



Science Knowledge Progression 'At Worthington We Will Know.....'



Biology			
	Plants	Animals including Humans	Living Things and their Habitats
Nursery	<p>We will know... Seeds can grow into plants and flowers.</p> <p>How to care for a seed so it grows into a plant.</p>	<p>We will know... The human life cycle is baby, toddler, child, teenager, adult, elderly.</p> <p>How to look after my teeth and make healthy choices.</p>	<p>We will know... Some animals can be pets and some are wild or live in the zoo.</p> <p>The names of some animals that live in the wild / zoo.</p> <p>How to identify some animals by their pattern – zebra, tiger, cheetah.</p>
	<p>Vocabulary Seed, plant, grow, change</p>	<p>Vocabulary family, name, history, brother, sister, mother, father, grandma, grandad, auntie, uncle, step-mother/father/brother/sister, special, skin, hair, eyes, teeth, belong, healthy, fruit, vegetables, germs, wash, toilet</p>	<p>Vocabulary pet, wild, zoo, pattern, country, animal, fur, skin, sort</p>

Reception	<p>We will know... Plants need water, light and soil to grow.</p> <p>Plants grow over time and some produce fruit and vegetables.</p>	<p>We will know... How to point to different parts of my body (named in the vocabulary list)</p> <p>We can explore the world around us using our 5 senses and identify the part of the body for each – touch, taste, smell, sight and sound.</p> <p>A butterfly life cycle is egg, caterpillar, chrysalis, butterfly.</p> <p>The frog life cycle is frogspawn, tadpole, froglet, frog.</p>	<p>We will know... Penguins have waterproof feathers, can swim to catch food and have a thick layer of fat to survive in a cold climate.</p> <p>Weather, buildings and animals in the South Pole are different to those in Sale.</p> <p>A habitat is made up of food, shelter and weather.</p> <p>The names of some nocturnal and diurnal animals i.e. mole, bat, fox, owl. The names of 2 different habitats i.e. woodland, rainforest, desert and polar.</p>
	<p>Vocabulary seed, plant, water, light, soil, fruit, vegetables</p>	<p>Vocabulary skeleton, skull, head, neck, shoulders, waist, arm, leg, elbow, knee, hand, fingers, feet, toes, hip, eye, ear, mouth, nose, face, hair, skin, teeth, tongue</p> <p>lifecycle, egg, caterpillar, chrysalis, butterfly, frogspawn, tadpole, froglet, frog</p>	<p>Vocabulary feather, waterproof, survive, climate, food, shelter, weather, woodland, rainforest, desert, polar</p>

Year One	We will know... Plants can be flowers, trees, vegetables, fruits. (others learnt at an earlier date). Parts of a plant are leaves, flowers, petals, blossom, stem/trunk/branch and roots. Trees are a type of plant that have a tall stem made of wood/bark. The purpose of the roots, stem, petals and leaves. Evergreen trees keep their leaves all year round (e.g. pine, yew, juniper in UK) Deciduous plants lose their leaves in winter (e.g. oak, silver birch, horse chestnut, sycamore, ash). Identify the trees in our school grounds – Holly, Silver Birch, Oak, Sycamore. The difference between wild (flowers that grow without help from humans) and garden flowers (planted to grow in gardens and parks). Some wild flowers– buttercup, daisy, dandelion, poppy Some garden flowers – daffodils, rose, sunflower, fuchsia	We will know... Animals can move, eat and breathe. Humans are animals. Animals have different features, including fins, wings, scales, legs, feathers, claws, paws etc. Animals can be sorted in different ways but a scientific classification can be used: -carnivores (only eat meat), herbivores (only eat plants) and omnivores (can eat both) - fish, amphibians, reptiles, birds and mammals (children will identify and name common animals from each group). Humans are omnivores, but some choose to eat only plants (vegetarian/vegan). Humans are made of many different body parts (see vocab below). Humans have five senses, smell, taste, touch, sight and hearing. The five senses are each associated with different body parts (eyes, ears, nose, tongue and skin/hands)	
	<u>Vocabulary</u> leaf, flower, blossom, petal, root, seed, trunk, branch, stem, bark, stalk, bud, holly, silver birch, oak, sycamore, buttercup, daisy, dandelion, poppy, daffodils, rose, sunflower, fuchsia, deciduous, evergreen	<u>Vocabulary</u> body parts as for reception plus: forehead, chin, cheek, eyebrows, eyelashes, lips, chest, back, stomach, wrist, ankle, heel, palm, finger nails, toe nails, senses shark, clown fish, tuna, frog, toad, snake, lizard, tortoise, penguin, flamingo, robin, humans, cat, dog, elephant. carnivore, herbivore, omnivore	

