

Landgate School Science Long Term Planning 2019-2023

Key Stage 2

Key stage 2 Intent:

We aim to ensure all our learners have access to the Science National Curriculum by:

- developing scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.
- developing understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.
- equipping learners with the scientific knowledge required to understand the uses and implications of science, today and for the future.

At Landgate, primary learners are assessed against Primary Learning Ladders which encompass The P Scales (stages 1-9) and National Curriculum Year expectations (stages 10-15).

Primary Science is planned and delivered by the lead class teacher or HLTA.

Links -

Relationships Education, Relationships and Sex Education (RSE) and Health Education:

At key stage 2 the national curriculum for science includes teaching about the main external parts of the body and changes to the human body as it grows from birth to old age, including puberty.

Key Stage Opportunities:

In Key Stage Two Science is delivered through extended weekly STEM sessions enabling them to acquire, develop and apply their learning in Science supported by the other STEM subjects. The sessions should:

- be sequential building on the knowledge and skills of the previous lesson.
- make good use of time to plan, investigate, record and come to a conclusion.
- include a range of strategies including adult directed activities, focused play activities and independent investigation.

Learners follow a range of themes which allow learners to be supported in following their own learning paths and gives them the opportunities and experiences to work towards:

- 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.
- 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.

Key Stage Two learners are to be given opportunities to see how science effects our daily lives and the environment around us. Therefore they will access the outdoor provision and visits out of school to investigate extend their understanding and contextual breadth.

Year A

Year B

Year C

Year D

	2019-20	2020-2021	2021-2022	2022-2023
--	---------	-----------	-----------	-----------

Key Focus:	Plants - life cycle/ Processes	Living things and their habitats - Classification/ Environmental Effects	Living things and their habitats - Life Cycles	Living things and their habitats - Classification
Key Knowledge/ Vocabulary: (Vocab highlighted in bold)	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ the functions of different parts of flowering plants. (petals, stems, leaves, roots) ➤ the requirements of plants for life and growth and variations. (Water, Sun, food,) ➤ the way in which water is transported within plants. ➤ seeds also seed formation and seed dispersal. ➤ the life cycle of flowering plants, including pollination. 	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ that living things can be grouped in a variety of ways. Insects - number of legs / wings, habitat, animals – fur, legs, scales, babies, eggs etc ➤ variety of living things in their local and wider environment and sort. Use classification keys. ➤ that environments can change and that this can sometimes pose dangers to living things. E.g. Arctic melting, litter 	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (i.e. caterpillar/ butterfly, birds) ➤ the life process of reproduction in some plants and animals. 	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. ➤ give reasons for classifying plants and animals based on specific characteristics.
Key Skills	<p>Working Scientifically Focused Skills</p> <ul style="list-style-type: none"> ❖ Observing- using all the senses, ❖ perform simple tests, ❖ identifying and classifying scientific enquiry ❖ Recording - labelled diagrams, ❖ using simple scientific evidence to answer questions. 	<p>Working Scientifically Focused skills</p> <ul style="list-style-type: none"> ❖ Comparing ❖ Observations, ❖ gathering, recording, classifying and presenting data ❖ recording findings using tables, ❖ concluding ❖ predicting 	<p>Working Scientifically Focused skills</p> <ul style="list-style-type: none"> ❖ Scientific enquiry. ❖ Carrying out simple practical enquiries, ❖ Comparing ❖ classifying and presenting data ❖ identifying differences and similarities. 	<p>Working Scientifically Focused skills</p> <ul style="list-style-type: none"> ❖ Comparing ❖ observing, ❖ gathering, recording, classifying and presenting data ❖ recording findings using tables, ❖ Concluding ❖ predicting
Opportunities	<p>Possible External Visits: Local area walks/ Parks – Haigh hall</p> <p>Activity ideas: tubes and water play, seed tough tray. Seeds inside fruits, colouring flowers,</p>	<p>Possible External Visits: Farms, zoos, Countryside education, litter collecting, pond dipping</p> <p>Activity ideas: Sorting, Bug tuff tray, creating own animal, Arctic and</p>	<p>Possible External Visits: Local area nature walk, butterfly sanctuary.</p> <p>Activity ideas: butterfly house, life cycle jigsaws, Life cycle hanging – velcro, books -</p>	<p>Possible External Visits: Local area walks</p> <p>Activity ideas: classification keys large scale, classification of learners based on characteristics</p>

