**Progression of skills, knowledge and concepts within the Science Curriculum**

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**Curriculum Intent for Science**

Through our Science curriculum, we intend for all pupils to have the opportunity to develop essential knowledge, concepts, methods, skills, processes and uses of science. We will encourage pupils to recognise the power of a rational explanation and develop a sense of excitement and curiosity about natural phenomena. We will also support them in developing an understanding of how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Our curriculum intent for Science is for all pupils to:

* develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
* develop an 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. Enquiry skills will include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources.
* be equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future
* use technical terminology accurately and precisely and build up an extended specialist vocabulary
* apply their mathematical knowledge to their understanding of science and answer questions through collecting, analysing and presenting data

**Implementation**

**Evaluation**

**Planning for Progression in Science at Lady Bay Primary School**

**Science in Early Years (The Natural World ELG15)**

In EYFS, children will develop their curiosity about the world around them and promote respect for the living and the non-living. The children will have access to a variety of activities to develop their scientific skills and thinking. They will be able to ask questions, group and classify, observe and test new things. Communication and Language has a key role within Science, as the children need to be able to articulate their ideas and ask questions to find out more.

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| By the end of December | By the end of March | **Early Learning Goal** |
| Ask questions about aspects of my familiar world, such as about the place where I live or about the natural world. Join in with discussions about the weather and the seasons. Explore ice and water and talk about the changes I have noticed. Begin to develop an understanding of growth, decay and changes over time. e.g. how I’ve grown, Autumn leaves (Leaf Man) | Talk about why things happen and how things work. Show care and concern for living things and the environment Explore the natural world. Enjoy drawing pictures of animals and plants. Describe what I see, hear and feel whilst outside. Understand the effect of changing seasons on the natural world around them e.g. leaves, trees and plants Enjoy reading books to find out about changes and growing | **Children at the expected level of development will:** Explore the natural world around them, making observations and drawing pictures of animals and plants; Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. |
| **What Science looks like in Foundation:****Floor book, sticky notes, areas within the unit, characteristics of learning, SeeSaw.** **Circle time-****-**Discuss change of seasons and the effect it has on them-Hygiene- washing hands/ their body/ change over time (baby, toddler, 4 year old)-Weather- daily discussion**Activities/ resources:****-**Floating and Sinking- testing materials/ predicting-Planting bulbs- what they need to grow.-Life cycles- chicken/ frogs/ butterfly/ farm animals-Living chicks- observation skills-Exploring with magnets-Different states of water- solid/liquid use senses to describe-Sorting healthy foods-Identifying farm animals and their young-Observing change with plants and how to look after them-Exploring the structure of leaves through leaf rubbing | **Questions to ask:**Do you think…?I wonder why…?How will we find…?What happens if…?I wonder how…?Tell me about…?What do you think will happen?Can you describe it?What do you notice?What has changed?Can you sort these objects… | **Vocabulary**Science, experiment, investigation, observe, prediction, test, reason, senses, world, plants (leaf, stem, roots, flower, seeds), animals, humans, materials, forces (magnets- push/pull), change, grow, decay, rot, environment, natural, seasons, changing states of matter (liquid, solid), ice, water |

