Year 5 Science Long Term Plan

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Science	Why are certain objects made from particular materials? **Properties and change of materials**	What is a force and how can they help us? **Forces**	The Earth, Sun or Moon- which is the odd one out? How do we get day and night, the seasons and climates? **Earth and Space**	Are life cycles all the same? **Living Things and their habitats**	Term 6 PSHE "Changing Me" **Animals Including Humans** How would you survive on a desert island? **Properties and change of materials**	

Year 5 Science Medium Term Plan

Term 1- Why are certain objects made from particular materials?		
National Curriculum Links	**Key Vocabulary**	**Pupil Offer**
Science- Properties and Changes of Materials • Compare and group together everyday materials on the basis of their properties, including their hardness…transparency, conductivity (electrical and thermal), and response to magnets.	Thermal conductivity – thermal conductor, thermal insulator Electrical conductivity – electrical conductor, electrical insulator Translucent, Transparent, Opaque	Opportunities for working scientifically have been incorporated into each weeks planning. Pupils will also be using the work from science to support geographical enquiry.

	Week 1	Week 2	Week 3	Week 4
Lesson Overview including Substantive knowledge	***KS1 Retrieval Task*** Recap work on describing materials ***Working Scientifically*** **Classifying** Provide pupils with a range of materials and ask them to classify them in different ways. NB this will involve retrieval of prior knowledge. Once pupils have explored this independently, introduce criteria such as hardness/transparency/magnetic and allow pupils to explore their classifications further.	***Working Scientifically*** **Comparative** Which materials allow electricity to pass through them? ***Y4 Retrieval Task*** Pupils will construct a simple series circuit and then use this to test different materials to determine if they conduct electricity.	***Working Scientifically*** **Comparative/Fair Testing** Which material is best at keeping me warm? Pupils will be planning an investigation to determine which materials are the best thermal insulators based on the use of warm water in cups to help them answer the lesson question.	**Retrieval- BIG QUESTION** Pupils will be given a range of objects and asked to justify why they have been made of the various materials.
Working Scientifically		Make decisions on how to record and present evidence	Given a wide range of resources, children make decisions on how to gather evidence to answer a question. Evaluate the choice of method, control of variables, precision and accuracy of measurements and credibility of secondary sources	Communicate their findings using relevant scientific language and illustrations.
Organisation & Communication	Seesaw photograph evidence Venn diagram/Carrol diagram	Pupils to decide on their own methods for recording	Scientific Method	Scientific explanation
Famous People				

Term 1 (2 weeks) & Term 2- What is a force and how can they help us?		
National Curriculum Links	**Key Vocabulary**	**Pupil Offer**
Science • 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	*Types of force:* Gravity, friction, air resistance, upthrust, weight *Measuring forces*: Newton meter, Newtons (N) Particles Surface area Push, pull Balance Mass – grams and kilograms Weight Mechanical devices – gears, levers, pulleys, springs	Pupils will have the opportunity to use new equipment- Newton Meters

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Lesson Overview including Substantive knowledge	What is a force? ***Y3 Retrieval*** Pupils will build their understanding that a force is a push or a pull. They will then develop their understanding of gravity. **Comparative** How does the surface area of a piece of paper affect how quickly it falls?	**Comparative/Fair Testing** How does the surface area of the blades affect the time it takes the spinner to fall? Pupils will complete a scientific investigation based on how quickly a spinner falls when they alter the length of the wings. They will also use retrieval from previous week to make predictions.	**Comparative/Fair Testing** What affects how well a parachute falls? Pupils will be considering the variables that they could change and use this to plan their own investigation.	How are forces measured? Pupils will be learning how forces are measured and will develop their accuracy using a newton meter. They will also be learning the difference between mass and weight. **Comparative** How can we make an object weigh less? Pupils will be exploring how water can reduce the weight of an object. They will then be relating this with upthrust.	**Comparative/Fair Testing** ***Year 3 Retrieval*** Pupils to retrieve information about how objects move on different surfaces. They will then build on this to develop their understanding of friction by testing trainers on different surfaces using Newton Meters.	What is a lever? Pupils will be learning about different mechanisms. They will then be focusing on levers and learning about the benefits of a lever. Pupils will also be researching William Heath Robinson during work on mechanisms (Week 6 & 7)	What is a pulley? Pupils will be exploring lifting water bottles using pulleys.	***Retrieval- BIG QUESTION*** Pupils will be producing an information page to detail what a force is as well as the benefits/uses of forces. This will include concept cartoons and pictures to promote discussion around what it would be like without forces.
Working Scientifically	Communicate their findings using relevant scientific language and illustrations.	Make predictions they can investigate using comparative and fair tests. Taking measurements, with increasing accuracy and precision, taking repeated readings when appropriate	Ask questions which can be tested Planning scientific enquiries to answer questions, including recognising and controlling variables where necessary Communicate their findings using relevant scientific language and illustrations. Identify limitations that reduce trust in their data	Use scales which involve decimal measurements	Children select measuring equipment to give the most precise results	Make decisions about when to take readings or make adjustments to the plan in order to get accurate data. Identify limitations that reduce trust in their data	Present the same data in different ways to help with answering the question	Communicate their findings using relevant scientific language and illustrations.
Organisation & Communication	Diagram	Prediction Conclusion	Instructions for a fair test Conclusion	Table Scientific Definition Scientific drawing to show forces acting on an object in water	Table	Annotated Photographs Evaluation	Table Diagram Explanation	
Famous People				Isaac Newton		William Heath Robinson		

