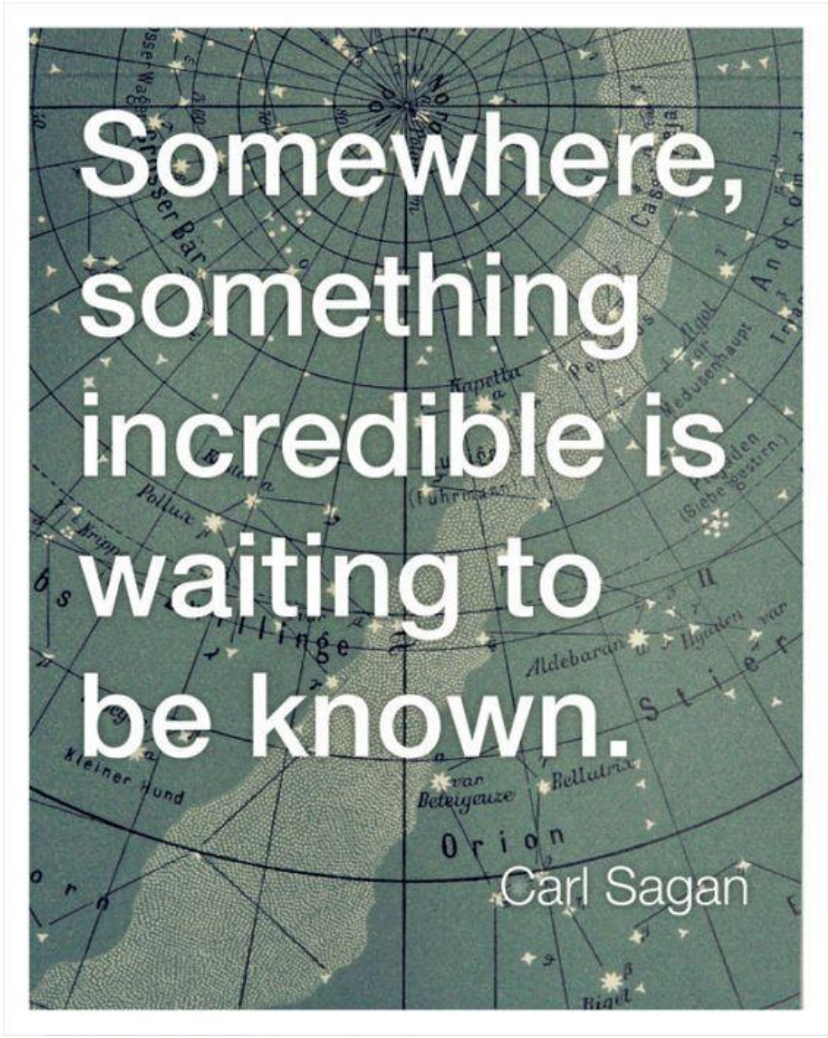

Somewhere,
something
incredible is
waiting to
be known.
Carl Sagan

SCIENCE

Science Intent

Why do we teach science?

At Westende Junior School, we recognise the importance of science in every aspect of daily life. As one of the core subjects taught in Primary Schools, we give the teaching and learning of science the prominence it requires.

The science curriculum aims to **help children develop basic scientific ideas and understanding about the biological and physical aspects of the world**, and the processes through which they develop this knowledge and understanding.

What is the aim of our curriculum for science?

The Scientific area of learning is concerned with increasing pupils' knowledge and understanding of our world, and with developing skills associated with science as a process of enquiry. It will develop the natural curiosity of the child, encourage respect for living organisms as well as the physical environment, and provide opportunities for critical evaluation of evidence

Science Intent

What do we teach in our science curriculum?

