SCIENCE

INTENT: At All Saints we believe that a high quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.
Science in our school is about developing children's ideas and ways of working that enable them to make sense of the world in which they live through investigation, as well as using and applying process skills. The staff at All Saints ensure that all children are exposed to high quality teaching and learning experiences, which includes allowing children to explore their outdoor environment and locality, thus developing their scientific enquiry and investigative skills.

IMPLEMENTATION: In ensuring high standards of teaching and learning in Science, we implement a curriculum that is progressive throughout the whole school. Science is taught in half termly blocks, that allow all of the National Curriculum programmes of study for each Year Group to be covered through 2-year rolling cycles. For example, the objectives for LKS2 are combined and shared out over a 2 year programme (such as Rocks, Teeth, Light etc…), as are the objectives for UKS2. The objectives for Y1 and Y2 are kept separate and taught annually, although they are linked to different topics each year (eg: The KS1 Animals unit will be investigated through the theme of *Under the Sea* one year, *Polar Regions/Farming* the next year, and *Minibeasts/Africa* the following year).
We have ensured that the Working Scientifically objectives are incorporated into the termly unit plans for Science through the use of Focussed Assessment Tasks. As much as possible, Science is explored by making close links to our local environment, visits from members of our local community and inspirational trips to locations further afield.

IMPACT: The impact and measure of this is to ensure that children at All Saints are equipped with skills and knowledge that will enable them to be ready for the curriculum at Key Stage 3 and for life as an adult in the wider world. We want the children to be confident about asking questions about the world around them and equip them with strategies to , Be providing inspirational and memorable learning experiences in Science, we aim to encourage our children to apply the scientific method to real life situations in the future.

SCIENCE

At the end of KS1, pupils will be able to:

- Name a variety of plants and animals linked to our local area and *Farming*, and to the wider topics of, *Polar Regions, Minibeasts, Sealife and Africa.*
- Describe the basic needs of animals, plants and humans, and be able to identify things that are living, dead or once alive.
- Label simple parts of plants and animals, as well as understand their different life cycles.
- Discuss how different living things are suited to different habitats and explore the food chains found in these areas.
- Understand and describe the importance of exercise, diet and hygiene in humans
- Identify and describe a variety of different materials, as well as their suitability for different purposes.
- Work scientifically by asking questions, classifying, carrying out tests using simple equipment, gathering data and making observations that help them to draw conclusions.

At the end of KS2, pupils will be able to:

- Label the parts of flowering plants in more detail, explain their life cycles and different methods of seed dispersal, and investigate how water is transported around a plant.
- Name and classify a wide variety of plants and animals according to common characteristics, and make links between these and their adaptations to specific habitats. Identify ways in which these adaptations may have lead to evolution.
- Recognise that some environments can change, and that this can sometimes pose dangers to living things.
- Describe in greater detail, the requirements for life and growth in different plants and animals, as well as the process of reproduction in some examples.
- Explain the function of different systems within the human body, including digestive system, circulatory system, skeleton, teeth and muscles.
- Explain the concepts of evolution and inheritance.
- Compare and classify rocks, types of soil and explain how fossils are formed.
- Recognise the need for light in order for us to see, explore reflection and shadows and understand the need to protect our eyes from the light from the sun. Be able to explain how light travels in straight lines and is reflected off the surface of objects to our eyes, which is why we can see them.
- Observe and compare the way in which forces act on objects moving along different surfaces, and the way in which magnetic materials work. Explain gravity in simple terms, as well as air/water resistance and friction.
- Explore how levers, pulleys and gears can be used to increase the output of a smaller force.
- Identify and compare solids, liquids and gases and observe the changes in state to some materials when they are heated or cooled.
- Describe the water cycle and the part played by evaporation and condensation.
- Recognise that sounds are cause by vibrations, and that these travel through a medium to the ear. Observe and describe the links between a sound's pitch or volume and the souce/strength of the vibrations causing it.
- Identify common uses of electricity, recognise and use symbols in circuit diagrams and construct simple series circuits using cells, lamps, buzzers, switches and wires.
- Recognise some common conductors and insulators and associate the brightness of a bulb/ volume of a buzzer with the voltage of cells used in a circuit.
- Describe the movements of the Earth, Moon, Sun and other planets within our solar system and explain day and night.
- Work scientifically to set up practical enquiries, comparative and fair tests, make systematic observations and measurements using a range of equipment and recordings and use scientific evidence to draw conclusions and present their results.

