Science Long Term Planning

'Achieve Excellence'

What does it mean to get better at Science at Wimboldsley?

At Wimboldsley, we strive to give our pupils the knowledge and abilities they need to excel in the field of science!

We provide a science curriculum that uses the disciplines of biology, chemistry, and physics to inspire students' interest, passion, and comprehension of the world around them. Additionally, through good pedagogy and vocabulary-rich teaching, the curriculum assures skill development and cumulative learning while enhancing and supporting the children's metacognitive learning processes. In order to ensure conceptual knowledge and ensure that subject-specific language is applied appropriately and precisely, it is taught and built upon over the primary phase . Since we are aware that our children learn best through inquiry-based learning, Wimboldsley's science curriculum has been designed to give them hands-on science experiences from the very beginning. This enables independent research and inquiry, which in turn promotes the development of communication.

Every year, our school participates in British Science Week to spread knowledge, spark interest, and celebrate STEM across the school community.

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Reception					
Understanding the World Chemistry Everyday Materials 🥫		Understanding the World Biology Animals including humans 👨‍🦲		Understanding the World Physics Forces and magnets	WORKING SCIENTIFICALLY

In play, explore a range of materials Describe natural materials	Taking care of themselves Animals grow and change	In play, explores forces. Floating and sinking Magnets	*Opportunities for Scientific Investigation to be embedded throughout the year with opportunity for extra focus in Summer 2.*
Suggested investigation question Which material is best to build a house from?	Suggested investigation question How long do butterflies stay in the chrysalis? What healthy choices can I make?	Suggested investigation question What will a magnet attract?	Consolidation of Scientific enquiry skills
Explores a range of materials, including natural materials. Makes objects from different materials, including natural materials. Uses senses in hands on exploration of natural materials. Can explore collections of materials with similar and or different properties. Talks about what I see using a wide vocabulary.	Knows about how to take care of themselves including dental care and hygiene. Talks about members of my immediate family and community. Knows about the life cycle of a caterpillar. Compare adult animals to their babies.	Explores how to change how things work. Explores how the wind can move objects. Explores how object move in water. Explore objects that float/sink. Plays with magnets to sort magnetic/non-magnetic objects.	- Make observations to suggest answers to questions. - Explain to others what I have found - In play, conducts simple tests. - Make relevant observations using simple equipment - Asks simple questions and recognise that they can be answered in different way - Identify and classify things. .

Vocabulary: Material, soft, hard, natural, wood, shiny, rough	**Vocabulary:** Animal, food, care, unwell, healthy, brush, teeth, adult, baby	**Vocabulary:** Magnetic, float, sink, push, pull	**Vocabulary:** Question, Answer, Sort, Explain, Experiment, Fair, Find Out, Why, Change
Understanding the World Physics Seasonal Change 🍂			
The changing seasons			
Suggested investigation question • What do we wear to stay warm in winter / keep cool in summer?			
Plays and explores outside in all seasons and in different weather. Observes living things and the weather throughout the year. Understands the effect of changing seasons on the natural world all around us.			
Vocabulary: Weather, Seasons			
Year One			
Chemistry Everyday Materials 🥫	Biology Animals including humans 👨‍🦲	Biology Plants 🌳	WORKING SCIENTIFICALLY

Identify different materials Properties of everyday materials Grouping materials	Name common animals Classify animals	Human body and the senses	Common plants Plant structure	*Opportunities for Scientific Investigation to be embedded throughout the year with opportunity for extra focus in Summer 2.*
Suggested investigation question Which material is best to keep you warm and dry on a rainy day?	Suggested investigation question How can we group animals based on what they eat?	Suggested investigation question Which part of the body uses taste/hearing etc.?	Suggested investigation question Which trees grow in our school grounds?	Consolidation of Scientific enquiry skills.
Know the name of a material an object is made from (glass, metal, wood, plastic) Know about the properties of everyday materials Be able to identify common use of everyday materials.	Know how to classify a range of animals by amphibian, reptile, mammal, fish and birds Know and classify a range of animals by what they eat (carnivore, herbivore, omnivore) Know how to sort living things and non-living things	Know and name the parts of a human body that can be seen	Know and name a variety of common wild and garden plants Know and name the stem, petals, leaves and root of a plant. Know and name the roots, trunk, branches and leaves of a tree.	-Ask simple questions and recognise they can be answered in different ways -Observe closely using simple equipment -Perform simple tests -Identify and classify - Read and spell scientific vocabulary at a level with their increasing word and spelling knowledge

