

Term	Autumn One	Autumn Two	Spring One	Spring Two	Summer One	Summer Two
Knowledge	Properties of materials	Changes of Materials	Forces	Earth and Space	Animals including humans	Living things in their habitats
Scientific enquiry	Researching Comparative/fair testing	Researching Comparative/fair testing	Comparative/fair testing	Observing over time Researching	Pattern seeking Researching	Classifying
Working scientifically skills	To plan an enquiry To make a prediction To measure accurately	To plan an enquiry To make a prediction To measure accurately To evaluate an investigation	To ask scientific questions To gather/record results To present results To interpret results	To observe closely To ask scientific questions	To draw conclusions To ask scientific questions	To ask scientific questions
Building science capital	Practical lesson activities	Practical Lesson Activities	Provide knowledge of forces in employment and the working world	External visitor with Science workshop Science Museum	Animal visit	Use of sensory garden, glass house and Edible Garden space
Composite knowledge	What is solubility and conductivity? How can mixtures (of different states) be separated?	What are irreversible changes? How are new materials formed?	What is gravity? What is air resistance? What is water resistance? What is friction? How do forces affect a mechanism? What is the effect of air resistance?	How do the sun, earth and moon look like? How does the earth and other planets move? How do we have night and day? Why does it look like the sun moves across the sky?	What as the changes a human makes when they develop into old age? How can you show human growth and development on a timeline? What is a gestation period? What differences are there between a human's gestation period and other animals?	What is the life cycle of a mammal, amphibian, insect and bird? What are the differences between the life cycle of different animals? What is asexual reproduction in plants? What is sexual reproduction in plants?
Component knowledge	-compare and group together everyday materials on the basis of their properties, including their hardness, solubility,	-demonstrate that dissolving, mixing and changes of state are reversible changes	-explain that unsupported objects fall towards the Earth because of the force of gravity acting between	-describe the movement of the Earth and other planets relative to the sun in the solar system	-identify changes humans make as they develop into old age.	-describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird

	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	-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	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	-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	-indicate stages in human growth and development. -understand and explain what a gestation period is. -make clear comparisons between human and other animals gestation periods.	-describe the life process of reproduction in some plants and animals
Vocabulary	conductivity, thermal and electrical insulators,	Soluble, insoluble, solute, solution, solvent, irreversible/ reversible changes	Forces, air resistance, water resistance, friction, mechanisms, pulleys, levers, gears, parachutes, sycamore seeds	Earth, planets, solar system, moon, rotation, spherical bodies, night and day.	Gestation period, growth, development,	Mammal, amphibian, insect, bird, life cycles, asexual reproduction, sexual reproduction
Links to prior knowledge	Year 1 and 2: Everyday Materials Year 4: States of matter	Year 1 and 2: Everyday Materials Year 4: States of matter	Year 3 Forces and Magnets	Year 3 Forces and Magnets	Year 1 - Year 4 Animals including humans	Year 2 and Year 4 Living things in their habitats
Key knowledge for assessment	Make comparison between materials using prior knowledge and	Explain the way to decide how to recover a substance	To raise questions about the effects of air resistance.	Use a model of the sun and earth to explain day and night.	To confidently indicate stages of human growth and development	To raise questions about their local environment.

	additional knowledge of material properties.	depends on its state of matter and properties.	Explore the effects of air resistances. Experience forces and their effects. Explore mechanisms that are impacted by force.	Understand the sun and the eight planets (Pluto's reclassification in 2006 as a 'dwarf planet').	Research and discuss the gestation periods of different animals. Make comparisons between a human's gestation period and other animals.	Make suggestions for similarities and differences in life cycles Make suggestions for similarities and differences in reproduction of animals and plants.
Cross-curricular links	River men conjuring poisons for Spanish Invaders and require knowledge of solubility	North America				

