DARWEN ST JAMES' C OF E PRIMARY ACADEMY
SCIENCE LONG TERM PLAN

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
NURSERY	Has a sense of own immediate family and relations. Explores objects by linking together different approaches e.g. hitting , looking, feeling, pulling, turning and poking Responds to the natural world ie. splashing in puddles, seeing leaves turn orange/brown, looking for worms Beginning to recall significant events in their lives e.g. birthdays, Christmas		In pretend play, imitates everyday actions and events from own family and cultural background, e.g. making and drinking tea Use all their senses in hands on exploration of natural materials Recognising significant events that happen during their day and other significant events		Learns that they have similarities and differences that connect them to, and distinguish them from, others. Are curious and interested to explore new and familiar experiences in nature: grass, mud, puddles, plants, animal life Follows routines of the day	

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
PRESCHOOL	**Science Links:** Exploring senses - what senses do we have? Sensory activities, hearing, feeling, smelling.	**Science Links:** Electricity - how do things work?What happens when we take the power away?	**Science Links:** How to care for animals and what do they need? **Science:** Living things in their habitats Explore our environment and collect natural materials, investigate the materials	**Science Links:** Sinking and floats experiment- heavy and light objects	**Science Links:** Food decomposition - apple experiment	**Science Links:** Changing of materials wet/ dry soft/hard

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
RECPETION	**Science links:** Our bodies, naming body parts.Notice and discuss changes around them. Hygiene including dental hygiene.	**Science Links:** Observing similarities and differences in Autumn, Observing changes, colours and patterns in the environment, Colour and light/dark. Woodlands, trees, leaves, seeds and creatures.	**Science links:** Make basic representations of things they have observed. Name and label features of their observations. Hygiene including dental hygiene. Understand some important processes and changes including irreversible changes. Freezing and melting, cooking, toasting, popping popcorn.	**Science Links:** Experience changes, cause and effect and make observations around them. Forces – pushes, pulls, gravity, buoyancy,	**Science links:** observing plants, naming plants, labelling plants. Eating fruits and finding seeds, growing and measuring plants. What do plants need? What do we need? Hygiene including dental hygiene, sleep, water, light etc. Exploring natural weather systems in the world around us – wind, clouds, rain, rainbows.	**Science links:** Minibeasts and their different needs and environments. Lifecycles. Seaside, sea, oceans, tides, rock pools. Creatures. Sun safety and keeping ourselves healthy.

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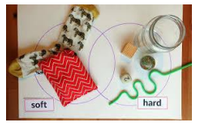
	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
YEAR 1	**SENSITIVE BODIES**  1. To name parts of the human body. To sort body parts into groups. 2. To name the body parts used for each sense. To spot patterns in data. 3. To identify the body parts used for the sense of taste and touch. To use the senses to make observations. 4. To identify the body parts used for the sense of smell and sight. To recognise that scientists are always making new discoveries. 5. To identify the body part used for the sense of hearing. To investigate how sound changes as you move further away. 6. To recognise how the senses are used in everyday life. To recognise the importance of the senses in certain jobs. **An Independent Writing Outcome:** A poem describing which body parts use which senses	**SEASONAL CHANGES**  1. To identify how the weather changes across the four seasons. 2. To identify events and activities that take place in different seasons. 3. To recognise how trees change across the four seasons. 4. To recognise that daylight hours change across the four seasons. To record data in a pictogram. 5. To observe changes across the four seasons. To gather and record data about how seasons change over time. 6. To plan and carry out a weather report. **An Independent Writing Outcome:** A descriptive piece of writing for each season	**EVERYDAY MATERIALS**  1. To identify everyday materials. To sort objects into groups based on the materials they are made from. 2. To recognise the difference between objects and materials. 3 & 4. To identify materials that can be recycled / reused. 5. To repurpose materials. **An Independent Writing Outcome:** A recycling explanation poster. **Note:** This unit involves small group visits on a rotation to a local recycling centre and SAMS in Blackburn to see a 'clean' recycling process. The children will then bring back some resources to create a group project.	**EVERYDAY MATERIALS**  1. To describe the properties of materials. 2. To group materials based on their properties (absorbency). To make observations and record data. 3. To group materials based on their properties (waterproofness). To plan a test and suggest what might happen. 4. To group materials based on their properties (toughness). To answer questions based on results. **An Independent Writing Outcome:** A simple advert for a coat design, explaining its properties	**INTRODUCTION TO PLANTS**  1. To identify plants in the school grounds. To plan an investigation. 2. To identify parts of a flowering plant. To draw and label a diagram. 3. To identify and name wild and garden plants. To sort flowers into groups. 4. To identify and name deciduous and evergreen trees. To measure and compare leaves. 5. To recognise that new plants come from seeds and bulbs. To recognise that observations do not always match predictions. 6. To recognise the importance of a scientist's role. To use observations to find answers to questions. **An Independent Writing Outcome:** Instructions on how to grow a seed for a seed packet	**COMPARING ANIMALS**  1. To identify and group animals. 2. To describe a variety of animals. 3. To compare the features of animals. 4. To identify animals that are carnivores, herbivores and omnivores. To research using non-fiction texts. 5. To recognise animals that make suitable pets. To gather and record data to help in answering questions. 6. To describe and compare the structure of animals. To know about famous scientists throughout history. **An Independent Writing Outcome:** Simple biography about Jane Goodall
	SEASONAL CHANGES (CONTINUOUS THROUGHOUT THE YEAR) – Observe changes across the 4 seasons; Observe and describe weather associated with the seasons and how the day length varies.					

