

Building
Brighter
Futures
Together

Eastwood Community School's Science curriculum



Comparative & Fair tests



This involves exploring cause and effect. Comparative tests – often from children's own questions – resulting in opportunities to measure and collect data.

E.g. Investigating how shadows change size
Investigating properties of materials (Which material is most suitable for an umbrella?)

OVERVIEW OF SCIENTIFIC ENQUIRY (DISCIPLINARY KNOWLEDGE)

Pattern seeking



This involves making measurements and observations where variables cannot be easily controlled or linked; often preliminary tests that might lead to more systematic studies.

E.g. Measuring the pulse rate after exercise
Taking observations of ice melting, water cooling.

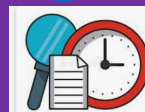
Identifying & Classifying



This involves sorting and grouping according to similarities and differences- trying to make sense of the world. Make measurements and observations.

E.g. Sorting animals into carnivores, herbivores and omnivores.
Looking at the types of trees growing in a playground.

ObServing over time



This involves exploring cause and effect from seconds to months.

E.g. Long term studies of how plants and habitats change throughout the year.
Length of shadows over time (over the day).

ReSearch



This involves developing reading and listening skills, but also helps children to learn to distinguish between facts and bias.

E.g. What is the strongest magnet in the world?
How is plastic made?

Year group substantive knowledge content coverage:

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Biology	Animals Including Humans	✓	✓	✓	✓	✓	✓
	Plants	✓	✓	✓			
	Living things and their Habitats		✓		✓	✓	✓
	Evolution						✓
Chemistry	Materials	Everyday materials	Uses of Everyday Materials	Rocks	States of Matter	Properties and changes of Materials	
Physics	Sound				✓		
	Forces			✓		✓	
	Electricity				✓		✓
	Earth and Space					✓	
	Light			✓			✓
	Seasonal Changes	✓					

Bold statements form end of key stage judgement

~~Red~~- End of key stage judgements are not currently covered in the national curriculum

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Biology	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. What are the most common British plants and where can we find them?	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.	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. Name, locate, and describe functions of main parts of plants- including those involved in transporting nutrients. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.			
	Subject Specific Vocabulary	Features of plants: Tree, Flower, Vegetable, Fruit, Berry, Leaf/leaves, Blossom, Petal, Stem, Trunk, Branch, Root, Seed, Bulb, Soil, Bark, Stalk, Bud Types of plants: Sunflower, Daffodil, Weed, Grass, Daffodil, Oak, Sycamore. Names of trees in the local area Names of garden and wild flowering plants in the local area	As previous year group plus : Growth of plants: Germination, Shoot, Grow, Food store, Life cycle, Die, Mature Needs of plants: Sunlight, Nutrients, Light, Healthy, Unhealthy, Air, Water, Temperature, Warm, Cold, Suitable	As previous year group plus : Function of different parts: Structure, Support, Function, Job, Water transportation: Transport, Evaporation, Evaporate, Absorb, Life cycle of flowering plants: Pollination (insect/wind), Pollen, Pollinators, Nectar, Seed formation, Seed Dispersal (animal/wind/water), Reproduce, Fertilisation, Carbon dioxide.			

	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. 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		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. Explain how environmental changes may have an impact on living things.	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. Describe and compare different reproductive processes and life cycles in animals. Name, locate and describe the function of the main part of plants, including those involved in reproduction. (Yr3 transportation of water and nutrients).	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 and microorganisms! Group, classify and identify them, using keys or other methods.
	Subject Specific Vocabulary		As previous year group plus : Living or dead: Living, Dead, Alive, Never been alive, Healthy, Habitats: Habitat, Suitable, Shelter, Safety, Survive, Suited, Space, Woodland, Local habitat, Ocean, Urban, Under leaves, Minibeast. Life processes: Movement, Sensitivity, Growth, Reproduction, Nutrition, Excretion, Respiration. Food chains: Food sources, Food, Producer, Consumer, Predator, Prey.		As previous year group plus : Living things: Organisms, Species, Classification, Classification keys, Characteristics, Vertebrate, Invertebrate, Amphibians, Reptile, Mammal Environmental changes: Environment, Environmental Dangers, Adapt, Natural changes, Climate change, Deforestation, Pollution, Endangered species, Extinct, Positive, Negative	As previous year group plus: Reproduction: Asexual reproduction, Sexual reproduction, Gestation, Metamorphosis, Offspring, Egg cells, Ovules, Stamen, Style.	As previous year group plus: Classifying: Flowering and Non-flowering plants, Variation. Microorganisms: Bacteria, Microbes, Microscopic, Microorganisms Virus, Fungi, Mould, Yeast, Microscope.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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Biology

