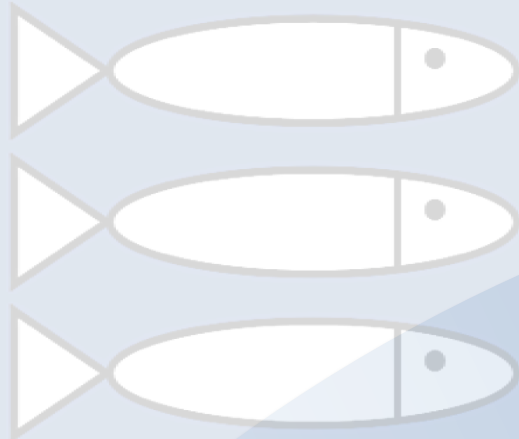


ST. JAMES



Progression in Knowledge across Science:

Years 1 to 6



ST. JAMES R.C. PRIMARY SCHOOL



Biology

Animals, including humans:

Years 1 to 6



Year 1- Animals including humans



Prior learning	In year 1	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> • Children should be able to identify different parts of their body. • Have some understanding of healthy food and the need for variety. • Should be able to show care and concern for living things. • Know the effects exercise has on their bodies. • Have some understanding of growth and change. • Can talk about things they have observed, including animals. 	<ul style="list-style-type: none"> • Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. • Can provide examples of animals that are herbivores, omnivores and carnivores. • Describe and compare the structure of a variety of common animals, including pets. • Identify, name, draw and label the basic parts of the human body and say which parts of the body are associated with each sense. 	<p>In Year 2, pupils will be taught to:</p> <p>Notice that animals, including humans, have offspring which grow into adults. Describe the basic needs of animals, including humans, for survival. Describe the importance for humans to exercise, eat the right amount of each food type, and to have good hygiene.</p> <p>In Year 3, pupils will be taught to:</p> <p>Identify that animals, including humans, need the right types and amount of nutrition which they gain through what they eat. Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>	<p>humans, amphibians, birds, fish, mammals, reptiles, carnivores, omnivores, herbivores, sight, hearing, touch, taste, smell, head, neck, ear, mouth, shoulder, hand, fingers, leg, foot, thumb, eye, nose, knee, toes, teeth, elbow.</p>

Working Scientifically

- Use observations and ideas to suggest answers to questions
- Carry out pre-planned investigations - with support
- Gather and record data to help answer questions - with support
- Start to use simple scientific language in context
- Identify and classify objects as part of an investigation



Year 2- Animals including humans



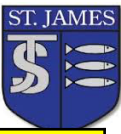
Prior learning	In year 2	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> • Make observations of animals, explain why some things occur and talk about changes • Identify and name a variety of common animals including fish, amphibians, reptiles, 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, 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. 	<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, air) • Notice that humans have offspring which grow into adults • Find out about and describe the basic needs for survival (food, water, air) • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene 	<p>In Year 3, pupils will be taught to:</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. Identify that humans and some other animals have skeletons and muscles for support, protection and movement Identify that 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 have skeletons and muscles for support, protection and movement</p> <p>In Year 4, pupils will be taught to:</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey 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</p> <p>In Year 5, pupils will be taught to:</p> <p>Describe the changes as humans develop to old age</p>	<p>Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples - meat, fish, vegetables, bread, rice, pasta)</p>

Working Scientifically

- Use observations and ideas to suggest answers to questions
- Carry out pre-planned investigations - with support
- Gather and record data to help answer questions - with support
- Start to use simple scientific language in context
- Identify and classify objects as part of an investigation



Year 3- Animals including humans



Prior learning	In year 3	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> • should be able to 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. 	<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. 	<p>In Year 4, pupils will be taught to:</p> <p>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.</p> <p>In Year 5, pupils will be taught to:</p> <p>Describe the changes as humans develop to old age</p> <p>In Year 6, pupils will be taught to:</p> <p>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.</p>	<p>Nutrients, nutrition, carbohydrates, protein, fats, vitamins, minerals, sugars, water, fibre, skeleton, bones, joints, muscles, skull, ribs, spine, endoskeleton, exoskeleton, hydrostatic skeleton, vertebrates, invertebrates, muscles, contract, relax, support, protect, move</p>

Working Scientifically

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. gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
4. recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
5. reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
6. using straightforward scientific evidence to answer questions or to support their findings.