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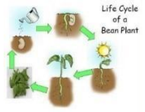
YEAR 2	LIFECYCLES	HEALTH	HABITATS	MICROHABITATS	PLANT GROWTH	USES OF EVERYDAY MATERIALS
						
	1. To identify different stages of the human life cycle. 2. To know which offspring come from which parent animal. 3. To observe and measure growth in butterflies. To make observations over time. 4. To observe and measure growth in humans. To use simple measuring equipment. 5. To identify and list the basic needs for survival for humans and animals. To use secondary resources to research. 6. To observe and measure growth in butterflies (end of long term observations). To make observations over time. **<u>An Independent Writing Outcome:</u>** Instructions for how to look after an animal	1. To recognise the importance of hygiene. 2. To recognise the importance of exercise. To make observations over time. 3. To identify how to have a balanced diet. To interpret collected results. 5. To explore scabs, saliva, germs, digestion, mucus and more, with a range of hands-on demonstrations at EUREKA gross lab visit. **<u>An Independent Writing Outcome:</u>** A healthy lifestyle poster to include exercise and diet	1. To identify some of the characteristics of living things. 2. To recognise the difference between things that are alive, were once alive or have never been alive. To classify objects into groups. 3. To identify plants and animals in different habitats. 4. To identify how a habitat provides animals and plants with what they need to survive. To carry out research to find answers to questions. 5. To recognise how animals and plants depend on each other. 6. To recall how animals get their food from plants and other animals. **<u>An Independent Writing Outcome:</u>** A postcard home describing animals they saw whilst on holiday	1. To classify a variety of minibeasts 2. To recognise how scientists answer questions 3. To recognise that living things live in habitats to which they are suited. To gather and record data to answer a question 4. To ask questions and plan how to carry out an experiment. 5. To carry out an experiment and record data in a table. 6. To identify a variety of flowering plants. To understand the role of a botanist. **<u>An Independent Writing Outcome:</u>** A minibeast fact file on the computer	1. To recognise that seeds need certain conditions for growth. To plan comparative tests. 2. To recognise that seeds and bulbs contain what they need to grow into a plant. To measure with a ruler. 3. To describe what seeds need to germinate. To record data in a table. 4. To describe the effect of light on plant growth. To observe using a magnifying glass. 5. To identify stages of a plant's life cycle. To draw and label diagrams. 6. To recognise what plants need for healthy growth. To recognise that humans have a responsibility to care for plants. **<u>An Independent Writing Outcome:</u>** A page about plants for a non-fiction book to add to a class book	1. To recognise that objects are made from materials that suit their uses. To recognise that objects can be grouped. 2. To recognise that objects are made from materials that suit their uses. 3. To recognise that the shape of some solid objects can be changed. To record data in a table. 4. To compare the suitability of materials for particular uses. To gather data and use it to answer a question. 5. To recognise that the strength of some materials can be changed. To record data in a block graph. 6. To compare the suitability of materials for particular uses. To recognise that some materials are harmful to the environment. **<u>An Independent Writing Outcome:</u>** An explanation about what material you would choose for a given purpose and why

'LET US NOT LOVE WITH WORDS OR SPEECH ALONE BUT WITH ACTIONS AND TRUTH' JOHN 3:18
NURTURING AMBITION THROUGH A LIVING FAITH