Year Two	<p>We will know...</p> <p>Plants may grow from either seeds or bulbs.</p> <p>Know some common plants that grow from bulbs (daffodil, snowdrop and tulip) and some bulbs are vegetables (onion, garlic and spring onion).</p> <p>Seeds and bulbs germinate and grow into seedlings which then continue to grow into mature plants.</p> <p>The life cycles of different plants and be able to name the stages - seed, roots, leaves, flowers, fruit and ripe fruit.</p> <p>How to describe that plants need water, light and a suitable temperature to grow and stay healthy.</p>	<p>We will know...</p> <p>There are six stages of human development- baby, toddler, child, teenager, adult, elderly.</p> <p>Animals may lay eggs like a caterpillar and have a different development/life cycle.</p> <p>All animals have basic needs - feeding, drinking and breathing (linked to MRS GREN).</p> <p>Exercise is important to grow into healthy adults. Good hygiene is also important in preventing infections and illnesses.</p> <p>Food groups- fruit and vegetables, protein, carbohydrates, fats, oils and sugars and dairy. Humans need a balanced diet to be healthy.</p>	<p>We will know...</p> <p>How to identify things that are living, dead, and things that have never been alive.</p> <p>Most living things live in habitats to which they are suited.</p> <p>Different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.</p> <p>The names of a variety of plants and animals in their habitats, including micro-habitats- moss, insects, spiders, bees, wasps (micro), vines, trees, jaguar, sloth, monkey (rainforest habitat).</p> <p>Animal get their food from plants and other animals, using the idea of a simple food chain. Some different sources of food- eggs come from chickens, milk comes from cows.</p>
	<p><u>Vocabulary</u></p> <p>leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud light, shade, sun, warm, cool, water, grow, healthy</p>	<p><u>Vocabulary</u></p> <p>offspring, reproduction, growth, baby, toddler, child, teenager, adult, old person, names of animals and their babies (e.g. chick/chicken, kitten/cat, caterpillar/butterfly), survive, survival, water, food, air, exercise, heartbeat, breathing, hygiene, germs, disease, food types (e.g. meat, fish, vegetables, bread, rice, pasta, dairy)</p>	<p><u>Vocabulary</u></p> <p>living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed.</p> <p>Names of local habitats e.g. pond, woodland etc.</p> <p>Names of micro-habitats e.g. under logs, in bushes etc.</p>

Year Three

We will know...

The functions of different parts of flowering plants:
The roots absorb nutrients from the soil, the leaves absorb light from the sun, flowers allow the plant to reproduce.

The requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow)

How water is transported within plants.

The part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Vocabulary

roots, stem, flower, anther, stigma, style, stamen, filament, petal, anther, nutrients, transport, seeds, carbon dioxide, sunlight, absorb, ovary, carpel, reproduction.

We will know...

The names of the food groups and the nutrients that different foods provide.

The nutritional values of different foods.

The differences between certain animals' skeletons.

How the human skeleton supports movement, including using the scientific names for human bones.

Bones and muscles work together to create movement and how muscles often work in pairs.