Term 3- The Earth, Sun or Moon- which is the odd one out? How do we get day and night, the seasons and climates? *NB parts of the second question are taught as part of geographical enquiry*		
National Curriculum Links	**Key Vocabulary**	**Pupil Offer**
Science- 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	Solar System, Earth, Sun, Moon Planets- Mercury, Venus, Mars, Jupitar, Saturn, Uranus, Neptune Spherical Axis, Rotates, Orbits Gravity	Pupils will be using IPad Apps to learn about the constellations. Weather permitting, this will include a star gazing evening with hot chocolate.

	Week 1	Week 2	Week 3	Week 4	Week 5
Lesson Overview including Substantive knowledge	**Prior Knowledge** Pupils to sort a series of statements about the solar system into true/false/unsure. Researching/Secondary Sources How many planets are there? **Order of the planets** Pupils will be learning the order of the planets. They will also be learning about the discovery of planets.	Researching/Secondary Sources What shape is the Earth? Prove it! Know the Earth is spherical and use scientific evidence to prove it. Researching/Secondary Sources How do the planets orbit? Pupils will be learning about the orbits of the planets in the solar system.	Researching/Secondary Sources Does the sun travel across the sky? Pupils will be learning about the Earth's rotation and the orbit of Earth and the moon. They will then use this knowledge to create role plays to model what they have learnt and describe the rotation/orbit.	How are shadows formed? ***Y3 Retrieval*** Pupils will be learning about shadows caused by the sun and how these can be used to tell the time. ***Retrieval- BIG QUESTION*** The Earth, Sun or Moon- which is the odd one out? Pupils must list as many reasons as possible that each one could be the odd one out.	***Retrieval- BIG QUESTION*** Researching/Secondary Sources Pupils will be planning and researching their own information text with the title "Earth, Space and Beyond". This must also include the answer to the second big question How do we get day and night, the seasons and climates?
Working Scientifically	Talk about how scientific ideas change due to new evidence or discoveries.	Discuss whether other evidence e.g. from other groups, secondary sources or scientific understanding, supports or refutes their answer	Communicate their findings using relevant scientific language and illustrations.	Communicate their findings using relevant scientific language and illustrations.	Recognise when secondary sources can answer a question which cannot be answered in practical work.
Organisation & Communication	Mnemonic	Scientific Explanation and diagrams	Videos of pupils' role play including notes (verbal or written) to describe.	Comparison Table and Diagrams	Non-Chronological Report
Famous People	Galileo Galilei	Aristarchus Aristotle			

