JOHN EMMESRON BATTY PRIMARY SCHOOL

SCIENCE PROGRESSION DOCUMENT

Working Scientifically

Area	UFS	Y1	Y2	Y3	Y4	Y5	Y6
Scientific Questions	• Show curiosity about objects, events and people -Playing & Exploring - Questions why things happen	• Explore the world around them and begin to raise their own simple questions	• Explore the world around them and raise their own **simple questions**	• Begin to raise their own **relevant questions** about the world around them	• Raise their own **relevant questions** about the world around them	• Begin to use their science experiences to explore ideas and raise different kinds of questions	• Use their science experiences to explore ideas and raise different kinds of questions
Experience and Knowledge of Scientific Enquiry	• Engage in open-ended activity -Playing & Exploring	• Experience different types of science enquiries, including practical activities	• Experience different types of science enquiries, including practical activities	• Experience a range of scientific experiences including different types of science enquiries to answer questions	• Experience a range of scientific experiences including different types of science enquiries to answer questions	• Begin to talk about how scientific ideas have developed over time.	• Talk about how scientific ideas have developed over time.
Planning Scientific Enquiry	• Take a risk, engage in new experiences and learn by trial and error Playing & Exploring	• Begin to recognise different ways in which they might answer scientific questions	• Recognise different ways in which they might answer scientific questions	• With help start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions	• Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions	• With help select and plan the most appropriate type of scientific enquiry to use to answer scientific questions.	• Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions
Performing Test	• Find ways to solve problems / find new ways to do things / test their ideas -Creating & Thinking Critically	• Begin to carry out simple tests with support.	• Carry out simple tests	• With help start to set up simple practical enquiries, comparative and fair tests. With help recognise when a simple fair test is necessary and help to decide how to set it up	• 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	• Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why	• Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why
Identifying and Classifying	• Develop ideas of grouping, sequences, cause and effect -Creating &Thinking Critically • Know about similarities and differences in relation to places, objects, materials and living things - The World	• With help use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying)	• Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying)	• Begin to talk about criteria for grouping, sorting and classifying; and use simple keys	• Talk about criteria for grouping, sorting and classifying; and use simple keys	• Use and with help develop keys and other information records to identify, classify and describe living things and materials, and with help identify patterns that might be found in the natural environment	• Use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment
Research and use of Secondary Sources	• Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world - The World:	• With help ask people questions and use simple secondary sources to find answers	• Ask people questions and use simple secondary sources to find answers	• With help recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations	• Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations	• With help recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.	• Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.
Selecting Types of Observation to use.	• Closely observes what animals, people and vehicles do -The World months • Use senses to explore the world around them -Playing & Exploring	• Begin to observe closely using simple equipment with help, observe changes over time	• Observe closely using simple equipment observe changes over time	• With help, begin to make systematic and careful observations. • Begin to make suggestions about what observations to make, how long to make them for and the type of simple equipment that might be used	• Make systematic and careful observations. • Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used	• Begin to make their own decisions about what observations to make, what measurements to use and how long to make them for	• Make their own decisions about what observations to make, what measurements to use and how long to make them for
Patterns and Causal Relationships	• Make links and notice patterns in their experience • - Creating & Thinking Critically	• With guidance, begin to notice patterns and relationships	• Begin to notice patterns and relationships	• Begin to look for naturally occurring patterns and relationships and with help decide what data to collect to identify them	• Look for naturally occurring patterns and relationships and decide what data to collect to identify them	• With help look for different causal relationships in their data and identify evidence that refutes or supports their ideas	• Look for different causal relationships in their data and identify evidence that refutes or supports their ideas