Biology	Animals Including Humans	Identify and name a variety of 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 basic parts of the human body and link to the associated sense. What are the names for all the parts of our body? How can we sort different animals?	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	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.	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.	Describe the changes as humans to develop to old age.	Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Recognise and describe 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.
	Subject Specific Vocabulary	Animals: Fish, Amphibians, Reptiles, Birds, Mammals, Carnivore, Herbivore, Omnivore. Human senses: Senses, Sight, Hearing, Touch, Smell, Taste. Loud, Quiet, Soft, Rough, Tongue, Nose, Eyes, Ears, Skin	As previous year group plus : Life cycle: Young, Offspring, Grow, Develop, Change, Hatch, Lay, Baby, Toddler, Child, teenager, Adult. Survival and Balanced diet: Needs, Survive, Food, Air, Exercise, Diet, Nutrition, Healthy, Balanced diet, Hygiene, Germs. Fruit and vegetables, Proteins, Dairy and alternatives, Carbohydrates, Oil and spreads, Fat, Salt, Sugar.	As previous year group plus : Balanced diet: Saturated fats, Unsaturated fats, Vitamins, Minerals. Skeletons and muscles: Skeleton, Muscles, Tendons, Joints, Protection, Support, Organs, Contract, Relax, Bone, Vertebrate, Invertebrate, Endoskeleton, Exoskeleton, Hydrostatic skeleton. Human bones: Skull, Spine, Vertebral column, Ribcage, Pelvis, Clavicle, Scapula, Humerus, Ulna, Pelvis, Radius, Femur, Tibia, Fibula.	As previous year group plus: Digestive system: Digest, Digestion, Saliva, Salivary glands, Oesophagus, Stomach, Liver, Pancreas, Gall bladder, Small intestine, Duodenum, Large intestine, Rectum, Anus, Faeces, Organ. Teeth: Molar, Premolar, Incisor, Canine, Crush, Grind, Tear, Rip, Cut, Tooth decay.	As previous year group plus: Reproduction: Gestation, Asexual reproduction, Sexual reproduction, Prenatal, cells. Changes and life cycle: Prenatal, Adolescence, Puberty, Menstruation, Adulthood, Life expectancy, Hormones, Sweat glands, Uterus.	As previous year group plus : Circulatory system: Circulation, blood vessels, Oxygenated blood, Deoxygenated blood, Arteries, Veins, Capillaries, Chambers, Plasma, Platelets, White blood cells, Red blood cells. Lifestyle: Drug, Alcohol, Chemicals, Relaxed.

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Biology	Evolution and Inheritance						Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago and evidence for evolution. 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.
	Subject Specific Vocabulary						<u>Evolution and inheritance:</u> Evolve, Adaptation, Inherit, Natural selection, Adaptive traits, Inherited traits, Mutations, Theory of evolution, Ancestors, Chromosomes, Genes, Charles Darwin.