Year 4- Animals including humans

Prior learning	In year 4	Later learning: <small>children do not need to be taught this year</small>	Key vocabulary
<ul style="list-style-type: none"> • should be able to 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. • 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. 	<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. • Recap food groups and eating a balanced diet 	<p style="background-color: #e91e63; color: white; padding: 5px;">In Year 5, pupils will be taught to:</p> <div style="background-color: #ffcc99; padding: 5px; text-align: center;">Describe the changes as humans develop to old age</div> <p style="background-color: #00838f; color: white; padding: 5px;">In Year 6, pupils will be taught to:</p> <div style="background-color: #00838f; color: white; padding: 5px;">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.</div>	<p>Digestive system, tongue, mouth, teeth, oesophagus, stomach, gall bladder, small intestine, pancreas, rectum, anus, large intestine, liver, duodenum, tooth, canine, incisor, molar, premolar, producer, consumer, carnivore, herbivore, omnivore</p>

Working Scientifically

1. recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
2. reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
3. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions



Year 5- Animals including humans



Prior learning	In year 5	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> • Should be able to 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 Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. • 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. • 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. • Understand food chains, identifying producers, predators and prey. 	<ul style="list-style-type: none"> • Describe the changes as humans develop to old age. 	<p>In Year 6, pupils will be taught to:</p> <p>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.</p>	<p>Puberty, life cycle, gestation, growth, reproduce, fetus, baby, fertilisation, toddler, child, adult, old age, life expectancy, adolescence, childhood, adulthood, womb, life, death.</p>

Working Scientifically

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, taking repeat readings when appropriate
3. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
4. Using test results to make predictions to set up further comparative and fair tests
5. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
6. Identifying scientific evidence that has been used to support or refute ideas or arguments.



Year 6- Animals including humans

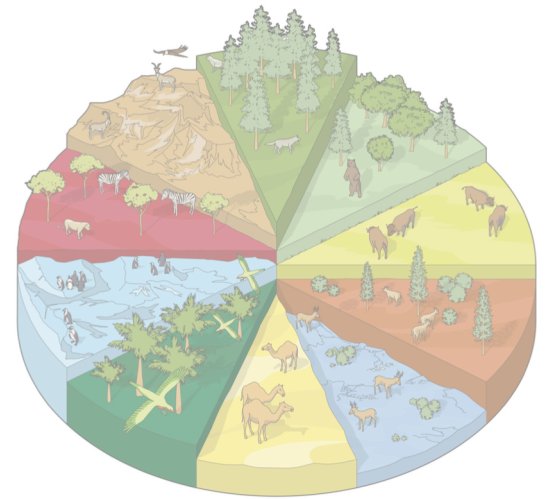


Prior learning	In year 6	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> • Should be able to notice that animals, including humans, have offspring which grow into adults. • Find out about and describe the basic needs of animals, including humans, for survival Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. • 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. • 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. • Understand food chains, identifying producers, predators and prey. • Describe the changes as humans develop to old age. 	<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. 	<p>In KS3, pupils will be taught to:</p> <p>Cells and organisation. The skeletal and muscular system. Nutrition and digestion. Gas exchange stems. Reproduction and health.</p>	<p>Circulatory system, heart, lungs, blood vessels, blood, artery, vein, pulmonary, alveoli, capillary, digestive, transported, gas exchange, nutrients, water, oxygen, alcohol, drugs, tobacco, pulse, rate, pumps, carbon dioxide, muscles, cycle, diet, lifestyle.</p>
<h3>Working Scientifically</h3>			

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, taking repeat readings when appropriate
3. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
4. Using test results to make predictions to set up further comparative and fair tests
5. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
6. Identifying scientific evidence that has been used to support or refute ideas or arguments.