SMSC

(to be developed in all lessons)

Spiritual: Explore beliefs and experience; respect faiths, feelings and values; enjoy learning about oneself, others and the surrounding world; use imagination and creativity; reflect.
Sharing moments of awe and wonder at the natural world and scientific processes. Exploring and respecting different faiths and recognising that some people may have different views on evolution, space and other areas of the science curriculum.

Moral: Recognise right and wrong; respect the law; understand consequences; investigate moral and ethical issues; offer reasoned views.
Making links to global warming, habitat loss for living things around the world and recognising the impact people can have on the natural world.

Social: Use a range of social skills; participate in the local community; appreciate diverse viewpoints; participate, volunteer and cooperate; resolve conflict; engage with the **'British values'** of democracy, the rule of law, liberty, respect and tolerance.
Exploring scientific opportunities in our local area, making links to farming, the countryside and the way in which we can support our communities through innovation and understanding.

Cultural: Appreciate cultural influences; appreciate the role of Britain's parliamentary system; participate in culture opportunities; understand, accept, respect and celebrate diversity.

SCIENCE

At the end of KS1, pupils will be able to:

KS1 KEY KNOWLEDGE

- **Plants**
- 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.
- **Seasonal Change**
- observe changes across the four seasons
- observe and describe weather associated with the seasons and how day length varies
- **Living Things and their Habitats**
- explore and compare the differences between things that are living, dead, and things that have never been alive
- identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other
- identify and name a variety of plants and animals in their habitats, including microhabitats
- describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.
- **Animals, Including Humans**
- 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.
- 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.
- **Everyday Materials**
- 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.
- 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.

KS1 KEY SKILLS – Working Scientifically

- 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.

SCIENCE

DIAMOND & TOPAZ CLASS

CYCLE YEAR 1

TOYS (OLD AND NEW)
Autumn Term 1 2019/2020

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)	ASPECTS TO COVER
Revision of material names, their properties and suitability for different purposes in all areas of learning. For example, what are different toys made from? Why might toys today be made from different materials to those from the past? Possible famous scientist/inventor to learn about: Ole Kirk Christiansen (Lego) **Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)**	**Year 1 pupils - Everyday Materials** • 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. **Year 2 pupils - 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 • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. **Y1 only Seasonal Change** • observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies

FIRE OF LONDON
Autumn Term 2 2019/2020

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)	ASPECTS TO COVER
Revision of material names, their properties and suitability for different purposes in all areas of learning. Making links to last year's Splish, Splash, Splosh topic. Waterproof materials/floating and sinking. Exploring suitability of different materials for fire buckets, waterproof coats etc… Possible famous scientist/inventor to learn about: Charles Mackintosh (waterproofing) **Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)**	**Year 1 pupils - Everyday Materials** • 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. **Year 2 pupils - 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 • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. **Y1 only Seasonal Change** • observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies

SCIENCE

POLAR REGIONS
Spring Term 1 2019/2020

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)

Making links to last year's topic, *Splish, Splash, Splosh*, and the animals that were covered then.

Links to exercise, hygiene and diet can also be made through PE lessons, lunchtime and playtime discussions throughout the year.

Possible famous scientist/inventor to learn about:
Weather – famous meteorologists

Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)

ASPECTS TO COVER

Year 1 pupils - Animals, Including Humans

- 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.*

Year 2 pupils - Animals, Including Humans

- 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.*

SOMEWHERE TO SETTLE (KATIE MORAG, ISLANDS, OUR LOCAL AREA - FARMING)
Spring Term 2 & Summer Term 1 2019/2020

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)

Making links to last year's topic, *Splish, Splash, Splosh*, and the animals that were covered then.

Real-life experiences of children with animals at home, on trips and through visits used to facilitate learning.

Possible famous scientist/inventor to learn about:
Weather – famous meteorologists

Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)

Trips – Farmer Palmer's
Farm animals day in school (local community)
Browsea Island

ASPECTS TO COVER

Year 1 pupils - Animals, Including Humans

- 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 Science –
- describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)

Year 2 pupils - Animals, Including Humans

- 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)

Year 2 pupils - Living Things and their Habitats

- explore and compare the differences between things that are living, dead, and things that have never been alive
- identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other
- identify and name a variety of plants and animals in their habitats, including microhabitats
- describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.

