

Talbot 20-20 Curriculum - Science

In our Science curriculum, there are **key threads** that run through and across year groups. These threads will be explored across the academic journey of a Talbot Child.

Each thread is underpinned by **key concepts and vocabulary** that will be explicitly taught in Science.

The key threads are detailed below, in addition to the concepts and vocabulary that will be explicitly taught within each year group. There follows an overview organised by academic year group, which lists the area of study, an overarching question, the key concepts, a precis of the unit, including the skills and knowledge from the National Curriculum. The greater detail of the taught curriculum can be found in the individual knowledge organisers for each unit of study.

Colour coded units of work highlight which areas of the fundamental areas of Science are being covered.

Biology

Chemistry

Physics

Key Threads

Plants	Animals including humans	Forces	Earth and Space	Properties and changes of Materials including states of matter	Living things and their environments	Evolution	Classification and identification	Working Scientifically (integrated)
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Key Concepts & Vocabulary

Yr	Science knowledge	Working scientifically
1	Parts of a plant; Parts of the body; Identify, compare and sort materials; Identify common animals; Seasonal change	- asking simple questions and recognising that they can be answered in different ways - observing closely, using simple equipment - performing simple tests - identifying and classifying - using their observations and ideas to suggest answers to questions - gathering and recording data to help in answering questions.
2	Plants; Habitats; Animals including humans; Uses of everyday materials	- asking simple questions and recognising that they can be answered in different ways - observing closely, using simple equipment - performing simple tests - identifying and classifying - using their observations and ideas to suggest answers to questions - gathering and recording data to help in answering questions.
3	Plants; Animals including humans; Rocks; Light; Forces and Magnetism	- asking relevant questions and using different types of scientific enquiries to answer them - setting up simple practical enquiries, comparative and fair tests - making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers - gathering, recording, classifying and presenting data in a variety of ways to help in answering questions - recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables - reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions - using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions - identifying differences, similarities or changes related to simple scientific ideas and processes - using straightforward scientific evidence to answer questions or to support their findings.
4	Living Things; Animals including humans; Classification; States of Matter; Sound; Electricity	- asking relevant questions and using different types of scientific enquiries to answer them - setting up simple practical enquiries, comparative and fair tests - making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers - gathering, recording, classifying and presenting data in a variety of ways to help in answering questions - recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables - reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions - using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions - identifying differences, similarities or changes related to simple scientific ideas and processes - using straightforward scientific evidence to answer questions or to support their findings.
5	Living Things and their habitats; Animals; including humans; Properties and Changes of Materials; Earth and Space; Forces	- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary - taking measurements, using a range of scientific equipment, with increasing accuracy and precision - recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs - using test results to make predictions to set up further comparative and fair tests - reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations - identifying scientific evidence that has been used to support or refute ideas or arguments.
6	Living Things and their habitats; Animals including humans; Evolution; Light; Electricity	- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary - taking measurements, using a range of scientific equipment, with increasing accuracy and precision - recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs - using test results to make predictions to set up further comparative and fair tests - reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations - identifying scientific evidence that has been used to support or refute ideas or arguments.

Key Stage One

SCIENCE CURRICULUM CONTENT

- The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.
- Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

WORKING SCIENTIFICALLY

Pupils in year 1 should explore the world around them and raise their own questions. They should experience different types of scientific enquiries, including practical activities, and begin to recognise ways in which they might answer scientific questions. They should use simple features to compare objects, materials and living things and, with help, decide how to sort and group them, observe changes over time, and, with guidance, they should begin to notice patterns and relationships. They should ask people questions and use simple secondary sources to find answers. They should use simple measurements and equipment (for example, hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out. With help, they should record and communicate their findings in a range of ways and begin to use simple scientific language.

Lower Key Stage Two

SCIENCE CURRICULUM CONTENT

- In Key Stage Two, pupils will be exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.
- Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

WORKING SCIENTIFICALLY

Pupils in years 3 & 4 should be given a range of scientific experiences to enable them to raise their own questions about the world around them. They should start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help to decide how to set it up; talk about criteria for grouping, sorting and classifying; and use simple keys. They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. They should help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. They should learn how to use new equipment, such as data loggers, appropriately. They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done. They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences.

Upper Key Stage Two

SCIENCE CURRICULUM CONTENT

- The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.
- Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

WORKING SCIENTIFICALLY

Pupils in years 5 & 6 should use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. They should use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment. They should make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately. They should decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas. They should use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.