Vocabulary

nutrition, nutrients, carbohydrates, protein, vitamins, minerals, fats, saturates, exoskeleton, endoskeleton, hydrostatic skeleton, vertebrates/invertebrates, clavicle, cranium, costal, thoracic cage, sternum, pelvis, patella, femur, fibula, tibia, metatarsals, metacarpals, phalanges, radius, ulna, humerus, biceps, triceps, hamstring, quadriceps, contract, relax.

Year Four

We will know...

The simple functions of the basic parts of the digestive system in humans.

The different types of teeth in humans and their simple functions.

How to construct and interpret a variety of food chains, identifying producers, predators and prey.

Vocabulary

incisor, canine, molar, premolar, digest, oesophagus, small intestine, large intestine, stomach, herbivore, carnivore, omnivore, predator, prey, producer.

We will know...

That living things can be grouped in a variety of ways.

How to use classification keys to help group, identify and name a variety of living things in the local and wider environment.

That environments can change and that this can sometimes pose dangers to living things.

Vocabulary

classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate

Year Five

We will know...

When babies are young, they grow rapidly. They are very dependent on their parents.

As they develop, they learn many skills.

At puberty, a child's body changes and develops primary and secondary sexual characteristics. This enables the adults to reproduce.

Vocabulary

puberty, adolescence, hormones, genitals, adulthood, reproduce, gestation

We will know...

As part of their life cycle, plants and animals reproduce.

Insects can go through complete for incomplete metamorphosis.

Birds have a hatchling, nestling and fledgling stage

Most animals reproduce sexually. This involves two parents where the sperm from the male fertilises the female egg.

Animals, including humans, have offspring which grow into adults.

In other animals such as chickens or snakes, there may be eggs laid that hatch to young then grow to be adults.

Plants reproduce sexually and asexually.

Gardeners may force plants to reproduce asexually by taking cuttings.

Sexual reproduction occurs through pollination, usually involving wind or insects.

Vocabulary

life cycle, sexual, sperm, fertilises, egg, live young, metamorphosis, nymph, hatchling, clone, tubers, nestling, fledgling, asexual, plantlets, runner, bulbs, cutting, cutting, pistil, stamen, petal, sepal

Year Six	Evolution and Inheritance:	Animals including Humans	Living Things and their Habitats
	<p>We will know...</p> <p>That life has changed over time.</p> <p>That fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>That living things produce offspring of the same kind.</p> <p>That offspring normally vary and are not identical to their parents.</p> <p>That animals and plants adapt over time to suit their environment.</p> <p>That adaptation may lead to evolution.</p>	<p>We will know...</p> <p>The main parts of the human circulatory system.</p> <p>The function of the heart, blood vessels and blood.</p> <p>The ways in which nutrients and water are transported in animals, including humans.</p> <p>The impact of diet, exercise, drugs and life style on health.</p>	<p>We will know...</p> <p>That micro-organisms, plants and animals are all living things.</p> <p>That living things are classified into broad groups according to their characteristics.</p> <p>That these characteristics are based on similarities and differences.</p> <p>That plants and animal characteristics can be classified in many different ways.</p>
	<p><u>Vocabulary</u> evolution, inheritance, offspring, adaptation, fossils, variation, vary, change, identical</p>	<p><u>Vocabulary</u> heart, blood vessels, veins, arteries, capillaries, blood cells, platelets, plasma, chamber, aorta, valve, oxygen, carbon dioxide, organ, villi,</p>	<p><u>Vocabulary</u> micro-organism, classification, characteristics, similarities, invertebrates, mammals, amphibians, reptiles.</p>

