



Scientific Knowledge and Skills – How am I working scientifically?			
YEAR THREE	YEAR FOUR	YEAR FIVE	YEAR SIX
<p><u>Working like Scientists 1 - PLAN</u> I can ask questions and use scientific knowledge to answer them.</p> <p><u>Working like Scientists 2 - DO</u> I can set up simple fair tests.</p> <p><u>Working like Scientists 3 - DO</u> I can make careful observations and take accurate measurements using a range of resources.</p> <p><u>Working like Scientists 4 - DO</u> I can gather and record findings using simple scientific language, drawings, labelled diagrams bar charts, and tables.</p> <p><u>Working like Scientists 5 - REVIEW</u> I can use results to draw conclusions and make predictions about future investigations.</p> <p><u>Working like Scientists 6 REVIEW</u> I can use straight forward scientific evidence to answer questions.</p>		<p><u>Working like Scientists 1 - PLAN</u> I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p><u>Working like Scientists 2 - DO</u> I can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p><u>Working like Scientists 3 -DO</u> I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p><u>Working like Scientists 4 - DO</u> I can use test results to make predictions to set up further comparative and fair tests.</p> <p><u>Working like Scientists 5 - REVIEW</u> I can 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.</p> <p><u>Working like Scientists 6 - REVIEW</u> I can identify scientific evidence that has been used to support or refute ideas or arguments.</p>	
<p><u>Enquiry Types</u></p> <ul style="list-style-type: none"> • Observing over time • Pattern seeking • Classifying and grouping • Comparative and fair testing • Research 			
YEAR GROUP SPECIFIC SCIENTIFIC STUDY – What is our intent?			
YEAR THREE	YEAR FOUR	YEAR FIVE	YEAR SIX
ANIMALS (including Humans)	ANIMALS (including Humans)	ANIMALS (including Humans)	ANIMALS, including Humans

<p>How can Usain Bolt move so quickly? Nutrition, linked to what we eat Skeletons and muscles</p> <ul style="list-style-type: none"> • What helps my body move? – Label human skeleton (<i>classify</i>) • How can different animals be classified? (<i>classify</i>) • How can different food be classified? (<i>classify</i>) • Why do different types of vitamins keep us healthy and which foods can we find them in? (research) • How much fat is in different foods? (fair testing) <p>ROCKS What do rocks tell us about the way the Earth was formed? How rocks are formed Different kinds of rocks Fossils Soil</p> <ul style="list-style-type: none"> • How are fossils formed? (gummy bears) (research) • How are fossils excavated? (chocolate chip) (research) • How can different rocks be classified? (<i>classify enquiry</i>) • Which soil absorbs the most water? (comparative test) • Mary Anning: Who was she and how did she work? (famous scientist) <p>LIGHT How far can you throw your shadow? Sources, including the Sun</p>	<p>What happens to the food we eat? Digestive System Teeth Food chains Predators and prey</p> <ul style="list-style-type: none"> • What are the names of the major organs in the digestive system? (<i>classify</i>) • How can we organise teeth into groups? (<i>classify</i>) • How does an eggshell change when left in cola? (observation over time) • Are foods that are high in energy always high in sugar? (pattern seeking) • Where do animals get their energy from? (research) <p>SOUND Why is the sound that 'One Direction' makes enjoyed by so many? Sources Vibration Loud and faint Pitch Volume Sound travelling</p> <ul style="list-style-type: none"> • How can I show sound in action? (<i>pattern seeking</i>) • Do different objects make different sounds? (<i>classify & pattern seeking</i>) • How does the length of string/tuning fork affect the pitch of the sound? (fair test) 	<p>How different will you be when you are as old as your grandparents? Changes as humans develop from birth to old age</p> <ul style="list-style-type: none"> • How can different humans be classified? (<i>classify enquiry</i>) • How do animals change over their lifetime? (observation over time) • How do humans change and grow over time? (observation over time & research) • Is there a relationship between a mammal's size and its gestation period? (pattern seeking) • How does the length and mass of a baby change as it grows? (observation over time and research) <p>EARTH AND SPACE Will we ever send another human to the moon? Earth