Progression in Science knowledge at Pitmaston Primary School

EYFS	Nursery Pupils will know how to:	Reception Pupils will know how to:
Understanding of the World	• **Plant** seeds and care for growing plants. • Understand the key features of the life cycle of a plant and an animal. • Begin to understand the need to respect and care for the **natural environment** and all living things.	• Explore the **natural world** around them. • Describe what they **see, hear and feel** whilst outside. • Recognise some **environments** that are different to the one in which they live. • Understand the effect of **changing seasons** on the **natural world** around them.
Expressive Arts and Design		
Mathematics		• **Count** objects, actions and sounds. • **Compare length, weight and capacity.** •
Literacy	• Engage in extended conversations about stories, learning new **vocabulary**. •	
Communication & Language	• Use a wider range of **vocabulary**.	• Learn new **vocabulary**.
Personal, Social and Emotional Development	• Select and use activities and **resources**, with help when needed. • Make **healthy choices** about food, drink, activity and tooth brushing.	• Know and talk about the different factors that support their overall **health and wellbeing.**
Physical Development		
Progression of vocabulary		
	Head, eyes, nose, mouth, ears, hands, fingers, feet, toes, arms, legs, animal, animal names, tree, leaf, flower, stem, seed, material, woo , glass, paper, hard, soft, Summer, day, Spring, dark, Autumn, light, Winter, night, star, Sun, loud, quiet	**Herbivore, face, carnivore, hair, omnivore, dinosaur, palaeontology, observation, growth, prediction, results, environment, natural wold, leg, human, knee, arm, fish, elbow, birds, back, head, toes, ear, hands, eye, fingers, mouth, nose, tree, petals, trunk, fruit, branch, roots, leaves, bulb, flowers, seed, stem, material, metal, wood, rock, plastic, hard, glass, soft, paper, fabric, material, smooth, shiny, rough, Season, Moon, Sun, Jupiter, Mars, Venus, Saturn, Earth, Mercury, planet, space, loud, quiet, volume, sound**

Progression in Science knowledge at Pitmaston Primary School

Plants

Year 1	Year 2	Year 3
Pupils will know how to: • 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.	Pupils will know how to: • 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. *Pupils should be introduced to the requirements of plants for germination, growth and survival.*	Pupils will know how to: • 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.
Progression of vocabulary:		
deciduous and evergreen trees, plant structures- leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem.	**seeds, bulbs, growth, light, water, suitable temperature, healthy, mature plants, survival, germination.**	**roots, stem for support, nutrition, air, light, nutrients, water, lifecycles, pollination, seed formation, seed dispersal, disperse, water transported, leaves for nutrition and flowers for reproduction, functions of parts of flowering plants, room to grow, different factors on plant growth, fertiliser, life cycles,**
Year 4	**Year 5**	**Year 6**

Progression in Science knowledge at Pitmaston Primary School

Animals including humans

Year 1	Year 2	Year 3
Pupils will know how to: • 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 and say which part of the body is associated with each sense.	Pupils will know how to: • 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.	Pupils will know how to: • identify that animals, including humans, need the right types and amount of nutrition. • know that animals cannot make their own food. • know animals get their nutritional needs from what they eat. • identify that humans and some other animals have skeletons and muscles for support, protection and movement.
Progression of vocabulary:		
Fish, amphibians, reptiles, birds, mammals, carnivores, herbivores, omnivores, basic human body parts (head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth) senses: touch, smell, see/sight, hear, taste, habitat, local environment.	**offspring, adults, humans, survival (food, water and air), exercise, food and hygiene, growth (no expectation to understand how reproduction occurs).**	**nutrition, skeleton, muscles for support, protection & movement, food groups, healthy,**
Year 4	**Year 5**	**Year 6**
Pupils will know how to: • 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.	Pupils will know how to: • describe the changes as humans develop to old age.	Pupils will know how to: • identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. • recognise 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.
Progression of vocabulary:		
functions of the basic parts of the digestive system in humans (teeth, mouth, tongue, oesophagus, stomach, small and large intestine), food chain, producers, predators and prey. **liver, pancreas, and gallbladder are the solid organs of the digestive system.**	**growth, development, puberty, gestation periods**	**circulatory system, functions of heart, blood vessels and blood, diet, impact of diet, exercise, drugs, substances, lifestyle, nutrients, internal organs (skeletal, muscular and digestive system), healthy bodies.**

Progression in Science knowledge at Pitmaston Primary School

Living things and their habitats

Year 1	Year 2	Year 3
	Pupils will know how to: • 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.	
	Progression of vocabulary:	
	Living things, dead, never been alive, habitats, basic needs, micro-habitats, simple food chain, different sources of food,	
Year 4	**Year 5**	**Year 6**
Pupils will know how to: 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.	Pupils will know how to: 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.	Pupils will know how 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. give reasons for classifying plants and animals based on specific characteristics.
Progression of vocabulary:		
Variety of living things, classification keys, local & wider environment, vertebrate animals (fish, amphibians, reptiles, birds, mammals) , invertebrate (snails & slugs, worms, spiders, insects)	**Differences in life cycles of a mammal, amphibian, insect, bird, process of reproduction in some plants and animals, sexual & asexual reproduction in plants, parent plant, tubers, root cuttings, bulbs,**	**Micro-organisms, plants & animals can be subdivided, specific characteristics, classification system,**