Selecting and Using Measuring Equipment	• Choose the resources they need for their chosen activities - Self Confidence & Self Awareness	• With support begin to use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data	• Effectively use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data	• Begin to take increasingly accurate measurements using standard units learn how to use a range of (new) equipment, such as data loggers / thermometers appropriately	• Take accurate measurements using standard units learn how to use a range of (new) equipment, such as data loggers / thermometers appropriately	• With help choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately. Take repeat measurements where appropriate.	• Choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately. Take repeat measurements where appropriate and understand the importance of repetition in reducing likelihood of error.
Gathering Data and Presenting Results.	• Create simple representations of events, people and objects - Being Imaginative:	• With support begin to record simple data	• Record simple data	• With help collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and begin to make suggestions about how to analyse this data	• Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data	• Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	• Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
Using Scientific Evidence	• Answer how and why questions about their – Understanding • Make observations of animals and plants and explain why some things occur, and talk about changes - The World	• With support begin to use observations and ideas to suggest answers to questions • Talk about what they have found out and how they found it out	• Use observations and ideas to suggest answers to questions • Talk about what they have found out and how they found it out	• With help look for changes, patterns, similarities and differences in their data in order to begin to draw simple conclusions and answer questions	• Look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions	• Identify scientific evidence that has been used to support or refute ideas or arguments	• Identify scientific evidence that has been used to support or refute ideas or arguments
Record and Communicate Scientifically	• Develop their own narratives and explanations by connecting ideas or events - Speaking • Builds up vocabulary that reflects the breadth of their experience -Understanding:	• With help, they should record and communicate their findings in a range of ways and begin to use simple scientific language	• Record and communicate their findings in a range of ways and use simple scientific language	• With help begin to use an increasing range of relevant simple scientific language to discuss their ideas and communicate their findings in ways that are increasingly appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions	• Use relevant simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions	• Use relevant scientific language and illustrations to discuss, communicate and begin to justify their scientific ideas, use oral and written forms such as displays and other presentations to report conclusions and causal and relationships.	• Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas, use oral and written forms such as displays and other presentations to report conclusions, causal relationships and explanations of degree of trust in results.
Make predictions and pose new lines of Scientific Enquiry	•	•	•	• With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and with help find ways of improving what they have already done.	• Identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and find ways of improving what they have already done.	• Begin to use their results to make predictions and identify when further observations, comparative and fair tests might be needed	• Use their results to make predictions and identify when further observations, comparative and fair tests might be needed

Biology

Area	UFS	Y1	Y2	Y3	Y4	Y5	Y6
Animals and Humans		**Animals Including Humans** • Understand that humans have bodies with similar parts – name and label them • Know some differences between humans: Eye colour Height / Hair colour Skin colour Facial features • Know we have five senses to find out about the world – name them and know what they are used for: Sight – to see Hearing – to hear Touch – to feel Taste – to taste Smell – to smell • Know and be able to identify different types of animals: mammals, birds, reptiles and amphibians • Know how to sort animals into groups • Name some animals in our local environment	**Animals Including Humans** • Know what the basic needs of animals are, including humans, for survival: Water Food Air Warmth • Know that exercise is important to humans to keep them healthy • Know that animals, including humans, have offspring, which grow into adults. • Know about the importance for humans of hygiene. • Know the importance of eating balanced amounts of different types of food:	**Animals including Humans** • Know what animals including humans need to stay healthy: Water Exercise Air Sleep Warmth Balanced diet Social Connections – mental health • Know that animals including humans cannot make their own food and they get nutrition from what they eat. • Know the different food groups: Meat and Proteins Dairy products Fruit Vegetables Fats and sugars Cereals, grains and beans • Know what is meant by a 'balanced diet' in terms of the food groups. • Know why some people have particular dietary needs: Lactose intolerant Allergies (e.g. nut, strawberry) Gluten intolerance • Know the main functions of the skeleton: Support – keeps body upright Posture – gives the body the correct shape Protection – protects internal organs e.g. brain, heart Movement – provides something rigid for the muscles to pull and pull on • Know that many different animals have similar but different skeletons. • Know that an adult human has approximately 206 bones.	**Animals including Humans** • Know the simple functions of the basic parts of the digestive system in humans: ➢ Mouth – break food into smaller parts – ingest ➢ Oesophagus – transport food to the stomach ➢ Stomach – food chemically broken down ➢ Small intestine – further chemical break down and absorb nutrients ➢ Large intestine (colon) – absorbs water and solidifies the waste product ➢ Anus – expels waste product. • Can make a model of the digestive system. • Can explain different diets of carnivores, herbivores and omnivores. • Identify the different types of teeth in humans and their simple functions and explain the importance of cleaning your teeth. • Define predator, prey and producer. • Make links between plants and animals in the form of food chains and understand what an energy chain is. • Can construct and interpret a variety of food chains, identifying producers, predators and prey	**Animals including Humans – Life Cycles** • Demonstrate their own knowledge about a human life cycle • Know and understand the term 'gestation period' • Know about the lifespans of different animals • Know and describe the characteristic features of the main stages of animals' life cycles describing differences in life cycles of a mammal, an amphibian, an insect and a bird. • Know that animals depend on their parents for different amounts of time. • Know that different animals have different gestation periods • Can compare different animal's gestation periods • Know the characteristic features of the main stages of animals and human life cycles • Can compare the height and weight of a child as it develops through the stages • Know the characteristic features of the main stages of human life cycles • Explain the puberty stage of a human life cycle, know that many changes take place during this stage • Investigate the different in size of a child's arm and their circumference of their head based upon children in different year groups and teachers of different ages	**Animals including Humans – including** • Cover some revision of the Skeletal, Muscular and Digestive Systems • Know that foods that provide energy for activity, contain large amounts of sugar and fat • Know that fruit and vegetables are vital to maintain good health • Know ways in which nutrients and water are transported within animals, including humans • Know the names of some internal organs including skeletal, muscular and digestive • Know that the heart acts as a pump for blood, functions of arteries and veins • Can explain the links between heartbeat and pulse rate • Can explain what the word 'drug' means, • Know that drugs can help and harm • Can consider some or the possible effects of smoking **Evolution and Inheritance** • Know that living things have changed over time and fossils provide information about living things • Know that living things produce offspring of the same kind, • Begin to learn about and understand what DNA and genes are