Years 3 & 4

In Year 3, the children will learn about:

- Rocks (fossils and soils)
- Light (reflection and shadows)
- Magnets & Forces (magnetic materials, attracting and repelling)
- Life Cycles (plants)
- Animals including humans (skeletons, muscles and nutrition)
- Habitats (homes and food chains)

In Year 4, the children will learn about:

- Habitats (classification keys)
- Sound (vibration, pitch and volume)
- Electricity (simple circuits, insulators and conductors)
- Animals including humans (digestion, teeth and food chains)
- States of matter (changes of state, evaporation and condensation)

Years 5 & 6

In Year 5, the children will learn about:

- Earth and Space (Earth, Sun, Moon and the Solar System)
- Forces (gravity, air resistance, water resistance and friction)
- Materials (dissolving, separating materials, reversible and irreversible changes)
- Living things and their habitats (life cycles and reproduction in humans and plants)
- Animals including humans (human development from birth to old age)

In Year 6, the children will learn about:

- Electricity (voltage and power in circuits, circuit components, symbols and diagrams)
- Light (how it travels, how we see, shadows)
- Evolution and inheritance (how living things have changed over time, fossils, dinosaurs, adaptation to environment)
- Living things and their habitat (classification, characteristics of plant and animal groups)
- Animals including humans (circulatory system, diet and exercise, healthy living)

Science Implementation

How is science taught at Westende Junior School?

In conjunction with the aims of the National Curriculum, our science teaching offers opportunities for children to:

- develop scientific knowledge and conceptual understanding
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them;
- be equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.
- develop the essential scientific enquiry skills to deepen their scientific knowledge.
- use a range of methods to communicate their scientific information and present it in a systematic, scientific manner, including I.C.T., diagrams, graphs and charts.
- develop a respect for the materials and equipment they handle with regard to their own, and other children's safety.
- develop an enthusiasm and enjoyment of scientific learning and discovery.

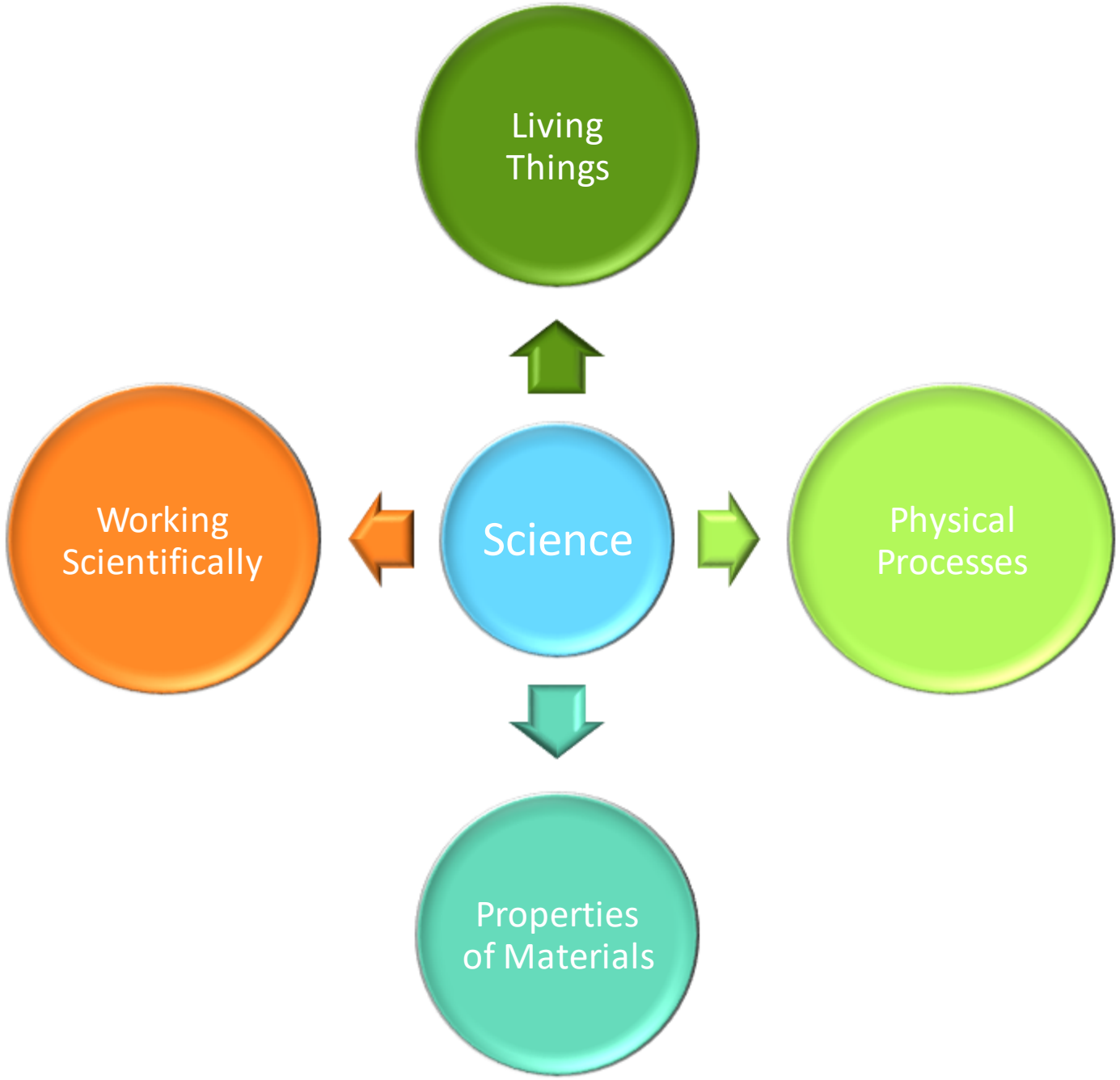
The National Curriculum will provide a structure and skill development for the science curriculum being taught throughout the school, which is now linked, where possible, to the year group topics to provide a more creative curriculum, which reflects a balanced programme of study.