	Chemistry Materials	Physics		
		Movement, Forces and Magnets	Electricity	Sound and Light
Nursery	<p>We will know... How to use my senses to explore natural materials.</p> <p>Why ice melts.</p> <p>How to group leaves according to their shape, colour and size.</p>	<p>We will know...</p> <p>Movement, Forces and Magnets Whether an object will float or sink. How to test this.</p> <p>Electricity How to switch on an electronic toy with batteries</p>	<p>We will know... How to experiment with a torch and use the language 'light' and 'dark'</p>	
	<p>Vocabulary group, experiment, sort, same, different, melt, find out, light, dark, torch</p>	<p>Vocabulary float, sink, force, push, pull, predict, test computer, electronic, electricity, whiteboard, power, batteries, plug, monitor</p>	<p>Vocabulary group, experiment, sort, same, different, melt, find out, light, dark, torch</p>	
Reception		<p>We will know... Magnets attract some materials.</p>	<p>We will know... That the black picture of us is our shadow.</p> <p>The we can block the sun with our bodies to make a shadow.</p>	
		<p>Vocabulary magnet, magnetic</p>	<p>Vocabulary shadow, sun, light, torch</p>	
			<p>We will know... There are 4 seasons (Autumn, Winter, Spring, Summer) and there are differences in the trees in different seasons.</p>	
			<p>Vocabulary Spring, Summer, Autumn, Winter, season</p>	

Year One

We will know...

Everyday Materials:

An object is a 'thing' that can be seen and touched.

Objects have a name and often have a purpose.

The material is what an object is made of, for example a cup can be made of paper or plastic

Common materials include wood, metal, glass, plastic, cotton and wool. (inc water and rock)

Materials have different physical properties, hard/soft, shiny/dull, absorbent/waterproof, opaque/transparent, rough/smooth.

Materials can be grouped in a number of ways based on their physical properties.

Vocabulary

material, object, wood, metal, glass, plastic, cotton, wool, water, rock, hard/soft, shiny/dull, absorbent/waterproof, opaque/transparent, rough/smooth
physical properties

We will know...

Seasonal Changes:

There are four seasons: spring, summer, autumn and winter.

The weather changes gradually as we move from season to season.

The weather can change rapidly in one day (e.g. sunny morning and rainy afternoon)

The differences between four seasons in terms of living things (trees lose leaves; flowers drop and we see different animals, such as butterflies in the summer)

In the summer there are more hours of daylight and in winter there are fewer hours of daylight.

How to record the weather.

How to compare the weather data.

Vocabulary

weather (sunny, rainy, windy, snowy, cloudy)
seasons (winter, summer, spring, autumn), day length, months of the year, data, weather vane, temperature, thermometer, rain gauge

Year Two

We will know...

Uses of Everyday Materials:

All objects are made of one or more materials that are chosen specifically because they have suitable properties for the task.

Materials have multiple uses- metal can be used to make coins, cars, cans and table legs

Different materials are used for the same things- spoons can be wooden, plastic and metal.

Why objects are made from certain materials- a table is made from wood because it is strong and smooth.

Objects made of some materials can be changed in shape by bending, stretching, squashing and twisting.

To know how the scientist John Dunlop developed a useful material.

Vocabulary:

Recap Y1 - *material, object, wood, metal, glass, plastic, cotton, wool, water, rock, hard/soft, shiny/dull, absorbent/waterproof, opaque/transparent, rough/smooth*

plus - translucent, reflective, nonreflective, flexible, rigid

Types of paper, rubber, man-made and natural

shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching

suitable, unsuitable, materials, properties

**Year
Three**

We will know...

Rocks:

You can compare different kinds of rocks based on their appearance in the context of understanding the difference between natural and human-made rocks.

You can group together different kinds of rocks on the basis of their simple physical properties.

Fossils are formed when things that have lived are trapped within rock by explaining the fossilisation process.

Soils are made from rocks and organic matter.

Vocabulary

igneous, sedimentary, metamorphic, human-made, permeable, durable, density, fossil, fossilisation, organic matter, decay.

We will know...

Forces and Magnets:

Some forces need contact between two objects.

Objects move differently on different surfaces.

That magnetic forces can act at a distance, attracting some materials and not others.

Magnets have two poles and we can predict whether two magnets will attract or repel each other, depending on which poles are facing.

How magnets attract or repel each other.