Vocabulary: Wood, plastic, glass, paper, metal, rock, fabric, brick, elastic, foil hard, soft, rough, smooth, shiny, dull, bendy, stiff, waterproof/ not waterproof, absorbant/ not absorbent, opaque/ transparent	**Vocabulary:** Amphibians, fish, reptiles, mammals, birds, habitat, herbivore, omnivore, carnivore	**Vocabulary:** head, nose, ear, mouth, eyes, neck, shoulder, arm, elbow, wrist, hand, back, chest, hip, leg, knee, ankle, foot sight, smell, touch, taste, hearing	**Vocabulary:** evergreen, tree, leaf, flower (blossom), petals, fruit, bulb, seed, roots, stem, trunk, branches *Names of variety of plants growing in school grounds; Horse Chestnut, Oak, Cherry Blossom, Willow, Beech*	**Vocabulary:** Question, answer, observe, observing, equipment, identify, sort, group, compare, differences, similarities, describe, measurements, test, results, secondary sources **Equipment -** magnifying glass **Record -** diagram, tables, charts
Physics Seasonal Change 🍂				
The four seasons Seasonal weather				
Suggested investigation question • What happens to trees in each season?				
Names the four seasons Can talk about the type of weather in each season				

Vocabulary:
Sun, rain, snow, frost, fog, wind, weather, season, spring, summer, autumn, winter, day length

Year Two

Chemistry Everyday Materials 🥫	Biology Animals including humans 👨‍🦲	Biology All living things and their habitats 🕸️	Biology Plants 🌳	WORKING SCIENTIFICALLY
Properties of materials Compare the use of different materials Compare the use of different materials	Basic needs Animal reproduction Healthy Living	Alive or dead Habitats Adaptations Food Chains	Plant and seed growth Plant reproduction Keeping plants healthy	*Opportunities for Scientific Investigation to be embedded throughout the year with opportunity for extra focus in Summer 2.*
Suggested investigation question Which material mops up a spill the best?	Suggested investigation question Can you match the animal to its offspring? (identify)	Suggested investigation question Do all animals with webbed feet live on or in water?	Suggested investigation question How does a plant change as it grows?	Consolidation of Scientific enquiry skills.
Know how materials can be changes by squashing, bending, twisting and	Name some animal babies (e.g. kitten, calf, duckling). Know the basic	Classify things by living, dead or never lived. Know to be alive you need to move, breathe and grow.	Know and explain how seeds and bulbs grow into plants. Know what	-Asking simple questions and recognise they can be answered in different ways - Observe

stretching Know why a material might or might not be used for a specific job Know that Materials can be used for more than one thing Know what recycling means	stages in a life cycle for animals (including humans) Know that humans need food, air and water to survive. Know why exercise, a balanced diet and good hygiene are important for humans. Know fruit and vegetables are healthy. Foods that contain lots of fats or sugars are not so healthy.	Match living things to their habitat. Know how a specific habitat provides for the basic needs of things living there (plants and animals) Find microhabitats Identify and name some minibeasts in microhabitats Name some different sources of food for animals. Know about and explain a simple food chain.	plants need to grow and stay healthy (water, light and suitable temperature) Record the growth of plants. Know that plants are alive because they move, breathe and grow. Label the name parts of a plant and tree. Order the life cycle of a plant.	closely using simple equipment -Perform simple tests -Identifying and classifying -Use their observations and ideas to suggest answers to questions -Gather and record data to help in answering questions.
Vocabulary: Brick, fabric, elastic, foil, property, solid, waterproof, absorbent,	**Vocabulary:** Survival, water, air, food reproduce, adult, baby, offspring, kitten, calf, puppy	**Vocabulary:** Living, dead, habitat, microhabitat, woodland, meadow, hedgerow, pond	**Vocabulary:** Growth, germinate, light, temperature, reproduce, lifecycle	**Vocabulary:** Question, answer, observe, observing, equipment, identify, sort,