relative to the Sun Moon relative to the Earth Relationship between Sun, Earth and Moon Earth's rotation Day and night</p> <ul style="list-style-type: none"> • How far is the Earth from the Sun? – Toilet-roll model (<i>research</i>) • How do we know the Earth is roughly spherical? (comparative testing) • What does the moon look like at different times of the month? – 	<p>What would a journey through your body be like? Circulatory system Heart, blood vessels Diet, exercise and drugs Transport of nutrients through the body</p> <ul style="list-style-type: none"> • Which organs of the body make up the circulation system, and where are they found? (<i>classify</i>) • How does the blood transport nutrients through the body? – Model blood (<i>research</i>) • Is there a pattern between what we eat for breakfast and how fast we can run? (pattern seeking) • How does my heart rate change over the day? (observation over time) • How does the amount of time I exercise affect my heart rate? (fair test) • Marie M Daly – Blood vessels <p>EVOLUTION and INHERITANCE Have we always looked like this? Fossils tell us about the past Off spring Changes to the human skeleton over time Darwin</p> <ul style="list-style-type: none"> • Compare the skeletons of apes, humans, and Neanderthals – how are they similar, and how are they different? (<i>classify</i>) • Charles Darwin – How does the shape of a bird's beak impact its survival?
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<p>Protecting eyes from the Sun Shadows Reflection /mirrors</p> <ul style="list-style-type: none"> • Thomas Edison – Potato Lightbulb (famous scientist) • How would you classify these light sources? (classify) • What happens when light reflects off a mirror? (research) • Is the sun the same brightness all day? (observation over time) • How are shadows formed? (pattern seeking) • How does the distance between the shadow puppet and the screen affect the size of the shadow? (fair test) <p>FORCES and MAGNETS Why are magnets so attractive? How magnets attract/repel some materials Magnetic poles Friction</p> <ul style="list-style-type: none"> • Why do magnets attract and repel each other? (pattern seeking) • Which materials are attracted and repelled by magnets? (classify) • Which magnet is strongest? (comparative test) • Does the shape and size of a magnet impact how strong it is? (pattern seeking) • Which surface is best to stop you slipping? (comparative test) 	<ul style="list-style-type: none"> • Do all animals have the same hearing range? (research) <p>STATES OF MATTER How would we survive without water? Solids, Liquids and Gases Heating and cooling (no baking, etc.) Evaporation and condensation</p> <ul style="list-style-type: none"> • How can materials be grouped? (classify) • What would happen if we heated some water? (pattern seeking) • How does evaporation make it rain? (classify) • Is there a pattern in how quickly ice-lollies melt? (pattern seeking) • Which material is the best to keep a snowman cold? (observation over time, fair test) • What temperatures do materials change state? (research) <p>ELECTRICITY How could we cope without electricity for one day? Identify common appliances Construct simple circuits including switches Common conductors and insulators Alternative sources of energy</p> <ul style="list-style-type: none"> • Which room has the most electrical sockets in a house? (<i>pattern seeking</i>) • How would you group these electrical devices based on where the electricity comes from? (classify) 	<p>Oreo Moons (observation over time and classify)</p> <ul style="list-style-type: none"> • How can I show the Sun appears to move across the sky? (<i>observation over time and fair test</i>) • Is there a pattern between the size of a planet and the time it takes to travel around the Sun? (pattern seeking) • How can space phenomena be split into groups? (classify) <p>FORCES Can you feel the force? Gravity Friction Air Resistance Water Resistance Gears, Pulleys, Leavers and Springs</p> <ul style="list-style-type: none"> • What would happen if I drop something? – Helicopter models (<i>pattern seeking</i>) • How does friction impact on cars? – Friction Ramps (<i>fair test enquiry and pattern seeking</i>) • How does air resistance help a parachute? (pattern seeking) • Do all objects fall through water in the same way? (<i>fair test</i>) • How do gears, pulleys, leavers and springs help in the