Vocabulary

friction, resistance, magnetic field, north and south pole, attract, repel

We will know...

Light:

We need light in order to see things and that dark is the absence of light.

Light is reflected from surfaces.

Light from the sun can be dangerous and there are ways to protect our eyes.

Shadows are formed when the light from a light source is blocked by a solid object.

There are patterns in the way that the sizes of shadows change.

Vocabulary

reflect, opaque, transparent, translucent

Year Four	<p>We will know... States of Matter: How to compare and group materials together, according to whether they are solids, liquids or gases.</p> <p>That some materials change state when they are heated or cooled.</p> <p>How to measure or research the temperature at which this happens in degrees Celsius (°C).</p> <p>The part played by evaporation and condensation in the water cycle and that the rate of evaporation is associated with temperature.</p>	<p>We will know... Electricity: Some common appliances that run on electricity.</p> <p>How to construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</p> <p>Whether or not a bulb will light in a simple series circuit, based on whether or not the bulb is part of a complete loop with a battery.</p> <p>A switch opens and closes a circuit and we can associate this with whether or not a bulb lights in a simple series circuit.</p> <p>Some common conductors and insulators, and that metals are generally good conductors</p>	<p>We will know... Sound: How sounds are made, associating some of them with something vibrating.</p> <p>That vibrations from sounds travel through a medium to the ear.</p> <p>There are patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Sounds get fainter as the distance from the sound source increases.</p>
	<p>Vocabulary solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle</p>	<p>Vocabulary electricity, electrical appliance, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator</p>	<p>Vocabulary sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation</p>

Year Five

We will know...

Properties and Changes of Materials:

Materials have different uses depending on their properties and state (liquid, solid or gas).

Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets.

Some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment.

Mixtures can be separated by filtering, sieving and evaporation.

Some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood and frying an egg result in the formation of new materials and these are not reversible.

Vocabulary

thermal/ electrical, insulator/ conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, new material.

We will know...

Forces:

A force causes an object to start moving, stop moving, speed up, slow down or change direction.

Gravity is a force that acts at distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall.

Air resistance, water resistance and friction are contact forces that act between moving surfaces. The object may be moving through the air or water, or the air and water may be moving over a stationary object.

A mechanism is a device that allows a small force to be increase to a larger force. The pay back is that it requires a greater movement. The small force moves a long distance and the resulting large force moves a small distance e.g. a crowbar or bottle top remover.

Pulleys, levers and gears are all mechanisms, also known as simple machines.

Vocabulary

force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears.

We will know...

Earth and Space:

The sun is a star and it is at the centre of our solar system.

There are 8 planets and we can name them.

These planets travel around the Sun in fixed orbits. Earth takes 365.25 days to complete its orbit around the Sun.

We have a leap year every four years because of this.

The Earth rotates on its axis every 24 hours. As Earth rotates, half faces the Sun (day) and half is facing away from the Sun (night).

As the Earth rotates, the Sun appears to move across the sky.

The moon orbits the Earth, it takes about 28 days to complete its orbit.

The Sun, Earth and Moon are approximately spherical.

Vocabulary

Earth, Sun, Moon, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, spherical, solar system, rotates, star, orbit, planets.

Year Six		<p>We will know...</p> <p><u>Electricity:</u></p> <p>We use scientific symbols to represent the components (parts) of a circuit.</p> <p>The brightness of a bulb or the loudness of a buzzer is affected by the number of cells in a circuit.</p> <p>The brightness of a bulb or the loudness of a buzzer is affected by the voltage of cells in a circuit.</p> <p>The number of components in a circuit can affect how they function.</p> <p>The arrangement of components in a circuit can affect how they function.</p> <p>The length of wires in a circuit can affect how the components function.</p>	<p>We will know...</p> <p><u>Light:</u></p> <p>Light appears to travel in straight lines.</p> <p>Objects are seen because they give out or reflect light into the eye.</p> <p>We see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.</p> <p>Why shadows have the same shape as the objects that cast them.</p>
		<p><u>Vocabulary</u></p> <p>circuit, component, electricity, cell (battery), switch, conductor, insulator, voltage, motor</p>	<p><u>Vocabulary</u></p> <p>light, light source, reflection, incident ray, reflected ray, refractions, visible spectrum, prism, shadow, transparent, translucent, opaque</p>