opaque, transparent, squash, bend, flexible, twist, stretch, push, pull, roll, slide, bounce, recycle	food chain, prey, predator, camouflage, protection, exercise, hygiene, balanced diet				group, compare, differences, similarities, describe, measurements, test, results, secondary sources **Equipment -** magnifying glass **Record -** diagram, tables, charts
Year Three					
Chemistry Rocks 🧱	Biology Animals including humans 👨‍🦲	Physics Light 🔦	Physics Forces and Magnets 🧲	Biology Plants 🌳	WORKING SCIENTIFICALLY
Compare and group rocks Fossil formation Soil	Skeletons and muscles Nutrition Exercise and Health	Reflections Shadows	Different Forces Magnets	Basic structure and function Life cycle Water transportation	*Opportunities for Scientific Investigation to be embedded throughout the year with opportunity for extra focus in Summer 2.*
Suggested investigation question	Suggested investigation question	Suggested investigation question	Suggested investigation question	Suggested investigation question	Consolidation of Scientific enquiry skills.

Classify the rocks according to simple physical properties / appearance	What job do our muscles do?	What is the best material to block out UV light?	Which materials are magnetic? Non magnetic?	How does water travel up the stem to the flowers?	
Compare and group rocks based on their appearance and physical properties giving reasons. Know how soil is made. Know how fossils are formed. Name and explain the difference between sedimentary, metamorphic and igneous rock. Know that concrete is a man made rock.	Know that humans cannot make their own food, they get nutrition from what they eat. Know about the importance of a nutritious, balanced diet. The food groups are: carbohydrates, protein, fats and oils, fruits and vegetables and dairy. Know how nutrients, oxygen and water are transported in animals and humans. Know about the skeletal and muscular system	Know that dark is the absence of light. Name different light sources. Know that the sun is the ultimate energy source for life on earth. Know about the danger of direct sunlight and describe how to keep protected. Know that light is needed in order to see and is reflected from a surface. Know and demonstrate how a shadow is formed. Can	Know about and describe how objects move on different surfaces. Use a simple pulley to move an object, can describe how it works. Give examples of forces that require contact and some that do not. Knows that not all objects are magnetic. Know about and explain how magnets attract and repel. Knows that magnets have two poles. Can predict whether a	Know the function of different parts of a flowering plant and tree (roots, leaves, stem and flower). Know how water is transported within plants. Know the plant life cycle, especially the importance of the flower. Know that seeds have their own structure and are an important food source. Name different ways that seeds can be dispersed.	- Ask relevant questions and use different types of scientific enquiry to answer them. -Use scientific evidence to support their findings -Make careful observations and take accurate measurements with a range of equipment -Set up simple practical enquiries (comparative and fair tests) -Identify differences, similarities and changes to simple scientific ideas/processes -Use results to draw simple conclusions -Make predictions -Record key findings -Gather and present data in a

	of a human. Names and identifies skull, spine and ribs.	demonstrate and explain how a shadow changes shape.	magnet will attract or repel and give explanation.		variety of ways -Report on findings with written explanations, displays or presentation of results or conclusions
Vocabulary: Soils, organic matter, fossil, crystal, sandstone, granite, marble, pumice absorbent, crumble sedimentary, layer, sediment igneous, magma, lava, gas bubbles (tiny holes/spaces) metamorphic, change, squeeze, pressure	**Vocabulary:** Skeleton, skull, bones, muscles, movement, support, protection, nutrition	**Vocabulary:** Light source, mirror, reflect, reflective, reflection shadow, blocked transparent, translucent, opaque	**Vocabulary:** Force, contact, surface, magnetic, attract, repel, poles	**Vocabulary:** Air, water, transportation, nutrients, soil, reproduction, seed formation, seed dispersal, pollination	**Vocabulary:** Oral and written explanations, conclusion, predictions, criteria, classify, changes, data, contrast, evidence, improve, secondary sources, guides, keys, construct, interpret. **Research -** relevant question **Equipment -** thermometer **Data** - gather, standard units, record, classify,