|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
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| **Questioning and Enquiring****Planning** | Ask simple questions about the world around us.Begin to recognise that these questions can be answered in different ways eg different types of enquiry including: observing changes over time, noticing patterns, grouping and classifying, carrying out simple comparative tests, finding things out from secondary sources. | Ask questions about the world around us. Begin to recognise that these questions can be answered in different ways eg different types of enquiry including: observing changes over time, noticing patterns, grouping and classifying, carrying out simple comparative tests, finding things out from secondary sources. | Ask some relevant questions and use different types of scientific enquiries to answer them.Begin to explore everyday phenomena and the relationships between living things and familiar environments.Begin to develop ideas about functions, relationships and interactions.Raise their own questions about the world around them.Begin to make decisions about the types of enquiry that will be the best way to answer questions including observing changes over time, noticing patterns, grouping and classifying, carrying out simple comparative and fair tests, finding things out from secondary sources. | Ask relevant questions and use different types of scientific enquiries to answer them.Explore everyday phenomena and the relationships between living things and familiar environments.Begin to develop ideas about functions, relationships and interactions.Raise their own questions about the world around them.Make some decisions about the types of enquiry that will be the best way to answer questions including observing changes over time, noticing patterns, grouping and classifying, carrying out simple comparative and fair tests, finding things out from secondary sources. | Begin to plan different types of scientific enquiries to answer questions, including identifying and controlling variables where necessary.Begin to explore and talk about ideas, formulate their own questions about scientific phenomena, analyse functions, relations and interactions in a more systematic way.Begin to identify some more abstract ideas and how these ideas help understanding of how the world operates.Begin to recognise that scientific ideas change and develop over time.Begin to choose the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over varying periods of time, noticing patterns, grouping and classifying, carrying out simple comparative and fair tests, finding things out using a wide range of secondary information sources. | Plan different types of scientific enquiries to answer questions, including identifying and controlling variables where necessary.Explore and talk about ideas, formulate their own questions about scientific phenomena, analyse functions, relations and interactions in a more systematic way.Begin to identify more abstract ideas and how these ideas help understanding of how the world operates.Begin to recognise that scientific ideas change and develop over time.Select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying, carrying out comparative and fair tests, finding things out using a wide range of secondary information sources. |
| **Observing, measuring, pattern****seeking** |  Begin to observe closely, using simple equipment.Use simple observations and ideas to suggest answers to questions.Observe simple changes over time and begin to notice patterns and relationships, with support.To say what they are looking for and measuring .To use simple equipment safely.To use equipment and make simple measurements with support .Begin to use standard units, reading cm, m, cl, l   and degrees Centigrade. | Observe closely, using simple equipment.Use observations and ideas to suggest answers to questions.Observe changes over time and begin to notice patterns and relationships, with support.To say what they are looking for and measuring .To use simple equipment safely.To use equipment and make simple measurements with increasing independence .Begin to use standard units, reading mm, cm, m, cl, l   and degrees Centigrade. | Begin to make systematic and careful observations and where appropriate, take accurate measurements using standard units and a range of equipment, including thermometers and data loggers.Begin to look for naturally-occurring patterns and relationships and decide what data to collect to identify them.Help to make decisions about what observations to make , how long to make them for and the type of simple equipment that they could use.Learn to use some new equipment appropriately eg data loggers.Begin to see a pattern in their results.Begin to select from a range of equipment.Begin to observe and measure accurately using standard units, including measuring time in minutes and seconds. | Make systematic and careful observations and where appropriate, take accurate measurements using standard units and a range of equipment, including thermometers and data loggers.Begin to look for naturally-occurring patterns and relationships and decide what data to collect to identify them.Help to make decisions about what observations to make , how long to make them for and the type of simple equipment that they could use.Learn to use some new equipment appropriately eg data loggers.Be able to identify patterns in their results.Choose from a selection of equipment appropriately.Can observe and measure accurately using standard units including measuring time in minutes and seconds. | Begin to take measurements, using a range of scientific equipment with increasing accuracy and precision, taking repeat readings where it is appropriate.Begin to identify patterns that may be found in the natural environment.Begin to make their own decisions about what observations to make , what measurements to use and how long to make them for and whether to repeat them. Choose the most appropriate equipment and explain how to use it accurately.Begin to interpret data and find patterns.Independently select equipment.Make a set of observations and say what the interval and range are.Begin to take accurate and precise measurements using standard units: N, g , kg, mm, cm, mins,seconds, m per second etcTo draw and interpret pie and line graphs. |  Take measurements, using a range of scientific equipment with increasing accuracy and precision, taking repeat readings where it is appropriate.Identify patterns that may be found in the natural environment.Make their own decisions about what observations to make , what measurements to use and how long to make them for and whether to repeat them. Choose the most appropriate equipment and explain how to use it accurately.Can interpret data and find patterns.Independently select equipment.Make a set of observations and say what the interval and range are.Take accurate and precise measurements using standard units: N, g , kg, mm, cm, mins,seconds, m per second etcTo draw and interpret pie ,line and bar graphs. |