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Living Things and Habitats			**Living Things and Their Habitats** • Explore and compare differences between things that are living, dead and never been alive. • Sort and classify according to criteria. • Identify and name a variety of plants and animals in their habitats including micro-habitats. • Describe how animals obtain food from plants and other animals. Create simple food chains including sources of food. • Most living things live in habitats they are suited to. • Different habitats provide for basic needs of plants and animals and how they depend on each other.		**Living things and their Habitats** • Can identify that living things live in a variety of habitats to which they are suited. • Can 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 • Can recognise that environments can change and that this can sometimes pose dangers to living things • Describe how human activity can affect habitats • Explain how habitats can be changed deliberately.	**All living things and their habitats** • Can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. • Can describe the life process of reproduction in some plants and animals.	**Living things: Habitats** • Can recognise, understand and explain the theory of classification and the term 'taxonomy' • Know that living things are grouped into different kingdoms and explain the six different kingdoms of the living world • Know that living things can be found in a variety of habitats and understand the variety of habitats • Identify living things from different habitats and understand invertebrates and invertebrates • Can group a set of given animals and explain why they are in each group

Plants		**Plants** • Discover what plants need to survive. • Plants found in the immediate/local area • Understand that plants are different to humans and animals. • Label parts of a plant • Differences between wild and garden plants – identify and name varieties of garden and wild plants • Understand deciduous trees and evergreen trees	**Plants** • Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. • Observe how bulbs/seeds grow into adult plants. • Set up comparative tests, observe, record conclude.	**Plants** • Name main parts of a plant. • Describe function of roots and plant stems. • Know the 7 different life processes. • Begin to understand photosynthesis if the process by which plants make their food. • Understand that there are nutrients in the soil. • Name parts of a flower and explain the life cycle of a flowering plant. • Understand importance of seed dispersal and ways it can happen. • Tests, observations and conclusions.			

Chemistry

Area	UFS	Y1	Y2	Y3	Y4	Y5	Y6
Materials/Rocks and Changes of State		**Everyday Materials** • Objects are made from materials which have properties that can be recognised and named • Sort and group materials • Test materials for waterproofing • Identify magnetic objects by using a magnet to detect • Test and record observations - explain what happens	**Uses of Everyday Materials** • Identify and discuss a range of materials, closely observe, test and compare a variety of materials (through manipulation) • Sort materials according to their properties, label materials used for different purposes • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • Some materials are used for many things, observe, test and compare a variety of materials (through computer modelling) • How can shapes of solid objects made from some materials be changed by squashing, bending, twisting and stretching?	**Rocks** • Identify where rocks have been used in and around school • Understand how rocks are useful • Explore characteristics of different rocks • Explore rocks further and recognise differences between rocks • Understand what fossils are and how they are formed • Investigate soil	**States of matter** • Can compare and group materials together, according to whether they are solids, liquids or gases • Can identify that some materials change state when they are heated or cooled. Measure or research the temperature at which this happens in degrees Celsius. • Can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. • Can identify differences, similarities or changes related to simple scientific ideas and processes	**Properties and changes of materials** • Know that some materials can be changed • Know that evaporation is when a liquid changes to a gas and occurs in a range of situations and that liquids other than water evaporate • Understand that air contains water vapour and when this hits a cold surface it may condense, condensation is when a gas turns to a liquid and that it is the reverse of evaporation • Know that melting, freezing, condensing and evaporating are all changes of state which can be reversed • Know that mixing materials can cause them to change • Know that insoluble materials can be separated by filtering and solids which have dissolved can be recovered by evaporating the liquid from the solution and know what soluble means • Know that heating and cooling some materials can cause them to change and heating something is different from burning something • Understand what irreversible and reversible means and identify whether the new material is a reversible or irreversible change • Know that materials react together to create new substances/ materials and how to create a new material • Identify whether the new material is a reversible or irreversible change	

