

St Augustine’s School

Science Components and Composite

Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Early Learning Goal</p> <p>ELG 05 Health and self-care: Children know the importance for good health of physical exercise and a healthy diet, and talk about ways to keep healthy and safe. They manage their own basic hygiene and personal needs successfully, including dressing and going to the toilet independently.</p> <p>ELG 14 The world: Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one to another. They make observations of animals and plants and explain why some things occur, and talk about changes.</p>	<p>National Curriculum Objectives:</p> <p><i>Pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</i></p> <ul style="list-style-type: none">- 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- 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- 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- 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- observe changes across the 4 seasons- observe and describe weather associated with the seasons and how day length varies- <i>explore and compare the differences between things that are living, dead, and things that have never been alive</i>- 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- 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- 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 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>National Curriculum Objectives:</p> <p>Pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none">- 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.- Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers- explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant- investigate the way in which water is transported within plants- explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal- 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- 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- 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- compare how things move on different surfaces- notice that some forces need contact between 2 objects, but magnetic forces can act at a distance- observe how magnets attract or repel each other and attract some materials and not others- compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials- describe magnets as having 2 poles- predict whether 2 magnets will attract or repel each other, depending on which poles are facing- recognise that 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- 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- 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- 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	<p>National Curriculum Objectives:</p> <p>Pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none">- 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, taking repeat readings when appropriate- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, 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 and a degree of trust in 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- describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird- describe the life process of reproduction in some plants and animals- describe the changes as humans develop to old age- 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- 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- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object- identify the effects of air resistance, water resistance and friction, that act between moving surfaces- recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect- describe 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- 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- 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- 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- associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit			

		<ul style="list-style-type: none">- recognise that sounds get fainter as the distance from the sound source increases- 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">- 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-			
Working Scientifically						
<p>Can they talk about what they see, touch, smell, hear or taste?</p> <p>Can they use simple equipment to help them make observations?</p> <p>Challenge</p> <p>Can they find out by watching, listening, tasting, smelling and touching?</p> <p>Challenge</p> <p>Can they give a simple reason for their answers?</p>	<p>Can they talk about what they see, touch, smell, hear or taste?</p> <p>Can they use simple equipment to help them make observations?</p> <p>Challenge</p> <p>Can they find out by watching, listening, tasting, smelling and touching?</p> <p>Can they perform a simple test? Can they tell other people about what they have done?</p> <p>Challenge</p> <p>Can they give a simple reason for their answers?</p>	<p>Can they talk about what they see, touch, smell, hear or taste?</p> <p>Can they use simple equipment to help them make observations?</p> <p>Challenge</p> <p>Can they find out by watching, listening, tasting, smelling and touching?</p> <p>Can they carry out a simple fair test?</p> <p>Can they explain why it might not be fair to compare two things? Can they say whether things happened as they expected?</p> <p>Can they suggest how to find things out?</p> <p>Can they use prompts to find things out?</p> <p>Challenge</p> <p>Can they say whether things happened as they expected and if not why not?</p>	<p>Can they use different ideas and suggest how to find something out?</p> <p>Can they make and record a prediction before testing?</p> <p>Can they plan a fair test and explain why it was fair?</p> <p>Can they set up a simple fair test to make comparisons?</p> <p>Can they explain why they need to collect information to answer a question?</p> <p>Challenge</p> <p>Can they record and present what they have found using scientific language, drawings, labelled diagrams, bar charts and tables?</p>	<p>Can they set up a simple fair test to make comparisons?</p> <p>Can they plan a fair test and isolate variables, explaining why it was fair and which variables have been isolated?</p> <p>Can they suggest improvements and predictions?</p> <p>Can they decide which information needs to be collected and decide which the best way to collect it is?</p> <p>Can they use their findings to draw a simple conclusion?</p> <p>Challenge</p> <p>Can they plan and carry out an investigation by controlling variables fairly and accurately?</p> <p>Can they use test results to make further predictions and set up further comparative tests?</p>	<p>Can they plan and carry out a scientific enquiry to answer questions, including recognising and controlling variables where necessary?</p> <p>Can they make a prediction with reasons?