ASHTON WEST END PRIMARY ACADEMY

SCIENCE SCHEME OF WORK

National Curriculum is the basis of the Science SOW. The SOW contains all the statutory requirements which have to be taught at each age group. Teachers use a variety of resources to plan and teach adapting to the children in their class. There is a recommendation to teach units in the order below, but these can be varied to allow for seasonal/weather changes (especially when growing plants, observing habitats and any outdoor work). The teacher ensures that the whole programme of study has been taught by the end of each academic year

All pupils will be taught to work scientifically when finding out about each of their topics

During Year 1 and Year 2 pupils should be taught to use the following practical methods and skills

- Ask simple questions and recognise they can be answered in different ways
- Observe closely, using simple equipment
- Perform simple tests
- Identifying and Classifying
- Use their observations and ideas to suggest answer to questions
- Gather and record data to help them answer questions

Half Term	Topic name	Year 1	Resources/trips?
THIS UNIT WILL BE REVISITED THROUGH OUT THE	**Seasonal changes**	• …observe changes across the 4 seasons • observe and describe weather associated with the seasons and how day length varies	Pictures same place at different times of year

YEAR			
Autumn 1	**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	Classification pictures of trees and common flowers. Diagrams of flowering plant Photos of plants in flowers, trees with fruit
Autumn 2	**Everyday materials**	• distinguish between an object and the material from which it is made • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock • describe the simple physical properties of a variety of everyday materials • compare and group together a variety of everyday materials on the basis of their simple physical properties	Links to recycling/eco Collection of common materials Feely bags and blindfolds Objects/Pictures of objects made of different materials Magnets Collections of fabrics (some waterproof)
Spring 1	**<u>Animals</u> (including humans)**	• identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • identify and name a variety of common animals that are carnivores, herbivores and omnivores	Blue planet Chester zoo Pets at home Classification cards of different animal groups.

		• describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)	
Spring 2	**<u>Humans</u> (including animals)**	• identify, name, draw and label the basic parts of the human body • look at how humans age and grow • say which part of the body is associated with each sense • Investigate different senses (eg taste, feely bags, listening games, blind folds)	Posters/picture books showing young and adult animals Photographs of same people young and old Tape of familiar sounds Collection of 'smelly' things (food stuffs, toiletries etc) Modelling material
Summer 1	**Plants**	• become familiar with common names of flowers, • grow from seed flowers or vegetables. Understand their needs • understand plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem).	Compost, plant pots Transparent plastic cups Seeds (cress, sunflowers, beans) Seedlings Small plants that will flower later in year (amaryllis, peas etc) Window greenhouses House plant to be replanted (spider plant) Potting compost Labelled plan of school grounds
Summer 2	**Living things and their habitats ****	• extend/review different animal groups. • Explore Micro-habitats • Minibeasts in the local environment	Pond dipping trip Food chain flip-overs Keep a wormery/ant farm?

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Half Term	Topic name	Year 2	Resources/trips?
THIS UNIT WILL BE REVISITED THROUGH OUT	**Seasonal changes**	• Pupils should observe and talk about changes in the weather and the seasons. Note: pupils should be warned that it is not safe to look directly at the sun, even when wearing dark glasses. • Pupils might work scientifically by: making tables and charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change.	Pictures same place at different times of year Weather vane, rain collector, weather chart

Autumn 1	**Plants**	• Review the names of some common flowers • Closer observation of flowers • Name and label parts of a flower • How does a flower reproduce?	Visit to King George's fields 'bee hives' for talk with wardens (walking trip) Classification pictures of trees and common flowers. Diagrams of flowering plant Photos of plants in flowers, trees with fruit
Autumn 2	**Use of everyday materials**	• identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	Links to recycling/eco Collection of common materials Feely bags and blindfolds Objects/Pictures of objects made of different materials Magnets Collections of fabrics (some waterproof)
Spring 1	**<u>Animals</u> (including humans)**	• notice that animals, including humans, have offspring which grow into adults • find out about and describe the basic needs of animals, including humans, for survival (water, food and air)	Pictures of animals in different stages to sort Visit by RSPCA or visit to Pets At Home
Spring 2	**<u>Humans</u> (including animals)**	• describe the importance for humans of exercise, • the importance of eating the right amounts of different types of food, • the importance of hygiene	Pulsemeters Healthy food examples Washing (glitter gel to represent germs) Different examples of washing substances.