| **Investigating** | Perform simple tests with support.To begin to discuss their ideas about how to find things out.To begin to say what happened in their investigation. | Perform simple tests.Discuss their ideas about how to find things out.Say what happened in their investigation. | Set up some simple practical enquiries, comparative and fair tests.Begin to recognise when a simple fair test is necessary and help to decide how to set it up.Begin to think of more than one variable factor. | Set up simple practical enquiries, comparative and fair tests.Recognise when a simple fair test is necessary and help to decide how to set it up.Can think of more than one variable factor. | Begin to use test results to make predictions to set up further comparative and fair tests.Begin to recognise when and how to set up comparative and fair tests and to explain which variables need to be controlled and why.Begin to suggest improvements to their method and give reasons.Begin to decide when it is appropriate to do a fair test. |  Use test results to make predictions to set up further comparative and fair tests.Recognise when and how to set up comparative and fair tests and to explain which variables need to be controlled and why.Suggest improvements to their method and give reasons.Decide when it is appropriate to do a fair test. |
| **Recording and reporting findings** | Gather and record data with some adult support, to help in answering questions.Begin to record simple data.Begin to record and communicate their findings in a range of ways.Can show their results in a simple table that the teacher has provided. | Gather and record data to help in answering questions.Record simple data.Record and communicate their findings in a range of ways.Can show their results in a table that the teacher has provided. |  Gather, record and begin to classify and present data in a variety of ways to help in answering questions.Begin to record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.Begin to report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.Begin to use notes, simple tables and standard units and help to decide how to record and analyse their data.Begin to record results in tables and bar charts. |  Gather, record, classify and present data in a variety of ways to help in answering questions.Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.Use notes, simple tables and standard units and help to decide how to record and analyse their data.Record results in tables and bar charts. |  Begin to record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs.Begin to report and present findings from enquiries.Begin to decide how to record data from a choice of familiar approaches.Begin to choose the best way to present data. |  Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs.Report and present findings from enquiries.Decide how to record data from a choice of familiar approaches.Can choose how best to present data. |
| **Identifying, Gouping and Classifying** | Identify and classify with some support.To begin to observe and identify, compare and describe.To begin to use simple features to compare objects, materials and living things and with help, decide how to sort and group them. | Can identify and classify.Observe and identify, compare and describe.Use simple features to compare objects, materials and living things and with help, decide how to sort and group them. | Begin to identify differences, similarities or changes related to simple scientific ideas and processes.Begin to talk about criteria for grouping, sorting and classifying and use simple keys.Begin to compare and group according to behaviour or properties, based on testing. |  Identify differences, similarities or changes related to simple scientific ideas and processes.Talk about criteria for grouping, sorting and classifying and use simple keys.Compare and group according to behaviour or properties, based on testing. | Begin to use and develop keys and other information records to identify, classify and describe living things and materials.  | Use and develop keys and other information records to identify, classify and describe living things and materials. |
| **Research** |  To begin to use simple secondary sources to find answers.To begin to find information from books and computers with support. | To use simple secondary sources to find answers. Can find information from books and computers with support. | Begin to identify when and how secondary sources might help to answer questions that cannot be answered through practical investigations. | Begin to identify when and how secondary sources might help to answer questions that cannot be answered through practical investigations. | Begin to identify which secondary sources will be most useful to research their ideas. |  Identify which secondary sources will be most useful to research their ideas. |