</p> <p>Can they use test results to make predictions to set up comparative and fair tests?</p> <p>Can they present a report of their findings through writing, display and presentation?</p> <p>Challenge</p> <p>Can they explore different ways to test an idea, choose the best way and give reasons?</p> <p>Can they vary one factor whilst keeping the others the same in an experiment?</p> <p>Can they use information to help make a prediction?</p> <p>Can they explain, in simple terms, a scientific idea and what evidence supports it?</p>	<p>Can they explore different ways to test an idea, choose the best way, and give reasons?</p> <p>Can they vary one factor whilst keeping the others the same in an experiment?</p> <p>Can they explain why they do this? Can they plan and carry out an investigation by controlling variables fairly and accurately?</p> <p>Can they make a prediction with reasons?</p> <p>Can they use information to help make a prediction?</p> <p>Can they use test results to make further predictions and set up further comparative tests?</p> <p>Can they explain, in simple terms, a scientific idea and what evidence supports it?</p> <p>Can they present a report of their findings through writing, display and presentation?</p> <p>Challenge</p> <p>Can they choose the best way to answer a question?</p> <p>Can they use information from different sources to answer a question and plan an investigation?</p> <p>Can they make a prediction which links with other scientific knowledge?</p> <p>Can they identify the key factors when planning a fair test?</p> <p>Can they explain how a scientist has used their scientific understanding plus good ideas to have a breakthrough?</p>
Identifying and classifying						
<p>Can they think of some questions to ask?</p> <p>Can they answer some scientific questions?</p> <p>Can they give a simple reason for their answers?</p> <p>Can they explain what they have found out?</p>	<p>Can they identify and classify things they observe?</p> <p>Can they think of some questions to ask?</p> <p>Can they answer some scientific questions?</p> <p>Can they give a simple reason for their answers?</p> <p>Can they explain what they have found out?</p> <p>Challenge</p> <p>Can they talk about similarities and differences?</p> <p>Can they explain what they have found out using scientific vocabulary?</p>	<p>Can they organise things into groups?</p> <p>Can they find simple patterns (or associations)?</p> <p>Can they identify animals and plants by a specific criteria, eg, lay eggs or not; have feathers or not?</p> <p>Challenge</p> <p>Can they suggest more than one way of grouping animals and plants and explain their reasons</p>	<p>Can they measure using different equipment and units of measure?</p> <p>Can they record their observations in different ways? labelled diagrams, charts etc.</p> <p>Can they describe what they have found using scientific language? Can they make accurate measurements using standard units?</p> <p>Challenge</p> <p>Can they explain their findings in different ways (display, presentation, and writing)?</p> <p>Can they use their findings to draw a simple conclusion?</p> <p>Can they suggest improvements and predictions for further tests?</p>	<p>Can they take measurements using different equipment and units of measure and record what they have found in a range of ways?</p> <p>Can they make accurate measurements using standard units?</p> <p>Can they explain their findings in different ways (display, presentation, and writing)?</p> <p>Challenge</p> <p>Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models?</p>	<p>Can they take measurements using a range of scientific equipment with increasing accuracy and precision?</p> <p>Can they take repeat readings when appropriate?</p> <p>Can they record more complex data and results using scientific diagrams, labels, classification keys, tables, scatter graphs, bar and line graphs?</p> <p>Challenge</p> <p>Can they decide which units of measurement they need to use?</p> <p>Can they explain why a measurement needs to be repeated?</p>	<p>Can they explain why they have chosen specific equipment? (incl ICT based equipment)</p> <p>Can they decide which units of measurement they need to use? Can they explain why a measurement needs to be repeated?</p> <p>Can they record their measurements in different ways? (Inc. bar charts, tables and line graphs)</p> <p>Can they take measurements using a range of scientific equipment with increasing accuracy and precision?</p> <p>Challenge</p> <p>Can they plan in advance which equipment they will need and use it well?</p> <p>Can they make precise measurements?</p> <p>Can they collect information in different ways?</p> <p>Can they record their measurements and observations systematically? Can they explain qualitative and quantitative data.</p>

Recording Findings						
<i>Can they show their work using pictures, labels and captions?</i>	<i>Can they show their work using pictures, labels and captions?</i> <i>Can they record their findings using standard units?</i> <i>Can they put some information in a chart or table?</i> Challenge <i>Can they use ICT to show their working?</i> <i>Can they make accurate measurements?</i>	<i>Can they use text, diagrams, pictures, charts, tables to record their observations?</i> <i>Can they measure using simple equipment?</i> Challenge <i>Can they use information from books and online information to find things out?</i>	<i>Can they explain what they have found out and use their measurements to say whether it helps to answer their question?</i> <i>Can they use a range of equipment (including datalogger) in a simple test?</i> Challenge <i>Can they suggest how to improve their work if they did it again?</i>	<i>Can they find any patterns in their evidence or measurements?</i> <i>Can they make a prediction based on something they have found out?</i> <i>Can they evaluate what they have found using scientific language, drawings, labelled diagrams, bar charts and tables?</i> <i>Can they use straightforward scientific evidence to answer questions or to support their findings?</i> <i>Can they identify differences, similarities or changes related to simple scientific ideas or processes?</i> Challenge <i>Can they report findings from Investigations through written explanations and conclusions?</i> <i>Can they use a graph or diagram to answer scientific questions?</i>	<i>Can they report and present findings from enquiries through written explanations and conclusions?</i> <i>Can they use a graph to answer scientific questions?</i> Challenge <i>Can they find a pattern from the data and explain what it shows?</i> <i>Can they link what they have found out to other science?</i> <i>Can they suggest how to improve their work and say why they think this?</i>	<i>Can they find a pattern from their data and explain what it shows?</i> <i>Can they use a graph to answer scientific questions?</i> <i>Can they link what they have found out to other science?</i> <i>Can they suggest how to improve their work and say why they think this?</i> <i>Can they suggest how to improve their work and say why they think this?</i> <i>Can they report findings from investigations through written explanations and conclusions?</i> <i>Can they identify scientific evidence that has been used to support to refute ideas or arguments?</i> <i>Can they report and present 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?</i> Challenge <i>Can they draw conclusions from their work?</i> <i>Can they link their conclusions to other scientific knowledge?</i> <i>Can they explain how they could improve their way of working?</i>
