Harrow Education Partnership
WORKING IN PARTNERSHIP FOR OUR SCHOOLS, OUR CHILDREN

Curriculum Skills Progression – Science

		Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically	**Asking Questions**	Looking at objects and pictures and discussing what they can see. Asks questions about aspects of their familiar world. Generating a variety of ideas for testing (not always realistic/appropriate) Prediction - Simple guess - what might happen?	Looking at objects and pictures and discussing what they can see. Asks questions about aspects of their familiar world. Generating a variety of ideas for testing (not always realistic/appropriate) Prediction - Simple guess - what might happen?	To be able to ask simple questions (modelled by teacher). To begin to read and spell scientific vocabulary when asking and answering questions. To be able to form predictions about what they think the outcomes of an investigation will be.	To be able to ask simple questions and recognise that they can be answered in different ways, e.g. do all living things have the same life-cycle?	To be able to make decisions, asking relevant questions	To be able to make decisions, asking relevant questions and using different types of scientific enquiries to answer them	To be able to plan different types of scientific enquiries to answer questions To recognise and control variables where necessary. To be able to explore and talk about their ideas. To be able to analyse functions, relationships and interactions.	To be able to plan independently different types of scientific enquiries to answer questions. To independently recognise and control variables where necessary. To be able to explore and talk about their ideas using scientific vocabulary. To ask their own questions about scientific phenomena To be able to analyse functions, relationships and interactions systematically.
	Observing	General sensory observations of animals and plants. Simple	General sensory observations of animals and plants. Simple	To observe changes over time and be able to notice patterns in	To observe closely changes over time using simple equipment to measure.	To set up simple practical enquiries, and begin to understand comparative and	To set up simple practical enquiries, comparative and fair tests	To be able to take measurements, using a range of scientific equipment.	To be able to take measurements, independently,using a range of scientific equipment.

		descriptions of the world around them.	descriptions of the world around them.	their observations. To understand that we can use observations to help with answering questions. To use simple equipment when observing: magnifying glasses, egg timers, sand timers. To use mostly first-hand experiences (with support) to observe but also begin to use secondary sources: books, photographs, videos.	To recognise patterns and explain their thinking. To perform simple tests and record results from their observations, eg. changes over time caterpillar to butterfly.	fair tests To work in groups or teacher to model how to make systematic and careful observations using notes and simple tables To begin to look for naturally occurring patterns and relationships	To make systematic and careful observations using notes and simple tables To identify differences, patterns, similarities or changes related to simple scientific ideas and processes	To take measurements with increasing accuracy To understand why it might be important to take repeat readings when appropriate.	To take measurements accurately and with precision. To take repeat readings when appropriate. and begin to account for anomalies.
	Measuring and Recording	To measure by direct comparison To use non-standard units of measurement	To measure by direct comparison To use non-standard units of measurement	To know there are different ways to record changes over time. To explore how to measure and	To use measuring equipment and record their findings on a chart or simple scale.	To take accurate measurements using standard units, using a range of equipment To gather, record,	To take accurate measurements using standard units, using a range of equipment, including thermometers	To understand how to take measurements, using a range of scientific equipment. To take	To be able to take measurements, using a range of scientific equipment. To take measurements

		To use simple comparative language e.g. smaller/bigger To record ideas simply e.g. pictures/images.	To use simple comparative language e.g. smaller/bigger To record ideas simply e.g. pictures/images.	record: whole class charts: bar graphs using multi link cubes, survey, tables. To begin to understand how science can be used to explain what is occuring. To sort and group in different topics: animals, plants.	To use simple scientific equipment including magnifying glasses when measuring and recording. To be able to gather and record data and present it in different ways including on charts, tables and simple graphs. To sort and group in different ways eg. materials	classify and present data to help in answering questions To record findings using simple scientific language, drawings, labelled diagrams, bar charts, and tables	and data loggers To gather, record, classify and present data in a variety of ways to help in answering questions To record findings using scientific language, drawings, labelled diagrams, keys, bar charts, and tables	measurements. To take repeat readings when appropriate. To be able to record data and results using scientific diagrams and labels. To show results using classification keys, tables, bar and line graphs .	with increasing accuracy and precision. To take repeat readings when appropriate. To be able to record data and results of increasing complexity using scientific diagrams and labels. To show results using classification keys, tables, scatter graphs, bar and line graphs.
	Concluding	To simply talk about objects and events.	To simply talk about objects and events.	To know that there are various ways to find answers (modelled by the teacher). To begin to use recording and observations to answer questions (modelled by teacher).	To use simple scientific language when recording their findings. To be able to present and analyse their findings using more sophisticated	To use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions To use straightforward scientific evidence	To report on findings from enquiries, using relevant scientific language, including oral and written explanations, displays or presentations of results and conclusions	To report and present findings and make conclusions from enquiries. To use evidence to justify ideas. To use scientific knowledge and understanding to explain findings.	To draw conclusions based on data and observations. To use scientific knowledge and understanding to explain findings. To identify causal relationships and explanations.