Y1 only Seasonal Change

- observe changes across the four seasons
- observe and describe weather associated with the seasons and how day length varies

SCIENCE

GOOD TO BE BRITISH (GEOG LEARNING ABOUT UK, ROYAL FAMILY)

Summer Term 2 2019/2020

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)

Make links back to plants grown in class last year (refer to attached seed investigation chart). Explore the local area, naming common plants and trees on our grounds and in the village.

Possible famous scientist/inventor to learn about: Tim Schmit & Nicholas Grimshaw (Eden Project, Greenhouses)

Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)

ASPECTS TO COVER

Year 1 Pupils - Plants

- 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. Refer to attached seed investigation chart.

Year 2 Pupils - Plants

- observe and describe how seeds and bulbs grow into mature plants Refer to attached seed investigation chart.
- find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Year 1 Pupils only - Seasonal Change

- observe changes across the four seasons
- observe and describe weather associated with the seasons and how day length varies.

SCIENCE

CYCLE YEAR 2

A HERO IS ALL YOU NEED

Autumn Term 2020/2021

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)

Revision of material names, their properties and suitability for different purposes in all areas of learning.

Best materials for superhero outfits, etc…

Possible famous scientist/inventor to learn about:
Louis Pasteur (hygiene, germs)
Elizabeth Garrett Anderson (doctors)

Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)

ASPECTS TO COVER

Year 1 pupils - Animals, Including Humans
- identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.

Year 2 pupils - Animals, Including Humans
- describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Year 1 pupils - Everyday Materials
- 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

Year 2 pupils - 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

Year 1 Pupils only - Seasonal Change
- observe changes across the four seasons
- observe and describe weather associated with the seasons and how day length varies.

ALL CREATURES GREAT AND SMALL (AFRICA/MINIBEASTS)

Spring Term 2020/2021

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)

Making links to last year's topics, *Polar Regions and Farming*, and the animals that were covered then.

Real-life experiences of children with animals at home, on trips and through visits used to facilitate learning.

Possible famous scientist/inventor to learn about:
Carl Haggenbeck & George Mottershead (Zoos and Conservation)

Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)

Trip – Carymoor (minibeasts and habitats – and plants in preparation for next term's science unit)

ASPECTS TO COVER

Year 1 pupils - Animals, Including Humans
- 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 Science –
- describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)

Year 2 pupils - Animals, Including Humans
- 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)

Year 2 pupils - Living Things and their Habitats
- explore and compare the differences between things that are living, dead, and things that have never been alive
- identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other
- identify and name a variety of plants and animals in their habitats, including microhabitats
- describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.

Y1 only Seasonal Change
- observe changes across the four seasons
- observe and describe weather associated with the seasons and how day length varies

SCIENCE

READY STEADY GO (JOURNEYS AND TRANSPORT INCL COMPARING CHRISTOPHER COLUMBUS AND NEIL ARMSTRONG, TITANIC ETC)

Summer Term 2020/2021

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)

Revision of material names, their properties and suitability for different purposes in all areas of learning.

For example, what are different vehicles made from? Why might vehicles today be made from different materials to those from the past?

Make links back to plants grown in class last year (refer to attached seed investigation chart). Explore the local area, naming common plants and trees on our grounds and in the village.

Possible famous scientist/inventor to learn about: Mae Jemison (astronaut)

Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)

Trip – Motor Museum (links to everyday materials)

ASPECTS TO COVER

Year 1 Pupils - Plants

- 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. Refer to attached seed investigation chart.

Year 2 Pupils - Plants

- observe and describe how seeds and bulbs grow into mature plants Refer to attached seed investigation chart.
- find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Year 1 pupils - Everyday Materials

- 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.

Year 2 pupils - 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
- find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Year 1 Pupils only - Seasonal Change

- observe changes across the four seasons
- observe and describe weather associated with the seasons and how day length varies.

SCIENCE

CYCLE YEAR 3

ONCE UPON A TIME… (CASTLES, FAIRY TALES, TRADITIONAL TALES, SIR WALTER RALEIGH)

Autumn Term 2021/2022

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)

Links to exercise, hygiene and diet can also be made through PE lessons, lunchtime and playtime discussions throughout the year.

Make links back to plants grown in class last year (refer to attached seed investigation chart). Explore the local area, naming common plants and trees on our grounds and in the village.

Possible famous scientist/inventor to learn about:
Linda Brown Buck (senses/smell)
Jane Colden (botany, parts of plants)

Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)

Note – there are also opportunuities for stand-alone Working Scientifically investigations linked to materials during this topic – Three Little Pigs houses, Castles etc…)

ASPECTS TO COVER

Year 1 pupils - Animals, Including Humans

- identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.