The Natural world						
Plants <i>Can they explore the natural world around them, making observations and drawing pictures of animals and plants?</i> Seasonal Changes <i>Can they understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</i> Living Things and their Habitats <i>Can they know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;</i>	Plants <i>Can they name the petals, stem, leaf, bulb, flower, seed, stem and root of a plant?</i> <i>Can they identify and name a range of common plants and trees?</i> <i>Can they recognise deciduous and evergreen trees?</i> <i>Can they name the trunk, branches and root of a tree?</i> <i>Can they describe the parts of a plant (roots, stem, leaves, flowers)?</i> <i>Can they name the main parts of a flowering plant?</i> Seasonal Changes <i>Can they observe changes across the four seasons?</i> <i>Can they name the four seasons in order?</i> <i>Can they observe and describe weather associated with the seasons?</i> <i>Can they observe and describe how day length varies?</i> Challenge <i>Can they observe features in the environment and explain that these are related to a specific season?</i> <i>Can they observe and talk about changes in the weather?</i> <i>Can they talk about weather variation in different parts of the world?</i>	Plants <i>Can they describe what plants need to survive?</i> <i>Can they observe and describe how seeds and bulbs grow into mature plants?</i> <i>Can they find out & describe how plants need water, light and a suitable temperature to grow and stay healthy?</i> Challenge <i>Can they describe what plants need to survive and link it to where they are found?</i> <i>Can they explain that plants grow and reproduce in different ways?</i> Living Things and their Habitats <i>Can they decide whether something is living, dead or non-living?</i> <i>Can they identify, name and describe a range of different habitats?</i> <i>Can they identify and name a variety of plants and animals in their habitats, including micro-habitats?</i> <i>Can they describe how animals obtain their food from plants and other animals?</i> <i>Can they use a simple food chain?</i> <i>Can they name different sources of food?</i> Challenge <i>Can they name some characteristics of an animal that help it to live in a particular habitat?</i> <i>Can they describe what animals need to survive and link this to their habitats?</i>	Plants <i>Can they identify and describe the functions of different parts of flowering plants? (roots, stem/trunk, leaves and flowers)?</i> <i>Can they explore the requirement of plants for life and growth (air, light, water, nutrients from soil, and room to grow)?</i> <i>Can they explain how they vary from plant to plant?</i> <i>Can they investigate the way in which water is transported within plants?</i> <i>Can they explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal?</i> Challenge <i>Can they classify a range of common plants according to many criteria (environment found, size, climate required, etc.)?</i> Rocks <i>Can they compare and group together different rocks on the basis of their appearance and simple physical properties?</i> <i>Can they describe and explain how different rocks can be useful to us?</i> <i>Can they describe and explain the differences between sedimentary and igneous rocks, considering the way they are formed?</i> <i>Can they describe in simple terms how fossils are formed when things that have lived are trapped within rock?</i> <i>Can they recognise that soils are made from rocks and organic matter?</i> Challenge <i>Can they classify igneous and sedimentary rocks?</i>	Living Things and their Habitats <i>Can they recognise that living things can be grouped in a variety of ways?</i> <i>Can they explore and use classification keys to identify and group a variety of things in their local environment and wider environment?</i> <i>Can they recognise that environments can change and that this can sometimes pose dangers to living things?</i> Challenge <i>Can they observe their local environment and draw conclusions about life-cycles, e.g. plants in the vegetable garden or flower border?</i> <i>Can they compare the life cycles of plants and animals in their local environment with the life cycles of those around the world, e.g. rainforests?</i>	Living Things and their Habitats <i>Can they describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird?</i> <i>Can they describe the life process of reproduction in some plants and animals?</i> Challenge <i>Can they explain why classification is important?</i> <i>Can they readily group animals into reptiles, fish, amphibians, birds and mammals?</i> <i>Can they sub divide their original groupings and explain their divisions?</i> <i>Can they group animals into vertebrates and invertebrates?</i> <i>Can they find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification?</i>	Living Things and their Habitats <i>Can they 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?</i> <i>Can they give reasons for classifying plants and animals based on specific characteristics?</i> Challenge <i>Can they research and describe the works of scientists such as Carl Linnaeus?</i> Evolution and Inheritance <i>Can they recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago?</i> <i>Can they recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents?</i> <i>Can they give reasons why offspring are not identical to each other or to their parents?</i> <i>Can they explain the process of evolution and describe the evidence for this?</i> Challenge <i>Can they talk about the work of Charles Darwin, Mary Anning and Alfred Wallace?</i> <i>Can they explain how some living things adapt to survive in extreme conditions?</i> <i>Can they analyse the advantages and disadvantages of specific</i>

			Can they begin to relate the properties of rocks with their uses?			adaptations, such as being on two rather than four feet? Can they begin to understand what is meant by DNA?