					present **Record -** drawings, labelled diagrams, keys, bar charts, tables.
Year Four					
Chemistry States of Matter 🧪	Biology Animals including humans 👨‍🦲	Physics Forces and Magnets 🧲 (22-23 Cycle ONLY)	Physics Light 🔦 (22-23 Cycle ONLY)	Physics Electricity ⚡	WORKING SCIENTIFICALLY
Suggested investigation question Where's the best place to dry washing? Comparative	Suggested investigation question What do the animals at **Tatton Park** eat?	Suggested investigation question Which materials are magnetic? Non magnetic?	Suggested investigation question What is the best material to reflect light?	Suggested investigation question What are the effects of adding more components to a simple series circuit?	Consolidation of Scientific enquiry skills.
Compare and group Solids, liquids and Gases Changing State Water Cycle	Digestive system Teeth Food Chains	Different Forces Magnets	Reflections Shadows	Uses of electricity Simple circuits and switches Conductors and insulators	*Opportunities for Scientific Investigation to be embedded throughout the year with opportunity for extra focus in Summer 2.*
Know the	Identify and	Know about and	Know that dark	Know that	- Ask relevant

temperature that materials change state. Can describe the particles in a solid, liquid and gas. Know about and explore how some materials change state. Know that melting and freezing are opposite processes. Melting turns a solid to a liquid and freezing turns a liquid to a solid. Know the part played by evaporation and condensation in the water cycle.	name parts of the human digestive system. Knows the functions of organs in the human digestive system. Identify and know different types of human teeth. Use and construct food chains to identify producers, predators and prey.	describe how objects move on different surfaces. Use a simple pulley to move an object, can describe how it works. Give examples of forces that require contact and some that do not. Knows that not all objects are magnetic. Know about and explain how magnets attract and repel. Knows that magnets have two poles. Can predict whether a magnet will attract or repel and give explanation.	is the absence of light. Name different light sources. Know that the sun is the ultimate energy source for life on earth. Know about the danger of direct sunlight and describe how to keep protected. Know that light is needed in order to see and is reflected from a surface. Know and demonstrate how a shadow is formed. Can demonstrate and explain how a shadow changes shape.	electricity is made by generators which can be powered by gas, coal, oil, wind or solar energy. Knows that electrical energy can be converted into other energy such as: light, heat, movement or sound. Identify and name appliances that need electricity to function. Construct a series circuit. Name the components (Including cells, wires, bulbs, switches, buzzers). Predict and test whether a bulb will light within a circuit.	questions and use different types of scientific enquiry to answer them. -Use scientific evidence to support their findings -Make careful observations and take accurate measurements with a range of equipment -Set up simple practical enquiries (comparative and fair tests) -Identify differences, similarities and changes to simple scientific ideas/processes -Use results to draw simple conclusions -Make predictions -Record key findings -Gather and present data in a variety of ways

				Knows the function of a switch. Know the difference between a conductor and an insulator, giving examples of each.	-Report on findings with written explanations, displays or presentation of results or conclusions
Vocabulary: Solid, liquid, gas, evaporation, condensation, particle, temperature, freezing, heating	**Vocabulary:** Mouth, tongue, teeth, oesophagus, stomach, small intestine, large intestine, digestive system, nutrients, absorb, canine, incisor, molar producer, consumer, apex predator	**Vocabulary:** Force, contact, surface, magnetic, attract, repel, poles	**Vocabulary:** Light source, mirror, reflect, reflective, reflection shadow, blocked transparent, translucent, opaque	**Vocabulary:** Appliance, battery power, main power, circuit, series, cell, battery, wire, bulb, switch, break in circuit conductor, insulator	**Vocabulary:** Oral and written explanations, conclusion, predictions, criteria, classify, changes, data, contrast, evidence, improve, secondary sources, guides, keys, construct, interpret. **Research -** relevant question **Equipment -** thermometer **Data** - gather,

					standard units, record, classify, present **Record -** drawings, labelled diagrams, keys, bar charts, tables.

Year Five/Six - Cycle 1 22-23

Physics Forces and Magnets 🧲	Biology Animals including humans 👨‍🦲	Biology All living things and their habitats 🕸️	Biology Evolution and Inheritance 👨‍👧‍👧	Physics Light 🔦	WORKING SCIENTIFICALLY
Gravity Friction	Year 5: Changes in the human body Year 6: The circulatory system Water transportation Impact of exercise on the body	Year5: Life Cycles Reproductive processes Tear 6: Classification of living things	Identical and non-identical offspring Fossil evidence and evolution Adaptation and evolution	How light travels Reflection Ray models of light	*Opportunities for Scientific Investigation to be embedded throughout the year with opportunity for extra focus in Summer 2.*
Suggested investigation question How does the height / surface of a ramp	Suggested investigation question How do our bodies change over time?	Suggested investigation question Are all animals / plants adapted to	Suggested investigation question Which bird 'beak' has adapted best	Suggested investigation question What is the link between the object's	Consolidation of Scientific enquiry skills.