Year 2 pupils - Animals, Including Humans

- describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene

Year 1 Pupils - Plants

- 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. Refer to attached seed investigation chart.

Year 2 Pupils - Plants

- observe and describe how seeds and bulbs grow into mature plants Refer to attached seed investigation chart.
- find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Year 1 Pupils only - Seasonal Change

- observe changes across the four seasons
- observe and describe weather associated with the seasons and how day length varies.

SCIENCE

CHINA (CHINESE NEW YEAR)

Spring Term 1 2021/2022

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)

Revision of material names, their properties and suitability for different purposes in all areas of learning.

Possible famous scientist/inventor to learn about:
Chester Greenwood (Earmuffs)

Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)

ASPECTS TO COVER

Year 1 pupils - Everyday Materials

- *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.

Year 2 pupils - 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
- *find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.*

GOOD TO BE GREEN (FAIRTRADE/ RECYCLING)

Spring Term 2 2021/2022

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)

Revision of material names, their properties and suitability for different purposes in all areas of learning.

Links to recycling and sorting materials. What are different everyday objects made from and how can they be recycled into new products?

Possible famous scientist/inventor to learn about:
Chester Greenwood (Earmuffs)

Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)

ASPECTS TO COVER

Year 1 pupils - Everyday Materials

- 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.*

Year 2 pupils - 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*
- find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Y1 only Seasonal Change

- observe changes across the four seasons
- observe and describe weather associated with the seasons and how day length varies

SCIENCE

SPLISH, SPLASH, SPLOSH

Summer Term 2021/2022

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)

Making links to last year's topic, *Africa/Minibeasts*, and the animals that were covered then.

Real-life experiences of children with animals at home, on trips and through visits used to facilitate learning
Possible famous scientist/inventor to learn about:
Rachel Carson – food chains/ocean habitats

Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)

Trips – Weymouth Sealife Centre

Note – there are also opportunuities for stand-alone Working Scientifically investigations linked to materials during this topic – boats, floating/sinking, waterproofing. The Focussed Assessment Tasks for the Materials Unit could be used either at the very end of Spring 2, or the very start for Summer 1).

ASPECTS TO COVER

Year 1 pupils - Animals, Including Humans

- 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 Science –
- describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)

Year 2 pupils - Animals, Including Humans

- 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)

Year 2 pupils - Living Things and their Habitats

- explore and compare the differences between things that are living, dead, and things that have never been alive
- identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other
- identify and name a variety of plants and animals in their habitats, including microhabitats
- describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.

Y1 only Seasonal Change

- observe changes across the four seasons
- observe and describe weather associated with the seasons and how day length varies

SCIENCE

At the end of KS2, pupils will be able to:

KS2 KEY KNOWLEDGE

- **Plants**
- 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.
- **Animals Including Humans**
- describe the ways in which nutrients and water are transported within animals, including humans.
- 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
- construct and interpret a variety of food chains, identifying producers, predators and prey
- describe the changes as humans develop through puberty to old age.
- 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
- **Rocks**
- 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 rocks
- recognise that soils are made from rocks and organic matter.
- **Light**
- recognise that they need light in order to see things and that dark is the absence of light
- 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
- 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.
- **Earth and Space**
- 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.
- **Forces and Magnets**
- 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.
- 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.
- **Living Things and Their Habitats**
- 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. recognise that environments can change and that this can sometimes pose dangers to living things.
- 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.

SCIENCE

- **Evolution and Inheritance**
- 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.
- **States of 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, 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.
- **Sound**
- 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.
- **Properties of Materials**
- 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.
- **Electricity**
- 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
- 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
- recognise some common conductors and insulators, and associate metals with being good conductors.
- associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- use recognised symbols when representing a simple circuit in a diagram.

KS2 KEY SKILLS – WORKING SCIENTIFICALLY

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- setting up simple practical enquiries, comparative and fair tests
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Using standard units, and 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, diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- 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
- using test results to make predictions to set up further comparative and fair tests identifying differences, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings.
- identifying scientific evidence that has been used to support or refute ideas or arguments.