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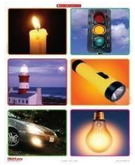
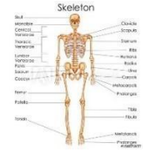
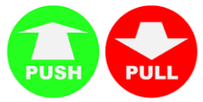
	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
YEAR 3	**LIGHT**  1. To explain the role of light sources. To plan and draw a results table. 2. To compare light reflecting on different surfaces. 3. To recognise which materials cast a shadow. To ask testable questions and plan how to answer them. 4. To summarise how shadows change throughout the day. To evaluate a method. 5. To investigate how the distance of the light source affects the size of its shadow. To find patterns in data and form conclusions. 6. To tell a story using shadow puppets. To recall how different people work with light and shadows. **<u>An Independent Writing Outcome:</u>** To write a biography about Sir Isaac Newton, Valerie Thomas or Euclid	**ANIMALS INCLUDING HUMANS**  1. To explain the role of a skeleton. To group animals based on their physical properties. 2. To recognise the main bones in the body. To measure and sort data. 3. To explain how muscles are used for movement. To explore scientific advances. 4. To explain how food is an essential energy source for animals. To gather and compare data to answer questions. 5. To identify the main nutrient groups and their simple functions. To record information using secondary sources. To explain what makes a balanced diet. To explore how knowledge has progressed over time and different jobs use this information. **<u>An Independent Writing Outcome:</u>** An information leaflet for a doctor's surgery on keeping healthy	**ROCKS**  1. To group rocks using their appearance. To observe the appearance of rocks closely, using a magnifying glass. 2. To group rocks using their physical properties. To make predictions, suggest improvements and explain observations over time. 3. To describe the process of fossil formation. To present research on fossil formation. 4. To identify fossils and group rocks accordingly. To use the fossil record to answer questions about the past. 5. To compare soils and how they were formed. To record the drainage rate for different soils in a bar chart. 6. To describe a soil sample using sedimentation. To draw and label a diagram. **<u>An Independent Writing Outcome:</u>** Instructions for making a wormery with explanations for choices	**FORCES AND MAGNETS**  1. To describe the effects of contact forces. To label a diagram using arrows and scientific vocabulary. 2. To recognise the effects and uses of forces. To write a scientific conclusion identifying cause and effect. 3. To interpret how and why things move differently on different surfaces. To plan an investigation using variables. 4. To describe the effects of magnets. To write a method. 5. To compare the properties of different types of magnets. To display data using a bar chart. 6. To explain the uses of magnets. To research the uses of magnets. **<u>An Independent Writing Outcome:</u>** A report on the use of magnets in everyday life	**PLANTS**  1. To identify the growth and survival needs of plants. To pose relevant questions. 2. To describe the relationship between structure and function in plants. To design simple results tables. 3. To investigate how water is transported in plants. To plan a simple enquiry. 4. To explore the role of flowers in the life cycle of a plant. To complete, read and interpret data in a bar chart. 5. To apply knowledge of plant life and growth. To identify and suggest changes to an enquiry. 6. To explore seed dispersal methods. To use results to draw conclusions. **<u>An Independent Writing Outcome:</u>** Books about plants collaboratively in groups	**INVESTIGATING GRIP STRENGTH**  1. To revise the units Movement and nutrition and Rocks and soil. To plan a pattern seeking enquiry. 2. To revise the units Movement and Nutrition and Plant Reproduction. To gather and record data. 3. To revise the unit Forces and magnets. To conclude and evaluate the investigation. 4. To revise the unit Uses of materials. To use sets of data to inform design. 5. To revise the units Light and Shadows and Movement and Nutrition. To report on my findings using a shadow puppet display. **<u>An Independent Writing Outcome:</u>** A play script for a puppet show