Physics							
Area	**UFS**	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Earth and Space and Seasons		**Seasonal Changes** • Find facts about the Sun (prior learning) • Observe that Sun appears to move across the sky. • Describe shadows as patches of darkness. • Explain that shadows change in length and position during the day. • Describe the weather. Measure aspects, record weather • Name four seasons. • Put months into seasons. • Describe each season.				**Earth and space** • Know that the Earth, Sun and Moon are approximately spherical bodies. • Know the apparent position of the Sun and how it changes over the course of a day • Know that different parts of the Earth face the Sun during the course of the day, and where it is day/night • Know that the apparent movement of the Sun is a result of the Earth rotating or spinning • Know that the Sun rises in the East and sets in the West • Know that a year is the time taken for the Earth to make one complete orbit of the Sun • Know that there are four seasons in a year and can name them • Know that the Moon takes approximately 28 days to orbit the Earth • Know that the Moon gives out no light of its own, and that we can see it because it reflects sunlight; • Know and explain the different phases of the moon	

Light				Light • Identify sources of light and that we need light to see. • Understand that darkness is an absence of light. • Know that we can see things because light bounces off them. • Know that somethings only reflect light and they are not a light source. • Explain how a mirror works. • Understand the terms 'opaque', 'translucent' and 'transparent'. • Understand the importance of transparency of a material in its use.			Light • Know that light appears to travel from a light source in straight lines. • Know we can see a light source when light from it enters their eyes directly. • Know that we can see objects when light travels from a light source, reflects off the object and then to the eyes. • Light travels from a light source and can be blocked by an opaque object. • Know the meaning of the terms opaque, translucent and transparent. • Know that shadows have the same shape as the objects that cast them because light travels in a straight line. • Know that a reflection is made when light bounces off an object. • Know that mirrors can reflect light and change the direction in which a light is travelling. • Know that nothing in the known universe travels faster than light.

Forces				**Forces and Magnets** • Understand that a force is a push, pull or twist and it can make objects speed up, slow down, change direction or stop. • Recognise that forces act in a particular direction. • Understand the lodestone is a natural magnet and that Earth can act like a gigantic bar magnet. • Name the 4 (8) main point of a compass. • Understand magnetic/non-magnetic and that not all metals are magnetic. • Understand terms 'attract' and 'repel'. • Suggest ways in which a magnet could be used.		**Forces** • Understand that a force is a push or a pull or twist. • Can identify a balanced and unbalanced force • Can explore gravity and begin to understand what life would be like without it • Explain what friction is and how it affects a moving object • Understand what air resistance is and the effect it has on moving objects • Understand water resistance and how it affects objects passing through it.	
Sound					Sound • Know how sounds are made and can associate some of them with something vibrating • Know that sounds get fainter as the distance from the sound source increases • Can recognise that vibrations from sounds travel through a medium to the ear • Find patterns between the volume of a sound and the strength of the vibrations that produced it • Find patterns between the pitch of a sound and features of the object that produced it		

Electricity					**Electricity** • Can identify common appliances that run on electricity – either mains and batteries (or both). • Can construct a simple series electrical circuit • Can recognise some common conductors and insulators, and associate metals with being good conductors • Can wire a plug. • Recognises that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • Can write a fact file or a biography about a scientist who helped our understanding of electricity.		**Electricity** • Can construct circuits that match a given description, from a conventional circuit diagram and draw circuit scientific diagrams of circuits they create. • Can examine a circuit diagram and explain how they know whether it will work or not. • Know that the brightness of a lamp or the volume of a buzzer is dependent on the total voltage of cells used in a circuit. • Decide how to investigate changes to circuits when different devices are added, switches are thrown or some of the wire is made thinner than the connecting wire. • Know how to stay safe when working with and using electricity
Sticky Assessment Knowledge + Vocabulary	**(Please see all topic Knowledge Mats for all sticky knowledge objectives and expected vocabulary.)**						