LONGMAN'S HILL CP SCHOOL CURRICULUM PROGRESSION TABLE- SCIENCE

SCIENCE	EYFS : Understanding the World: The Natural World		
EYFS Development Matters Statements for Reception Children...	Examples of how we might support this...	Enabling Environments	Specific Longman's Hill examples...
 Explore the (natural) world around them. [UTW P67]	• Provide children with frequent opportunities for outdoor play and exploration. • Encourage interactions with the outdoors to foster curiosity and give children freedom to touch, smell and hear the natural world around them during hands-on experiences. • Create opportunities to discuss how we care for the natural world around us. • Offer opportunities to sing songs and join in with rhymes and poems about the natural world. • After close observation, draw pictures of the natural world, including animals and plants. • Observe and interact with natural processes, such as ice melting, a sound causing a vibration, light travelling through transparent material, an object casting a shadow, a magnet attracting an object and a boat floating on water • Teach skills and knowledge in the context of practical activities, e.g. learning about the characteristics of liquids and solids by involving children in melting chocolate or cooking eggs.	• Provide stories that help children to make sense of different environments. Use the local area for exploring both the built and the natural environment. • Provide opportunities to observe things closely through a variety of means, including magnifiers and photographs. • Provide play maps and small world equipment for children to create their own environments.	• Provide opportunities for children to use a microscope and other science equipment. • Visit the school pond, wildlife area and allotments. • Have a chance to grow their own plants from seed and give them a chance to grow their own food. • Ensure that all the children have the opportunity to look at, hold and study live animals or insects. • Observe and take part in plan science experiments and investigative, open ended experiences. • Have an opportunity to join in forest school activities outside. EG: Bug Hunt. • Join in with whole school science and STEM days. • Visit or meet a farmer to learn about food and animals. • Study and experience the seasons and all weathers.
 Describe what they see, hear and feel whilst outside. [UTW P67]	• Encourage focused observation of the natural world. • Listen to children describing and commenting on things they have seen whilst outside, including plants and animals. • Encourage positive interaction with the outside world, offering children a chance to take supported risks, appropriate to themselves and the environment within which they are in. • Name and describe some plants and animals children are likely to see, encouraging children to recognise familiar plants and animals whilst outside		
 Understand the effect of changing seasons on the natural world around them. [UTW P68]	• Guide children's understanding by draw children's attention to the weather and seasonal features. • Provide opportunities for children to note and record the weather. Select texts to share with the children about the changing seasons. • Throughout the year, take children outside to observe the natural world and encourage children to observe how animals behave differently as the seasons change. • Look for children incorporating their understanding of the seasons and weather in their play		

ELG: The Natural World (Understanding the World)

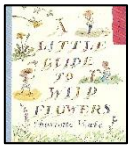
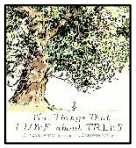
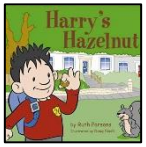
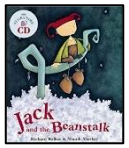
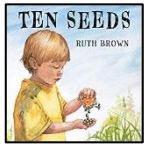
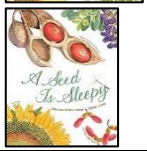
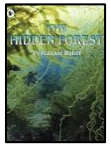
Children at the expected level of development will:

- Explore the natural world around them, making observations and drawing pictures of animals and plants;

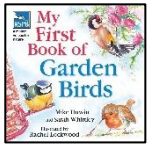
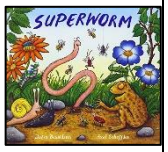
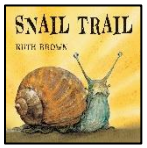
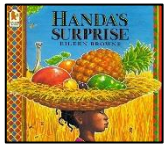
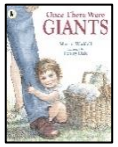
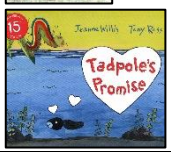
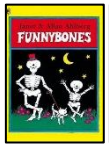
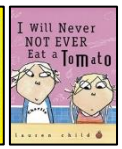
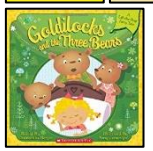
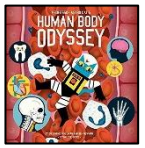
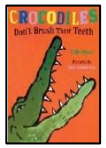
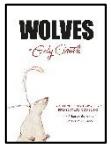
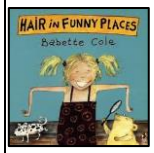
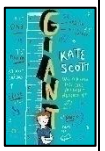
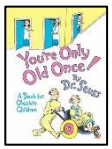
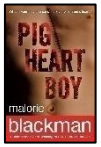
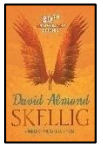
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;

- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

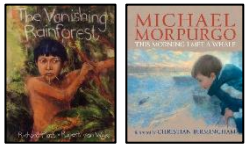
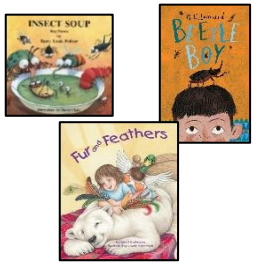
SCIENCE	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
THRESHOLD CONCEPTS FOR SCIENCE	← Understanding the Natural World → 					
	← Understanding the Physical world → 					
	← Working Scientifically → 					
 THRESHOLD CONCEPT: UNDERSTANDING THE NATURAL WORLD	**BIOLOGY** PLANTS Knowledge (Semantic)	**Plants** Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees.	**Plants** observe and describe how seeds and bulbs grow into mature plants find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	**Plants** identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers explore 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 plant investigate the way in which water is transported within plants explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. **Possible Longman's List Link:** Grow something to eat. Which part of the plant do you eat? Is that the same for all plants? eg grow potatoes, herbs (mint?), borage, courgettes and strawberries- great time-lapse videos available for watching the flower turn into the fruit.			

SUBJECT SPECIFIC VOCABULARY PLANTS	Identify Name Wild plants Garden plants Deciduous Flowering plants Trees Leaves Flowers Blossom Petals Fruit Roots Bud Seed Trunk bark stalk Branches Stem	Observe Describe Seeds Bulbs Mature plants Plants Water Light Suitable temperature Healthy Germination Growth Survival Reproduction Shade Sun Warm cool	Identify Describe Function Flowering plants Roots Stem Trunk Leaves Flowers Air Light Water Nutrients Transported Life cycle Pollination Seed formation Seed dispersal Structure Pollen support Photosynthesis Nutrition Reproduction			
SUGGESTED LINKED TEXTS (READING ACROSS THE CURRICULUM)	***A Little Guide to Wild Flowers*** *(Charlotte Voake)* ***The Things That I LOVE about TREES*** *(Chris Butterworth)* ***Harry's Hazelnut*** *(Ruth Parsons)*   	***Jack and the Beanstalk*** *(Richard Walker)* ***Ten Seeds*** *(Ruth Brown)* **A Seed Is Sleepy** (Dianna Aston)   	***The Story of Frog Belly Rat Bone*** *(Timothy Basil Ering)* ***The Hidden Forest*** *(Jeannie Baker)* ***George and Flora's Secret Garden*** *(Jo Elworthy)*   			

THRESHOLD CONCEPT: UNDERSTANDING THE NATURAL WORLD	**BIOLOGY** ANIMALS INCLUDING HUMANS Knowledge (Semantic)	**Animals including humans** Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals identify and name a variety of common animals that are carnivores, herbivores and omnivores describe 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. **Possible Longman's List Link:** Hold a live animal. Label a photograph of the animal that they held and compare to a different on eg this one has fur, this one has feathers.. **Possible Longman's List Link:** Hunt for bugs- where do they live? Why do thy live there?	**Animals including humans** notice that animals, including humans, have offspring which grow into adults find 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 **Possible Longman's List Link:** Hold a live animal. Research the animal and find out what it needs to survive. It that what we need?	**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 eat identify that humans and some other animals have skeletons and muscles for support, protection and movement.	**Animals including humans** describe the simple functions of the basic parts of the digestive system in humans identify the different types of teeth in humans and their simple functions construct and interpret a variety of food chains, identifying producers, predators and prey.	**Animals including humans** describe the changes as humans develop to old age.	**Animals including humans** identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function describe the ways in which nutrients and water are transported within animals, including humans. **Suggested scientists:** **Justus von Liebig** (Theories of Nutrition and Metabolism) **Sir Richard Doll** (Linking Smoking and Health Problems) **Leonardo Da Vinci** (Anatomy)