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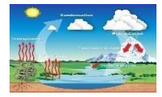
YEAR 4	LIVING THINGS AND THEIR HABITATS	SOUND	ANIMALS INCLUDING HUMANS	ELECTRICITY	STATES OF MATTER	INVESTIGATING LIQUIDS
	 1. To group animals in various ways. To record data in different ways. 2. To group plants in various ways. To apply and create classification keys. 3. To make careful observations. To make and use classification keys. 4. To recognise and describe different habitats and their inhabitants. To gather, record, classify and present data. 5. To recognise the impact humans can have on habitats. To research using an information sheet. 6. To recognise the impact of natural disasters on habitats. **An Independent Writing Outcome:** Newspaper report on the impact environmental and physical changes can have on habitats	 1. To describe how sounds are made. To observe closely how different instruments create a sound. 2. To describe how sounds are heard through different mediums. To research how whales and dolphins communicate underwater. 3. To describe the relationship between vibration strength and volume. To present results using a bar chart. 4. To describe the relationship between volume and distance. To suggest which variables to measure and for how long. 5. To describe pitch and how to change it. To design simple results tables. 6. To explain how insulating materials can be used to muffle sound. Working scientifically: To identify when results or observations do not match predictions. **An Independent Writing Outcome:** An advertisement for insulation material	 1. To describe the function of the human digestive system. To evaluate a model. 2. To recognise the different types of human teeth and their roles in eating. To describe real observation methods and evidence collected. 3. To explain how to care for our teeth. To plan an enquiry by considering which variables should be changed, measured and controlled. To determine why scientists need to work collaboratively and evaluate experiments. 4. To recognise that differences in teeth relate to an animal's diet. To classify animals based on their diet. 5. To recognise producers, predators and prey in food chains. To analyse trends in line graphs and form conclusions using scientific knowledge. 6. To recognise that animal poo can give us clues about digestion, teeth and diet. To construct a results table for recording observations. **An Independent Writing Outcome:** A letter to Steve Backshall explaining what they have learnt about animals in the wild	 1. To recognise how electrical appliances are powered. To record and classify qualitative data. 2. To construct an electrical circuit. To draw a scientific diagram. 3. To explain the use of switches in a circuit. 4. To explain the use of materials as electrical conductors or insulators. To write a method. 5. To investigate what affects bulb brightness. To pose questions and plan ways to test them. 6. To explain how to be safe around electricity. To explore how scientific advances inform safety advice. **An Independent Writing Outcome:** An information booklet on electrical safety	 1. To identify solids using their properties. To ask relevant questions about the properties of solids. 2. To identify liquids and gases using their properties. To use results to draw simple conclusions about the properties of liquids. 3. To describe melting and freezing. To use thermometers to take accurate measurements before and after melting. 4. To describe condensing and evaporating. To make predictions for new values about evaporation rates. 5. To describe the different stages of the water cycle. To record the stages of the water cycle using a labelled diagram. 6. To describe how temperature affects evaporation rates and the water cycle. To research climate change and the water cycle. **An Independent Writing Outcome:** A report on climate change and the effects on our lives	 1. To revise the units States of matter and Classification and Changing Habitats. To plan a comparative test. 2. To revise the unit Electricity and Circuits. To gather and record data. 3. To revise the units States of Matter and Sound and Vibrations. To conclude and evaluate the investigation. 4. To revise the unit Digestion and Food. To observe carefully and apply these observations to problem solve. 5. To revise the unit States of Matter. To report on my findings.  **An Independent Writing Outcome:** A template with instructions for carry carrying out any investigation

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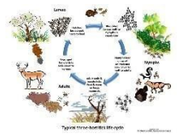
	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
YEAR 5	**MIXTURES & SEPARATING**  1. To describe mixtures. To research using a range of secondary resources. 2. To explain the process of sieving. To draw and annotate a diagram to explain a concept. 3. To explain the process of filtering. To identify testable questions and how to answer them. 4. To describe solutions and how they can be identified. To make observations about solutions. 5. To identify which factors affect the time taken to dissolve. To plan a fair test with consideration of variables and measurements. 6. To describe the process of evaporation. **<u>An Independent Writing Outcome:</u>** A poem/rap based on either separating mixtures or the water cycle	**PROPERTIES & CHANGES**  1. To determine the hardness of materials and link this to their uses. To evaluate the hardness test to determine the degree of trust in the results. 2. To determine the transparency of different materials and link this to their uses. To plan and draw a table of results. 3. To determine the conductivity of different materials and link this to their uses. To write a detailed, organised method which is easy to follow. 4. To demonstrate reversible changes. To write a prediction using prior knowledge of the states of matter. 5. To demonstrate irreversible changes. To analyse observations about rusting and use them to support a conclusion. 6. To demonstrate irreversible changes. To measure the circumference of a balloon accurately. **<u>An Independent Writing Outcome:</u>** A glossary for a science book	**IMBALANCED FORCES**  1. To describe gravity and its effects. To analyse data to write a conclusion. 2. To describe air resistance and its effects. To plan a fair test to investigate air resistance. 3. To describe water resistance and its effects. To design a results table. 4. To describe friction and its effects. To evaluate a method. 5. To describe the effects of levers, pulleys and simple machines on movement. To draw and label a diagram. 6. To describe the relationship between lever length and effort. To draw an accurate line graph. **<u>An Independent Writing Outcome:</u>** A knowledge map for a forces unit of work	**EARTH & SPACE**  1. To compare the contributions of Ptolemy, Alhazen and Copernicus to models of the Solar system. To pose testable questions about the solar system. 2. To describe the movement and shapes of the celestial bodies in our Solar System. To develop a model to represent the Solar System. 3. To describe the movement of the Moon relative to the Earth. To design and draw a table. 4. To explain the causes of day and night and the seasons. To draw a diagram to explain day and night. 5. To devise a sundial to tell the time. To calibrate and use a sundial to measure time. 6. To describe some uses of satellites and the problems posed by space junk. To use temperature data to make predictions about climate change. **<u>An Independent Writing Outcome:</u>** A PowerPoint slideshow about the solar system – using hyperlinks etc.	**LIFE CYCLES & REPRODUCTION**  1. To describe the life cycle of a plant, including the reproductive stage. To observe and compare equivalent parts in different flowers. 2. To describe the life cycle of a mammal. To research the life cycles of different mammals. 3. To describe the life cycle of a bird and compare it with that of a mammal. To pose questions to compare the life cycles of different birds. 4. To describe the life cycle of an amphibian. To suggest how temperature may affect egg hatching. 5. To describe the life cycle of an insect and compare it with that of an amphibian. To use data to describe a relationship and make predictions. 6. To describe asexual reproduction in plants. To represent root growth over time on a line graph. **<u>An Independent Writing Outcome:</u>** A collective class book comparing different life cycles	**HUMAN TIMELINE**  1. To describe how humans change from babies through to old age. To use a line graph to identify patterns in height and predict values. 2. To identify changes in males and females as a result of puberty. 3. To explore the gestation To explore the gestation periods of humans and other animals. To plot data on a scatter graph. **<u>An Independent Writing Outcome:</u>** A leaflet for children about puberty **INVESTIGATING ASTEROID CRATERS**  1. To revise the units Earth and Space and Life Cycles and Reproduction. To plan a comparative test. 2. To revise Unbalanced Forces and Mixtures and Separation. To gather and record data. 3. To revise Separating mixtures and Unbalanced Forces. To conclude and evaluate the investigation.