		<p>Outdoor Experiences: Locating different seeds on trees, Bucket School - using large pictures and labels to create the pollination process.</p>	<p>melting tuff trays, Local litter affecting animals.</p> <p>Outdoor Experiences: bug hotel, Investigating</p>	<p>Outdoor Experiences: Locating different seeds on trees, Bucket school – large life cycle labels and pictures to organise, pic/label bibs and string to connect learners.</p>	<p>such as shoes or trainers etc, Microscope/ projector activities.</p> <p>Outdoor Experiences: Bug hotel, Bucket school - Characteristics stations game.using toy animals or pictures in buckets.</p>
--	--	--	--	--	---

2	Key Focus:	Animals Including humans - Nutrition/ Physical structure	Animals including humans - Digestive system/ Food chains	Animals including humans - Growth/ Nutrition	Animals including humans - Circulation/ Health
	Key Knowledge/ Vocabulary: (Vocab highlighted in bold)	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ that animals, including humans, need the right types and amount of nutrition/ food, and that they cannot make their own food; they get nutrition from what they eat ➤ that humans and some other animals have skeletons and muscles for support, protection and movement. 	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ describe the simple functions of the basic parts of the digestive system in humans ➤ identify the different types of teeth (Incisors, Cuspids, Canines, Molars, Premolars / Bicuspids, Wisdom Teeth / Third Molars.) ➤ in humans and their simple functions ➤ construct and interpret a variety of food chains, identifying producers, predators and prey. 	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ describe the changes as humans develop to old age. (baby, toddler, child, teenager, adult, elderly) ➤ describe the ways in which nutrients and water are transported within animals, including humans. 	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ identify and name the main parts of the human body including internal systems 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
	Key Skills:	<p>Working Scientifically Focused skills</p> <ul style="list-style-type: none"> ❖ simple practical enquiry ❖ Observing ❖ gathering, recording, classifying ❖ presenting data ❖ asking relevant questions 	<p>Working Scientifically Focused skills</p> <ul style="list-style-type: none"> ❖ simple practical enquiry ❖ comparing and fair tests ❖ making systematic and careful observations ❖ recording 	<p>Working Scientifically Focused skills</p> <ul style="list-style-type: none"> ❖ gathering, and presenting data ❖ recording findings ❖ Developing simple scientific language, ❖ drawings, labelling diagrams, 	<p>Working Scientifically Focused skills</p> <ul style="list-style-type: none"> ❖ asking relevant questions ❖ using different types of scientific enquiries to answer them ❖ simple practical enquiry

	Opportunities:	Possible External Visits: Playground, Manchester museum – dinosaur bones, Activity ideas: School Skeleton/ bone collection, identify the bone, Action and movement, Sorting types of food, healthy plate, healthy food search, food tasting Outdoor Experiences: Making a skeleton out of natural materials, bone hunt, Resistance band movement activities, large scale healthy meal.	Possible External Visits: dentist Activity ideas: Teeth models, tooth brushing, food tasting, digestive system model (see twinkl), string food chains, small play animals of Africa. Outdoor Experiences: Create food chains around the outdoor area to follow. Make a food web – using animals from one specific habitat.	Possible External Visits: Doctors, baby clinic, care home Activity ideas: Baby pictures, clinic, role play, water play tubes, clothing sorting Outdoor Experiences: visiting baby clinics, Moving like people of different ages.	Possible External Visits: doctors Activity ideas: food types, tuff tray heart, heart models from science dept, pulse, blood pressure, play doctors. Outdoor Experiences: Effects of exercise on the heart – physical exercises
--	-----------------------	--	---	---	---