SUBJECT SPECIFIC VOCABULARY ANIMALS INCLUDING HUMANS	Animals Fish Amphibians Reptiles Birds Mammals Pets Human body Sense Habitat Local environment Head Neck Arms Elbow Legs Knees Ears Face Eyes Hair Mouth Teeth Feathers Fur Beak Paws Hooves Wing Fin Scales Carnivore Herbivore Omnivore Children do not need to use these words, they just need to know that some animals eat meat, some eat plants and some eat both.	Humans Offspring Grow Adults Animals Survival Water Food Air Exercise Hygiene Reproduction Growth Egg /chick/ chicken egg/caterpillar/pupa/butterfly Spawn/tadpole/frog Lamb/sheep Baby Toddler child Teenager Adult	Identify Humans Animals Nutrition Food Skeleton Muscles Support Protection Movement Diet Nutrients Carbohydrate Sugars Protein Vitamins Minerals Fibre Fat Water Food groups Function Skeletal system Bones Ribs Skull Spine Joints Muscular system.	Describe Function Digestive system Construct Interpret Food chains Producers Predators Prey Mouth Tongue Teeth Oesophagus Stomach Small intestine Large intestine Herbivores Carnivores Digestion saliva, Nutrients Rectum Anus incisor canine molar	Describe Changes Humans Old age Develop Timeline Stages Growth Puberty Gestation period	Identify Name Circulatory system Functions Heart Blood vessels Blood Impact Diet Exercise Drugs Lifestyle Function Nutrients Transported Skeletal system Muscular system Digestive system Healthy Substances harmful
SUGGESTED LINKED TEXTS (READING ACROSS THE CURRICULUM)	***RSPB: My First Book of Garden Birds*** *(Mike Unwin and Sarah Whittley)* ***Snail Trail*** *(Ruth Brown)* ***Superworm*** *(Julia Donaldson & Axel Scheffler)*    	***Handa's Surprise*** *(Eileen Brown)* ***Once There Were Giants*** *(Martin Waddell and Penny Dale)* ***Tadpole's Promise*** *(Jeanne Willis and Tony Ross)*    	***Funnybones*** *(Janet and Allan Ahlberg)* ***I Will Never Not Ever Eat a Tomato*** *(Lauren Child)* ***Goldilocks and the Three Bears*** *(Samantha Berger)*    	***Human Body Odyssey*** *(Werner Holzwarth)* ***Crocodiles Don't Brush Their Teeth*** *(Colin Fancy)* ***Wolves*** *(Emily Gravett)*    	***Hair in Funny Places*** *(Babette Cole)* ***Giant*** *(Kate Scott)* ***You're Only Old Once!*** *(Dr. Seuss)*    	***Pig-Heart Boy*** *(Malorie Blackman)* ***Skellig*** *(David Almond)* ***A Heart Pumping Adventure*** *(Heather Manley)*   

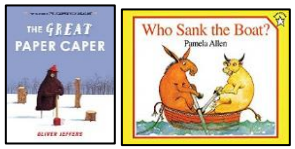
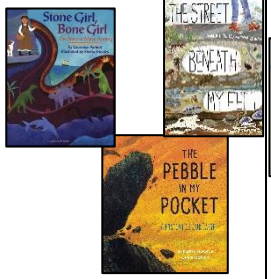
 THRESHOLD CONCEPT: UNDERSTANDING THE NATURAL WORLD	**BIOLOGY** LIVING THINGS AND THEIR HABITATS Knowledge (Semantic)		**Living things and their habitats** explore and compare the differences between things that are living, dead, and things that have never been alive identify that most living things live 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 other identify and name a variety of plants and animals in their habitats, including micro-habitats describe 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. **Possible Longman's List Link:** Hunt for bugs.		**Living things and their habitats** 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 recognise that environments can change and that this can sometimes pose dangers to living things. **Possible Longman's List Link:** Discover what lives in a pond. Pong dipping- use a classification key.	**All living things and their habitats** describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird describe the life process of reproduction in some plants and animals. **Possible Longman's List Link:** Make a film. Children could make a nature film in the style of Richard Attenborough. **Suggested scientists:** **David Attenborough** (Naturalist and Nature Documentary Broadcaster) **James Brodie of Brodie** (Reproduction of Plants by Spores)	**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 micro-organisms, plants and animals give reasons for classifying plants and animals based on specific characteristics. **Possible Longman's List Link:** Discover what lives in a pond. Pong dipping – classify discoveries, make a classification key on J2e. Go rock-pooling (Residential) **Suggested scientists:** **Carl Linnaeus** (Identifying, Naming and Classifying Organisms)