ST. JAMES R.C. PRIMARY SCHOOL



Biology

Living things and their habitats:

Years 2, 4, 5 and 6



Year 2- Living Things and their habitats



Prior learning	In year 2	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> • Make comments and ask questions about the place they live or the natural world. • To be able to show care and concern for living things and the environment. • Can talk about things they have observed, such as plants or animals. • Notices features of living things in their environment. • Children are able to make comments and ask questions about their familiar world. 	<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 are able to describe how different habitats provide for the basic needs of different animals and plants. • 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. 	<p>In Year 4, pupils will be taught to: To 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 local and wider environments. Recognise that environments can change (both naturally and due to human actions) and that this can sometimes pose dangers to living things.</p> <p>In Year 5, pupils will be taught to: To 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.</p> <p>In Year 6, pupils will be taught to: To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics.</p>	<p>Living, dead, never alive, habitats, micro-habitats, food, food chain, leaf litter, shelter, sea shore, woodland, ocean, rainforest, conditions, desert, damp, shade,</p>

Working Scientifically

- Use observations and ideas to suggest answers to questions
- Carry out pre-planned investigations - with support
- Gather and record data to help answer questions - with support
- Start to use simple scientific language in context
- Identify and classify objects as part of an investigation



Year 4- Living Things and their habitats



Prior learning	In year 4	Later learning: children do not need to be taught this year	Key vocabulary
<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 are able to describe how different habitats provide for the basic needs of different animals and plants. 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. 	<ul style="list-style-type: none"> 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 	<p>In Year 5, pupils will be taught to:</p> <p>To 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.</p> <p>In Year 6, pupils will be taught to:</p> <p>To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics.</p>	<p>Environment, flowering, non-flowering, plants, animals, vertebrates, fish, amphibians, reptiles, mammals, invertebrate, human impact, nature reserves, deforestation, positive, negative</p>

Working Scientifically

- 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



Year 5- Living Things and their habitats



Prior learning	In year 5	Later learning: children do not need to be taught this year	Key vocabulary
<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 are able to describe how different habitats provide for the basic needs of different animals and plants. 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. Recognise that living things can be grouped in a variety of ways, using 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 	<ul style="list-style-type: none"> To 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. 	<p>In Year 6, pupils will be taught to:</p> <p>To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. give reasons for classifying plants and animals based on specific characteristics.</p>	<p>Sexual, asexual, reproduction, cell, fertilisation, pollination, male, female, pregnancy, gestation, mammal, metamorphosis, amphibian, insect, egg, embryo, bird, plant.</p> <p>Life cycle, reproduce, sperm, live young, asexual, plantlets, runners, bulbs, cuttings</p>
<h3>Working Scientifically</h3>			

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, taking repeat readings when appropriate
3. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
4. Using test results to make predictions to set up further comparative and fair tests
5. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
6. Identifying scientific evidence that has been used to support or refute ideas or arguments.



Year 6- Living Things and their habitats



Prior learning	In year 6	Later learning: <small>children do not need to be taught this year</small>	Key vocabulary
<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 are able to describe how different habitats provide for the basic needs of different animals and plants. 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. Recognise that living things can be grouped in a variety of ways, using 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 To 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. 	<ul style="list-style-type: none"> To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics. 	<p>In Year KS3, pupils will be taught to:</p> <p><i>Genetics and evolution. Chromosomes, genes and DNA in hereditary. Differences between species. Variations within a species. Changes in the environment which may lead to a species less well adapted to compete and reproduce. The importance of maintaining biodiversity.</i></p>	<p>Classify, compare, bacteria, characteristics, classification, microorganism, organism, invertebrates, vertebrates, flowering, non-flowering, Linnaean, fish, amphibians, reptiles, birds, mammals, insects, spiders, snails, worms.</p>

Working Scientifically

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, taking repeat readings when appropriate
3. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
4. Using test results to make predictions to set up further comparative and fair tests
5. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
6. Identifying scientific evidence that has been used to support or refute ideas or arguments.