SCIENCE

RUBY CLASS

CYCLE YEAR 1

LOCAL AREA Autumn 1 2019/2020 & 2021/2022	
PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency) Point out and discuss items that use electricity/ sources of electricity throughout Y3 and Y4 in relation to everyday experience. Possible famous scientist/inventor to learn about: Thomas Edison **Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)**	**ASPECTS TO COVER** **Electricity** • 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.

COASTS AND WATER CYCLE Autumn 2 2019/2020 & 2021/2022	
PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency) Refer back to learning in KS1 – grouping and classifying materials based on physical properties. Link water cycle objective to Geography unit exploring coasts and waterways Possible famous scientist/inventor to learn about: Lord Kelvin (temperature and thermometers) **Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)**	**ASPECTS TO COVER** **States of 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, and measure or research the temperature at which this happens in degrees Celsius (°C) • identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

SCIENCE

ANGLO SAXONS
Spring Term 1 2019/2020 & 2021/2022

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)	ASPECTS TO COVER
Make regular links throughout Y3 and Y4 in relation to everyday experience. Eg harvest, growing crops in the Spring, lunchtimes, snack at breaktime etc Refer back to learning in Year 2 on diet and designing a healthy meal. **Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)**	**Animals Including Humans (digestion and nutrition)** • 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 • describe the simple functions of the basic parts of the digestive system in humans

ANGLO SAXONS
Spring Term 2 2019/2020 & 2021/2022

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)	ASPECTS TO COVER
Refer back to learning in KS1 : **Year 1 Pupils - Plants** • 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. sunflowers/beans **Year 2 Pupils - Plants** • observe and describe how seeds and bulbs grow into mature plants peas/onions • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. Possible famous scientist/inventor to learn about: George Washington Carver (growing crops) **Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)**	**Plants** • 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 • Refer to attached seed investigation chart (marigolds/pumpkin plants) • 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.

SCIENCE

ROMANS
Summer Term 1 2019/2020 & 2021/2022

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)	ASPECTS TO COVER
Possible famous scientist/inventor to learn about: Several scientists, including William Sturgeon (using coiled wire to create electromagnets, and their applications) **Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)**	**Forces and Magnets** • 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.

ROMANS
Summer Term 2 2019/2020 & 2021/2022

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)	ASPECTS TO COVER
Links to Romans topic: Romans used candles and oil lamps to light their homes. Where does light come from? What light sources can we identify? Which is the brightest? Romans used mirrors of polished metal or metal-backed glass for personal care and signalling. What can we see in a mirror? What can we see in a curved or bendy mirror? How are curved mirrors useful to us? Can we use a mirror to signal like the Romans did? Possible famous scientist/inventor to learn about: Arthur James Wilson (Concave/Convex) **Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)**	**Light and Shadows** • 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 byan opaque object • find patterns in the way that the size of shadows change.

SCIENCE

CYCLE YEAR 2

Autumn Term 1 2020/2021 & 2022/2023

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)	ASPECTS TO COVER
Egg shell investigation (tooth decay) Plaque disclosing tablets/ toothbrushing and hygiene (link back to KS1 lessons on hygiene and germs) Opportunity to invite school nurse/local dentist to visit school for talk etc… Possible famous scientist/inventor to learn about: Marie Curie (X-Rays/Bones) Washington Sheffield (invented modern toothpaste) **Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)**	**Animals Including Humans (body structures)** • identify that humans and some other animals have skeletons and muscles for support, protection and movement. • identify the different types of teeth in humans and their simple functions

Autumn Term 2 2020/2021 & 2022/2023

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)	ASPECTS TO COVER
Possible famous scientist/inventor to learn about: Alexander Graham Bell (telephone, etc…) **Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)**	**Sound** • identify how sounds are made, associating some of them with something vibrating • recognise that vibrations from sounds travel through a medium to the ear • find patterns between the pitch of a sound and features of the object that produced it • find patterns between the volume of a sound and the strength of the vibrations that produced it • recognise that sounds get fainter as the distance from the sound source increases.

SCIENCE

STONE AGE
Spring Term 2020/2021 & 2022/2023

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)	ASPECTS TO COVER
Link back to previous learning in Year 1 on Materials. (sand comes from ground up rocks and can be heated to create glass, describing properties of natural and man-made materials such as rocks, bricks, tiles, etc…) Links back to KS1 topic, Splish, Splash, Splosh looking at sea animals, shell creatures etc when discussing fossils. Possible famous scientist/inventor to learn about: William Smith (using fossils to age rocks) Inge Lehmann (the Earth's Core) **Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)**	**Rocks** • 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.