Animals including humans						
Can they explore the natural world around them, making observations and drawing pictures of animals and plants?	Can they point out some of the differences between different animals? Can they sort photographs of living things and non-living things? Can they identify and name a variety of common animals? (birds, fish, amphibians, reptiles, mammals, invertebrates) Can they describe how an animal is suited to its environment? Can they identify and name a variety of common animals that are carnivores, herbivores and omnivores? Can they name the parts of the human body that they can see? Can they draw & label basic parts of the human body? Can they identify the main parts of the human body and link them to their senses? Can they name the parts of an animal's body? Can they name a range of domestic animals? Can they classify animals by what they eat? (carnivore, herbivore, omnivore) Can they compare the bodies of different animals? Challenge Can they begin to classify animals according to a number of given criteria? Can they point out differences between living things and non-living things? Can they name some parts of the human body that cannot be seen? Can they say why certain animals have certain characteristics? Can they name a range of wild animals?	Can they describe what animals need to survive? Can they explain that animals grow and reproduce? Can they explain why animals have offspring which grow into adults? Can they describe the life cycle of some living things? (e.g. egg, chick, chicken) Can they explain the basic needs of animals, including humans for survival? (water, food, air) Can they describe why exercise, balanced diet and hygiene are important for humans? Challenge Can they explain that animals reproduce in different ways?	Can they explain the importance of a nutritionally balanced diet? Can they describe how nutrients, water and oxygen are transported within animals and humans? Can they explain how animals including humans get nutrition from what they eat? Can they identify that animals, including humans, cannot make their own food: they get nutrition from what they eat? Can they describe and explain the skeletal system of a human? Can they describe and explain the muscular system of a human? Challenge Can they explain how the muscular and skeletal systems work together to create movement? Can they classify living things and non-living things by a number of characteristics that they have thought of?	Can they identify and name the basic parts of the digestive system in humans? Can they describe the simple functions of the basic parts of the digestive system in humans? Can they identify the simple function of different types of teeth in humans? Can they compare the teeth of herbivores and carnivores? Can they explain what a simple food chain shows? Can they construct and interpret a variety of food chains, identifying producers, predators and prey? Challenge Can they explain how certain living things depend on one another to survive?	Can they describe the changes as humans develop to old age? Can they understand that all living things have lifecycles? Challenge Can they create a timeline to indicate stages of growth in certain animals, such as frogs and butterflies? Can they describe the changes experienced in puberty? Can they draw a timeline to indicate stages in the growth and development of humans?	Can they identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood? Can they recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function? Can they describe the ways in which nutrients and water are transported within animals, including humans? Challenge Can they describe the pulmonary and systemic circulatory systems? Can they explore the work of medical pioneers, for example, William Harvey and Galen and recognise how much we have learnt about our bodies? Can they compare the organ systems of humans to other animals?