affect how the mine cart travels along it?		the environment in which they live?	for which type of bird 'food'?	distance from a light source and its shadow?	
Knows what gravity is and the impact on our lives. Knows that an object always has two forces acting upon it. If two forces are balance, it keeps the object still. If one force is bigger, the object will move. Identify and know the effect of air and water resistance. Identify and know the effect of friction. Knows that friction is always used to stop moving vehicles. Explain how levers, pulleys and gears allow a smaller force to have a greater effect.	**Year 5 End Points:** Create a timeline to indicate stages of growth of humans. Describe the stages of human development --- **Year 6 End Points:** Identify and name the main parts of the human circulatory system. Know the function of the heart, blood vessels and blood. Know and describe how the human heart works.	**Year 5 End Points:** Know the lifecycle of different living things (amphibian, mammal, insect, bird) Know the differences between different life cycles. Know the process of reproduction in plants. Know the process of reproduction in animals. --- **Year 6 End Points:** Classify living things into	Know that the ratch and living things have changed over time. Most organisms die without leading a trace. Some organisms are embedded in sedimentary rock and have formed a fossil. The positioning of these fossils can explain when the organisms were around. Know that fossils can therefore bee used to find out about the past. Mary Anning helped us to understand more about fossils. Offspring inherit traits from their parents. Sometimes there is a mutation which causes them to have a survival	Knows how light travels Know and demonstrate how we see objects. Knows why shadows have the same shape as the object that casts them and recognises that opaque objects that block more light make clearer defined shadows than translucent object. Know how simple optical instruments work e.g. periscope, binoculars, magnifying glass etc. Identify and explore prisms	-Plan different types of scientific enquiries to answer questions - Recognise and control variables where necessary -Identify scientific evidence that has been used to support or refute ideas or arguments. - Take measurements using a range of scientific equipment with increasing accuracy and precision, repeating readings where necessary - Use test results to make predictions to set up further comparative and fair tests. REcord data and results of increasing complexity using scientific diagrams and labels,

	Know the impact of diet, exercise and drugs on lifestyle. Know the ways in which nutrients and water are transported in animals, including humans.	broad groups according to observational characteristics and based on similarities and differences. Know how living things have been classified. Give reasons for classifying plants and animals in a certain way.	advantage that they then pass on to their own off spring. Chales Darwin helped us to understand more about natural selection. Inherited traits are traits that are physically passed down from a parent. Over time, natural selection takes place. Evidence has shown this is how human evolution has occurred Link adaptation over time to evolution.	to allow us to see the visible spectrum. Recognise and explain Isaac Newton's experiments about light and colour.	classification keys, tables and bar and line graphs - Report and present findings from enquiries including conclusions, casual relationships, explanations and trust in results orally and in presentations
Vocabulary: Air resistance, water resistance, friction, gravity lever, gear, pulley, Newtons	**Vocabulary:** Year 5: Womb, foetus, embryo, gestation, baby, toddler, teenager, elderly	**Vocabulary:** Year 5: Life process, reproduction, offspring	**Vocabulary:** adaptation, evolution, inheritance, characteristic, reproduction, genetics, survival	**Vocabulary:** Refraction, reflection, spectrum, rainbow	**Vocabulary:** Plan, variables, measurements, accuracy, precision, repeat readings, predictions, further

	growth, development, puberty Year 6: Function, circulatory system, heart, valve, blood vessel, vein, artery transport, oxygenated, deoxygenated lifestyle, drug	Year 6: Characteristic, classification, organism, microorganism			comparative and fair test, identify, classify and describe, patterns, systematic, quantitative measurements. **Report data** - scientific diagrams, labels, classification keys, tables, scatter graphs, bar graphs, line graphs. **Report and present** - conclusions, casual relationships, explanations, degree of trust, oral and written display and presentation. **Evidence** - support, refute, ideas or arguments Biology, Physics,

					Chemistry

Year Five/Six - Cycle 2 23-24					
Chemistry Properties and changes of materials 	Biology Animals including humans 	Physics Earth and Space 	Biology All living things and their habitats 	Physics Electricity 	WORKING SCIENTIFICALLY