ST. JAMES R.C. PRIMARY SCHOOL



Biology

Seasonal change; Plants; and Evolution and

Inheritance :

Years 1, 2, 3 and 6



Year 1- Seasonal changes



Prior learning	In year 1	Later learning: <small>children do not need to be taught this year</small>	Key vocabulary
<ul style="list-style-type: none"> Children know about similarities and differences in relation to places, objects, materials and living things. They talk about features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes (Early Learning Goal). 	<ul style="list-style-type: none"> Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies 	<p>In Year 3, pupils will be taught to:</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Light)</p> <p>In Year 5, pupils will be taught to:</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. (Earth and space)</p>	<p>weather, sunny, rainy, windy, snowy, cloudy, stormy, clear, seasons, Winter, Summer, Spring, Autumn, sun, sunrise, sunset, day length, temperature,</p>

Working Scientifically

- Ask simple questions
- Recognise that questions can be answered in different ways
- Perform simple tests
- Observe closely
- Use simple equipment
- Talk about what they have found out



Year 1- plants



Prior learning	In year 1	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> Children know about similarities and differences in relation to places, objects, materials and living things. They talk about features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes (Early Learning Goal). 	<ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees Identify and describe the basic structure of a variety of common flowering plants, including trees 	<p>In Year 2, pupils will be taught to:</p> <p>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.</p> <p>In Year 3, pupils will be taught to:</p> <p>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 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.</p>	<p>Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, Oak, Beech, Willow, Pine, Elm evergreen, deciduous,</p>

Working Scientifically

- Ask simple questions
- Recognise that questions can be answered in different ways
- Perform simple tests
- Observe closely
- Use simple equipment
- Talk about what they have found out



Year 2- plants



Prior learning	In year 2	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees Identify and describe the basic structure of a variety of common flowering plants, including trees 	<ul style="list-style-type: none"> Children should be taught to 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. 	<p>In Year 3, pupils will be taught to:</p> <p>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 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.</p>	<p>Observation, growth, compare, record, seeds, bulbs, temperature, roots, stem, predict, leaf, flower, measure, diagram, measure, comparative tests, life cycle, life process, germinate, grain, sunlight, water, nutrients, soil, warmth</p>

Working Scientifically

- Ask simple questions
- Recognise that questions can be answered in different ways
- Perform simple tests
- Observe closely
- Use simple equipment
- Talk about what they have found out



Year 3- plants



Prior learning	In year 3	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees Identify and describe the basic structure of a variety of common flowering plants, including trees 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. 	<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 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. 	<p>In Year 5, pupils will be taught to:</p> <p>To describe the life process of reproduction in some plants (habitats)</p>	<p>Flower, seed, leaf, stem, roots, petal, pollen, life cycle, dispersal, fertilisation, germination, ovary, ovule, sepal, stamen, anther, filament, stigma, style, photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)</p>

Working Scientifically

1. making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
2. setting up simple practical enquiries, comparative and fair tests
3. gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
4. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
5. using straightforward scientific evidence to answer questions or to support their findings.



Year 6- Evolution and Inheritance



Prior learning	In year 6	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Describe the changes as humans develop to old age. Describe the life process of reproduction in some plants and animals. Recognise that environments can change and that this can sometimes pose dangers to living things. Notice that animals, including humans, have offspring which grow into adults. 	<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. 	<p>In KS3, pupils will be taught to:</p> <p>Inheritance, chromosomes and DNA. Hereditary as the process by which genetic information is transmitted from generation to generation. Simple models of chromosomes, DNA and genes including the part played by Watson, Crick, Wilkins, and Franklin. Differences between species. Variation between species. Changes in the environment may leave some species less well adapted to compete successfully and reproduce, leading to extinction. Importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.</p>	<p>Evolution, adaptation, inherited traits, inherited, adapted, natural selection, DNA, genes, variation, parent, offspring, fossil, environment, habitat, fossilisation, sexual reproduction, vary, characteristics, suited, species.</p>

Working Scientifically

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, taking repeat readings when appropriate
3. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
4. Using test results to make predictions to set up further comparative and fair tests
5. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
6. Identifying scientific evidence that has been used to support or refute ideas or arguments.