SUBJECT SPECIFIC VOCABULARY LIVING THINGS AND THEIR HABITATS		Explore Compare Living Dead Never been alive Habitats Animals Suitable Basic Needs shelter Plants Micro-habitats Food chain food Characteristics Alive Healthy Woodland Ocean Seashore Rainforest Food source		Living things Explore Classification keys Group Identify Local environment Wider environment Danger Hibernate Plants Animals Habitat Flowering plants Non-flowering plants Vertebrates Fish Amphibians Reptiles Birds Mammals Invertebrates Snails and slugs Worms Spiders Insects Human impact Positive Negative Population Development Deforestation	Describe Differences Life cycle Mammal Amphibian Insect Bird Life processes Plants Animals Local environment Naturalists Animal behaviourists Jane Goodall Reproduction Sexual reproduction Asexual reproduction sperm metamorphosis live young fertilise gametes Parent plant identical Seeds Stem Root cuttings Tubers runners Bulbs	Describe Living things Classified Classifying Groups Common Observable features Characteristics Similarities Differences Micro-organisms Plants Animals Classification system Invertebrates Insects Spiders Snails Worms Vertebrates Fish Amphibians Reptiles Mammals Birds Keys Unfamiliar environment Habitats
SUGGESTED LINKED TEXTS (READING ACROSS THE CURRICULUM)		***The Gruffalo*** *(Julia Donaldson)* ***Meerkat Mail*** *(Emily Gravett)* ***No Place Like Home*** *(Jonathon Emmett)* 		***The Vanishing Rainforest*** *(Richard Platt)* ***The Morning I Met a Whale*** *(Michael Morpurgo)* 	***Charlotte's Web*** *(E.B. White)* ***The Land of Neverbelieve*** *(Norman Messenger)* ***Mummy Laid an Egg*** *(Babette Cole)* 	***Beetle Boy*** *(M G Leonard)* ***Insect Soup*** *(Barry Louis Polisar)* ***Fur and Feathers*** *(Janet Halfmann)* 

THRESHOLD CONCEPT: UNDERSTANDING THE NATURAL WORLD	**BIOLOGY** SEASONAL CHANGE Knowledge (Semantic)	**Seasonal change** Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies.					
SUBJECT SPECIFIC VOCABULARY SEASONAL CHANGE		Observe Changes Four seasons Weather Sunny Windy Rainy Snowy Day length Sunset Sunrise Spring Summer Autumn Winter					
SUGGESTED LINKED TEXTS (READING ACROSS THE CURRICULUM)		***Tree: Seasons Come, Seasons Go*** *(Patricia Hegarty and Britta Teckentrup)* ***One Year with Kipper*** *(Mick Inkpen)* ***After the Storm*** *(Nick Butterworth)* 					

THRESHOLD CONCEPT: UNDERSTANDING THE NATURAL WORLD	**BIOLOGY** EVOLUTION Knowledge (Semantic)						**Evolution** recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. **Suggested scientists:** **Charles Darwin and Alfred Russel Wallace** (Theory of Evolution by Natural Selection) **Jane Goodall** (Chimpanzees)
SUBJECT SPECIFIC VOCABULARY EVOLUTION							Recognise Living things Changed Fossils Inhabited Produce Offspring Vary Not identical Parents Sexual reproduction Adapted Environment Adaptation Evolution Characteristics Inherited Suited Species Breeds Variation More able to survive Less able to survive Palaeontologists Mary Anning Advantages Disadvantages
SUGGESTED LINKED TEXTS (READING ACROSS THE CURRICULUM)							***One Smart Fish*** *(Christopher Wormell)* ***The Molliebird*** *(Jules Pottle)* ***Our Family Tree*** *(Lisa Westberg Peters)*   