Materials						
States of Matter Can they understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	Everyday Materials Can they distinguish between an object and the material from which it is made? Can they describe materials using their senses, using specific scientific words? Can they explain what material objects are made from? Can they explain why a material might be useful for a specific job? Can they name some different everyday materials? e.g. wood, plastic, metal, water and rock. Can they sort materials into groups by a given criteria? Can they explain how solid shapes can be changed by squashing, bending, twisting and stretching?	Everyday Materials Can they describe the simple physical properties of a variety of everyday materials? Can they compare and group together a variety of materials based on their simple physical properties? Can they explore how the shapes of solid objects can be changed? (squashing, bending, twisting, stretching) Can they say which materials are natural and which are man-made? Can they find out about people who developed useful new materials? (John Dunlop, Charles Macintosh, John McAdam) Can they identify and compare a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper, cardboard for particular uses?	Consolidation of KS1 knowledge	States of Matter Can they compare and group materials together, according to whether they are solids, liquids or gases? Can they explain what happens to materials when they are heated or cooled? Can they measure or research the temperature at which different materials change state in degrees Celsius? Can they use measurements to explain changes to the state of water? Can they identify the part that evaporation and condensation has in the water cycle? Can they associate the rate of evaporation with temperature? Challenge Can they explain what	Properties and Changes of Materials Can they compare and group together everyday materials on the basis of their properties including hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets? Can they explain how some materials dissolve in liquid to form a solution? Can they describe how to recover a substance from a solution? Can they use their knowledge of solids, liquids and gases to decide Can they explain how mixtures might be separate including through filtering, sieving, evaporating? Can they give reasons, based on evidence for comparative and fair tests for the particular uses	Consolidation of KS2 knowledge

	<p>Can they explore and experiment using a wide variety of materials including brick, paper, fabric, elastic and foil?</p> <p>Challenge</p> <p>Can they describe things that are similar and different between materials?</p> <p>Can they explain what happens to certain materials when they are heated, e.g. bread, ice, chocolate?</p> <p>Can they explain what happens to certain materials when they are cooled, e.g. jelly, heated chocolate?</p>	<p>Can they explain how things move on different surfaces?</p> <p>Challenge</p> <p>Can they explain how materials are changed by heating and cooling?</p> <p>Challenge</p> <p>Can they describe the properties of different materials using words like, transparent or opaque, flexible, etc.?</p>		<p>happens over time to materials such as puddles on the playground or washing hanging on a line?</p> <p>Can they relate temperature to change of state of materials?</p>	<p>everyday materials, including metals, wood and plastic?</p> <p>Can they describe changes using scientific words? (evaporation, condensation)</p> <p>Can they demonstrate that dissolving, mixing and changes of state are reversible changes?</p> <p>Can they 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 bicarbonate of soda?</p> <p>Can they use the terms ‘reversible’ and ‘irreversible’</p> <p>Challenges</p> <p>Can they describe methods for separating mixtures? (filtration, distillation)</p> <p>Can they work out which materials are most effective for keeping us warm or for keeping something cold?</p> <p>Can they use their knowledge of materials to suggest ways to classify? (solids, liquids, gases)</p> <p>Can they explore changes that are difficult to reverse, e.g. burning, rusting and reactions such as vinegar with bicarbonate of soda?</p> <p>Can they explore the work of chemists who created new materials, e.g. Spencer Silver (glue on sticky notes) or Ruth Benerito (wrinkle free cotton)?</p>	
The Physical World						
			<p>Light</p> <p>Can they recognise that they need light in order to see things and that darkness is the absence of light?</p> <p>Can they notice that light is reflected on surfaces?</p> <p>Can they recognise that light from the sun can be dangerous?</p> <p>Can they identify ways to protect their eyes?</p> <p>Can they recognise that shadows are formed when the light from a light source is blocked by an object?</p> <p>Can they find patterns in the way that the size of shadows change?</p> <p>Challenge:</p> <p>Can they understand that light travels in a straight line?</p> <p>Forces and Magnets</p> <p>Can they compare how things move on different surfaces?</p> <p>Can they observe that magnetic forces can be transmitted without direct contact?</p> <p>Can they observe how some magnets attract or repel each other?</p> <p>Can they classify which materials are attracted to magnets and which are not?</p> <p>Can they identify some magnetic materials?</p> <p>Can they describe magnets have having two poles (N & S)?</p> <p>Can they predict whether two magnets will attract or repel each other depending on which poles are facing?</p> <p>Challenge</p> <p>Can they investigate the strengths of different magnets</p>	<p>Sound</p> <p>Can they describe a range of sounds and explain how they are made?</p> <p>Can they associate some sounds with something vibrating?</p> <p>Can they compare sources of sound and explain how the sounds differ?</p> <p>Can they explain how to change a sound (louder/softer)?</p> <p>Can they recognise how vibrations from sound travel through a medium to the ear?</p> <p>Can they find patterns between the pitch of a sound and features of the object that produce it?