3	Key Focus:	States of Matter	Rocks - fossils	Changes of materials – mixtures and separating	Evolution and Inheritance
	Key Knowledge/ Vocabulary: (Vocab highlighted in bold)	To observe, experience, investigate, identify, describe, and/or evaluate... <ul style="list-style-type: none"> ➤ compare and group materials together, according to whether they are solids, liquids or gases. ➤ observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). ➤ identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. 	To observe, experience, investigate, identify, describe, and/or evaluate... <ul style="list-style-type: none"> ➤ Identify what a fossil is. ➤ describe in simple terms how fossils are formed when things that have lived are trapped within rock. ➤ recognise that fossils are made from rocks and organic matter. 	To observe, experience, investigate, identify, describe, and/or evaluate... <ul style="list-style-type: none"> ➤ know that some materials will dissolve in liquid to form a solution, ➤ 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. ➤ demonstrate that dissolving, mixing and changes of state are reversible changes. 	To observe, experience, investigate, identify, describe, and/or evaluate... <ul style="list-style-type: none"> ➤ recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. ➤ recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. ➤ identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

	Key Skills:	Working Scientifically Focused skills <ul style="list-style-type: none"> ❖ asking relevant questions ❖ simple practical enquiry ❖ comparing and fair tests ❖ making systematic and careful observations ❖ gathering, recording, classifying and presenting data 	Working Scientifically Focused skills <ul style="list-style-type: none"> ❖ asking relevant questions ❖ setting up simple practical enquiries, ❖ Comparing ❖ observing ❖ gathering, recording, classifying and presenting data 	Working Scientifically Focused skills <ul style="list-style-type: none"> ❖ simple practical enquiries, ❖ comparing ❖ observing ❖ gathering, recording, classifying and presenting data ❖ recording findings using simple scientific language 	Working Scientifically Focused skills <ul style="list-style-type: none"> ❖ asking relevant questions ❖ observing ❖ making systematic and careful observations and, where appropriate, ❖ recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
	Opportunities:	Possible External Visits: www.classtrips.co.uk/school-trip/chocolate-collective/ Activity ideas: www.unitedutilities.com/corporate/responsibility/communities/education/all-about-water/ , ice pops, chocolate, Outdoor Experiences: Large scale water play/ collection.	Possible External Visits: Manchester museum school visits - https://www.educationgroup.co.uk/workshops/dinosaur-visit Beach Activity ideas: Plaster casts, sorting, making fossils, printing fossils, Dinosaur tuff tray Outdoor Experiences: beach finding pebbles.	Activity ideas: creating potions, ice/ jelly/ chocolate – changing temperature, Filtering dirty water, Sieving tuff trays. Outdoor Experiences: mixing and separating natural materials, making mud pie, Filtering dirty water large scale.	Possible External Visits: Manchester museum school visits - https://www.educationgroup.co.uk/workshops/dinosaur-visit Activity ideas: Plaster casts, sorting, creating own animals, features of the family Outdoor Experiences: beach finding fossils, Bucket school – collecting natural objects to make fossils of.

4	Key Focus:	Light	Sound - Travelling	Earth and Space	Light - Travelling
---	-------------------	--------------	---------------------------	------------------------	---------------------------