Scientific Enquiry Questions and Enquiry Types

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery	How do we keep healthy? <i>Comparative Testing</i>	Why do the leaves fall off the trees in Autumn? <i>Observing over time</i> <i>Comparative Testing</i>	What equipment can I use in Nursery to play music and make sounds?	What floats and sinks? <i>Comparative Testing</i>	How does a beanstalk grow? <i>Observing over time</i>	How can we sort animals? <i>Research</i> <i>Identifying and Classifying</i>
Reception		Why do leaves fall off in Autumn?	What do the animals in the Gruffalo eat and where do they live?	What equipment does a health worker use?	How does a beanstalk grow?	Which animals live in a zoo?
Year One	Seasonal changes Does the wind always blow the same way? In which season does it rain the most? <i>Observing over time</i>	Animals including Humans How can we organise all the zoo animals? <i>Identifying and Classifying</i>	Seasonal changes Does the wind always blow the same way? In which season does it rain the most? <i>Observing over time</i>	Everyday Materials Is there a pattern in the types of materials that are used to make objects in a school? <i>Pattern Seeking</i>	Plants How do my cress seeds change in the week? <i>Observing over time</i>	Seasonal changes Does the wind always blow the same way? In which season does it rain the most? <i>Observing over time</i>
Year Two	Living things and their habitats Where do animals and plants live? <i>Identifying and Classifying</i>		Forces Which boat floats the longest? <i>Observing over time</i>		Plants Do bigger seeds grow into bigger plants? <i>Pattern Seeking</i>	Animals including Humans Do bananas make us run faster? <i>Comparative testing</i>
Year Three	Animals including humans Do male humans have larger skulls than female humans? <i>Pattern Seeking</i>	Forces and magnets Which materials are magnetic? <i>Identifying and Classifying</i>	Rocks Who was Mary Anning and what did she discover? <i>Research</i>	Plants Which conditions help seeds germinate faster? <i>Comparative and fair testing</i>	Light Is the sun the same brightness all day? <i>Observing over time</i>	

Year Four	Animals including humans What impact does diet have on humans? <i>Observing over time</i>	Living things and their habitats How can we group living things from our local area? <i>Research</i>	Electricity How can you use electricity to make an alarm? <i>Identifying and Classifying</i>	Sound Can you explain how to alter the pitch and volume on different instruments? <i>Pattern Seeking</i>	States of matter How can you make water disappear? <i>Comparative and fair test</i>	
Year Five	Properties and changes of materials How does a sugar cube change as it is put in a glass of water? <i>Identifying and Classifying</i>		Forces What affects how well a parachute works? <i>Comparative and Fair Testing</i>	Living things and their habitats Can you identify all the stages in the life cycle of a bird? <i>Research</i>	Earth and Space How does the moon change over the period of a month? <i>Observing over time</i>	Animals including humans Is there a pattern between the size of an animal and their gestation periods? <i>Pattern Seeking</i>
Year Six	Electricity How does the voltage of the battery affect the brightness of a bulb? <i>Pattern Seeking</i>	Light How can you change the direction of light? <i>Observing over time</i>	Animals including Humans How does the length of time we exercise affect our heart rate? <i>Comparative and Fair Testing</i>		Evolution and Inheritance What happened when Charles Darwin visited the Galapagos Islands? <i>Research</i>	Living things and their habitats How do we classify living things, and why? <i>Identifying, grouping and classifying</i>
	How would you group electrical components and appliances based on what electricity makes them do? <i>Identifying and classifying</i>					