Science

Overview and Progression Maps

Science Curriculum

Science Curriculum Intent

At Saxon all children are scientists. Our curriculum aims to build on the skills and prior scientific knowledge through scientific enquiry and practical hands on learning year on year. Children are able to learn with others as well as independently to problem solve. They can question and discuss using accurate scientific vocabulary to unravel misconceptions alongside scientific enquiries. By the end of Year 6, our aim is for all children to have the ability to transition easily to secondary school science and beyond. They will have sustained accurate understanding of the science subjects and have developed the skills of this discipline; they are able to choose their method of enquiry. As lifelong curious learners who question the world around them, they understand the relevance of science both in everyday life and in our ever-changing world. The relevance of science is promoted by looking at both past and present scientists and how they, the children, could change our world in the future. By using our community and our environment, a love for science is further embedded.

The Core Concepts for Science

Core Concepts in Science			
Physics	**Chemistry**	**Biology**	**Earth Science**
Forces and magnets	States of matter	Animals, including humans	Earth and space
Sound	Materials	Evolution and inheritance	Rocks
Electricity		Living things and their habitats	Seasonal changes
Light		Plants	
Earth and space			
States of matter			
Scientific Enquiry			
Observing over time			
Comparative and fair testing			
Identifying and classifying			
Pattern seeking			
Researching using secondary sources			

Science Curriculum

	Autumn I	Autumn II	Spring I	Spring II	Summer I	Summer II
Year 1	Weather and Seasonal changes plants Materials	Weather and Seasonal changes, plants Materials	Weather and Seasonal changes, plants Animals	Weather and Seasonal changes, plants Senses	Weather and Seasonal changes Plants	Weather and Seasonal changes Plants Enquiry based consolidation
Year 2	Plants - bulbs	Animals including humans	Living things and their habitats	Materials	Plants - seeds microhabitats	Coastal Habitats Animals including humans- nutrition, exercise, hygiene
Year 3	Rocks and soils	Forces and magnets	Light	Plants	Plants	Animals including Humans
Year 4	States of Matter	Sound	Electricity	Digestion	Living Things and their Habitats	Animals
Year 5	Properties of Materials	Properties of Materials	Forces	Earth and Space	Living Things and their Habitats	Animals and Humans
Year 6	Electricity	Light	Evolution and inheritance	Living Things and their Habitats	Living Things and their Habitats	Animals including Humans

SCIENCE LEARNING MAP

YEAR 1

- Identify and name a variety of common wild and garden plants.
- Identify and describe the basic structure of a variety of common flowering plants, including trees.
- Know and use key vocabulary.

YEAR 2

- 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

YEAR 3

- Identify and describe the functions of different parts of flowering plants: roots, stem/ trunk, leaves and flowers
- Explore the requirements of plants for life and growth and how they vary from plant to plant
- Investigate the way in which water is transported within plants
- Explore the part that flowers play in the lifecycle of flowering plants, including pollination, seed formation and seed dispersal

Plants

Progression Map

Vocabulary

Common wild plants, garden plants, tree, deciduous, evergreen, trunk, branches, leaf, root, plant, bud, flowers, blossom, petals, stem, fruit, vegetables, bulb, seed, water, light, suitable temperature, grow, healthy, germination, reproduction, structure, flowering, leaves, function, nutrition, support, reproduction, makes own food, requirements for life and growth, air, nutrients, fertiliser, life cycle, pollination, seed formation, seed dispersal.

SCIENCE LEARNING MAP

Animals including humans

Progression Map

YEAR 1

- Identify and name a variety of common animals.
- 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.
- 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

- Notice that animals, including humans, have offspring which grow into adults.
- Find out about and describe the basic needs of animals (Inc. Humans) for survival.
- Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

YEAR 3

- Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.
- Identify that humans and some other animals have skeletons and muscles for support, protection and movement.

YEAR 4

- 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.

YEAR 5

- Describe the changes as humans develop to old age.

YEAR 6

- 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.

Vocabulary

Common animals, fish, amphibians, reptiles, birds, mammals, pets, carnivores, meat, herbivores, plants, omnivores, human, hear, offspring, grow, adults, nutrition, reproduce, survival, water, food, air, exercise, hygiene, vitamins, minerals, fats, protein, carbohydrates, skeletons, support, protection, skulls, ribs, joint, muscles, movement, pull, contract, relax, diet, digestive system, transports, stomach, acid, enzymes, brush, floss, food chain, sun, producers, prey, predators, circulatory systems, heart, blood, blood vessels, pumps, oxygen, carbon dioxide, lungs, nutrients, lifestyle.

SCIENCE LEARNING MAP

YEAR 2

- Explore and compare the difference 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 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 micro-habitats
- Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.

YEAR 6

- 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

Living things and their habitats

Progression Map

YEAR 5

- Describe the differences in the lifecycles of a mammal, an amphibian, an insect and a bird.
- Describe the life process of reproduction in some plants and animals.

YEAR 4

- 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.

Vocabulary

Living, dead, never alive, habitats, micro-habitats, food, food chain, alive, healthy, logs, leaf litter, stony path, under bushes, shelter, seashore, woodland, ocean, rainforest, conditions, hot, warm, cold, dry, damp, wet, bright, shade, dark, environment, flowering, non-flowering, plants, animals, vertebrae, danger, invertebrates, vertebrates, population development, deforestation, reproduction, sexual, asexual, mammal, amphibian, insect, bird, prehistoric, similarities, differences, germination, pollination, stamen, stigma, organism, micro-organism, fungus, mushrooms, classification keys, environment, fish, reptiles.