Science 20-20 curriculum - Key Stage 1

Explicit vocabulary taught across all units of work: KS1 Science - To use a wide vocabulary of everyday scientific terms.

Year 1		Overarching Question	Key Concepts	Precis
Aut 1	States of matter	KQ: How can I sort materials?	Hardness, Flexibility, Transparent, Opaque Translucent	<p>Pupils should explore, name, discuss and raise and answer questions about everyday materials so that they become familiar with the names of materials and properties.</p> <ul style="list-style-type: none"> 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
Aut 2				
Spr 1				
Spr 2	Plants	KQ : What plant is this?	Deciduous, Evergreen, Environment, Common Rare, Wild/Cultivated, Petal, stem, leaf, root, flower ,fruit, seed	<p>Pupils should use the local environment throughout the year to explore and answer questions about plants growing in their habitat. Where possible, they should observe the growth of flowers and vegetables that they have planted.</p> <ul style="list-style-type: none"> identify and name a variety of common wild and garden plants, including deciduous and evergreen trees <p>identify and describe the basic structure of a variety of common flowering plants, including trees</p>
Sum 1	Animals including humans	KQ: What animal is this?	Fish, Reptile, Amphibian, mammal, bird, Carnivore, herbivore, omnivore, Senses	<p>Pupils should use the local environment throughout the year to explore and answer questions about animals in their habitat. They should understand how to take care of animals taken from their local environment and the need to return them safely after study.</p> <ul style="list-style-type: none"> identify and name a variety of common animals including, fish, amphibians, reptiles, birds and mammals 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 (fish, amphibians, reptiles, birds and mammals including pets) <p>identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p>

Year 1	Overarching Question	Key Concepts	Precis
Sum 2	Animals including humans	KQ: What animal is this?	Fish, Reptile, Amphibian, mammal, bird, Carnivore, herbivore, omnivore, Senses Pupils should use the local environment throughout the year to explore and answer questions about animals in their habitat. They should understand how to take care of animals taken from their local environment and the need to return them safely after study. <ul style="list-style-type: none"> • identify and name a variety of common animals including, fish, amphibians, reptiles, birds and mammals • 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 (fish, amphibians, reptiles, birds and mammals 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.
Across the year	Seasonal change	KQ: How does the tree outside my window change over the year?	Winter, spring, summer, autumn, Daylight, Day length Pupils should observe and talk about changes in the weather and the seasons. <i>Note: pupils should be warned that it is not safe to look directly at the sun, even when wearing dark glasses.</i> <ul style="list-style-type: none"> • observe changes across the 4 seasons • observe and describe weather associated with the seasons and how day length varies.

Year 1 Assessment Fundamentals - The following skills and knowledge should be secure for all pupils by the end of Year One

SCIENCE	WORKING SCIENTIFICALLY
<ul style="list-style-type: none"> • Identify and name common plants and their structure • Name and compare common animal groups • Identify and label the human senses • Describe, compare and group everyday objects using what its made from and its characteristics • Describe seasonal changes 	<ul style="list-style-type: none"> • Ask questions based on observations • Use simple recording equipment • Perform simple tests (eg floating/sinking)

Science 20-20 curriculum KS1

Explicit vocabulary taught across all units of work: KS1 Science - To use a wide vocabulary of everyday scientific terms.

Year 2		Overarching Question	Key Concepts	Precis
Aut 1 and 2	Materials	KQ: Why should I use this material?	Force, Friction, Solid, Liquid, Gas	<p>Pupils should identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing or different materials are used for the same thing. They should think about the properties of materials that make them suitable or unsuitable for particular purposes and they should be encouraged to think about unusual and creative uses for everyday materials.</p> <ul style="list-style-type: none"> • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for different uses • compare how things move on different surfaces. <p>find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</p>
Spr 1				
Spr 2	Habitats	KQ: Why do organisms live where they do?	Living, Deceased, Habitat, Environment, Organisms, Ecosystem Food chain, Microhabitat	<p>Pupils should be introduced to the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'microhabitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter). They should raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat and observe how living things depend on each other.</p> <ul style="list-style-type: none"> • explore and compare the differences between things that are living, dead, and things that have never been alive • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other • identify and name a variety of plants and animals in their habitats, including microhabitats • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.