Half Termly Planning

Autumn 1	Lesson Objective	Main Task	Resources	New Vocabulary taught
Lesson 1	To retrieve knowledge.	Revisited the lesson content from year 4 with regards to states of matter. Main task included children drawing the structure and annotating different states of matter.	Plain paper Lower 20% used pictures to understand the structure of the states of matter.	Solid, liquid, gas,
Lesson 2/ 3	LO: To plan an investigation to explore thermal insulating properties.	Chunked learning. Understanding a thermal insulator and conductor. Writing own version of definition in books. Understand what a variable is. Children then sort the variables in pairs and discuss. Discuss answers as a class. Then children write in books. Children then 'think pair share' their predictions before writing in books. Lastly, they draw a prediction table.	Variables cards to sort. Lower 20% can stick variables in book.	Thermal insulator and conductor, heat energy, independent variable
Lesson 4	LO: To perform an investigation to explore thermal and insulating properties.	Children to perform experiment then interpret results. The class fill in their results table as we collectively share results. Interpreting results involves looking at unreliability of the experiment and human error. Explore and analyse the temperature drop of cups that are made of different materials.	Different cups, thermometers, warm water, timer	Unreliable, human error, thickness of the cup, incorrect reading, thermometer

Lesson 5	LO: To plan an investigation to explore solubility of a material.	Explore the solubility of different ingredients e.g., oil, jam, sugar, salt and flour. Chunked learning. Children sort variables in pairs and discuss. Ensure fair testing is covered in the lesson and the structure of the investigation. Then class discussion and work through correct answers for a fair test. Children write fair test variables in their books. Children then 'think pair share' their predictions before writing in books. Lastly, they draw a prediction table. The skill of recording and presenting results will be covered when the children will make a table and draw a graph.	-LA (Lower 20%) can stick in variables. - Instructions for the layout of work in books.	Dissolve Soluble Insoluble Dependent variable
Lesson 6	LO: To perform an investigation to explore solubility of materials.	Children to perform experiment then interpret results. The class fill in their results table as we collectively share results. Interpreting results involves looking at unreliability of the experiment and human error. What observations led to the results e.g., cloudy solution and bubbles.	Same cups, different household ingredients, water, measuring cups	Solution solute
Lesson 7	LO: To observe and understand reversible and irreversible changes.	Chunked learning. Understanding a reversible and irreversible changes. Partner talk mixing, heating and burning. Discuss method. Children then sort the variables in pairs and discuss. Discuss answers as a class. Then children write in books. Children then 'think pair share' their predictions before writing in books. Draw prediction table in books and results table.	- LA (Lower 20%) - focus on using the communication imprint. - Detailed Instructions for the layout of work in books.	Reversible changes Irreversible change

Autumn 2	Lesson Objective	Main Task	Resources	Vocabulary
Lesson 1	LO: To observe and understand reversible and irreversible changes.	Practical investigation involving making solutions and using filter paper. This is to deepen the understanding of reversible and irreversible changes.	- LA (Lower 20%) - focus on using the communication imprint. - Detailed Instructions for the layout of work in books.	Year 4 – Heating, mixing, burning, Year 5 – Reversible , irreversible , filtering, dependent and independent variable
Lesson 2 /3	LO: To investigate the durability of a material.	To focus on understanding the concept of material properties and presentation in books.	- LA (Lower 20%) - focus on using the communication imprint.	Durability Suitable Strength of a material