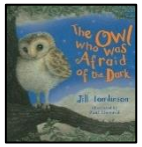
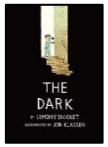
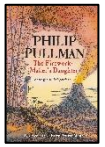
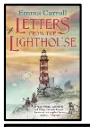
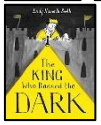
 THRESHOLD CONCEPT: UNDERSTANDING THE PHYSICAL WORLD	**PHYSICS** MATERIALS Knowledge (Semantic)	**Everyday Materials** Distinguish between an object and the material from which it is made identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock describe the simple physical properties of a variety of everyday materials compare and group together a variety of everyday materials on the basis of their simple physical properties.	**Use of 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 uses find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching **Possible Longman's List Link:** Follow a recipe to bake something- If making biscuits or something with a dough, children will have the opportunity to use language related to material properties eg squashing and stretching.	**Rocks** compare and group together different kinds of rocks on the basis of their appearance and simple physical properties describe in simple terms how fossils are formed when things that have lived are trapped within rock recognise that soils are made from rocks and organic matter.	**States of matter** compare and group materials together, according to whether they are solids, liquids or gases observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	**Properties and changes of material** compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic demonstrate that dissolving, mixing and changes of state are reversible changes 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. **Possible Longman's List Link:** Fly a kite. **Suggested scientists: Spencer Silver, Arthur Fry and Alan Amron** (Post-It Notes) **Ruth Benerito** (Wrinkle-Free Cotton)	

SUBJECT SPECIFIC VOCABULARY MATERIALS	wood plastic glass metal water rock fabric carboard rubber wool hard soft stretchy stiff shiny dull rough smooth bendy not bendy waterproof not waterproof absorbent not absorbent see through	Wood Plastic Glass Metal water Rock brick paper cardboard squashing Bending twisting Stretching Suitable Unsuitable Properties Absorbent Opaque Strong Weak Optional opportunities: John Dunlop – tyres Charles Macintosh	Rocks Stone Pebble Boulder Layers Hard Soft Texture Absorb Marble Chalk Granite Sandstone Slate Peat Appearance Physical properties Fossils Soil Organic matter Grains Crystals	Solids Liquids Gases State changed Heated Cooled Temperature Degrees Celsius (°C) Evaporation Condensation Water cycle Investigate Effect Oxygen condensing Iron melting	hardness solubility transparency Electrical conductivity Thermal conductivity response to magnets Dissolve Solution Recover from solution Soluble Insoluble Solids Liquids Gases Separated Filtering Sieving evaporating Metal Wood Plastic mixture changes of state reversible changes Irreversible changes Burning Acid Bicarbonate of soda rusting melting	
SUGGESTED LINKED TEXTS (READING ACROSS THE CURRICULUM)	***The Great Paper Caper*** *(Oliver Jeffers)* ***Who Sank the Boat*** *(Pamela Allen)* 	***The Tin Forest*** *(Helen Ward)* ***Traction Man*** *(Mini Grey)* ***Three Little Pigs*** *(Lesley Sims)* 	***The Pebble in My Pocket*** *(Meredith Hooper)* ***Stone Girl, Bone Girl*** *(Laurence Anholt)* ***The Street Beneath My Feet*** *(Charlotte Guillain & Yuval Zommer)* 	***Charlie and the Chocolate Factory*** *(Roald Dahl)* ***Once Upon a Raindrop: The Story of Water*** *(James Carter)* ***Sticks*** *(Diane Alber)* 	***Itch*** *(Simon Mayo)* ***Kensuke's Kingdom*** *(Michael Morpurgo)* ***The BFG*** *(Roald Dahl)* 	