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Chemistry	Materials	Everyday materials Distinguish between an object and the material it is made from. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock. Describe the physical properties of everyday materials. Compare and group together a variety of everyday materials on the basis of their simple physical properties. Which materials are the most absorbent? We need to choose a material to make an umbrella. Which materials are waterproof?	Uses of everyday materials <u>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</u> Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Rocks <u>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.</u> 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. Describe characteristics. Observe and describe how 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 materials <u>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.</u> <u>Know, identify and describe that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution.</u> <u>Use knowledge of solids, liquids and gases to decide how mixtures (and solutions) might be separated, including through filtering, sieving and evaporating.</u> <u>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</u> Justify use based on properties. 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.	
	Subject Specific Vocabulary	Names of materials: Wood, Plastic, Glass, Metal, Water, Rock, Paper, Cardboard, Rubber, Fabric. Properties of materials: Hard, Soft, Shiny, Dull, Stretchy, Rough, Smooth, Bendy, Transparent, Opaque, Waterproof, Absorbent, Sharp, Stiff.	As previous year group plus : Materials: Squash, Bend, Twist, Stretch, Strong, Flexible, Light, Hard-wearing, Suitable.	As previous year group plus : Rocks: Sedimentary rock, Igneous rock, Metamorphic rock, Permeable, Impermeable, Durable, Marble, Chalk, Granite, Sandstone, Slate. Formation fossils: Natural, Man-made, Magma, Lava, Molten rock, Sediment, Erosion, Fossilisation, Layers, Bone, Fossil, Palaeontology. Soil: Topsoil, Subsoil, Bedrock, Mineral, Organic matter, Compost.	As previous year group plus: States of matter: Solids, Liquids, Gases, Particles. Evaporate, Condense, Melt, Freeze, Heat, Cool, Melting point, Freezing point, Boiling point, Water vapour. Water cycle: Precipitation, Evaporation, Condensation, Atmosphere, Droplets.	As previous year group plus: Properties of materials: Conductivity, Insulator, Conductor, Thermal, Mixtures and solutions: Dissolving, Substance, Soluble, Insoluble. Changes of materials: Reversible change, Physical change, Irreversible change, Chemical change Separating: Sieving, Filtering,	

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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Physics

Light

Subject Specific Vocabulary

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 an opaque object.
Find patterns in the way that the size of shadows change.

Light: Dark, Absence of light, Light source, Visible, Shadow, Translucent, Block, Candle, Torch, Fire, Lantern, Lightning.
Reflective light: Reflect, Reflection, Surface, Ray, Reverse, Angle, Mirror, Moon.
Sun safety: Dangerous, Retina, Damage, UV light, UV rating, Sunglasses, Direct.

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 that cast them.

As previous year group plus:
 • **Reflection:** Incident ray, Reflected ray.
Light: Visible Spectrum, Prism, Refraction, Light waves.

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Physics	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.		Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. Use a simple apparatus to construct and control a series 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. Describe how the circuit may be affected when changes are made to it. Use recognised symbols when representing a simple circuit in a diagram.
	Subject Specific Vocabulary				Electricity: Mains-powered, Battery-powered, mains Electricity, Plug, Appliances, Devices. Circuits: Circuit, Simple Series circuit, Complete circuit, Incomplete circuit, Bulb, Cell, Wire, Buzzer, Switch, Motor, Battery, Electrical conductor, Electrical insulator, Diagram.		As previous year group plus: Electricity: Voltage, Amps, Resistance, Electrons, volts (V), Current. Circuits: Symbol, Component, Function, Dimmer, Brighter, Louder, Quieter, Variation.

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Physics	Forces			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.		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.	
	Subject Specific Vocabulary			Forces: Forces, Friction, Movement, Surface, Distance, Push, Pull, Motion, Object, Magnets: Magnetic, Magnetic field, Magnetic force, Magnetic Poles (north pole, south pole), Attract, Repel, Iron, Nickel, Cobalt, Compass, Invisible. .		As previous year group plus: Forces: Air resistance, Water resistance, Buoyancy, Upthrust, Earth's Gravitational pull, Gravity, Opposing forces, Driving force, Streamlined, Mechanism, Levers, Pulleys, Gears/cogs. Measurements: Weight, Mass, Kilograms (kg), Newtons (N), Scales	

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Physics	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				<u>Sound:</u> Eardrum, Vibration, Particles, Pitch, Volume, Amplitude, Sound wave, Distance, Soundproof.		

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Physics	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.	
	Subject Specific Vocabulary					<u>Earth and Space:</u> Star, Planet, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Neptune, Uranus, Spherical bodies, Sphere, Rotate, Axis, Orbit, Satellite, Sunrise, Sunset, Midday, Time zone. <u>Theories:</u> Geocentric model, Heliocentric model, Astronomer.	