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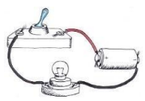
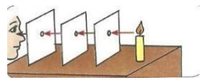
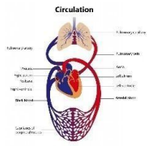
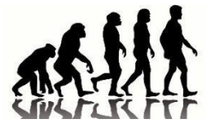
YEAR 6	ELECTRICITY	LIGHT	LIVING THINGS & THEIR HABITATS	ANIMALS INCLUDING HUMANS	EVOLUTION & INHERITANCE
					
	1. To use recognised symbols for electrical components. 2. To predict and present results for electrical circuits. To use standardised symbols when drawing diagrams. 3. To recognise a link between the number of components and resistance. To explain results using scientific knowledge. 4. To identify ways to change voltage within an electrical circuit. To design a results table. 5. To investigate how voltage affects bulb brightness. To plan an enquiry. 6. To apply knowledge of circuits and components to a practical solution. To recognise that scientific knowledge can solve a problem. **An Independent Writing Outcome:** An explanation for how a circuit in a given scenario work	1. To describe the pathway of light. To use evidence to form conclusions. 2. To describe how we see. To draw scientific diagrams. 3. To explain how shadows change. To pose questions. 4. To investigate what affects the angle of the reflected ray. Working scientifically: To record results as a line graph. 5. To explain how a periscope works. 6. To explain how mirrors are helpful. To explore different jobs or inventions that depend on reflection. **An Independent Writing Outcome:** A persuasive advertisement for a mirror which can be used within a job	1. To explain how organisms are classified using the Linnaean system. 2. To classify the cold-blooded vertebrate groups using their common characteristics. 3. To classify the warm-blooded vertebrate groups using their common characteristics. 4. To classify invertebrates. 5. To describe how the plant kingdom is organised (based on shared characteristics). To produce a working classification key. 6. To describe and classify microorganisms. **An Independent Writing Outcome:** A biography about Carl Linnaeus	1. To identify factors that affect our health and how to reduce their negative impact. To evaluate sources of information. 2. To summarise the key structures and purpose of the circulatory system. 3. To identify the key roles of blood. To evaluate a model. 4. To explore the relationship between animal size and heart rate. To interpret patterns in data. 5. To investigate the relationship between exercise and heart rate. To write a method. 6. To describe the relationship between heart rate and fitness. To draw a line graph. **An Independent Writing Outcome:** A healthy living leaflet for a doctor's surgery	1. To explain why there are differences within a species. To group factors. 2. To recognise the inheritance of characteristics in plants and animals. 3. To explain why adaptation is necessary. 4. To model how natural selection affects population size. To evaluate the degree of trust and pose new questions for further enquiry. 5. To describe the theory of evolution. To consider evidence used to inform theories. 6. To recognise evidence that can be used for evolution. To consider the degree of trust in the evidence used. **An Independent Writing Outcome:** A debate around women in science with a focus on Mary Anning and evolution

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