Here at Westende Junior school, children have weekly lessons in science, using various methods of study and resources. Additional opportunities are provided in science, such as Science weeks/days in school and educational visits linked to the science curriculum, such as visits to 3M and Marwell Zoo.

Science Content Spine

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Yr 3	Properties of Materials	Physical Processes	Physical Processes	Living Things	Living Things	Scientists and Inventors
	Rocks and Soil	Light and Shadow	Forces and Magnets	Animals including Humans	Plants	
Yr 4	Living Things	Living Things		Properties of Materials	(Physical Processes)	Physical Processes Living Things
	Living things and their habitats	Animals including humans		States of Matter	Sound	Electricity SRE
Yr5	Physical Processes	Properties of Materials	Physical Processes	Living Things	Living Things	Scientists and Inventors
	Forces	Materials and their properties	Space	Life Cycles	Animals including Humans	Smashing Stereotypes
Yr 6		(Living things)	(Living things)	((Living things) (Properties f materials)	(Living things)	(Living things)
		How we see things	Evolution	Animals in their habitats STEM Project	Animals in their habitats	Sex and relatoinships education

Science
Key Concepts



Science Progression Map – Living Things

Life Proesses	Humans And Other Animals	Green Plants	Variation & Classification
3	• 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; • identify that humans and some other animals have skeletons and muscles for support, protection and movement	• identify and describe the functions of different parts of flowering plants: roots, stem/trunk, 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 part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	
4	• 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; • identify that humans and some other animals have skeletons and muscles for support, protection and movement.		• recognise that living things can be grouped in a variety of ways; • explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment: • recognise that environments can change and that this can sometimes pose dangers to living things.

Science Progression Map – Living Things

	Life Proesses	Humans And Other Animals	Green Plants	Variation & Classification
5	• 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 the changes as humans develop to old age		
6	• 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 their parents; • identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	• identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood; • recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies' function; • describe the ways in which nutrients and water are transported within animals, including humans.		• 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; • give reasons for classifying plants and animals based on specific characteristics.

Science Progression Map – Properties of Materials

	Grouping and Classifying Materials	Changing Materials	Separating Materials
3	• compare and group together different kinds of rocks on the basis of their appearance and simple physical properties; • describe in simple terms how fossils are formed when things that have lived are trapped within rock; • recognise that soils are made from rocks and organic matter.		
4	• 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 or research the temperature at which this happens in degrees Celsius (°C); • identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	

Science Progression Map – Properties of Materials

	Grouping and Classifying Materials	Changing Materials	Separating Materials
5	• compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets; • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic;	• know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution; • 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 and the action of acid on bicarbonate of soda.	• use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating;
6			

Science Progression Map – Forces

	Electricity	Forces	Light and Sound	Earth and Space
3	• dentify 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.	• compare how things move on different surfaces; • notice that some forces need contact between 2 objects, but magnetic forces can act at a distance; • observe 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.	• recognise that they need light in order to see things and that dark is the absence of light; • 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 an opaque object; • find patterns in the way that the size of shadows change.	

Science Progression Map – Forces

	Electricity	Forces	Light and Sound	Earth and Space
4			• 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.	