<p>Key Knowledge/ Vocabulary: (Vocab highlighted in bold)</p>	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ changes in light, shadows and the absence of light. ➤ sources of light. ➤ that they need light in order to see things and that dark is the absence of light. ➤ that light is reflected from surfaces. ➤ that light from the sun can be dangerous and that there are ways to protect their eyes. ➤ that shadows are formed when the light from a light source is blocked by an opaque object. 	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ identify how sounds are made, associating some of them with something vibrating ➤ recognise that vibrations from sounds travel through a medium to the ear ➤ find patterns between the pitch of a sound and features of the object that produced it 	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ describe the movement of the Earth, and other planets, relative to the Sun in the solar system ➤ describe the movement of the Moon relative to the Earth ➤ describe the Sun, Earth and Moon as approximately spherical bodies ➤ use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. 	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ recognise that light appears to travel in straight lines ➤ use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye and explain why shadows have the same shape as the objects that cast them. ➤ 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>Key Skills:</p>	<p>Working Scientifically Focused skills</p> <ul style="list-style-type: none"> ❖ making systematic and careful observations ❖ taking accurate measurements, ❖ identifying changes ❖ Understanding scientific ideas and processes, ❖ using straightforward scientific evidence 	<p>Working Scientifically Focused skills</p> <ul style="list-style-type: none"> ❖ asking relevant questions ❖ using different types of scientific enquiries ❖ making systematic and careful observations ❖ using a range of equipment 	<p>Working Scientifically Focused skills</p> <ul style="list-style-type: none"> ❖ asking relevant questions ❖ using different types of scientific enquiries ❖ Investigating ❖ Identifying ❖ Increasing use of scientific vocabulary 	<p>Working Scientifically Focused skills</p> <ul style="list-style-type: none"> ❖ making systematic and careful observations ❖ taking accurate measurements, ❖ identifying changes ❖ Understanding scientific ideas and processes, ❖ using straightforward scientific evidence
<p>Opportunities:</p>	<p>Possible External Visits: Science museums</p> <p>Activity ideas: Sensory room exploring lights, shadow puppets, mirrors, prisms.</p> <p>Outdoor Experiences: Making shadows in playground, drawing round shadows of objects in the playground and returning later to see changes.</p>	<p>Possible External Visits: Jodrell Bank external sound gallery/ sound rich environments - parks/ roads</p> <p>Activity ideas: instruments, tuning forks, telephone making, hidden sound identification,</p> <p>Outdoor Experiences: listening for sounds, distance sounds. Bucket schools - Make a telephone out of the pieces in your bucket.</p>	<p>Possible External Visits: Jodrell Bank</p> <p>Activity ideas: Sun pictures, learners take it in turns to take home a pack of resources to look at the night sky during winter. Blow up solar system. Role play with torch for sun in dark room – create an eclipse.</p> <p>Outdoor Experiences: Sun/ shadows, solar system role play.</p>	<p>Possible External Visits: Science museums</p> <p>Activity ideas: Investigate lights, reflective materials, opaque and translucent materials, prisms</p> <p>Outdoor Experiences: shadows, Bucket schools - using mirrors to reflect the sun. Colour paddles</p>

5	Key Focus:	Forces and Magnets	Electricity	Forces	Electricity - Changes
	Key Knowledge/ Vocabulary: (Vocab highlighted in bold)	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ how things move on different surfaces. ➤ that some forces need contact between two objects, but magnetic forces can act at a distance. ➤ how magnets attract or repel each other and attract some materials and not others. ➤ a variety of everyday materials on the basis of whether they are attracted to a magnet. ➤ magnets as having two poles. 	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ common appliances that run on electricity. ➤ a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers ➤ a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit ➤ common conductors and insulators, and associate metals with being good conductors. 	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object ➤ identify the effects of air resistance, water resistance and friction, that act between moving surfaces ➤ recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. 	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit ➤ compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches ➤ use recognised symbols when representing a simple circuit in a diagram.
	Key Skills:	<p>Working Scientifically Focused skills</p> <ul style="list-style-type: none"> ❖ setting up simple practical enquiry ❖ comparing ❖ observing ❖ taking accurate measurements ❖ using a range of equipment 	<p>Working Scientifically Focused skills</p> <ul style="list-style-type: none"> ❖ scientific enquiry ❖ making systematic and careful observations ❖ taking accurate measurements using standard units, ❖ Accurate use of equipment 	<p>Working Scientifically Focused skills</p> <ul style="list-style-type: none"> ❖ setting up simple practical enquiries, ❖ measuring using standard units, using a range of equipment, ❖ gathering, recording, classifying and presenting data in a variety of ways ❖ labelling diagrams 	<p>Working Scientifically Focused skills</p> <ul style="list-style-type: none"> ❖ scientific enquiry ❖ making systematic and careful observations ❖ taking accurate measurements using standard units, ❖ Accurate use of equipment
Opportunities:	<p>Possible External Visits – See the work of a magnet on a crane, playground</p> <p>Activity ideas: experimenting with materials and magnets, finding objects around school with magnets, Cars on ramp with different materials.</p>	<p>Possible External Visits: Science and industry museum,</p> <p>Activity ideas: creating circuits, light switch for a model, finding electrical equipment, cause and effect switches.</p>	<p>Possible External Visits: Playground</p> <p>Activity ideas: drop investigations, use pulleys and sand buckets, tug of war.</p> <p>Outdoor Experiences: playground forces/ large scale water/ air experiments with guttering.</p>	<p>Possible External Visits: Science and industry museum,</p> <p>Activity ideas: creating circuits, light switch for a model, finding electrical equipment, cause and effect switches.</p>	