Progression in Science knowledge at Pitmaston Primary School

Materials

Year 1	Year 2	Year 3
Everyday Materials Pupils will know how to: 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.	**Uses of Everyday Materials** Pupils will know how to: 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.	**Rocks** Pupils will know how to: 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.
Progression of vocabulary:		
Object, variety of everyday materials including wood, plastic, glass, metal, water, rock, simple physical properties, hard/soft, stretchy/stiff, shiny/dull, rough/smooth, bendy/not bendy, waterproof/not waterproof, absorbent/not absorbent, opaque/transparent, brick, fabric, paper, elastic, foil,	**Suitability of a variety of everyday materials including wood, metal, plastic, glass, brick, rock, paper, cardboard, solid objects, squashing, bending, twisting, stretching,**	**Rocks, appearance, simple physical properties, fossils, organic matter,**

Year 4	Year 5
States of Matter Pupils will know how to: • 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.	**Properties and changes of Materials** Pupils will know how 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. • 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. • demonstrate that dissolving, mixing and changes of state are reversible. • 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.
Progression of vocabulary:	
Solids, liquids, gases, change state, heated, cooled, temperature, degrees Celsius, evaporation, condensation, water cycle, substances	**Hardness, solubility, transparency, conductivity, (electrical & thermal), dissolve, solution, mixtures, separated, filtering, sieving, evaporating, metals, wood, plastic, reversible/irreversible changes, melting, evaporating**

Progression in Science knowledge at Pitmaston Primary School

Progression in Science knowledge at Pitmaston Primary School

Light	Year 1	Year 2	Year 3
			Pupils will know how to: • 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 a solid object. find patterns in the way that the size of shadows change
	Progression of vocabulary:		
			Light, dark is absence of light, reflected, protect eyes, shadows, patterns & size of shadows,
	Year 4	Year 5	Year 6
			Pupils will know how 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. • 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.
	Progression of vocabulary:		
			Light travels in straight lines, reflect, light sources, shadows, light sources, reflection, shadows,

Progression in Science knowledge at Pitmaston Primary School

Progression in Science knowledge at Pitmaston Primary School

Electricity

Year 1	Year 2	Year 3
Year 4	**Year 5**	**Year 6**
Pupils will know how to: • 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.		Pupils will know how to: • 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.
Progression of vocabulary:		
Common appliances, electricity, simple series electrical circuit, naming basic parts including cells, wires, bulbs, switched, buzzers, complete loop, battery, common conductors & insulators, metals are good conductors, components,		**Brightness of a lamp, volume of a buzzer, voltage of cells, circuit, brightness of bulbs, loudness of buzzers, on/off position of switches, recognised symbols when representing a simple circuit in a diagram, components, motors,**

Progression in Science knowledge at Pitmaston Primary School

Sound	Year 1	Year 2	Year 3
	Year 4	Year 5	Year 6
	Pupils will know how to: • 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.		
	Progression of vocabulary:		
	Vibrating, vibrations, medium, pitch, volume, sound source,		

Progression in Science knowledge at Pitmaston Primary School

Evolution and Inheritance	Year 1	Year 2	Year 3
	Year 4	Year 5	Year 6
			Pupils will know how to: • 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.
	Progression of vocabulary:		
			How fossils provide information, offspring, offspring not always identical to their parents, adaptation, evolution, breeds, variations in offspring,

Progression in Science knowledge at Pitmaston Primary School

Seasonal Changes

Year 1	Year 2	Year 3
Pupils will know how to: • observe changes across the four seasons. • observe and describe weather associated with the seasons and how day length varies.		
Progression of vocabulary:		
Four seasons, weather, day length varies,		
Year 4	**Year 5**	**Year 6**

Progression in Science knowledge at Pitmaston Primary School

Earth and Space

Year 1	Year 2	Year 3
Year 4	**Year 5**	**Year 6**
	Pupils will know how to: • 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.	
Progression of vocabulary:		
	Movement of Earth, 8 planets (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune), sun, solar system, moon, spherical bodies, earth's rotation, day & night, star	

Progression in Science knowledge at Pitmaston Primary School

Forces and magnets

Year 1	Year 2	Year 3
		Pupils will know how to: • 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. • describe magnets as having two poles. • predict whether two magnets will attract or repel each other, depending on which poles are facing. compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet.
Progression of vocabulary:		
		Different surfaces, contact/non-contact forces, magnetic forces, attract, repel, magnetic materials, two poles (North & South), different magnets (bar, ring, button, horseshoe)

Year 4	Year 5	Year 6
	Pupils will know how to: • 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.	
Progression of vocabulary:		
	Gravity, air resistance, water resistance, friction, mechanisms, levers, pulleys & gears,	