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Physics	Seasonal Changes	Observe and describe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies How does the Oak tree change over the year? In which season does it rain the most?					
	Subject Specific Vocabulary	Seasons: Spring, Summer, Autumn, Winter, Seasonal change, Night, Day, Daylight Weather: Sun, Rain, Snow, Sleet, Frost, Ice, Fog, Cloud, hot/warm, Cold, Storm, Wind, Thunder, Weather forecast, Temperature, Rainfall, Wind direction, Thermometer					

Cultural capital			
Year group	Biology	Chemistry	Physics
1	Wild walk Local forests Pond dipping Zoologist Doctor/nurse	Recycling centre	Seasonal walks in different habitats Video calls to different parts of the world
2	Visit to a farm—looking at food etc Sports coach, nutritionist Video calls to science research centre (rainforest etc) Flower farm—farmer come in		Builder—materials
3	Experiments with water outside Bee keeper (importance of flowers) Physiotherapist—muscles Skeleton—vets	Malhom cove Worm farm	Optician—how light enters the eye Scrap yard
4	Allotment—ordering and classifying Museum—insects exhibition Zoologist—effects of global warming Dentist		Musician—different instruments Audiologist Electrician
5		Chemist—solutions Waste management—how water is cleaned Mechanic—how things are built	Astronomer Sleep over—star watching, constellations Observatory Space dome
6	Sports people—importance of health Natural historian—fossils Video natural history museum		Ww2—importance of periscopes Lasers—light technicians/computer Engineers optical wires

Working Scientifically Skills Year 1 & 2

Asking simple questions and recognising that they can be answered in different ways	Children to develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where appropriate, they answer these questions. The children answer questions developed with the teacher often through a scenario. The children are involved in planning how to use resources provided to answer the questions using different types of enquiry, helping them to recognise that there are different ways in which questions can be answered.
Observing closely, using simple equipment	Children explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. They begin to take measurements, initially by comparisons, then using non-standard units.
Performing simple tests	The children use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time.
Identifying and classifying	Children use their observations and testing to compare objects, materials and living things. They sort and group these things, identifying their own criteria for sorting. They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing.
Gathering and recording data to help in answering questions	The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. They record their measurements e.g. using prepared tables, pictograms, tally charts and block graphs. They classify using simple prepared tables and sorting rings.
Using their observations and ideas to suggest answers to questions	Children use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources. The children recognise 'biggest and smallest', 'best and worst' etc. from their data.

Working Scientifically skills Year 3 & 4

Asking relevant questions and using different types of scientific enquiries to answer them	The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions. The children answer questions posed by the teacher. Given a range of resources, the children decide for themselves how to gather evidence to answer the question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They identify the type of enquiry that they have chosen to answer their question.
Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	The children make systematic and careful observations. They use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements (ml, m, Kg).
Setting up simple practical enquiries, comparative and fair tests.	The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.
Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications e.g. using tables, Venn diagrams, Carroll diagrams. Children are supported to present the same data in different ways in order to help with answering the question.
Using straightforward scientific evidence to answer questions or to support their findings	Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence.
Identifying differences, similarities or changes related to simple scientific ideas and processes	Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns.
Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	They draw conclusions based on their evidence and current subject knowledge. They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. Children use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface. Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry.
Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.

Working Scientifically skills Year 5 & 6

Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	Children independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions based on their developed understanding following an enquiry. Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question. They choose a type of enquiry to carry out and justify their choice. They recognise how secondary sources can be used to answer questions that cannot be answered through practical work. The children select from a range of practical resources to gather evidence to answer their questions. They carry out fair tests, recognising and controlling variables. They decide what observations or measurements to make over time and for how long. They look for patterns and relationships using a suitable sample.
Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	The children select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. During an enquiry, they make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value).
Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. Children present the same data in different ways in order to help with answering the question.
Identifying scientific evidence that has been used to support or refute ideas or arguments	Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer. They talk about how their scientific ideas change due to new evidence that they have gathered. They talk about how new discoveries change scientific understanding.
Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations	In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge. They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. They identify any limitations that reduce the trust they have in their data. They communicate their findings to an audience using relevant scientific language and illustrations.
Using test results to make predictions to set up further comparative and fair tests	Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.