</p> <p>Can they find patterns between the volume of the sound and the strength of the vibrations that produced it?</p> <p>Can they recognise that sounds get fainter as the distance from the sound source increases?</p> <p>Can they investigate how different materials can affect the pitch and volume of sounds?</p> <p>Challenge</p> <p>Can they explain why sound gets fainter or louder according to the distance?</p> <p>Can they explain how pitch and volume can be changed in a variety of ways?</p> <p>Can they work out which materials give the best insulation for sound?</p> <p>Electricity</p> <p>Can they identify common appliances that run on electricity?</p>	<p>Forces and Magnets</p> <p>Can they explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object?</p> <p>Can they identify the effects of air resistance, water resistance and friction that act between moving surfaces?</p> <p>Can they recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect?</p> <p>Challenge</p> <p>Can they describe and explain how motion is affected by forces? (including gravitational attractions, magnetic attraction and friction)</p> <p>Can they design very effective parachutes?</p> <p>Can they work out how water can cause resistance to floating objects?</p> <p>Can they explore how scientists such as Galileo , Galilei and Issac Newron helped to develop the theory of gravitation?</p> <p>Earth and Space</p> <p>Can they identify and explain the movement of the Earth and other planets relative to the sun in the solar system?</p> <p>Can they describe and explain the movement of the Moon relative to the Earth?</p> <p>Can they describe the sun, earth and moon as approximately spherical bodies?</p> <p>Can they use the idea of the earth’s rotation to explain</p>	<p>Light</p> <p>Can they recognise that light appears to travel in straight lines?</p> <p>Can they use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye?</p> <p>Can they explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes?</p> <p>Can they 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>Challenge</p> <p>Can they explain how different colours of light can be created? Can they use and explain how simple optical instruments work? (periscope, telescope, binoculars, mirror, magnifying glass, Newton’s first reflecting telescope)</p> <p>Can they explore a range of phenomena, including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters.</p> <p>Electricity</p> <p>Can they associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in a circuit?</p> <p>Can they compare and give reasons for variations in how components function including the brightness of bulbs, the loudness of buzzers and the on/off position of switches?</p>

			and find fair ways to compare them?	Can they identify and name the basic parts of a simple electric circuit? (cells, wires, bulbs, switches, buzzers) Can they identify whether or not a lamp will light in a simple series circuit based on whether or not the lamp is part of a closed loop with a battery? Can they recognise that a switch opens and closes a circuit and associate this with whether or not a lamp will light in a simple series circuit? Can they recognise some common conductors and insulators, and associate metals with being good conductors? Challenge Can they explain the danger of short circuits? Can they explain what a fuse is? Can they explain how to make changes in a circuit? Can they explain the impact of changes in a circuit? Can they explain the effect of changing the voltage of a battery?	day and night and the apparent movement of the sun across the sky? Challenge Can they begin to understand how older civilisations used the sun to create astronomical clocks, e.g. Stonehenge? Can they explore the work of some scientists? (Ptolemy, Alhazen, Copernicus)	Can they use recognised symbols when representing a simple circuit in a diagram? Challenge Can they explain why cautions are necessary for working safely with electricity? Can they design and make a functioning circuit for a set of traffic lights, a burglar alarm or some other useful circuit?
Non-Negotiables –						
Evidence of ability to use scientific language recorded e.g. in learning diaries on Tapestry. Experimental opportunities where children can explore and describe what they see. Opportunities to plan, complete and discuss fair tests e.g. Sinking/floating items in water.	Weekly science lesson Clear science related learning objective (WALT) for each lesson. Final piece of work recorded each term. At least one experimental opportunity each half term (Where children can plan, complete and analyse a fair test). Evidence of use of scientific language in books.	Weekly science lesson Clear science related learning objective (WALT) for each lesson. Final piece of work recorded each term. At least one experimental opportunity each half term (Where children can plan, complete and analyse a fair test). Evidence of use of scientific language in books.	Weekly science lesson Clear science related learning objective (WALT) for each lesson. Final piece of work recorded each term. At least one experimental opportunity each half term (Where children can plan, complete and analyse a fair test). Evidence of use of scientific language in books.	Weekly science lesson Clear science related learning objective (WALT) for each lesson. Final piece of work recorded each term. At least one experimental opportunity each half term (Where children can plan, complete and analyse a fair test). Evidence of use of scientific language in books.	Weekly science lesson Clear science related learning objective (WALT) for each lesson. Final piece of work recorded each term. At least one experimental opportunity each half term (Where children can plan, complete and analyse a fair test). Evidence of use of scientific language in books.	Weekly science lesson Clear science related learning objective (WALT) for each lesson. Final piece of work recorded each term. At least one experimental opportunity each half term (Where children can plan, complete and analyse a fair test). Evidence of use of scientific language in books.
Composite Curricular Goal To use knowledge learnt to produce, the following...						