			- Detailed Instructions for the layout of work in books.	
Lesson 4	LO: To group materials according to their properties	Enquiry question involved sorting materials based on a range of properties e.g. solubility, hardness, durability, thermal conductor, thermal insulator.	Scaffolds CIP	Electrical insulator Magnetic
Lesson 5	LO: To practically group materials according to their properties	Active investigation to independently explore properties of materials. Children should be able to apply their knowledge of properties to test particular properties e.g. solubility, hardness, durability, thermal conductor, thermal insulator.	Scaffold CIP	Electrical insulator Magnetic
Lesson 6	LO: To plan and carry out oxidation investigation.	Nail rusting investigation. Children to look at and sort variables. Which variables need to be kept the same, to be observed and to be changed. Each group to perform one part of the investigation with a different liquid.	Communication imprint to sort (mixed ability pairs)	Variables to observe Variables to change (independent variable Variables to keep the same (dependent variables) Rust oxidation
Lesson 7	LO: To plan and carry out investigation looking at irreversible changes.	Look at yeast and how it causes an irreversible reaction. Understand the importance of a reliable investigation. Carry out the experiment in groups.	Communication imprint to sort (mixed ability pairs)	Variable Yeast Irreversible reaction Carbon dioxide Change of state (bubbles means there's a gas)
Lesson 7	LO : To assess what I have learned over the term.	Children will answer assessment questions.	Low ability learners will have communication imprint to support answers.	Revisit vocabulary and concepts from the term.

Spring 1	Lesson Objective	Main Task	Resources	Vocabulary
Lesson 1	LO: To plan and carry out an investigation to explore gravity.	Dropping weights and classroom objects to compare which objects fall faster. Outcome should be the heavier objects fall faster as the mass means there is more gravity acting on the object. Children will write the enquiry in their books alongside their results tables and conclusions.	Variables to sort (communication imprint)	Balanced forces Unbalanced forces Gravity

Lesson 2	LO: To understand the effects of air resistance and how it acts between moving surfaces.	Making parachutes to test which parachute will fall faster or slower. Outcome should be the larger parachute has a bigger surface area so there's more air resistance acting upon it. This makes it land slower.	Vocabulary to sort Variables to sort (communication imprint)	Friction Air resistance Surface Area
Lesson 3	LO: To understand the effects of water resistance and how it acts between moving surfaces.	Make three shapes. Cone, flat circle and flat square. Compare which fell faster and slower. The cone fell faster as it was a streamline shape. It had less water resistance acting upon it so it well faster.	Vocabulary to sort Variables to sort (communication imprint) Results table for the emerging	Water resistance Surface Area Stream lined shape
Lesson 4	LO: To investigate how levers work	Children to use the pictures and sort the variables. Once completed, answers on the slide to discuss and write as a class. Draw diagram of levers. Children then choose objects in the class to make lever (e.g. ruler and 3D shape) and test out.	Variables to sort (Communication imprint)	Class 1 Lever Class 2 Lever Effort , Load, fulcrum Effective balance
Lesson 5	LO: TO investigate how pulleys work.	Children to use the pictures and sort the variables. Once completed, answers on the slide to discuss and write as a class. Draw diagram of pulley. Children then make pulleys with glue stick as fulcrum and string. Then test out.	Variables to sort (Communication imprint)	Pulley , Effort, load, fulcrum, Effective Lift
Lesson 6	Assessment	Forces assessment, MCQ and poster to present knowledge of the term.	LA assessment sheet with 6 questions	

Spring 2	Lesson Objective	Main Task	Resources	Vocabulary
Lesson 1	L O: To know different aspects of the solar system.	Practically sort planets in the solar system with the data table to guide the order. Then use facts to sort. Children to draw the solar system in books across 2 pages. Include the definitions.	Widgit sheet Facts to sort sheet	Comet, asteroids, planets, orbit pathway, axis
Lesson 2	L O: To research about Earth and Space	Computer room and video to research basic facts.	Computer room Widgit to guide LA learners	Earth and space Solar System Distance Life and survival, Axis,