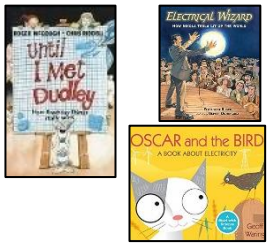
 THRESHOLD CONCEPT: UNDERSTANDING THE PHYSICAL WORLD	**PHYSICS** FORCES Knowledge (Semantic)			**Forces and Magnets** compare how things move on different surfaces notice that some forces need contact between two objects, but magnetic forces can act at a distance observe how magnets attract or repel each other and attract some materials and not others compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials describe magnets as having two poles predict whether two magnets will attract or repel each other, depending on which poles are facing.		**Forces** explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object identify the effects of air resistance, water resistance and friction, that act between moving surfaces recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. **Possible Longman's List Link:** Fly a kite. **Suggested scientists:** **Galileo Galilei** (Gravity and Acceleration) **Isaac Newton** (Gravitation) **Archimedes of Syracuse** (Levers)	

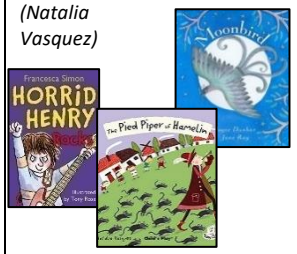
SUBJECT SPECIFIC VOCABULARY FORCES			Compare Surface Forc Push Pull Twist Contact force Non contact force Magnetic Attract Repel Magnetic materials Iron Steel Group Poles Predict Strength Button magnet Horse shoe magnet Bar magnet		Force Gravity Air resistance Water resistance Friction Mechanism Simple machine Levers Pulleys Gears Smaller Greater Effects	
SUGGESTED LINKED TEXTS (READING ACROSS THE CURRICULUM)			***The Iron Man*** *(Ted Hughes)* ***Mrs Armitage: Queen of the Road*** *(Quentin Blake)* ***Mr Archimedes' Bath*** *(Pamela Allen)* 		***The Enormous Turnip*** *(Katie Daynes)* ***Leonardo's Dream*** *(Hans de Beer)* ***The Aerodynamics of Biscuits*** *(Clare Helen Welsh)* 	

THRESHOLD CONCEPT: UNDERSTANDING THE PHYSICAL WORLD	**PHYSICS** LIGHT Knowledge (Semantic)			**Light** recognise that they need light in order to see things and that dark is the absence of light notice that light is reflected from surfaces recognise that light from the sun can be dangerous and that there are ways to protect their eyes recognise that shadows are formed when the light from a light source is blocked by a solid object find patterns in the way that the size of shadows change.			**Light** recognise that light appears to travel in straight lines use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes use the idea that light travels in straight lines to explain why shadows have the same shape as the objects cast by them. **Suggested scientists:** **Thomas Young** (Wave Theory of Light) **Ibn al-Haytham (Alhazen)** (Light and our Eyes)
SUBJECT SPECIFIC VOCABULARY LIGHT				Light Dark Surfaces Sun Shadows Light source Blocked Change Mirror Reflective Light source Absence of light Transparent Translucent Opaque Shiny Matt Surface Dangerous			Light Travel Straight lines Reflect Eye Shadows Light source Light rays Reflection Periscope Shadow puppets Coloured filters

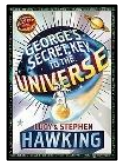
SUGGESTED LINKED TEXTS (READING ACROSS THE CURRICULUM)			***The Owl Who Was Afraid of the Dark*** *(Jill Tomlinson)* ***The Dark*** *(Lemony Snicket)* ***The Firework-Maker's Daughter*** *(Philip Pullman)*   			***Letters from the Lighthouse*** *(Emma Carroll)* ***The Gruffalo's Child*** *(Julia Donaldson)* ***The King Who Banned the Dark*** *(Emily Haworth-Booth)*   

 THRESHOLD CONCEPT: UNDERSTANDING THE PHYSICAL WORLD	**PHYSICS** ELECTRICITY Knowledge (Semantic)				**Electricity** identify common appliances that run on electricity construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers identify 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 battery recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit recognise some common conductors and insulators, and associate metals with being good conductors. predict whether two magnets will attract or repel each other, depending on which poles are facing.		**Electricity** associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches use recognised symbols when representing a simple circuit in a diagram.