Autumn Naming something you can see, hear, touch, smell, taste in the world around us? Spring Drawing different animal habitats. Summer Labelling the lifecycle of 2 animals.	Autumn Carrying out an experiment to find the best material to use for a particular purpose. Spring Labelling the structure of a fish. Create a senses map to show what they experienced on a trip to the beach. Summer Designing an environment suitable for a chosen animal and its needs. Drawing a picture to show how a deciduous tree changes each season. Weather diaries.	Autumn Carrying out an experiment to find out which materials can/can't be changed back after heating/cooling. Spring A poster demonstrating a healthy meal – Labelled and annotated. Diagram of an animal's life cycle. Summer Name many characteristics of an animals that help it to live in particular habitats. Labelled poster of what a plant needs to grow.	Autumn Museum preparation – write about the uses and properties of rocks. Magnets double page spread. Spring Investigate the way in which water is transported within plants. Leaning Tower of Pisa shadow puppet experiment. Summer Create a human skeleton in groups.	Autumn Term How does the digestive system work? (Collage/Diagram/2-page spread). How do materials change states? (In books) Spring Life cycles 2-page spread. Summer Electricity – Can they create a small closed circuit? (Photos in books) Pitch/Sound experiment and 2-page spread on sound in books.	Autumn Double page spread Q: How do humans and animals produce and develop? Spring Double page spread - forces Summer Double page spread – space & light	Autumn 1 Draw, create and explain circuits. Autumn 2 Double page spread: Light Spring 1 Circulatory system labelled diagram Spring 2 Double page spread: Explain impact of diet, exercise, drugs and lifestyle on the way your body functions. Summer 1 Double page spread: Match animals to habitats and explain how characteristics suit different environments. Summer 2 Double page spread: Explain evolution and inheritance.

Vocabulary		
By the end of Year 2	By the end of Year 4	By the end of Year 6
Questions, answers, equipment, gather, measure, record, results, sort, group, test, explore, observe, compare,	Previous vocab plus: scientific enquiry changes over time, notice patterns, secondary sources, comparative	Previous vocab plus; notice patterns, relationships, independent variable, dependent variable, controlled

<p>describe, similar/ities, different/ces, beaker, pipette, syringe, observe changes over time, notice patterns, secondary sources, hand lenses, egg timers, identify, classify, data.</p> <p>Body, head, neck, arms, elbows, legs, knees, face, ears, eyes, eyebrows, eyelashes, nose, hair, mouth, teeth, tongue, feet, toes, fingers, nails, ankle, calf, thigh, hips, waist, trunk, chest, shoulders, back, hands, wrist, tail, wing, claw, fin, scales, feathers, fur, beak, senses, hearing, seeing, touching, offspring, life cycles, grow, change, adults, basic needs, water, food, air survival, exercise, food types (fruit and veg, bread, rice, pasta, milk, dairy, foods high in fat and sugar, meat, fish, eggs, beans), hygiene .</p> <p>Living, dead, never been alive, names of local habitats, pond, woodland, meadow, name micro habitats, under log, stony path, under bushes, suited, basic needs, depend, food, food chain, shelter.</p> <p>Names of: wild plants, garden pants, flowering plants, trees, leaf, flower, blossom, petal, fruit, berry, root, bulb, seed, trunk, branch, stem, bark, stalk, vegetable seeds, bulbs, water, light, growth, healthy, shoot, seedling.</p> <p>Season, spring, summer, autumn, winter, weather, hot, warm, cool cold, sunny, cloudy, windy, rainy, snowing, hailing, sleet, frost, fog, mist, icy, rainbow, thunder, lightning, storm, light, dark, day, night.</p> <p>Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, waterproof, absorbent, tear, rough, smooth, shiny, dull, see through, not see through Suitable/unsuitable, use, object, material, property, wood, plastic, glass, metal water, rock, fabrics, hard, soft, stretchy, flexible, waterproof, absorbent, transparent, translucent, opaque, shape, change, twist, squash, bend, stretch, roll, squeeze.</p>	<p>tests, fair tests, careful, accurate, observations, equipment, gather, measure, record, data, evidence, results, keys, bar charts, table, results, conclusions, predictions, support, thermometers, enquiry types increase, decrease, identify, classify, order, notice patterns, relationships, appearance, present results, data loggers.</p> <p>Nutrition, food types, carbohydrates, protein, vitamins and minerals, fat, sugar, fruits and veg, dietary fibre, water, balanced diet, skeleton, muscles, support, protection, movement, names of bones, vertebrate, invertebrate Digestive system, nutrition, mouth, teeth, canine, incisor, molar, pre-molar, saliva, tongue, rip, tear, chew, grind, cut, oesophagus (gullet), stomach, small intestine, large intestine, rectum, anus, carnivore, herbivore, omnivore, producer, consumer, predator, prey, food chain.