SCIENCE LEARNING MAP

YEAR 6
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 adaption may lead to evolution.

YEAR 1
Seasonal Change

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

Seasonal change Evolution and Inheritance

Progression Map

Vocabulary

Seasonal Change Season

spring, summer, autumn, winter, weather, hot, warm, cool, sold, sun, sunny, cloud, cloudy, wind, windy, rain, rainy, snow, snowing, hail, hailing, sleet, frost, fog, mist, ice, icy, rainbow, thunder, lightning, storm, light, dark, day, night.

Evolution and Inheritance

Evolution, suited, suitable, adapted, adaptation, offspring, characteristics, vary, variation, inherit, inheritance, fossils.

SCIENCE LEARNING MAP

YEAR 5

- Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets -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.

YEAR 1

- 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 every day materials by their simple physical properties.

YEAR 2

- Identify and compare the suitability of a variety of every day 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.

Materials

Progression Map

YEAR 3— 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.

YEAR 4 – 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.
- Identify the part the played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

SAXON PRIMARY SCHOOL

Vocabulary

Material, wood, plastic, glass, metal, water, rock, properties, hard, soft, stretch, stiff, shiny, dull, rough, smooth, bendy, waterproof, absorbent, brick, paper, fabrics, elastic, cardboard, squashing, bending, twisting, stretching, hardness, solubility, transparency, conductive, response to magnets, dissolve, liquid, solution, separate, filtering, sieving, evaporating, melting, insulation, condensing.

<u>Rocks</u>

Rock, stone, pebble, boulder, soil, fossil, grains, crystals, hard, soft, texture, absorb water, marble, chalk, granite, sandstone, clay soil, chalky soil, peat.

<u>States of Matter</u>

Solid, liquid, gas, air, oxygen, powder, grain, granular, crystals, ice, water, steam, water vapour, heated, heating, cooled, cooling, temperature, degrees Celsius, melt, freeze, solidify, melting point, molten, boil.

SCIENCE LEARNING MAP

YEAR 5

- 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.

Earth and Space

Progression Map

Vocabulary

Earth, planets, sun, solar system, moon, celestial body, sphere, spherical, rotate, rotation, spin, night and day, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, dwarf planet, orbit, revolve, geocentric model, heliocentric model, shadow clocks, sundials, astronomical clocks.

SCIENCE LEARNING MAP

YEAR 3 – Light

- 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 there are ways to protect their eyes
- Recognise that shadows are formed when the light from a light source is blocked by a solid object. Find patterns in the way that the size of shadows change

Light and Sound

Progression Map

YEAR 4 – 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.

YEAR 6 – 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.

Vocabulary

Light

Light, see, dark, reflect, reflective, surface, natural, star, sun, moon, artificial, torch, candle, lamp, translucent, transparent, travels, straight, reflection, light source, object, shadows, mirrors, periscope, rainbow, filters.

Sound

Sound, sound source, noise, vibrate, travel, solid, liquid, gas, pitch, tune, high, low, volume, loud, quiet, fainter, muffle, vibrations, insulation, instrument, percussion, strings, bass, woodwind, tuned instrument.

SCIENCE LEARNING MAP

Forces and Magnets

Progression Map

YEAR 3

- 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.

YEAR 5

- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- Identify the effects of air resistance, water resistance and friction that act between moving surfaces
- Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect

Vocabulary

Force, push, pull, open, surface, magnet, magnetic, attract, repel, magnetic poles, north, south, metal, iron, steel, fall, gravity, air resistance, water resistance, friction, moving surfaces, mechanisms, levers, pulleys, gears, magnetic force.

SCIENCE LEARNING MAP

YEAR 6

- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
- Use recognised symbols when representing a simple circuit in a diagram

Electricity

Progression Map

YEAR 4

- 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

Vocabulary

Appliances, electricity, electrical circuit, cell, wire, bulb, buzzer, danger, electrical safety, sign, insulators, wood, rubber, plastic, glass, conductors, metal, water, switch, open, closed, components, plug, motor, mains, complete circuit, circuit diagram, circuit symbol, components, battery, positive, negative, terminal, connection, loose connection, short circuit, wire, crocodile clip, bulb, brightness, switch, buzzer, volume, motor, insulator, voltage, current, resistance, series circuit.

SCIENCE LEARNING MAP

YEARS 1-2

- During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:
- 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

YEARS 3-4

- During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:
- 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

YEARS 5-6

- During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:
- 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 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

Working Scientifically

Progression Map

Vocabulary

question, questioning, observe, record, identify, group, classify, sort, predict, diagram, chart, bar chart, table, data.

relevant, questions, predication, plan, observations, record, research, enquiry, comparative, fair, accurate, measurements, thermometer, data logger, classify, keys, diagrams, graphs, charts, tables, conclusion, explanation.

Vocabulary

predication, plan, variables, observations, record, repeat, identify, comparative, fair, accurate, precise, quantitive, measurements, scientific, diagrams, classification, keys, present, systematic, patterns, interpret, conclusion, explanation, relationships, evidence, refute, validity