SUBJECT SPECIFIC VOCABULARY ELECTRICITY				Common appliances Electricity Simple series circuit Cells Wires Bulbs Switches Buzzers Lamp Switch Open Closed Conductors Insulators Components Motors Safety Simple devices Mains Plug Battery Positive Negative Connect/connections Short circuit, Crocodile clip Buzzer Motor Conductor Insulator, Metal Non-metal Symbol		Circuit Complete circuit Circuit diagram Circuit symbol Brightness Lamp Volume Buzzer Voltage Cells Batteries Switch Voltage Component Variation Loudness Diagram Systematic Safety Changing
SUGGESTED LINKED TEXTS (READING ACROSS THE CURRICULUM)				***Until I Met Dudley*** *(Roger McGough)* ***Oscar and the Bird: A Book about Electricity*** *(Geoff Waring)* ***Electrical Wizard: How Nikola Tesla Lit Up the World*** *(Elizabeth Rusch)* 		***Good Night Mr Tom*** *(Michelle Magorian)* ***Horrible Science: Shocking Electricity*** *(Nick Arnold and Tony De Saulles)* 

THRESHOLD CONCEPT: UNDERSTANDING THE PHYSICAL WORLD	**PHYSICS** SOUND Knowledge (Semantic)				**Sound** identify how sounds are made, associating some of them with something vibrating recognise that vibrations from sounds travel through a medium to the ear find patterns between the pitch of a sound and features of the object that produced it find patterns between the volume of a sound and the strength of the vibrations that produced it recognise that sounds get fainter as the distance from the sound source increases.		
SUBJECT SPECIFIC VOCABULARY SOUND					Vibrate Ear Pitch Sound Travel Volume Pattern Strength Faint Source Musical instruments Insulation		
SUGGESTED LINKED TEXTS (READING ACROSS THE CURRICULUM)					***Horrid Henry Rocks*** *(Francesca Simon)* ***Moonbird*** *(Joyce Dunbar)* ***The Pied Piper of Hamelin*** *(Natalia Vasquez)* 		

 THRESHOLD CONCEPT: UNDERSTANDING THE PHYSICAL WORLD	**PHYSICS** EARTH AND SPACE Knowledge (Semantic)					**Earth and Space** describe the movement of the Earth, and other planets, relative to the Sun in the solar system describe the movement of the Moon relative to the Earth describe the Sun, Earth and Moon as approximately spherical bodies use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. **Suggested scientists: Claudius Ptolemy and Nicolaus Copernicus** (Heliocentric vs Geocentric Universe) **Neil Armstrong** (First man on the Moon) **Helen Sharman** (First British astronaut) **Tim Peake** (First British ESA astronaut)	

SUBJECT SPECIFIC VOCABULARY EARTH AND SPACE					Solar system Movement Earth Planets Sun Star Moon Spherical Rotation Day Night Mercury Venus Earth Mars Jupiter Saturn Uranus Neptune moons Celestial body Axis Orbit Safety Astronomical clocks Sundials Calibration	
SUGGESTED LINKED TEXTS (READING ACROSS THE CURRICULUM)					***The Skies Above My Eyes*** *(Charlotte Guillain & Yuval Zommer)* ***George's Secret Key to the Universe*** *(Lucy and Stephen Hawking with Christophe Galfard)* ***The Way Back Home*** *(Oliver Jeffers)*   	

