

Substantive knowledge	<p>Biology B1: Living things are special collections of matter that make copies of themselves, use energy and grow. B2: Living things on Earth come in a huge variety of different forms that are all related because they all came from the same starting point 4.5 billion years ago. B3: The different kinds of life, animals, plants and microorganisms, have evolved over millions of generations into different forms in order to survive in the environments in which they live.</p>
	<p>Chemistry C1: All matter (stuff) in the universe is made up of tiny building blocks. C2: The arrangement, movement and type of the building blocks of matter and the forces that hold them together or push them apart explain all the properties of matter (e.g. hot/cold, soft/hard, light/heavy, etc). C3: Matter can change if the arrangement of these building blocks changes.</p>
	<p>Physics P1: The universe follows unbreakable rules that are all about forces, matter and energy. P2: Forces are different kinds of pushes and pulls that act on all the matter that is in the universe. Matter is all the stuff, or mass, in the universe. P3: Energy, which cannot be created or destroyed, comes in many different forms and tends to move away from objects that have lots of it.</p>
	<p>Earth science E1: The Earth is one of eight planets that orbit the sun. E2: The Earth is tilted and spins on its axis leading to day and night, the seasons and the climate. E3: The Earth is made up of several layers, including a relatively thin rocky surface which is divided into tectonic plates, and the movement of these plates leads to many geologic events (such as earthquakes and volcanoes) and geographical features (such as mountains.)</p>

Science Curriculum- Heymann Primary School

Working Scientifically – Disciplinary knowledge Skills to be taught alongside other areas						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<ul style="list-style-type: none"> • Can talk about some of the things they have observed such as plants, animals, natural and found objects. • Talks about why things happen and how things work. • Shows care and concern for living things and the environment. • Explore and make observations of the world around them • Ask questions about what they have observed • Suggest possible answers to questions • Looks closely at similarities, differences, patterns and change • Group together similar objects 	<ul style="list-style-type: none"> • asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions. 	<ul style="list-style-type: none"> • asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings. 	<ul style="list-style-type: none"> • planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • using test results to make predictions to set up further comparative and fair tests • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations • identifying scientific evidence that has been used to support or refute ideas or arguments. 			

	EYFS		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Biology	Understanding Plants	<p>Plants</p> <p>Identify different types of plants eg flower, tree, grass</p> <p>Identify similarities and differences in different leaves</p> <p>Identify similarities and differences in different seeds</p> <p>Explore how seeds and bulbs grow into plants</p>	<p>Plants:</p> <ul style="list-style-type: none"> 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. 	<p>Plants:</p> <ul style="list-style-type: none"> observe and describe how seeds and bulbs grow into mature plants find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats) 	<p>Plants:</p> <ul style="list-style-type: none"> 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. 	<p>Plants:</p> <ul style="list-style-type: none"> recognise that living things can be grouped in a variety of ways. (Y4 - Living things and their habitats) explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 - Living things and their habitats) recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats) 	<p>Plants:</p> <ul style="list-style-type: none"> describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats) 	<p>Plants:</p> <ul style="list-style-type: none"> 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. (Y6 - Living things and their habitats) give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)
	To understand animals and humans	<p>Animals including humans</p> <p>To recognise and know the names of different animals (farm, pets, zoo, sea etc)</p> <p>To know where these animals live</p> <p>To understand about what their body can do and know what contributes to a healthy body</p>	<p>Animals including humans:</p> <ul style="list-style-type: none"> 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. 	<p>Animals including humans:</p> <ul style="list-style-type: none"> 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. 	<p>Animals including humans:</p> <ul style="list-style-type: none"> 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. 	<p>Animals including humans:</p> <ul style="list-style-type: none"> 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. 	<p>Animals including humans:</p> <ul style="list-style-type: none"> describe the changes as humans develop to old age. describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats) describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats) 	<p>Animals including humans:</p> <ul style="list-style-type: none"> 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. 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. (Y6 - Living things and their habitats) give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats) <p>Evolution and inheritance</p> <ul style="list-style-type: none"> 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.
	To investigate living things	<p>Living things and their habitats</p> <p>Identify similarities and differences in different leaves</p> <p>Identify similarities and differences in different seeds</p> <p>Explore how seeds and bulbs grow into plants</p> <p>To group animals according to features and their habitats.</p> <p>To understand about what their body can do and know what contributes to a healthy body</p>	<p>Living things and their habitats</p> <ul style="list-style-type: none"> identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants) identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans) identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans) describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans) Observe changes across the four seasons. (Y1 - Seasonal change) 	<p>Living things and their habitats:</p> <ul style="list-style-type: none"> 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. notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals including humans) 	<p>Living things and their habitats</p> <ul style="list-style-type: none"> explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants) 	<p>Living things and their habitats:</p> <ul style="list-style-type: none"> 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. construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 - Animals, including humans) 	<p>Living things and their habitats</p> <ul style="list-style-type: none"> 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. 	<p>Living things and their habitats</p> <ul style="list-style-type: none"> 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.

		EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Physics	Forces			<u>Forces:</u> <ul style="list-style-type: none">Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)	<u>Forces:</u> <ul style="list-style-type: none">compare how things move on different surfacesnotice that some forces need contact between two objects, but magnetic forces can act at a distanceobserve how magnets attract or repel each other and attract some materials and not otherscompare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materialsdescribe magnets as having two polespredict whether two magnets will attract or repel each other, depending on which poles are facing.		<u>Forces:</u> <ul style="list-style-type: none">explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling objectidentify the effects of air resistance, water resistance and friction, that act between moving surfacesrecognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	
	Light		<u>Light:</u> <ul style="list-style-type: none">identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)		<u>Light:</u> <ul style="list-style-type: none">Recognise that they need light in order to see things and that dark is the absence of lightnotice that light is reflected from surfacesrecognise that light from the sun can be dangerous and that there are ways to protect their eyesrecognise that shadows are formed when the light from a light source is blocked by a solid objectfind patterns in the way that the size of shadows change.			<u>Light:</u> <ul style="list-style-type: none">recognise that light appears to travel in straight linesuse the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eyeexplain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyesuse the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
	Sound		<u>Sound:</u> <ul style="list-style-type: none">identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)			<u>Sound:</u> <ul style="list-style-type: none">Identify how sounds are made, associating some of them with something vibratingrecognise that vibrations from sounds travel through a medium to the earfind patterns between the pitch of a sound and features of the object that produced itfind patterns between the volume of a sound and the strength of the vibrations that produced itrecognise that sounds get fainter as the distance from the sound source increases.		
	Electricity					<u>Electricity:</u> <ul style="list-style-type: none">identify common appliances that run on electricityconstruct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzersidentify 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 batteryrecognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuitrecognise some common conductors and insulators, and associate metals with being good conductors.		<u>Electricity:</u> <ul style="list-style-type: none">Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuitcompare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switchesuse recognised symbols when representing a simple circuit in a diagram.
	Earth, Space and Seasonal Changes	<u>Seasonal Change</u> Talk about the weather Know the names of the four seasons and know Name some changes caused by seasons	<u>Seasonal Changes:</u> <ul style="list-style-type: none">observe changes across the four seasonsobserve and describe weather associated with the seasons and how day length varies				<u>Earth and Space:</u> <ul style="list-style-type: none">Describe the movement of the Earth, and other planets, relative to the Sun in the solar systemdescribe the movement of the Moon relative to the Earthdescribe the Sun, Earth and Moon as approximately spherical bodiesuse the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the sky.	

		EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Chemistry	Materials	<p><u>Materials</u></p> <p>Explore different materials</p> <p>To use talk to describe different everyday materials</p> <p>Group materials identifying similarities and differences</p>	<p><u>Materials:</u></p> <ul style="list-style-type: none"> 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. 	<p><u>Materials:</u></p> <ul style="list-style-type: none"> 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. 	<p><u>Rocks:</u></p> <ul style="list-style-type: none"> 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. 	<p><u>Materials:</u></p> <ul style="list-style-type: none"> 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. 	<p><u>Materials:</u></p> <ul style="list-style-type: none"> 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 changes explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. 	