world? (research) 	<ul style="list-style-type: none"> • How do different animal embryos change? • Can you classify these observations into evidence for and against the ideas of evolution? (classify) What characteristics can we inherit from our parents? (research) <p>LIGHT Does light really light up my life? How light travels Shadows</p> <ul style="list-style-type: none"> • Can I describe how light travels? (classify) • How does my shadow change over the day? (observation over time) • How does the angle that a light ray hits a plane mirror affect the angle at which it reflects off the surface? (fair test) • How does light travel through water? • How did Sir Isaac Newton view the light spectrum? (Famous Scientist) <p>ELECTRICITY Will electricity give us that lightbulb moment? Brightness links to volts Compare how components functions Symbols</p> <ul style="list-style-type: none"> • How would you group electrical appliances and components based on what electricity makes them do? • How does the voltage of the batteries in a circuit affect the brightness of the lamp? (fair test)
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<p>PLANTS How did that blossom become an apple? Function of different parts of plants What different plants need to flourish Journey of water through a plant Life cycle of a plant</p> <ul style="list-style-type: none"> • Why are bees so important? (research) • What will happen to a fungus lab? (observation over time) • Can I classify different parts of a plant? (classify) • Why is seed dispersal so important? (pattern seeking) • How do flowers in a vase change over time? (observation over time) • Which conditions help seeds germinate faster? (comparative test) 	<ul style="list-style-type: none"> • How would you make a lightbulb work. • Which metal is the best conductor of electricity? (comparative test) • How does a light bulb work? (research) <p>LIVING THINGS and their Habitats Which wild animals and plants thrive in your locality? Identify and name a variety of living things (plants and animals) in the local and wider environment and group them Recognise that environments can change and can pose dangers</p> <ul style="list-style-type: none"> • What can we find in our local environment? (classify) • Does the amount of light affect how many woodlice we can see? (fair test) • How has the use of insecticides affected the bee population? (pattern seeking and research) • How does are school environment change over the course of the year? (observation over time) 	<p>REVERSIBLE AND IRREVERSIBLE CHANGES How can we manipulate different materials? Properties & changes of materials Dissolving Evaporating Filtering</p> <ul style="list-style-type: none"> • How does a sugar cube change as it is put in a glass of water? (observation over time) • Which type of sugar dissolves the fastest? (comparative test) • How does the temperature of tea affect how long it takes for a sugar cube to dissolve? (fair test) • Does the size of particle impact how easy it is to filter? (pattern seeking) • Does the amount of water impact how long it takes to evaporate? (pattern seeking) • Spencer Silver – How do we know which substance will be the best glue? <p>LIVING THINGS and their Habitats Do all animals and plants start life as an egg? Life cycles of plants and animals Birth, growth, development and reproduction</p> <ul style="list-style-type: none"> • How do animals change over their lifetime? (observation over time) 	<ul style="list-style-type: none"> • How does the voltage of the batteries in a circuit affect the volume of the buzzer? (fair test) • Does the temperatures of a lightbulb change the longer it is on? (observation over times & pattern seeking) <p>LIVING THINGS and their Habitats Could Spiderman really exist? Classification of living things Vertebrates and invertebrates Classifying reptiles, amphibians, mammals, insects, etc.</p> <ul style="list-style-type: none"> • Do all flowers have the same number of petals? (pattern seeking) • What happens to a piece of bread if we leave it on the windowsill for a week? (observation over time) • What do different types of microorganisms do? Are they always harmful? (research) • How does temperature affect how much gas is produced by yeast? (fair test) • How would you make a classification key for vertebrates/invertebrates or microorganisms? (classify) – Link to Carl Linnaeus
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