	Outdoor Experiences: Impact of forces on outdoor equipment i.e. swings/ bikes etc, Tug of war, uses of forces/ magnets QR hunt.			
--	--	--	--	--

9	Key Focus:	Earth and Space	Properties of materials	Sound - changing sounds	Rocks
	Key Knowledge/ Vocabulary: (Vocab highlighted in bold)	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ The main parts of the solar system. ➤ the movement of the Moon, Earth, and other planets, relative to the Sun in the solar system ➤ Plants as approximately spherical bodies ➤ the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. 	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ Identifying and naming materials – metal/ plastic/ paper, stone, wood ➤ Identifying everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), magnetic. 	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ 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. 	<p>To observe, experience, investigate, identify, describe, and/or evaluate...</p> <ul style="list-style-type: none"> ➤ compare and group together different kinds of rocks (sedimentary, metamorphic, and igneous) on the basis of their appearance and simple physical properties. ➤ recognise that soils are made from rocks and organic matter.
	Key Skills:	<p>Working Scientifically Focused skills</p> <ul style="list-style-type: none"> ❖ asking relevant questions ❖ presenting data in a variety of ways ❖ recording findings using simple scientific language, ❖ reporting on findings from enquiries, 	<p>Working Scientifically Focused skills</p> <ul style="list-style-type: none"> ❖ setting up simple practical enquiries ❖ comparing and fair tests ❖ making systematic and careful observations ❖ gathering, recording, classifying and presenting data 	<p>Working Scientifically Focused skills</p> <ul style="list-style-type: none"> ❖ asking relevant questions ❖ using different types of scientific enquiries ❖ making systematic and careful observations ❖ using a range of equipment 	<p>Working Scientifically Focused skills</p> <ul style="list-style-type: none"> ❖ setting up simple practical enquiries, comparative and fair tests ❖ making systematic and careful observations ❖ gathering, recording, classifying and presenting data
	Opportunities:	<p>Possible External Visits: Jodrell bank planetarium.</p> <p>Activity ideas: Shadows, Space travel role play, torch Blow up solar system. Role play with torch for sun in dark room – create an eclipse.</p>	<p>Possible External Visits: Fabric shop, DIY shop</p> <p>Activity ideas: sorting, locating around school, recycling, QR treasure hunt.</p>	<p>Possible External Visits: Jodrell Bank external sound gallery/ sound rich environments - parks/ roads</p> <p>Activity ideas: instruments, tuning forks, telephone making, hidden sound identification,</p>	<p>Possible External Visits: Manchester museum , beach, slate mine</p> <p>Activity ideas: Plaster casts, sorting, making soil, floating rocks,</p>

		Outdoor Experiences: Finding sun/ moon (safety – eyes), solar system role play.	Outdoor Experiences: Finding uses of materials, collecting materials, materials investigative tuff tray.	Outdoor Experiences: listening for sounds, distance sounds.	Outdoor Experiences: bucket schools - beach finding pebbles./ walk finding stones
--	--	--	---	--	--