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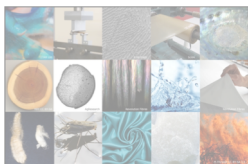


Chemistry

Materials, Rocks and States of Matter:

Years 1-5

Year 1- Everyday Materials

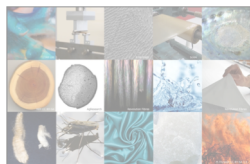


Prior learning	In year 1	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> Children know about similarities and differences in relation to places, objects, materials and living things. They talk about features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes (Early Learning Goal). 	<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. 	<p>In Year 2, pupils will be taught to:</p> <p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p> <p>In Year 3, pupils will be taught to:</p> <p>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</p> <p>In Year 4, pupils are taught to:</p> <p>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: measure or research the temperature at which this happens in degrees C. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>	<p>Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, rubber, card/cardboard, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through</p>

Working Scientifically

- Ask simple questions
- Recognise that questions can be answered in different ways
- Perform simple tests
- Observe closely
- Talk about what they have found out

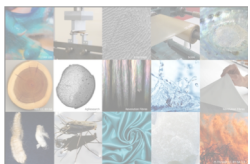
Year 2- Materials and their uses



Prior learning	In year 2	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> 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. 	<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 particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching 	<p>In Year 3, pupils will be taught to:</p> <p>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</p> <p>In Year 4, pupils are taught to:</p> <p>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: measure or research the temperature at which this happens in degrees C. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>	<p>Materials, wood, metal, plastic, glass, brick, rock, paper, cardboard, properties opaque, transparent, translucent reflective, flexible, rigid, dull, hard, soft, rough, smooth, flexible, stiff, strong, fragile, push/pushing, pull/puling, twist/twisting, squash/squashing, bend/bending, stretch/stretching</p>

Working Scientifically

- Use observations and ideas to suggest answers to questions
- Carry out pre-planned investigations - with support
- Gather and record data to help answer questions - with support
- Start to use simple scientific language in context
- Identify and classify objects as part of an investigation



Year 3- Rocks



Prior learning	In year 3	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> 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. Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Have some understanding of fossils 	<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. 	<p>In Year 6, pupils will be taught to:</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>Rocks, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, igneous, metamorphic, sedimentary, permeable, impermeable, absorb water, marble, chalk, granite, sandstone, slate, chemical fossil, body fossil, trace fossil, cast fossil, mould fossil, replacement fossil, extinct, organic matter, soil, peat, sandy/chalk/clay soil, weathered</p>

Working Scientifically

1. asking relevant questions and using different types of scientific enquiries to answer them
2. making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
3. setting up simple practical enquiries, comparative and fair tests
4. reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
5. identifying differences, similarities or changes related to simple scientific ideas and processes



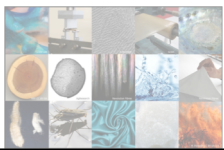
Year 4- States of Matter



Prior learning	In year 4	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> 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. Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching 	<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: measure or research the temperature at which this happens in degrees C. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature 	<p>In Year 5, pupils will be taught to:</p> <p>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. 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. 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.</p>	<p>Solid, liquid, gas, particles, state, materials, properties, matter, melt, freeze, water, ice, temperature, process, condensation, evaporation, water vapour, energy, precipitation, collection,</p>

Working Scientifically

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4. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
5. identifying differences, similarities or changes related to simple scientific ideas and processes
6. using straightforward scientific evidence to answer questions or to support their findings.



Year 5- Properties and changing materials



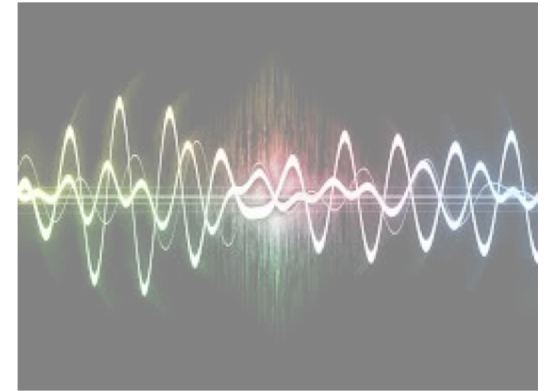
Prior learning	In year 5	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 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. 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: measure or research the temperature at which this happens in degrees C. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. 	<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. 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. 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. 	<p>In KS3, pupils will be taught to:</p> <p>The particulate nature of matter. Atoms, elements and compounds. Pure and impure substances. Chemical reactions. Periodic table. Materials such as carbon, ceramics, polymers and composites.</p>	<p>Material, conductor, dissolve, insoluble, suspension, chemical, physical, irreversible, solution, reversible, separate, mixture, insulator, transparent, flexible, permeable, soluble, property, magnetic, hard.</p>