 THRESHOLD CONCEPT: WORKING SCIENTIFICALLY	Skills (Procedural knowledge)	QUESTIONING	With help and encouragement I ask simple questions that begin with why, what if, how or when.	I ask simple questions and recognise these questions can be answered in different ways.	I can ask questions and I recognise that there are different types of enquiry	I ask relevant questions and use different types of scientific enquiries to answer them.	I ask relevant questions (containing scientific knowledge and understanding) and with help I recognise which type of enquiry is best to answer a question.	I ask relevant questions (containing scientific knowledge and understanding).
		INVESTIGATING	I make suggestions about how to do things when we plan a simple test. With help, I use simple equipment and non-standard units to find things out.	I decide with help, what to find out, observe or measure.	I can set up a simple practical enquiry and I am beginning to understand how to make a test fair.	I can set up simple practical enquiries, comparative or fair tests.	I use a range of equipment independently.	I recognise which type of enquiry is best to answer a question. I can plan different types of science enquiries to answer questions. I recognise and control variables where necessary.
		OBSERVATION AND MEASUREMENT	I observe using my senses	I observe closely, using simple equipment and non-standard units. I can identify and classify. I can perform a simple test.	I make suggestions about what observations and measurements to make and what equipment I need. I am beginning to make systematic and careful observations. I sometimes use standard units. With help I can use information sources provided to find things out.	I decide what observations and measurements to make and what equipment to use. I use a range of equipment (including thermometers and dataloggers). I make systematic and careful observations and take accurate measurements using standard units. I use information sources provided to find things out.	I decide what observations and measurements to make (controlling variables with help where necessary) and what equipment to use to make my measurements and observations. The series of observations and measurements I take are adequate for the task. I use information sources provided to find things out. I identify possible risks to myself and others.	I decide what observations and measurements to make and what equipment to use (giving reasons) to make my measurements and observations. I take measurements, using a range of scientific equipment with increasing accuracy and precision. I take repeat readings when appropriate. I use relevant information sources to find things out I identify possible risks to myself and others.
		RECORDING FINDINGS	With help, I can gather and record data to help me answer my questions.	I gather data and record data to help me answer my questions. I record what I have found out using e.g. words or pictures, tables or simple prepared formats.	I gather data and using a pre-prepared table I can record data. I record my findings using a drawing and/or words. With help, I can present my data.	I gather, record and classify data in a variety of ways to help me answer my questions. I record my findings using simple scientific language, tables, drawings and labelled diagrams. I present my data in a variety of ways using e.g. Venn diagrams, bar charts, simple scatter graphs and keys.	I gather and record non-complex results (data and observations) using e.g. tables and scientific diagrams. I present the results (data and observations) in a range of formats e.g. bar and line graphs, simple scatter graphs, keys and frequency charts.	I record data and results of increasing complexity using e.g. scientific diagrams and labels and tables I choose a method to suit the results, e.g. a two column table I present the data and results in suitable formats using e.g. line graphs, bar graphs, scatter graphs and classification keys.

		CONCLUSIONS AND REFLECTIONS	I talk about what happened and/or what I saw I talk about what I did.	I use my observations and ideas to suggest answers to my questions. I talk about how I found out what I found out.	I can use my results when I talk about what happened. I can talk about what went wrong!	I use my results to draw simple conclusions and I make predictions for new values. I communicate what I have found out using straightforward scientific ideas and I report my findings using oral and written explanations and displays. I suggest improvements to the way I carried out the enquiry.	I draw conclusions from my data and observations. I begin to use basic scientific evidence to support or refute the ideas or arguments for my conclusion. I look at my results and decide if any observations or measurements are unsuitable. I use what I have found out to suggest improvements to my work giving reasons.	From my data and observations I draw valid conclusions (i.e. consistent with the evidence) including causal relationships. I identify scientific evidence to support or refute the ideas or arguments for my conclusion. I look at my results and decide if any observations or measurements are unsuitable and need to be carried out again. I offer simple explanations for differences in results.
		FURTHER INVESTIGATIONS			I have ideas about what else I would like to find out.	I suggest further questions to investigate.	I can set up further questions to investigate.	I use my test results to make predictions to set up further enquiries e.g. comparative and fair tests and suggest how my working methods could be improved, with reasons.
WORKING SCIENTIFICALLY VOCABULARY			Identify Name Questions Suggestions Test Equipment Observe Identify Compare Enquiry Observing Patterns, Groups classifying Comparative Secondary source	Observe Describe Group Record Data Contrast Diagram Chart Map	Research Enquiry Measurement Systematic Data – gather, record, present Results Table	Predictions Evidence Improve Conclusion Comparative Venn diagram Bar chart Scatter graph Interpret Differences Similarities Changes Thermometers Dataloggers Systematic Standard units Further investigations	Plan Variables Repeat readings report Scientific diagrams, Labels, Classification keys, Line graphs Further comparative and fair test Report and present – conclusions Improvements Risks Non-complex	Causal relationship Explanations Degree of trust, Evidence - support, refute ideas or arguments Accuracy Precision Complex Systematic Quantitative