Year 2		Overarching Question	Key Concepts	Precis
Sum 1	Plants	KQ: What do healthy plants need to grow ?	Seedling, Mature, Nutrients, Temperature	<p>Pupils should use the local environment throughout the year to observe how plants grow. Pupils should be introduced to the requirements of plants for germination, growth and survival, as well as the processes of reproduction and growth in plants.</p> <ul style="list-style-type: none"> observe and describe how seeds and bulbs grow into mature plants find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.
Sum 2	Animals including humans	KQ: What do we need to survive?	Offspring/reproduction, Exercise, Hygiene, Diet	<p>Pupils should be introduced to the basic needs of animals for survival, as well as the importance of exercise and nutrition for humans. They should also be introduced to the processes of reproduction and growth in animals. The focus at this stage should be on questions that help pupils to recognise growth; they should not be expected to understand how reproduction occurs.</p> <ul style="list-style-type: none"> notice that animals, including humans, have offspring which grow into adults find out about 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.

Year 2 Assessment Fundamentals - The following skills and knowledge should be secure for all pupils by the end of Year Two

SCIENCE

- Identify a range of habitats and the organisms that live within them and why
- Observe and describe how plants grow (including bulbs) and their requirements
- Describe the needs of animals for survival and that animals reproduce
- Identify, describe and sort everyday materials based on their uses
- Describe how materials can be changed using force

WORKING SCIENTIFICALLY

- Ask questions based on observations
- Use simple recording equipment
- Perform simple tests (eg floating/sinking)

Science 20/20 curriculum – KS2

Scientific vocabulary explicitly taught across all units of work KS2 – to use an increasing range of scientific vocabulary and terminology confidently and accurately

Year 3		Overarching Question	Key Concepts	Precis
Aut 1	Light	KQ: What makes a shadow?	Photons, Reflective Shadow, Opaque Transparent, Translucent	<p>Pupils should explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves.</p> <ul style="list-style-type: none"> 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 a solid object find patterns in the way that the size of shadows changes.
Aut 2	Magnetism	KQ: Are the biggest magnets the strongest?	Magnetism	<p>Pupils should observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary. They should explore the behaviour and everyday uses of different magnets.</p> <ul style="list-style-type: none"> 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
Spr 1 and 2	Rocks	KQ: Why are rocks different?	Igneous, Metamorphic Sedimentary, Fossilisation, Solubility	<p>Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment.</p> <ul style="list-style-type: none"> 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.

Year 3	Overarching Question	Key Concepts	Precis
Sum 1	Plants	KQ: Plants. Do we need them? Pollination, Germination Seed Dispersal, Seed Formation, Fertilisation Xylem/Phloem	Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. <ul style="list-style-type: none"> 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
Sum 2	Bones, muscles and nutrition	KQ: How do we move? Nutrition, Diet, Eat well plate, Skeleton, Bones Cartilage, Muscles, Endo-Exo- and Hydrostatic skeletons	Pupils should continue to learn about the importance of nutrition and should be introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions. <ul style="list-style-type: none"> 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

Year 3 Assessment Fundamentals - The following skills and knowledge should be secure for all pupils by the end of Year Three

SCIENCE

- Name and group different rocks according to their appearance
- Describe how fossils are formed
- Know that soil comes from rock
- Light allows us to see and comes from many sources and produces shadows
- The sun can be dangerous and we need to protect ourselves from it
- Identify parts of a plant and their requirements for healthy growth
- Describe the lifecycle of a plant
- Magnetism is an invisible force that will either attract or repel certain materials
- Name the basic bones and muscles of the skeleton and know the requirements for a healthy lifestyle

WORKING SCIENTIFICALLY

- Design and set up their own tests to answer their own questions
- Make and record measurements accurately using a range of equipment including thermometers and dataloggers
- Record results using a range of models and tables
- Draw conclusions from results based on their observations, findings and knowledge
- Answer questions based on evidence to support their conclusions

Science 20/20 curriculum – KS2

Scientific vocabulary explicitly taught across all units of work KS2 – to use an increasing range of scientific vocabulary and terminology confidently and accurately

Year 4	Overarching Question	Key Concepts	Precis
Aut 1	Teeth and Digestion	KQ: How do we process food?	<p>Ingestion, Digestion Absorption, Excretion, Food chains, Ecosystem, Producers, predators and prey</p> <p>Pupils should be introduced to the main body parts associated with the digestive system, for example: mouth, tongue, teeth, oesophagus, stomach, and small and large intestine, and explore questions that help them to understand their special functions</p> <ul style="list-style-type: none"> 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 construct and interpret a variety of food chains, identifying producers, predators and prey.
Aut 2	Electricity	KQ: What is electricity and how do we use it?	<p>Electrons, Circuit Power Components, Conduction, Insulation</p> <p>Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices.</p> <ul style="list-style-type: none"> 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.
Spr 1	States of matter	KQ: How can this material be changed?	<p>Evaporation, Condensation, Boiling, Melting</p> <p>Pupils should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled.</p> <ul style="list-style-type: none"> 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.

