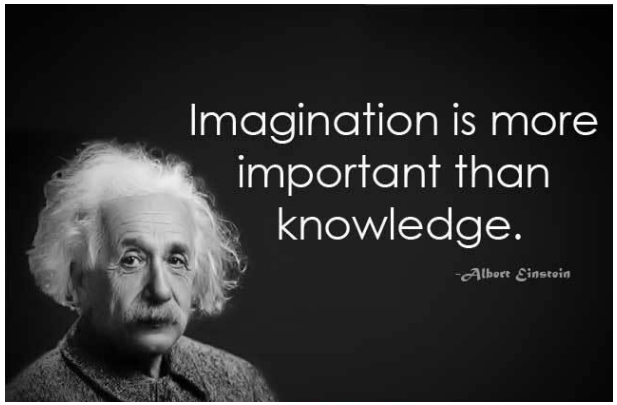
Science

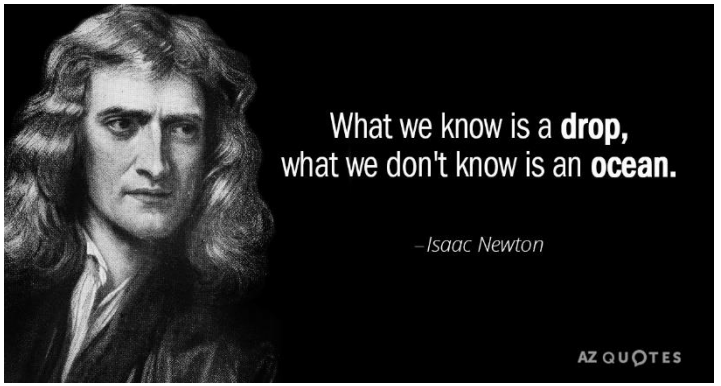
Why

At CVPS, we love science because it is the key to understanding the world. As scientists, we ask questions and answer them through scientific enquiries. We don't just collect facts we discover new ones by having ideas and testing these.

We want our children to be:

- Curious and observant of the world around them.
- Confident to ask questions and be willing to work scientifically to find an answer.
- Solve practical problems and make informed decisions.
- Carry out scientific enquiries and develop their ability to notice, observe, describe, compare, measure, explain.
- Able to think and behave like scientists in all aspects of Science.
- Able to see how science has changed our lives today and where it will take us in the future.
- Inspired to choose careers in STEM.
- Research and communicate their scientific understanding in a variety of ways.





How

At CVPS our science has four strands

Biology

- Animals
- Human body
- Plants
- Living things and their habitats
- Seasonal Changes
- Evolution and Inheritance

Physics

- Earth and Space
- Seasonal Changes
- Forces
- Magnets
- Rocks
- Light
- Sound
- Electricity

Chemistry

- Everyday materials
- Properties and changes of materials
- States of matter

Working Scientifically

- Asking questions
- Planning and carrying out practical enquiries
- Making observations and measurements
- Gathering, recording and presenting data
- Reporting and presenting findings
- Using scientific evidence to support or disprove ideas.

What Science looks like at CVPS in EYFS

EYFS			
	Autumn **Home is Where the Heart is** 	**Spring** **Off on our travels** 	**Summer** **Fun on the Farm** 
Understanding the world	Skills: Discuss various materials to build houses. (M&M/P&C) Compare materials: straw, brick, wood. Which material is best to build a house? Discuss the differences between a habitat and human homes (U/TW) Discuss the importance of recycling and looking after our world (TW) Know which animals live in the sea and why they live in the sea (TW/U) Recreate the ocean children can explore the animals/coral/marine gardens (BI). Recreate different homes i.e. houses, zoo, farm, bug homes etc. (TW)	Skills: Discuss the importance of recycling and looking after our world and the effect of pollution and ways we can help save the world Ask questions and learn about different types of transport and countries Investigate different destinations – weather, location, human and geographical features and how we can get there from the U.K Learn about travel and transport in the past Explore famous people who have contributed to growths in transport Discuss differences and similarities between transport in the past and now Know similarities and differences between the natural world around them and contrasting environments	Skills:

What Science looks like in KS1

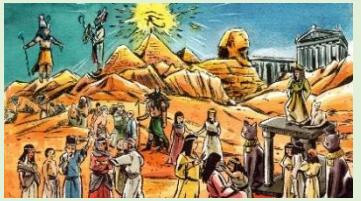
Year 1			
	Autumn **My World and Me** 	**Spring** **We are Britain** 	**Summer** **All Creatures Great and Small** 
Plants		• identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • identify and describe the basic structure of a variety of common flowering plants, including trees	
Animals including humans	• identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense		• 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)
Seasons	• observe changes across the 4 seasons • observe and describe weather associated with the seasons and how day length varies		
Everyday Materials	• distinguish between an object and the material from which it is made • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock • describe the simple physical properties of a variety of everyday materials		