					scientific vocabulary. To use their observations and ideas to suggest answers to questions. To predict what might happen	to answer questions or to support their findings.	To use straightforward scientific evidence to answer questions and to support their findings.		To recognise 'degree of trust' in result, in oral and written forms.
	Evaluating		To begin to say what went well when they try things out	To begin to understand the reasons why changes happen. To begin to analyse what has occurred and use scientific vocabulary to describe.	To be able to use scientific vocabulary when writing a conclusion to a test.	To reflect on results and begin to suggest improvements and raise further questions To start to recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	To make predictions for new values, suggest improvements and raise further questions To recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	To use test results to make predictions. To set up further comparative and fair tests. To recognise that scientific ideas change and develop over time. To identify scientific evidence that has been used to support or refute ideas or arguments	To use test results and scientific knowledge to make predictions. To set up further comparative and fair tests independently. To independently recognise that scientific ideas change and develop over time. To independently identify scientific evidence that has been used to support or refute ideas or arguments.

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. To observe and explore plants in the local environment. To observe changes in growth of flowers and vegetables they have planted.	To observe and describe how seeds and bulbs grow into mature plants. To observe plants over time. To find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.				

Animals, 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. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). Identify, name, draw and label the basic parts of the human body	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.	To 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 To identify that humans and some animals have skeletons and muscles for support, protection and movement.	To describe the simple functions of the basic parts of the digestive system in humans To identify the different types of teeth in humans and their simple functions To construct and interpret a variety of food chains, identifying producers, predators and prey.	To describe the changes as humans develop to old age. To draw a timeline to indicate stages in the growth and development of humans. To learn about the changes experienced in puberty	To identify and name the main parts of the human circulatory system. To describe the functions of the heart, blood vessels and blood. To recognise the impact of diet, exercise, drugs and lifestyle on the way bodies function. To describe the ways in which nutrients and water are transported within animals, including humans. To explore questions to understand how the circulatory system enables the body to function. To learn how to

			and say which part of the body is associated with each sense. To know how to take care of animals that are taken from the environment.					keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body. To explore the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.

Living things and their habitats				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. Explore and compare the differences between things that are living,		To recognise that living things (including those in the locality) can be grouped in a variety of ways To explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment	To describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird To describe the life process of reproduction in some plants and animals. To design a comparative test to find the best fertilzers for growth in marigolds. Compare the life cycles of plants in the local environment (the school garden) with that of the rainforest explaining any similarities and differences. To raise questions about their local environment throughout the year.	To 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 To give reasons for classifying plants and animals based on specific characteristics. To know that broad groupings, such as micro-organisms, plants and animals can be subdivided. To classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish,

				dead and things that have never been alive.			To find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall. To find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals.	amphibians, reptiles, birds and mammals). To find out about significance of the work of scientists such as Carl Linnaeus, a pioneer of classification.

Light					To recognise that they need light in order to see things and that dark is the absence of light To notice that light is reflected from surfaces To recognise that light from the sun can be dangerous and that there are ways to protect their eyes To recognise that shadows are formed when the light from a light source is blocked by a solid object To find patterns in the way that the size of shadows change.			To recognise that light appears to travel in straight lines To 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 To 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 To use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. To work scientifically by: deciding where to

								place rear-view mirrors on cars; designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works. To look at a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur).

Forces and Magnets					To compare how things move on different surfaces To 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 To 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 To describe magnets as having two poles predict whether two magnets will		To explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object To identify the effects of air resistance, water resistance and friction, that act between moving surfaces To recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. To explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds	

					attract or repel each other, depending on which poles are facing		fall. To explore the effects of friction on movement and find out how it slows or stops moving objects. To find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.	