Year 4		Overarching Question	Key Concepts	Precis
Spr 2	Sound	KQ: How do we hear sounds?	Vibration, Wave, Volume, Pitch	<p>Pupils should explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways.</p> <ul style="list-style-type: none"> • 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
Sum 1 and 2	Classification and habitats	KQ: What effects our environment?	Classify, Identify Environment, Climate, Pollution	<p>Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. They should identify how the habitat changes throughout the year. Pupils should explore possible ways of grouping a wide selection of living things that include animals, flowering plants and non-flowering plants. Pupils could begin to put vertebrate animals into groups, for example: fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects.</p> <ul style="list-style-type: none"> • Recognise that environments can change and that this can sometimes pose dangers to living things. • 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

Year 4 Assessment Fundamentals - The following skills and knowledge should be secure for all pupils by the end of Year Four

SCIENCE

- Can use scientific keys accurately
- Name and classify a range of organisms from different habitats
- Name and describe the process of ingestion and digestion
- Construct simple food chains and identify producers, predators and prey
- Compare, group and describe solid, liquids and gases
- Observe and describe changes of state and the temperature it occurs
- Describe how sound is made, travels and is changed
- Identify sources of electricity and appliances that use it
- Construct a complete circuit and describe what is needed
- Identify conductors and insulators
- Know the dangers of electricity

WORKING SCIENTIFICALLY

- Design and set up their own tests to answer their own questions
- Make and record measurements accurately using a range of equipment including thermometers and dataloggers
- Record results using a range of models and tables
- Draw conclusions from results based on their observations, findings and knowledge
- Answer questions based on evidence to support their conclusions

Science 20/20 curriculum

Scientific vocabulary explicitly taught across all units of work KS2 – to use an increasing range of scientific vocabulary and terminology confidently and accurately

Year 5	Overarching Question	Key Concepts	Precis
Aut 1	Forces	KQ: What forces are acting on us? Friction, Gravity Air resistance, Thrust, Fulcrum, Gears, Levers, Transference	<p>Pupils should explore falling objects and raise questions about the effects of air resistance. They should explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall. They should experience forces that make things begin to move, get faster or slow down. Pupils should explore the effects of friction on movement and find out how it slows or stops moving objects</p> <ul style="list-style-type: none"> 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
Aut 2	Earth and space	KQ: Are we alone? Planet, Star, Orbit Moon, Solar system Universe, Geocentric, Heliocentric	<p>Pupils should be introduced to a model of the sun and Earth that enables them to explain day and night. Pupils should learn that the sun is a star at the centre of our solar system and that it has 8 planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. They should understand that a moon is a celestial body that orbits a planet</p> <ul style="list-style-type: none"> 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.
Spr 1 and 2	Properties and changes of materials	KQ: What happens if I do this..... Solubility, Conductivity, Magnetic, Transparent, Flexibility, Rigidity, Dissolve, Solution Solute, Filter, Evaporate, Sieving, Reversible, Irreversible, Burning, Reactivity	<p>Pupils should build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials, including relating these to what they learnt about magnetism in year 3 and about electricity in year 4. They should explore reversible changes, including evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes.</p> <ul style="list-style-type: none"> 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 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

	Year 5	Overarching Question	Key Concepts	Precis
Sum 1	Properties and changes of materials	KQ: What happens if I do this.....	Solubility, Conductivity, Magnetic, Transparent, Flexibility, Rigidity, Dissolve, Solution Solute, Filter, Evaporate, Sieving, Reversible, Irreversible, Burning, Reactivity	<p>Pupils should explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda.</p> <ul style="list-style-type: none"> • use knowledge of solids, liquids and gases to decide how mixtures might be 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 • 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.
Sum 2	Human lifecycle	KQ: What happens as we get older?	Reproduction, Aging	<p>Pupils should draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes experienced in puberty.</p> <ul style="list-style-type: none"> • describe the changes as humans develop to old age.
	Lifecycles and Reproduction	KQ: How are animal lifecycles similar/different?	Reproduction, Aging, Asexual /sexual	<p>Pupils should study and raise questions about their local environment throughout the year. They should observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border, and animals in the local environment.</p> <ul style="list-style-type: none"> • Describe the life process of reproduction in some plants and animals. • describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird

Year 5 Assessment Fundamentals - The following skills and knowledge should be secure for all pupils by the end of Year Five