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ST. JAMES R.C. PRIMARY SCHOOL



Physics

Light and Sound:

Years 3, 4 and 6



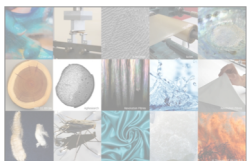
Year 3- Light



Prior learning	In year 3	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> • May have some knowledge of where light comes from. <p>Will most likely have seen their shadows and may know they appear when it is sunny.</p> <p>Some understanding of a reflection.</p> <p>May understand they need light to be able to see things.</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 an opaque object. • Find patterns in the way that the size of shadows change. 	<p>In Year 6, pupils will be taught to:</p> <p>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.</p>	<p>Light, light source, dark, absence of light reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent, shiny, matt, surface, mirror, sunlight, dangerous</p>

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3. setting up simple practical enquiries, comparative and fair tests
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.



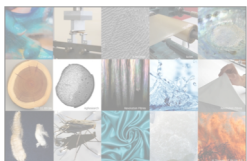
Year 6- Light



Prior learning	In year 6	Later learning: <small>children do not need to be taught this year</small>	Key vocabulary
<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 an opaque object. 	<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. 	<p>In KS3, pupils will be taught to:</p> <p>Light waves. Including the speed of light, light waves and the transmission of light through materials. Light refraction and light transferring energy from source to absorber leading the chemical and electrical effects. Colours and different frequencies of light.</p>	<p>Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, filter, colour, absorb, refract, spectrum, wavelength, prism, visible, lens, angle, incidence, straight, ray, beam, wave.</p>

Working Scientifically

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, taking repeat readings when appropriate
3. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
4. Using test results to make predictions to set up further comparative and fair tests
5. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
6. Identifying scientific evidence that has been used to support or refute ideas or arguments.



Year 4- Sound



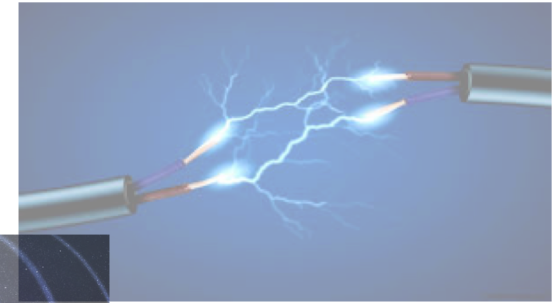
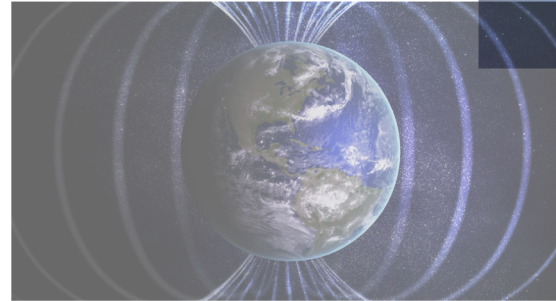
Prior learning	In year 4	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> • May have some understanding that objects make different sounds. • some understanding that they use their ears to hear sounds. • know about their different senses and that hearing is one of the five senses. 	<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. • Identify differing ear positions of animals' ears - on top/side (linked to predator/prey) 		<p>volume, quiet, loud, faint, ear, pitch, high, low, instruments, bang, blow, shake, pluck, soundwave, vibrations, insulation, sound source, decibel, crescendo, diminuendo</p>

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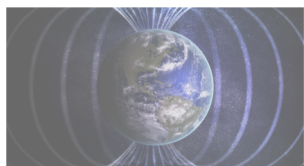
ST. JAMES R.C. PRIMARY SCHOOL



Physics

Electricity; Forces; Earth and Space :