	• compare and group together a variety of everyday materials on the basis of their simple physical properties (and recapped in Summer)		

Year 2			
	Autumn **Adventures in the City** 	**Spring** **World Wide Adventures** 	**Summer** **Adventures in the High Seas** 
Plants	• observe and describe how seeds and bulbs grow into mature plants • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy		
Animals including humans	• 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	• notice that animals, including humans, have offspring which grow into adults	
Living things and their Habitats			• explore and compare the differences between things that are living, dead, and things that have never been alive • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other

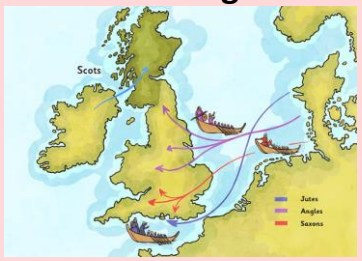
			• identify and name a variety of plants and animals in their habitats, including microhabitats • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food
Uses of everyday materials		• identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching (recapped in Summer)	

What Science looks like in KS2

Year 3			
	Autumn **On Our Doorstep** 	**Spring** **The Ancient World - Britain** 	**Summer** **The Ancient World – Egypt** 
Plants		• identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant • investigate the way in which water is transported within plants • explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	
Animals including humans	• identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • identify that humans and some other animals have skeletons and muscles for support, protection and movement		
Light			• 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 an opaque object • find patterns in the way that the size of shadows change
Rocks		• compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • describe in simple terms how fossils are formed when things that have lived are trapped within rock • recognise that soils are made from rocks and organic matter •	
Forces and magnets	• compare how things move on different surfaces • notice that some forces need contact between 2 objects, but magnetic forces can act at a distance • observe how magnets attract or repel each other and attract some materials and not others • compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials • describe magnets as having 2 poles • predict whether 2 magnets will attract or repel each other, depending on which poles are facing		

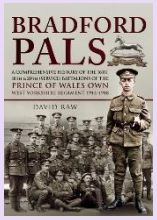
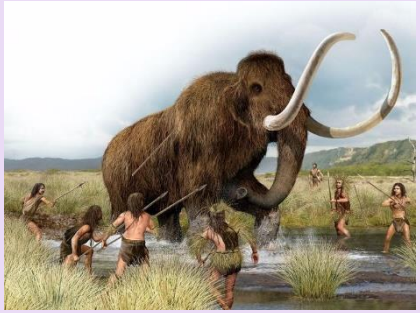
Year 4

	Autumn **Village Settlers**	**Spring** **The Dig**	**Summer** **The Golden Age of Greece**
			
Living things and their habitats	• 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		
Animals including humans	• describe the simple functions of the basic parts of the digestive system in humans • identify the different types of teeth in humans and their simple functions • construct and interpret a variety of food chains, identifying producers, predators and prey		
States of Matter		• compare and group materials together, according to whether they are solids, liquids or gases • observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) • identify the part played by evaporation and condensation in the water cycle and	

		associate the rate of evaporation with temperature	
Sound			• identify how sounds are made, associating some of them with something vibrating • recognise that vibrations from sounds travel through a medium to the ear • find patterns between the pitch of a sound and features of the object that produced it • find patterns between the volume of a sound and the strength of the vibrations that produced it • recognise that sounds get fainter as the distance from the sound source increases
Electricity			• identify common appliances that run on electricity • construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery • recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • recognise some common conductors and insulators, and associate metals with being good conductors

Year 5			
	Autumn **The Rise and Fall of Bradford** 	**Spring** **The Rise and Fall of Britain** 	**Summer** **The Rise and Fall of Baghdad**  
Living things and their habitats	• describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird • describe the life process of reproduction in some plants and animals		
Animals, including humans	• describe the changes as humans develop to old age		
Properties and changes of materials		• 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	
Earth and Space			• describe the movement of the Earth and other planets relative to the sun in the solar system • describe the movement of the moon relative to the Earth • describe the sun, Earth and moon as approximately spherical bodies • use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky
Forces		• explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • identify the effects of air resistance, water resistance and friction, that act between moving surfaces • recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect	

Year 6			
	Autumn **Rebuilding Bradford**  	**Spring** **Where it all Began** 	**Summer** **Rebuilding Britain** 
Living things and their habitats	• describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals • give reasons for classifying plants and animals based on specific characteristics		
Animals, including humans	• identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • 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		
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	
Light			• recognise that light appears to travel in straight lines • use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye • explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them
Electricity			• associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches • use recognised symbols when representing a simple circuit in a diagram

Overall picture

Science
KS1 - The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.
LKS2 - The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.
UKS2 - The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.
Working Scientifically – 'Working and thinking scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study.