Lesson 3	LO: To understand how the solar system works using an orrey.	Practically make solar system orrey. Scientifically explain the distance of each planet from the sun and how the helio-central model works.	Coloured card Objects available in class for varying sizes Widgit sheet Sentence starters to help verbal explanations	Heliocentric model
Lesson 4	LO: To begin to understand how the earth's rotation	Recap vocabulary linked to today's practical. Then organise the children so they are aware of their roles in the practical. Children will physically be the earth rotating while travelling on it's orbit pathway around the sun.	Widgit sheet Sentence starters to guide verbal explanations	Rotation, day, night, orbit,
Lesson 5	LO: To understand how the earth's movement explains seasons and the year.	Recap vocabulary and practically answer questions about day, night and seasons.	Widgit sheet Sentence starters to guide verbal explanations	Rotation, axis, titled, hemisphere, patterns, seasons, complete orbit
Lesson 6	LO: To understand how planets move and how the earth's rotation explains day and night.	Children to answer the following questions practically: How do we have day and night? Why do different countries have day and night at different times? How does the Earth make a year? How do we get seasons? Use labels and each person is a celestial body in the solar system e.g. sun, earth, invisible orbit pathway etc.	Labels for each child in a group (sun, earth, orbit pathway and narrator)	North Pole South Pole Northern hemisphere Southern hemisphere Patterns Seasons

Summer 1	Enquiry Question	Main Task	Resources	Vocabulary
Lesson 1	EQ: Why do planets move and why the Moon appear the way it does?	Children to explain how the moon orbits Earth and sunlight is reflected off its lunar surface. The light reflected off makes it look different shapes when it is in different phases of its cycle. Children can draw and write about it.	Widgit sheet to guide verbal and written explanation. Moon phases picture.	Moon orbit, sunlight, reflects, lunar surface, changing shape, moon phases.
Lesson 2	EQ: What are the key stages of human fetal development?	Starter about digestive system and food chain. Children to discuss and sort statements and pictures regarding age and the human life cycle. Match the picture with that might be happening	Pictures and statements for WHO,WHAT and WHEN. Foetal development statements to sort.	Time period, babies develop, inside the mother, before birth, foetus, embryo.

		in their life. What is gestation, new vocabulary and different stages in weeks.	Foetal development pictures in the womb.	
Lesson 3	EQ: What does the baby growth chart show?	Children to collect the data of the growth of a foetus using the foetal development pictures from last week. They will collect the age (in weeks ONLY) and the size. Then, children can use the data to draw a line graph. They will answer questions about the graph e.g. What happens to the size of the foetus as the age increases? What advise will a doctor give if a foetus is measuring 100mm at 12 weeks old?	Graph paper Foetal development sheet with data to collect. Scaffolded sheet.	Primary data, secondary data, Foetal development, gestation period, weeks, size, increases, further scans.
Lesson 4	EQ: How are gestation times different between animals.	Children will order gestation periods between different species of animals on a timeline. They will then answer questions that will conclude their observations about the length of gestation periods. Children will identify similarities and differences.	Data table, scaffolded data table with picture of animals.	Gestation period, weeks, comparing, similar, different.
Lesson 5	EQ: How are sexual and asexual reproduction different?	Starter about human growth and development. Introduction of new vocabulary. Sheet explaining the different ways of reproduction. We will give the children a sheet with several activities, including a diagram of a flower and its reproduction.	Activity sheet. Scaffolded version.	Reproduction, sexual, asexual, gametes, mammals, eggs, plants, clones.
Lesson 6	General assessment.	Assessment task covering all Y5 Science topics.	Assessment sheet.	

Summer 2	Lesson Objective	Main Task	Resources	Vocabulary
Lesson 1	LO: To understand sexual reproduction in plants.	Children to use the engaging video about water lilies to write notes about sexual reproduction in plants. They can then draw the process of sexual reproduction in plants,	Engaging BBC video Scaffold with key vocabulary	Nectaries, nectar, bees, stamen (anther, filament), ovary, style stigma, two parents(plants), fertilization, pollination, ovule, pollen
Lesson 2	Assessment week	Assessment week	Assessment week	Assessment week

Lesson 3	LO: To understand asexual reproduction in plants.			
Lesson 4	LO: To understand the life cycles of different animals including amphibians.			
Lesson 5	LO: To identify differences between life cycles of different animals.			
Lesson 6				
Lesson 7				