Years 3, 4, 5 and 6



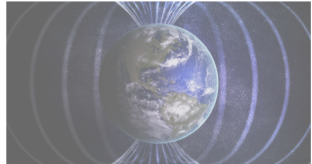
Year 3- Forces and Magnets



Prior learning	In year 3	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> • May have an awareness of how to make things stop and start. • The shape of some materials can be changed when they are stretched, twisted, bent and squashed. • Know how different toys move. • Know what a force is and be able to explain that a push and pull are types of forces. 	<ul style="list-style-type: none"> • Compare how things move on different surfaces. • Notice that some forces need contact between two 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 two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing. 	<p>In Year 5, pupils will be taught to:</p> <p>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.</p>	<p>Force, push, pull, twist friction, surface, magnet, magnetic, magnet, strength, magnetic field, pole, north, south, attract, repel, compass, bar magnet, ring magnet, button magnet, horseshoe magnet, metal, iron, steel</p>

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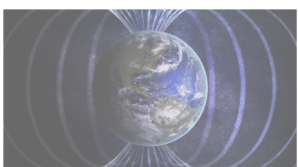
Year 5- Forces



Prior learning	In year 5	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> • Compare how things move on different surfaces. • Notice that some forces need contact between two 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 two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing. 	<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. 		<p>Force, push, pull, opposing, gravity, air resistance, water resistance, friction, streamline, brake, gear, mechanism, lever, cog, pulley, machine, Earth</p>

Working Scientifically

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4. Using test results to make predictions to set up further comparative and fair tests
5. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
6. Identifying scientific evidence that has been used to support or refute ideas or arguments.



Year 5- Earth and Space



Prior learning	In year 5	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> • Have some knowledge about space. • Have some understanding about how the Earth orbits the sun. • May understand that night and day are linked to the Earth's rotation. 	<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. 	<p>In KS3, pupils will be taught to:</p> <p>The composition of the Earth and the structure of the Earth. The rock cycle and the formation of igneous, sedimentary and metamorphic rocks. Earth as a source of limited resources and the efficacy of recycling. The carbon cycle and the composition of the atmosphere. The production of carbon dioxide by human activity and the impact on climate. Gravity forces between the earth and the moon and the earth and the sun. Sun as a star, and stars in other galaxies. Seasons and the earth's tilt, day length. Light years</p>	<p>Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets, planets, day, night, axis, dwarf planets</p>

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6. Identifying scientific evidence that has been used to support or refute ideas or arguments.



Year 4- Electricity



Prior learning	In year 4	Later learning: children do not need to be taught this year	Key vocabulary
<ul style="list-style-type: none"> • May have some understanding that objects need electricity to work. • May understand that a switch will turn something on or off. 	<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. 	<p>In Year 6, pupils will be taught to:</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. 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.</p>	<p>electric current, appliances, mains, crocodile clips, wires, bulb, battery cell, battery holder, motor, buzzer, switch, conductor, electrical insulator.</p>

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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.



Year 6- Electricity



Prior learning	In year 6	Later learning: <small>children do not need to be taught this year</small>	Key vocabulary
<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. 	<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. 	<p>In KS3, pupils will be taught to:</p> <p>Electrical currents, measured in amperes, in circuits, series and parallel circuits. Currents add where branches meet and current as a flow of charge. Measuring in volts. Battery and bulb rating, resistance, measured in ohms. Differences in resistance. Static electricity- the separation of positive or negative charges when objects are rubbed together. Force between charged objects. Electrical field and forces acting across the space between objects not in contact.</p>	<p>Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, current, voltage</p> <p>(the words "cells" and "batteries" are now used interchangeably)</p>

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6. Identifying scientific evidence that has been used to support or refute ideas or arguments.



ST. JAMES

Progression in Knowledge across Science:

Year 1



ST. JAMES

Progression in Knowledge across Science:

Year 2



ST. JAMES

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Progression in Knowledge across Science:

Year 3

The crest of St. James' School is a shield-shaped emblem. At the top, a blue horizontal band contains the text 'ST. JAMES' in white, serif, all-caps font. Below this band, the shield is divided into two vertical sections. The left section contains a large, white, stylized monogram 'S' and 'J' intertwined. The right section contains three white fish arranged vertically, facing right. The entire crest is set against a light blue background that features a large, curved, semi-transparent blue shape on the right side.

ST. JAMES

Progression in Knowledge across Science:

Year 4



ST. JAMES

Progression in Knowledge across Science:

Year 5

ST. JAMES

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Progression in Knowledge across Science:

Year 6