| **Conclusions** | Begin to talk about what they have discovered and how they found it out.Begin to say what happened in their investigation.Begin to talk about whether they were surprised by their results or not.Begin to talk about what they would change about their investigation. | Talk about what they have discovered and how they found it out.Say what happened in their investigation.Talk about whether they were surprised by their results or not.Talk about what they would change about their investigation. | Begin to use results to draw simple conclusions, make predictions, suggest improvements and raise further questions.Begin to use straightforward scientific evidence to answer questions or to support their findings.With help, begin to look for changes, patterns, similarities and differences in their data in order to draw simple conclusions. With support, begin to identify new questions arising from the data, make new predictions and find ways of improving what they have already done.Begin to see a pattern in their results.Begin to say how they could improve their test.Begin to answer questions about their findings. | Use results to draw simple conclusions, make predictions, suggest improvements and raise further questions.Use straightforward scientific evidence to answer questions or to support their findings.With help, look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions arising from the data, make new predictions and find ways of improving what they have already done.Can see a pattern in their results.Can say how they could improve their test.Can answer questions about their findings. | Begin to report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.Begin to identify scientific evidence that has been used to support or refute ideas or arguments.Begin to draw conclusions based on their data and observations, use evidence to justify their ideas, use scientific knowledge and understanding to explain their findings.Begin to use test results to make predictions to set up further comparative and fair tests.Begin to look for different causal relationships in their data and identify evidence that refutes or supports their ideas.Use their results to identify when further tests and observations are needed.Begin to separate opinion from fact.Begin to draw conclusions and identify scientific evidence.Can use simple models.Know which evidence proves a scientific point.Begin to use test results to make predictions to set up further comparative and fair tests.  |  Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.Identify scientific evidence that has been used to support or refute ideas or arguments.Draw conclusions based on their data and observations, use evidence to justify their ideas, use scientific knowledge and understanding to explain their findings.Use test results to make predictions to set up further comparative and fair tests.Look for different causal relationships in their data and identify evidence that refutes or supports their ideas.Use their results to identify when further tests and observations are needed.Distinguish opinion from fact.Begin to separate opinion from fact.Can draw conclusions and identify scientific evidence.Can use simple models.Know which evidence proves a scientific point.Use test results to make predictions to set up further comparative and fair tests. |
| **Vocabulary** |  Use some simple scientific language.Begin to use some science words.Use comparative language with support. | Use simple scientific language and some science words.Use comparative language (eg bigger, faster etc) | Begin to use some scientific language to talk about and then write about what they have discovered.Begin to use relevant scientific language.Begin to use comparative and superlative language. | Use some scientific language to talk about and then write about what they have discovered.Use relevant scientific language.Use comparative and superlative language. | Begin to read, spell and pronounce scientific vocabulary correctly.Begin to use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.Begin to use a range of scientific vocabulary with confidence.Begin to use scientific conventions such as: trend, rogue result, support prediction and –er word generalisation.Begin to use scientific ideas when describing simple processes.Begin to select and use correct scientific vocabulary. | Read, spell and pronounce scientific vocabulary correctly.Can use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.Can use a range of scientific vocabulary with confidence.Can use scientific conventions such as: trend, rogue result, support prediction and –er word generalisation.Can use scientific ideas when describing simple processes.Can select and use correct scientific vocabulary. |
| **Understanding** |  Begin to talk about how science helps in daily life eg. torches and lights in darkness.Begin to understand that science can sometimes be dangerous. | Can talk about how science helps in daily life eg. torches and lights in darkness.Begin to understand that science can sometimes be dangerous. | Begin to understand which things in science have improved how we live.Can begin to understand risk in science. | Understand which things in science have improved how we live.Can understand that there is some risk in science. | Begin to talk about how scientific ideas have changed over time.Begin to explain the positive and negative effects of scientific development.Begin to see how science is useful in everyday life.Begin to say which areas of our lives rely on science. | Can talk about how scientific ideas have changed over time.Can explain the positive and negative effects of scientific development.Can see how science is useful in everyday life.Can say which areas of our lives rely on science. |
| **Scientific knowledge**  | **Plants:** Identify and name a variety of common wild and garden plants, including deciduous and evergreen treesIdentify and describe the basic structure of a variety of common flowering plants, including trees.**Animals, including humans:**Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammalsIdentify and name a variety of common animals that are carnivores, herbivores and omnivoresDescribe 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.**Everyday materials:**Distinguish between an object and the material from which it is madeIdentify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rockDescribe the simple physical properties of a variety of everyday materials |  **Plants:** Observe and describe how seeds and bulbs grow into mature plantsFind out and describe how plants need water, light and a suitable temperature to grow and stay healthy.**Animals, including humans:**Notice that animals, including humans, have offspring which grow into adultsFind 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.