Seasonal Changes			Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies. Pupils should observe and talk about changes in the weather and the seasons.					

Materials/Changes/States of matter			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. Become familiar with the names of materials and properties such	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.		To explore a variety of everyday materials and develop simple descriptions of the states of matter To compare and group materials together, according to whether they are solids, liquids or gases To 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) To identify the part played by evaporation and condensation in the water cycle	To 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 To know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating	

			as: hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent. To explore a wide range of materials e.g bricks, foil, elastic, paper, fabrics.			and associate the rate of evaporation with temperature.	To give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic To demonstrate that dissolving, mixing and changes of state are reversible changes To 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. To explore reversible changes, including, evaporating, filtering, sieving, melting and	

							dissolving, recognising that melting and dissolving are different processes. To explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda.	

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

Earth and Space							To describe the movement of the Earth, and other planets, relative to the Sun in the solar system To describe the movement of the Moon relative to the Earth. To describe the Sun, Earth and Moon as approximately spherical bodies To use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. To learn that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn,	

							Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). To understand that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones).	

Sound						To identify how sounds are made, associating some of them with something vibrating To recognise that vibrations from sounds travel through a medium to the ear To find patterns between the pitch of a sound and features of the object that produced it To find patterns between the volume of a sound and the strength of the vibrations that produced it To recognise that sounds get fainter as the distance from the sound source increases.		

Electricity						To identify common appliances that run on electricity To construct a simple series circuit, identifying/naming its basic parts, including cell, wire, bulb, switch and buzzer To use their circuits to create simple devices To draw the circuit as a pictorial representation (not necessarily using conventional circuit symbols) To discuss precautions for working safely with electricity. To identify whether or not a lamp will light in a simple series circuit To recognise that		To associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. To 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. To use recognised symbols when representing a simple circuit in a diagram. To construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs,

						a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit To recognise some common conductors and insulators, and associate metals with being good conductors.		buzzers and motors. To learn how to represent a simple circuit in a diagram using recognised symbols.

Rocks					To compare and group together different kinds of rocks (including those in the locality) on the basis of appearance and simple physical properties To describe in simple terms how fossils are formed when things that have lived are trapped within rock To recognise that soils are made from rocks and organic matter			

Key Vocabulary			Evergreen, Deciduous, root Stem, flower, seed, canopy, trunk, fish, amphibians, reptiles, birds, mammals, carnivores, herbivores, omnivores, nose, ear, mouth, hands, feet, torso, head, skull, wood, plastic, glass, metal, water, rock, flexible, hard, soft, absorbs, season, autumn, winter, spring, summer	Habitat, dead, alive, food chain, predator, prey, source, light, air, water, warmth, offspring, hygiene, states, shapes, suitability	Roots, stem, trunk, leaves, flowers, air, light, water, nutrients,transported, life cycle, pollination, seed formation, seed dispersal, nutrition, skeletons, muscles, protection, fossils, trapped, organic, absence, reflected, surfaces, opaque, transparent, translucent, magnetic, forces, attraction, attract, repel, poles	Classification, keys, digestion, stomach, acid, incisor, molar, premolar, canine, food chain, producer, prey, predator, solids, liquids, gases, state, evaporation, condensation, vibration, pitch, volume, strength, appliance, circuit, cells, wires, bulbs, switches, buzzers, conductor, insulator	Lifecycle, Amphibian, reptile, reproduction, properties, transparency, conductivity, thermal, magnetic, dissolve, solution, mixture, separated, evaporation, reversible, irreversible, axis, spherical, clockwise, anti-clockwise, rotation, gravity, resistance, air resistance, water resistance, frictions, mechanism, lever, pulley, gear, force	Characteristics, micro-organisms, circulatory system, blood vessels, capillaries, aorta, veins, nutrients, fossils, adaptation, environment, evolutions, reflect, reflection, reflecting, sources, shadows, circuits

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General comments from the Science coordination network

Any recommended Apps/websites used for science?

- STEM
- Explorify
- TAPPS Assessments
- CLEAPS
- Primary Science Trust
- Twinkl assessment for science gives percentages at end of unit of work and for working scientifically.
- Tree identification App from Woodland Trust
- ASE

Recommended visits?

- RHS Wisley - taught
- WonderLab at The Science Museum (free for school groups)
- Geobus-they come to your school and are free but booked up early
- Affinity Water
- junk orchestra workshop (Year 4 Sound)

Next steps?