VIKINGS
Summer Term 1 2020/2021 & 2022/2023

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)	ASPECTS TO COVER
Links back to KS1 learning on habitats and microhabitats Possible famous scientist/inventor to learn about: Gerald Durrell (conservation in Madagascar) **Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)**	**Living Things and their Habitats** • 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.

VIKINGS
Summer Term 2 2020/2021 & 2022/2023

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)	ASPECTS TO COVER
Y3s will have learned about food chains and this vocabulary last year in the context of Polar animals and British animals. Y4s will have learned about food chains two years ago in the context of Underwater animals.	**Animals Including Humans** • construct and interpret a variety of food chains, identifying producers, predators and prey.

SCIENCE

SAPPHIRE CLASS

CYCLE YEAR 1

LOCAL AREA Autumn 1 2019/2020 & 2021/2022	
PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency) Links back to KS1 learning on habitats and microhabitats Links back to learning in LKS2: **Living Things and their Habitats** • 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. Making links to the local area and habitats as part of topic. Possible famous scientist/inventor to learn about: Eva Crane (bees life cycles) Libbie Hynman (classifying invertebrates) **Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)**	**ASPECTS TO COVER** **Living Things and their Habitats** • 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 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.

Mountains, Volcanoes and Earthquakes Autumn 2 2019/2020 & 2021/2022	
PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency) Links back to LKS2 learning on Rocks and fossils Possible famous scientist/inventor to learn about: Mary Leaky (fossils) **Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)**	**ASPECTS TO COVER** **Evolution and Inheritance** • 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.

SCIENCE

ANCIENT EGYPT
Spring Term 2019/2020 & 2021/2022

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)

Recap/revsit learning from LKS2

- 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.

Possible famous scientist/inventor to learn about:
Steve Jobs (circuits and electronics)

Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)

ASPECTS TO COVER

Electricity

- 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.

ISLAMIC CIVILISATION
Summer Term 2019/2020 & 2021/2022

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)

Link back to learning on forces and magnets from LKS2

- compare how things move on different surfaces
- notice that some forces need contact between two objects, but magnetic forces can act at a distance

Y6 pupils should have also covered the UKS2 unit on Space and Earth (and discussed gravity in this context) last year.

Possible famous scientist/inventor to learn about:
Stephen Hawking (gravity - black holes)

Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)

ASPECTS TO COVER

Forces

- 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.

SCIENCE

CYCLE YEAR 2

Autumn Term 1 2020/2021 & 2022/2023

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)	ASPECTS TO COVER
Link back to learning on light and shadows from LKS2 • 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. **Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)**	**Light** • 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.

Autumn Term 2 2020/2021 & 2022/2023

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)	ASPECTS TO COVER
Link back to learning on materials/properties from KS1 Link back to learning on states of matter in LKS2 Look at Focussed Assessment Tasks available for this unit (there are 5) – Lots of opportunities to cover WSc skills through different investigations, even if they aren't all formally assessed. **Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)**	**Properties and Changes of Materials** • 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.

SCIENCE

ANCIENT GREECE
Spring Term 2020/2021 & 2022/2023

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)	ASPECTS TO COVER
Link back to learning in LKS2 (covered over both Y3 & 4) on skeletons, muscles, teeth, digestion, nutrition and food chains. (Pupils should draw timelines of changes in humans as they age, including puberty). Possible famous scientist/inventor to learn about: Leonardo da Vinci (Vitruvian Man) David Attenborough (wildlife documentary) Alexander Flemming (penicillin) Daniel Hale Williams (circulatory system) **Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)**	**Animals Including Humans** • describe the changes as humans develop to old age. • 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.

WW2
Summer Term 2020/2021 & 2022/2023

PREVIOUS LEARNING IN SUBJECT & POSSIBLE CONNECTIONS TO BE MADE (fluency)	ASPECTS TO COVER
Link back to learning in LKS2 on light and shadows. Y6 pupils should also have covered the UKS2 unit on light last year. Link back to learning in LKS2 on forces and magnets. Y6 pupils should have also covered the UKS2 unit on forces last year (including gravity). Possible famous scientist/inventor to learn about: Margaret Hamilton (Apollo Moon Mission) Stonehenge – arguments for and against it being an astronomical calendar (perfect opportunity to cover the UKS2 WSc objective, *identifying scientific evidence that has been used to support or refute ideas or arguments*.) **Working Scientifically Skills should be incorporated into all science topics (see attached coverage charts)**	**Space and Earth** • 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.