Summer 1	**Plants**	• observe and describe how seeds and bulbs grow into mature plants • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy • grow plants from seed or bulbs. • Investigate what is necessary for healthy growth	Compost, plant pots Transparent plastic cups Seeds (cress, sunflowers, beans) Seedlings Small plants that will flower later in year (amaryllis, peas etc) Window greenhouses House plant to be replanted (spider plant) Potting compost Labelled plan of school grounds Seeds and bulbs to grow in the classroom.
Summer 2	**Living things and their habitats**	• explore and compare the differences between things that are living, dead, and things that have never been alive • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other • identify and name a variety of plants and animals in their habitats, including micro-habitats • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food	Pond dipping trip Food chain flip-overs Farm to Fork materials Where does our food come from?

ASHTON WEST END PRIMARY ACADEMY

SCIENCE SCHEME OF WORK

All pupils will be taught to work scientifically when finding out about each of their topics

During Year 3 and Year 4 pupils should be taught to use the following practical methods and skills

- Ask relevant questions and use different types of scientific enquiries to answer them
- Set up simple practical enquiries, comparative and fair tests
- Make systematic and careful observations and take accurate measurements using standard units. Use a range of equipment including thermometers and data loggers
- Gather, record, classify and present data in a variety of ways to help to answer questions
- Record findings using simple scientific language, drawings, diagrams, keys, bar charts and tables
- Report on findings from enquiries, including oral and written explanations/presentations of results.
- Use results to draw simple conclusions, make predictions for new investigations, suggest improvements
- Identify differences, similarities or changes related to simple scientific ideas and processes
- Use straightforward scientific evidence to answer questions or to support findings.

Half Term	Topic name	**Year 3**	Resources/trips?
Autumn 1	**Animals including humans**	• identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • identify that humans and some other animals have skeletons and muscles for support, protection and movement	Information from dental health team re: teeth care Books about food types and diet Model of teeth (large diagram if not) Small mirrors Collection of food packages Disclosing tablets Model skeleton (3D) Real bones/Xrays Video sources Foam bones jigsaw
Autumn 2	**Forces- magnets**	• compare how things move on different surfaces • notice that some forces need contact between 2 objects, but magnetic forces can act at a distance • observe how magnets attract or repel each other and attract some	Variety of magnets Paper clips Rulers Variety of labelled metal objects

		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 2 poles • predict whether 2 magnets will attract or repel each other, depending on which poles are facing	
Spring 1	**Rocks**	• compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • describe in simple terms how fossils are formed when things that have lived are trapped within rock • recognise that soils are made from rocks and organic matter	Rocks, including one permeable rock (chalk, sandstone) one non-permeable (granite,marble) Hand lenses Sieves, Soil samples Pictures of different landscapes. Collection of soils, powders and liquids in transparent containers Water/sand wheel Sieves, filters and funnel Cards with everyday processes written on them.

Spring 2	**Plants**	• identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant • investigate the way in which water is transported within plants • explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	Classification cards and sheets for trees. Diagrams of parts and functions of flowering plants. Life cycle diagrams
Summer 1	**Forces - Friction**	• investigate forces and how objects act on one another • investigate how to slow things down	
Summer 2	**Light and shadows**	• recognise that they need light in order to see things and that dark	Torches, Opaque objects Shadow\sticks,compass Translucent, transparent sheets. OHP and screen

		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	

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		Year 4	**Resources/trips?**

Half Term	Topic name		
Autumn 1	**Animals including humans**	• describe the simple functions of the basic parts of the digestive system in humans • identify the different types of teeth in humans and their simple functions • construct and interpret a variety of food chains, identifying producers, predators and prey	Information from dental health team re: teeth care Books about food types and diet Model of teeth (large diagram if not) Small mirrors Collection of food packages Disclosing tablets Model skeleton (3D) Real bones/Xrays Video sources Foam bones jigsaw
Autumn 2	**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	Batteries of different voltages Wires, bulbs and buzzers Video or other source showing hazards of electricity Sample materials which conduct or insulate Electrical devices with switches Variety of magnets Paper clips Rulers Variety of labelled metal objects

		being good conductors	
Spring 1	**States of matter**	• compare and group materials together, according to whether they are solids, liquids or gases • observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) • identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	Rocks, including one permeable rock (chalk, sandstone) one non-permeable (granite,marble) Hand lenses Sieves, Soil samples Pictures of different landscapes. Collection of soils, powders and liquids in transparent containers Magnets, Water/sand wheel Sieves, filters and funnel Cards with everyday processes written on them.
Spring 2	**Plants**	• explore and use classification keys to help group plants (trees and wild flowers) • identify and name a variety of living things in their local and wider environment (trees and wild flowers) • Diagrams of parts and functions of flowering plants	Classification cards and sheets for trees. Diagrams of parts and functions of flowering plants. Life cycle diagrams
Summer 1	**Living things and their**	• recognise that living things	**Classification cards of different animal groups.