**Living things and their habitats** Explore and compare the differences between things that are living, dead, and things that have never been aliveIdentify 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 otherIdentify and name a variety of plants and animals in their habitats, including microhabitatsDescribe 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. | **Plants** Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowersExplore 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 plantInvestigate the way in which water is transported within plantsExplore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal**Animals, including humans:**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 eatIdentify that humans and some other animals have skeletons and muscles for support, protection and movement**Rocks** Compare and group together different kinds of rocks on the basis of their appearance and simple physical propertiesDescribe in simple terms how fossils are formed when things that have lived are trapped within rockRecognise that soils are made from rocks and organic matter. | **Living things and their habitats** Recognise that living things can be grouped in a variety of waysExplore and use classification keys to help group, identify and name a variety of living things in their local and wider environmentRecognise that environments can change and that this can sometimes pose dangers to living things**Animals, including humans:**Describe the simple functions of the basic parts of the digestive system in humansIdentify the different types of teeth in humans and their simple functionsConstruct and interpret a variety of food chains, identifying producers, predators and prey.**States of matter:**Compare and group materials together, according to whether they are solids, liquids or gasesObserve 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 | **Living things and their habitats** Describe the differences in the life cycles of a mammal, an amphibian, an insect and a birdDescribe the life process of reproduction in some plants and animals.**Animals, including humans:**Describe the changes as humans develop to old age.**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 magnetsKnow that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solutionUse knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporatingGive reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plasticDemonstrate that dissolving, mixing and changes of state are reversible changes | **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 microorganisms, plants and animalsGive reasons for classifying plants and animals based on specific characteristics.**Animals, including humans:**Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and bloodRecognise the impact of diet, exercise, drugs and lifestyle on the way their bodies functionDescribe the ways in which nutrients and water are transported within animals, including humans.**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 agoRecognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parentsIdentify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. |
|  | Compare and group together a variety of everyday materials on the basis of their simple physical properties.**Seasonal changes**Observe changes across the four seasonsObserve and describe weather associated with the seasons and how day length varies | **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 usesFind out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. | **Light**Recognise that they need light in order to see things and that dark is the absence of lightNotice that light is reflected from surfacesRecognise that light from the sun can be dangerous and that there are ways to protect their eyesRecognise that shadows are formed when the light from a light source is blocked byan opaque objectFind patterns in the way that the size of shadows change.**Force and magnets** Compare how things move on different surfacesNotice that some forces need contact between two objects, but magnetic forces can act at a distanceObserve how magnets attract or repel each other and attract some materials and not othersCompare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materialsDescribe magnets as having two polesPredict whether two magnets will attract or repel each other, depending on which poles are facing | **Sound**Identify how sounds are made, associating some of them with something vibratingRecognise that vibrations from sounds travel through a medium to the earFind patterns between the pitch of a sound and features of the object that produced itFind patterns between the volume of a sound and the strength of the vibrations that produced itRecognise that sounds get fainter as the distance from the sound source increases**Electricity** Identify common appliances that run on electricityConstruct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzersIdentify 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 batteryRecognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuitRecognise some common conductors and insulators, and associate metals with being good conductors | 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.**Earth and space**Describe the movement of the Earth, and other planets, relative to the Sun in the solar systemDescribe the movement of the Moon relative to the EarthDescribe the Sun, Earth and Moon as approximately spherical bodiesUse the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the sky.**Forces**Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling objectIdentify the effects of air resistance, water resistance and friction, that act between moving surfacesRecognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. | **Light**Recognise that light appears to travel in straight linesUse the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eyeExplain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyesUse the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them**Electricity**Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuitCompare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switchesUse recognised symbols when representing a simple circuit in a diagram. |