SCIENCE

- Describe the lifecycles of animals and plants (including aging in humans)
- Compare and contrast materials based on their properties
- Changes of state can be reversible or irreversible
- Name some ways of separating materials and how to recover a solution from a solution
- Describe the movement of the Earth in relation to the solar system
- Describe the structure of the Solar system
- Describe the movement of the Earth and moon
- Effects of gravity, air resistance, friction and water resistance
- The use of levers and pulleys to generate a larger force

WORKING SCIENTIFICALLY

- Planning, recording and analysing results to answer their own and others enquiries
- Using a range of scientific equipment to take accurate measurements using standard units
- Recording results in an increasingly complex way – using a range of recording devices (line graph, stem and leaf etc)
- Using results to reach conclusions and to give predictions for further questions
- Present results in a range of ways including written and verbal
- Identifying scientific research/evidence that supports or refutes ideas or arguments

Science 20/20 curriculum

Scientific vocabulary explicitly taught across all units of work KS2 – to use an increasing range of scientific vocabulary and terminology confidently and accurately

	Year 6	Overarching Question	Key Concepts	Precis
Aut 1	Light	KQ: How does light travel?	Reflection, Incidence, Angle of incidence, Angle of reflection, Shadows, Opaque, Transparent, Translucent, Sources	<p>Pupils should build on the work on light in year 3, exploring the way that light behaves, including light sources, reflection and shadows. They should talk about what happens and make predictions.</p> <ul style="list-style-type: none"> 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
Aut 2	Electricity	KQ: Have you got the power?	Circuit Series/Parallel Voltage Brightness Dimness components	<p>Building on their work in yr 4, pupils should construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. They should learn how to represent a simple circuit in a diagram using recognised symbols.</p> <ul style="list-style-type: none"> 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.
Spr 1 and 2	Classification	KQ: How do we identify organisms?	Kingdom, Phylum Genus, Species	<p>Pupils should build on their learning about grouping living things in year 4 by looking at the classification system in more detail. They should be introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided. Through direct observations where possible, they should classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). They should discuss reasons why living things are placed in one group and not another. Pupils might find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification.</p> <ul style="list-style-type: none"> 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.

	Year 6	Overarching Question	Key Concepts	Precis
Sum 1	Human Body	KQ: Why is it important to be healthy?	Circulatory system, Absorption, Exercise and diet, Obesity	<p>Pupils should build on their learning from years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system) to explore and answer questions that help them to understand how the circulatory system enables the body to function. Pupils should learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body.</p> <ul style="list-style-type: none"> • 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.
Sum 2	Evolution	KQ: Where did we come from?	Fossil record, Pentadactyl limb, Genetics, Genetic variation, Mutation, Recombination, Offspring, Generation,	<p>Building on what they learned about fossils in the topic on rocks in year 3, pupils should find out more about how living things on earth have changed over time. find out about Mary Anning, Charles Darwin and Alfred Wallace developed their ideas on evolution.</p> <ul style="list-style-type: none"> • 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.

Year 6 Assessment Fundamentals - The following skills and knowledge should be secure for all pupils by the end of Year Six

SCIENCE

- Classify organisms using observable and specific characteristics
- Name and describe the circulatory, digestive and pulmonary systems
- Identify how organisms are suited to their environment
- Identify that organism have changed and adapted over time
- Identify how light travels and is reflected off different surfaces
- Identify that shadows are formed by opaque objects
- Make series and parallel circuits
- Use conventional symbols to represent a circuit diagram
- Compare how components in a circuit are affected by a change in voltage of cells

WORKING SCIENTIFICALLY

- Planning, recording and analysing results to answer their own and others enquiries
- Using a range of scientific equipment to take accurate measurements using standard units
- Recording results in an increasingly complex way – using a range of recording devices (line graph, stem and leaf etc)
- Using results to reach conclusions and to give predictions for further questions
- Present results in a range of ways including written and verbal
- Identifying scientific research/evidence that supports or refutes ideas or arguments

Science – Broad Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Reception	Knowledge and understanding of the world					
Year 1	States of Matter			Plants	Animals, including humans	
	Seasonal Change					
Year 2	Materials			Habitats	Plants	Animals including Humans
Year 3	Light	Magnetism	Rocks and soils		Plants	Bones, muscles and nutrition
Year 4	Teeth and Digestion	Electricity	States of Matter	Sound	Classification and habitats	
Year 5	Forces	Earth and Space	Properties and changes of materials		Forces	Lifecycles and Reproduction Human lifecycle
Year 6	Human Body	Electricity	Classification		Light	Evolution