Term 4 and Half Term 5 Science- Are life cycles all the same?		
National Curriculum Links	**Key Vocabulary**	**Pupil Offer**
Science • 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	Mammal, amphibian, reptile Life cycle, Reproduce, Sexual, Asexual, Fertilises Metamorphosis, Nymph, Larva, pupa, Hatchling, fledgling Juvenile Plantlets, Runners, Tubers, Bulbs, Cuttings, Pollination, Germination, Fertilisation, Seed Formation, Seed Dispersal. Sepal, petal, Stamen, Stigma, ovary, anther, filament, style, ovule	Children to be able to dissect a flower to explore the different part pertaining to life cycle/reproduction. Wild flower seed Grow a plant (vegetables) and monitor and record the changes.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Lesson Overview including Substantive knowledge	***Prior Years Retrieval Task*** What do you already know about plants? **Flowering Plants lifecycle** Identify the parts of a flower and describe their functions. Use this knowledge to describe the life cycle of a flowering plant. Observing Over Time ***Working Scientifically*** Pupils will be growing different plants (vegetables) and observing throughout the rest of the year.	Researching **Pollination** Understand the process of pollination and explain what it is.	Researching/Secondary Sources **Non-Flowering Plants Lifecycle** Classify and name non-flowering plants and explore how non-flowering plants reproduce.	***Retrieval- BIG QUESTION*** Answering the big question – 'Are all life cycles the same?' based on plants ***Y4 Retrieval Task*** Classification of different types of animal	Classifying Researching/Secondary Sources **Bird Life Cycle** Classify what a bird is and the different types of birds. Understand the different stages of a birds' life cycle.	Classifying Researching/Secondary Sources **Amphibian and Insect Lifecycle** ***Y2 Retrieval Task*** *(Frog lifecycle)* Classify what an insect and amphibian are and learn about complete and incomplete metamorphosis (linked with butterfly and dragonfly).	**Mammal Lifecycle** Explore different groups of mammals and understand the different stages of the life cycles. Pattern Seeking ***Working Scientifically*** **Comparing life cycles of different animal groups** Using a gestational chart of comparing different gestational periods for animals and humans and identifying patterns.	***Retrieval- BIG QUESTION*** Answering the big question – 'Are all life cycles the same?' based on animals.
Working Scientifically	Make decisions about when to take readings	Communicate their findings using relevant scientific language and illustrations.	Communicate their findings using relevant scientific language and illustrations.	Make decisions on how to record and present evidence Communicate their findings using relevant scientific language and illustrations.	Recognise when secondary sources can answer a question which cannot be answered in practical work. Communicate their findings using relevant scientific language and illustrations.	Communicate their findings using relevant scientific language and illustrations.	Identify results which do not fit the overall pattern Identify causal relations and patterns in the natural world from their evidence	Make decisions on how to record and present evidence Communicate their findings using relevant scientific language and illustrations.
Organisation & Communication	Labelled diagram	Video explanation	Diagram/Explanation	Own recording method to show answer to the big question based on plants.	Life Cycle Diagram	Comparison map	Life Cycle Diagram Conclusion	Own recording method to show answer to the big question based on animals.
Famous People								

Term 6 Science- How would you survive on a desert island?		
National Curriculum Links	**Key Vocabulary**	**Pupil Offer**
Science- Properties and changes of materials • Compare and group together everyday materials on the basis of their properties, including their…solubility… • 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 • 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	**Dissolving** – Solvent, solution, solute, soluble, insoluble, solid, liquid, particles, suspensions **Separating materials** – Sieve, filter, evaporate, condense Reversible/Irreversible	Pupils will be completing survival based activities linked with this enquiry.

	Week 1	Week 2	Week 3	Week 4	Week 6
Lesson Overview including Substantive knowledge	**Assess prior knowledge** Pupils will be given a mystery mixture (salt, soil, stones and water) Explain that there are 4 things in the water but do not tell them what they are. Ask pupils to use observation to work out what is in the mixture and then describe how they can separate the materials. ***Y4 Retrieval Task*** **States of Matter** Recap the three states of mater- solid, liquid and gas and discuss their properties. Use this knowledge to predict what will happen to raisins when added to lemonade. **Reversible and Irreversible** Introduce terms reversible and irreversible.	**Sieving** How can we separate mixtures of different solids? Pupils to explore using different types of sieves to separate solids mixed together. NB this will also include paper slips to assess pupils who can retrieve information from Year 3 on magnetism. **Filtering** Pupils to be introduced to filtering with the use of tea bags. They will then use filter papers to explore filtering soil from water before being challenged to make the water as clean as possible using only filter papers.	Comparative/Fair Testing **Filtering** Working Scientifically What is the best material for filtering? Pupils to investigate which material makes the best filter. They will need to choose their own method for recording results. **Dissolving** Introduce pupils to dissolving by using sugar and water so that pupils can taste the final solution.	Comparative/Fair Testing **Dissolving** Working Scientifically What affects how well sugar dissolves? Provide pupils with the following context- Teachers whinging in the staffroom that their sugar takes too long to dissolve! Pupils will then plan their own investigation. **Separating through evaporation** Discuss with children what happens to the water on the playground over time. Pupils will then set up class investigation to observe this to separate salt from water.	***Retrieval- BIG QUESTION*** Provide pupils with the mystery mixture from week 1. Pupils o use their knowledge from this term to separate the mixture. They will then use all of their knowledge to write a letter to Michael (Kensuke's kingdom) explaining how the skills they have learnt this term can help them to survive on a desert island.
Working Scientifically			Make predictions they can investigate using comparative and fair tests. Make decisions on how to record and present evidence	Given a wide range of resources, children make decisions on how to gather evidence to answer a question. Make decisions about when to take readings or make adjustments to the plan in order to get accurate data.	
Organisation & Communication	Diagram and Explanation	Photographs and Explanation	Prediction Pupils choice of recording method	Scientific Investigation	Letter
Famous People					