Science Progression Map – Forces

Electricity	Forces	Light and Sound	Earth and Space
5	• explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object; • identify the effects of air resistance, water resistance and friction, that act between moving surfaces; • recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.		• 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.

Science Progression Map – Forces

	Electricity	Forces	Light and Sound	Earth and Space
6	• 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		• recognise that light appears to travel in straight lines; • 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; • 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; • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	

Science Progression Map – Working Scientifically

	Ideas and Evidence in Science	Planning	Obtaining and Presenting Evidence	Considering Evidence and Evaluating
3	• Recognise why it is important to collect data to answer questions.	• Act on suggestions and put forward my own ideas about how to find the answer to a question. • Carry out a fair test and explain why it was fair. • Predict what might happen before I carry out any tests using scientific reasoning. • Measure length, mass, time and temperatures using suitable equipment.	• Use scientific vocabulary to describe my observations. • Make relevant observations and measure quantities, such as length or mass, using a range of simple equipment. • Record my observations, comparisons and measurements using tables, charts, text and labelled diagrams.	• Give reasons for observations. • Look for patterns in my data and try to explain them. • Suggest how make improvements to my work.
4	• Recognise that scientific ideas are based on evidence.	• Decide on the most appropriate approach to an investigation (e.g. a fair test) to answer a question. • Describe how to vary one factor while keeping others the same. • Make predictions. • Select which information to use from sources provided for me (print and screen). • Begin to identify risks in investigations.	• Make observations using materials and equipment that are right for the task. • Record my observations using tables and bar charts. • Pot points to make line graphs.	• Use data to interpret patterns in my data. • Consider how changing one variable can alter another and use the convention of 'er' words to describe this (eg. the heavier the load, the longer the spring). • Relate conclusions to these patterns. • Use appropriate scientific language. • Suggest improvements to my work and give reasons.

Science Progression Map – Working Scientifically

	Ideas and Evidence in Science	Planning	Obtaining and Presenting Evidence	Considering Evidence and Evaluating
5	• Describe how experimental evidence and creative thinking have been combined to provide a scientific explanation. (eg. Jenner's work on vaccination.)	• Find an appropriate approach when trying to answer a question. • Select from a range of sources of information. • When investigation involves a fair test, I find the key factors to be considered. • Make predictions based on my scientific knowledge and understanding.	• Select apparatus and plan to use it effectively. • Make a series of observations, comparisons or measurements with precision. • Use the computer to collect data • Record observations and measurements systematically. • Use appropriate scientific language and conventions to communicate data.	• Repeat observations and measurements and offer explanations for any differences I encounter. • Draw conclusions that are consistent with the evidence and relate these to scientific knowledge. • Make practical suggestions about how my working methods can be improved.
6	• Describe evidence for some accepted scientific ideas and explain how the interpretation of evidence by scientists leads to the development and acceptance of new ideas.	• Use scientific knowledge and understanding to identify an appropriate approach. • Select and use sources of information effectively.	• Make enough measurements, comparisons and observations for the task. • Measure a variety of quantities with precision, using instruments with fine-scale divisions. • Choose scales for graphs and diagrams that enable me to show data and features effectively. • Select and use appropriate methods for communicating qualitative and quantitative data	• Identify measurements and observations that do not fit the main pattern shown. • Draw conclusions that are consistent with the evidence and use scientific knowledge and understanding to explain them. • Make reasoned suggestions about how their working methods could be improved.

Science Progression Map – Scientists and inventors

3	• Find out about people who have found recent fossils, as well as famous archaeologists, like Mary Anning. • Wilhelm Roentgen who discovered X-rays.
4	• Learn about Thomas Edison and how he invented the telephone; • Rachel Carson and her investigations into the polluting effect of pesticides; • George Washington Carver and how he discovered many ways of using peanuts.
5	• find out about the work of naturalists and animal behaviourists (non-statutory), such as David Attenborough; • describe how scientific ideas have changed over time (non-statutory). • Look at how various scientists, over hundreds of years from all different cultures, have added to our understanding of the solar system, including Brian Cox, Dorothy Johnson Vaughan and Mae Carol Jemison.
6	• Alhazen and the discoveries he made on optics and the eye; • Louis Pasteur and his discovery of bacteria; • Marie M Day and her discoveries about how diet affects the circulatory system; • Percy Julian and how he chemically synthesized medicinal drugs from plants.