</p> <p>Classification keys, environment, fish, amphibians, reptiles, birds, mammals, vertebrates, invertebrates, names of them, human impact, positive, negative (impact).</p> <p>leaf, flower, blossom, petal, fruit, root, bulb, seed trunk, branch, stem, water, light, air, nutrients, soil, fertiliser, grow, healthy, transported, life cycle, pollination, seed formation, seed dispersal.</p> <p>States of matter, solid, liquid, gas, air, oxygen, powder, granular/grain, crystals, change state, ice/water/steam, water vapour, heating, cooling, temperature, degrees Celsius, melt, freeze, solidify, melting point, boil, boiling point, evaporation, condensation, water cycle, precipitation, transpiration.</p> <p>Rock, stone, pebble, boulder, soil, fossils, grains, crystals, texture, absorb water, let water through, marble, chalk, granite, sandstone, slate, sandy soil, clay soil, chalky soil, peat.</p> <p>Light, light source, darkness, reflect, reflective, mirror, shadow, block, direction, transparent, opaque, translucent.</p> <p>Sound, sound source, noise, vibration, travel, solid, liquid, gas, pitch, tune, high, low, volume, loud, quiet, fainter, muffle, strength of vibrations, insulation, instrument, percussion, strings, bass, woodwind, tuned instrument.</p> <p>Force, contact force, non contact force, magnetic force, magnet, strength, bar/ring/button/horseshoe magnets, attract, repel, magnetic material, metal, iron, steel, non magnetic, poles, north/south pole.</p> <p>Electricity, appliance, device, mains, plug, electrical circuit, complete circuit, circuit diagram, circuit symbol, components, cell, battery, positive/negative, connect, connection, short circuit, wire, crocodile clip, bulb, bright/dim, switch, buzzer, motor, faster/slower, conductor, insulator, metal/non metal.</p>	<p>variable, accuracy, precision, degree of trust, classification keys, scatter graphs, line graphs, causal relationships, support/refute, data loggers, opinion/fact, confidently name scientific enquiry types.</p> <p>Circulatory system, heart, blood, blood vessels, pumps, oxygen, carbon dioxide, lungs, nutrients, water, diet, exercise, drugs, lifestyle, evolution, suited/suitable, adapted, adaptation, offspring, reproduction, variation, inherit, inheritance, fossils smelling, tasting, smooth, bright, dim, loud, quiet, high, low.</p> <p>Life cycle, reproduction, sexual, asexual, germination, pollination, seed formation, seed dispersal, pollen, stamen, stigma, plantlets, runners, mammal, amphibian, insect, bird, fish, reptile, eggs, live young Organism, micro-organism, fungus, mushrooms, classification keys, environment, fish, amphibians, reptiles, birds, ,mammals, vertebrates, invertebrates, name some of these, arachnid, mollusc, insect, crustacean.</p> <p>Y4 vocabulary plus; rigid, hard, soft, stretchy, flexible, waterproof, absorbent, electrical/thermal conductivity, melting, dissolve, solution, insoluble, solute, solvent, particle, mixture, filtering, sieving, residue, reversible/non reversible changes, new material, burning, rusting.</p> <p>Light, light source, darkness, reflect, reflective, shadow, block, absorb, direction, transparent, opaque, translucent.</p> <p>Fall, Earth, gravity, weight, mass, air resistance, water resistance, friction, moving surfaces, mechanisms, levers, pulleys, gears, force, transfers.</p> <p>Electricity, appliance, device, electrical circuit, complete circuit, circuit diagram, circuit symbol, components, cell, battery, positive, negative, terminal, connection, short circuit, wire, crocodile clip, bulb, bright/dim, switch, buzzer, volume, motor, conductor, insulator, voltage, current, resistance.</p> <p>Earth, planets, sun, solar system, moon, celestial body, spherical, rotation, spin, night and day, names of planets, dwarf planet, orbit, geocentric model, heliocentric model, shadow clocks, sundials, astronomical clocks.</p>
Visits/Visitors and websites		
<p>Visitors</p> <p>Secondary Science teachers</p> <p>Explorer Dome</p> <p>Dorset Waste Partnership</p> <p>RSPB</p> <p>Monkey World</p> <p>Life Bus</p> <p>Sublime science workshop</p> <p>Fizz pop science workshop</p> <p>Pop up Planetarium</p> <p>Science and dinosaur digital mobile dome</p>	<p>Visits</p> <p>Lorton Meadows</p> <p>Local Secondary School Science Department</p> <p>Chesil Beach Visitor Centre</p> <p>Wide Horizons Townsend Centre in Swanage</p> <p>Lyme Regis fossil hunt</p> <p>Sea life centre</p> <p>Museum of Jurassic marine life</p> <p>Lyme Regis museum</p> <p>Abbotsbury swannery</p> <p>Monkey World</p> <p>Winchester science centre</p>	<p>Websites</p> <p>https://www.stem.org.uk/resources</p> <p>https://www.sciencemuseum.org.uk/home</p> <p>https://www.howtosmile.org/</p> <p>https://nsdl.oercommons.org/</p> <p>School Trip Stem Ideas Primary and Secondary Schools (ukschooltrips.co.uk)</p>