in humans and their simple functions.</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p>	<p>including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes.</p>	<p>kind, but normally offspring vary and are not identical to their parents.</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p> <p><u>Light</u></p> <p>Recognise that light appears to travel in straight lines.</p> <p>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.</p> <p>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.</p> <p>Use the idea that light travels in straight lines to explain why</p>
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	<p>Notice that light is reflected from surfaces</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p>Recognise that shadows are formed when the light from a light source is blocked by a solid object</p> <p>Find patterns in the way that the size of shadows change.</p>	<p>All living things</p> <p>Recognise that living things can be grouped in a variety of ways.</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p>	<p>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 and the action of acid on bicarbonate of soda.</p>	<p>shadows have the same shape as the objects that cast them.</p>
<p>Working Scientifically</p>	<p>Years 3 and 4 Overview</p> <ol style="list-style-type: none">1. Asking relevant questions and using different types of scientific enquiries to answer them.2. Setting up simple practical enquiries, comparative and fair tests.3. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.4. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.5. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.6. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.7. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.8. Identifying differences, similarities or changes related to simple scientific ideas and processes.9. Using straightforward scientific evidence to answer questions or to support their findings.			



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Year 3

Plants

Rocks

Forces & Magnets

Animals including humans.

Light

Year 4

Electricity

Which materials conduct electricity? 1, 2, 5, 6, 7

Investigating circuits working – light – apply predictions to other circuits.

Making a circuit with a switch?

Sound

Creating a sound map of telford junior school - Measure sound levels in different locations around the school using data loggers. – 3 and 5

Make our guitars – length and thickness, tautness of string - Investigate how to alter pitch – Find patterns between the pitch of a sound and features of the object that produced it. – 3, 7

Investigating how sound travels (string phones)

States of Matter

Wilson Bentley research (snowflake photographer – classifying)

Which solids change state when heated? How long do they take to change state? Reversible irreversible 1, 2,3,4,5,6,7,8,9

Create miniature Water Cycle models - 3,8,9

Evaporation/condensation – observation



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Exploring properties of solid/liquid/gases

Animals inc humans.

Investigation – research – how digestive system works demo

Which drinks cause tooth decay? – 1, 3, 6, 7

Identify types of teeth and compare to animals teeth -

Living things and their habitats

Do different insects live in different places? – Compare habitats and what can be found there.

Research that environments can change and that this can sometimes pose dangers to living things.

Years 5 and 6 Overview

1. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
2. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision.
3. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs.
4. Using test results to make predictions to set up further comparative and fair tests.
5. Using simple models to describe scientific ideas.
6. Reporting findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions.
7. Presenting findings in written form, displays and other presentations.
8. Identifying scientific evidence that has been used to support or refute ideas or arguments.

Year 5

Earth and Space

Investigate sources of evidence to explain the shape of the Earth. (5,6,7,8)

Recording a Moon Diary (3,5,7)

Understand the relative sizes/distances of ESM. (5,8)



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Investigate how shadows change during the day. (2,5,6,7)
Investigate the motion of the Earth and how this links to day and night patterns. (5,6,7)
Investigate how the amount of sunlight hours changes throughout the year and why. (3,5,6,8)
Explore how the phases of the Moon are created. (5,6)

Forces & Simple machines

Explore Gravity and how it can change including the connection between mass and weight. (2,3,4)
Explore different types of simple machine and different lever arrangements. (2,3,6,7)
Investigate cogs/gears and pulleys as simple machines. (2,3,6)
Understand and investigate friction as a force. (1,2,3,4,6,7)
Plan an investigation into the best Gyrocopter. (1,2,3,4,6,7)

Living things including humans and their habitats

What does a seed need to germinate? (1,2,3,4,6)
Understand and compare the lifecycles of amphibians, insects, birds and mammals. (6,7)

Properties of materials

Classify materials by comparing properties. (3,5,7)
What is the best material to insulate a potato. (1,2,3,4,6,7)
Investigate melting/solidifying points in materials. (1,3,6)
Explore methods to separate a range of solids. (6,7)
What happens when solids and liquids are mixed. (1,2,4,7)
Explore the difference between melting and dissolving. (3,6)
Investigate into what can affect rusting. (1,2,3,4,6,7)

Year 6

Living things and their habitat

- We consider the varying ways that living things can be classified using different criteria.
- We research the history of classification with emphasis on the life and achievements of Carl Linnaeus.
- Using leaves, we examine the different characteristics of specimens to understand how plants are classified.
- We learn how animals are classified – we begin with simple observable characteristics and move onto more complex classification.
- We create our own woodland invertebrates classification system.



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- Learning moves onto understanding bacteria = where we conduct an experiment to find the best conditions to make yeast grow.

Animals inc humans

- We learn all about the human circulatory system.
- We learn about the functions of the heart and the lungs and detailed diagrams are labelled.
- We learn about the components of blood and replicate it using different ingredients (each ingredient representing a component).
- Children actively play the role of oxygenated and deoxygenated blood and how it moves around the body – this is carried out in the playground on an oversize chalk body, drawn on the playground.
- Children investigate what happens to the heart when we exercise via hypothesis, investigation, recording and explaining.
- We learn about healthy bodies and the impact of diet, exercise and harmful substances.

Electricity

- Children are reminded of the symbols that are used when representing parallel and series circuits on a diagram.
- Children plan and design a model of a set design for a scene in *Clockwork*, (the text that we are studying in English).

Children construct a parallel or series circuit in a shoebox, to light their model of a set design.

Evolution and Inheritance

- Children bring in family photographs to examine and identify the characteristics that they may have inherited from their parents and grandparents.
- Children choose an environment and consider the conditions of the habitats. They research a living organism that lives in the environment and identify the organism's advantageous characteristics and how it has adapted to survive.
- Children learn about Charles Darwin to understand the impact that his research has had on our understanding on evolution.
- Children play a *Blob game* to understand how adaptation can lead to evolution.

Children learn how humans have evolved over time and make predictions, (with explanations) as to how they will evolve in the future.

Light