	habitats	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	
Summer 2	**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	

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SCIENCE SCHEME OF WORK

All pupils will be taught to work scientifically when finding out about each of their topics

During Year 5 and Year 6 pupils should be taught to use the following practical methods and skills

- Plan different types of scientific enquiries to answer questions including recognising and controlling variables where necessary.
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision. Take repeat readings where appropriate.

- Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs.
- Use test results to make predictions to set up further comparative and fair tests.
- Report and present findings from enquiries, including conclusions, causal relationships and explanation of results, in oral and written forms such as displays and other presentations
- Identify scientific evidence that has been used to support or refute ideas and arguments.

Half Term	Topic name	**Year 5**	Resources/trips?
Autumn1	**Materials** **Properties and changes**	• compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets • know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic	Kettle Beakers Thermometers Same size containers (pots, cups) Battery powered fan Ice Pictures of drying appliances Frozen can of fizzy pop Filters and sieves 'Dirty' water Apparatus for boiling salt water Samples of granular materials and powders Timers IT temp. sensor Cling film

Autumn 2	**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	Photographs of earth taken from space Pictures of earth, sun and moon Globe Spheres of different sizes, (beach ball, pea, bead ¼ size of pea) Compass and shadow stick Powerful torch Data re: sunset times Torches White card Small mirrors Shiny/polished materials Unpolished/dull material Opaque objects for shadows Metre stick and tape measures
Spring 1	**Animals, including humans**	• describe the changes as humans develop to old age • pupils draw a timeline to indicate stages in the growth and development of humans • learn about the changes experienced in puberty • work scientifically to research gestation periods of humans and other animals • make comparisons/record length and mass of a growing baby	Baby scan photos, PSHE support materials for sex education i-pads for research
Spring 2	**Materials : irreversible changes**	• 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	Filters and sieves 'Dirty' water Apparatus for boiling salt water Samples of granular materials and powders Timers IT temp. sensor Cling film

		associated with burning and the action of acid on bicarbonate of soda	
Summer 1	**Forces**	• explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • identify the effects of air resistance, water resistance and friction, that act between moving surfaces • recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect	Batteries of different volts. Wires Bulbs Buzzers Electric motors Circuit diagrams (simple and from real situations) Springs and Newton metres, scales Diagrams Pendulum/Newtons cradle Magnets
Summer 2	**Living things and their habitats**	• describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird • describe the life process of reproduction in some plants and animals • classification of different animal groups • food chains	Visit to Knowsley Safari Park ? Classification cards of different animal types. Intel play microscope Live yeast/dough Sealed bag of grass cuttings Food packaging (showing preservatives/additives) Mouldy food, ie: bread, fruit)

Half Term	Topic name	Year 6	Resources/trips?
Autumn1	**Animals, including humans**	• identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • describe the ways in which nutrients and water are transported within animals, including humans	Visit to science learning centre re: circulatory system Heart models
Autumn 2	**Light**	• recognise that light appears to travel in straight lines • use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye • explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our	Photographs of earth taken from space Pictures of earth, sun and moon Globe Spheres of different sizes, (beach ball, pea, bead ¼ size of pea) Compass and shadow stick Powerful torch Data re: sunset times Torches White card Small mirrors Shiny/polished materials Unpolished/dull material Opaque objects for shadows Metre stick and tape measures

		eyes • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	
Spring 1	**Animals, including <u>humans</u>**	• recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function • research the work of scientists who have developed new medicines	Research scientists such as Pasteur and Lister re: development of medicines
Spring 2	**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 • 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	
Summer 1	**Electricity**	• associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches • use recognised symbols when representing a simple circuit in a diagram	Batteries of different volts. Wires Bulbs Buzzers Electric motors Circuit diagrams (simple and from real situations) Springs and Newton metres, scales Diagrams Pendulum/Newtons cradle Magnets
Summer 2	**Living things and their habitats**	• describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals • give reasons for	Visit to Knowsley Safari Park ? Classification cards of different animal types. Intel play microscope Live yeast/dough Sealed bag of grass cuttings Food packaging (showing preservatives/additives) Mouldy food ie: bread, fruit)

		classifying plants and animals based on specific characteristics	