

Jennett's Park Science Curriculum

Intent

At our school, we want to inspire and excite our children's natural curiosity about the universe around them, developing an understanding of the impact science has. We want the experience of exploring and investigating scientifically, in a range of contexts, in order to create a continually evolving knowledge and understanding. We will enable pupils to work scientifically, to encourage enquiry, ask questions, take risks and to investigate. Through this, pupils will acquire and apply core skills and knowledge to equip them with resilience for an ever-changing future. These skills are embedded in each aspect of the programme of study, from EYFS to Year 6 and beyond. Topics are revisited, with a sequence of knowledge and concepts, giving pupils the opportunity to further develop their skills and build on prior knowledge. All of our pupils are given opportunities to ask questions, make predictions, investigate and be able to reflect and reach conclusions. The curriculum is designed to ensure that children are able to acquire key scientific knowledge through practical experiences; using equipment, conducting experiments, building arguments and explaining concepts confidently. Technical vocabulary for the disciplines of chemistry, biology and physics is taught across the school; key skills are mapped for each year group and are progressive throughout the key stages. These ensure systematic progression in accordance with the Working Scientifically skills expectations of the National Curriculum. Cross-curricular opportunities are also identified and planned to ensure contextual relevance.

Educating for Wisdom, Knowledge and Skills	To help grow resourceful, resilient and reflective children who are equipped with the skills, knowledge and tenacity empower themselves, their learning throughout their lives.
Educating for Hope and Aspiration	To inspire and enrich lives beyond current opportunities and experiences in order to open minds to the potential their future holds
Educating for Community and Living Well Together	To be a multi-cultural, inclusive community of individuals loved by God who feel valued and involved where we create qualities of character to enable people to flourish.
Educating for Dignity and Respect	That children might know how much that they are loved and valued by so that they might show dignity and respect for themselves and others by carefully and safely thinking through their actions.

Implementation

Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all pupils are capable of achieving high standards in science. In EYFS, science is predominately delivered as part of continuous provision, through high-quality learning environments including access to the outdoors. Where appropriate, adult-led science inputs are delivered to inspire our pupils. Within KS1 and KS2, science planning is based on the National Curriculum content for each year group. Teachers are aware of the knowledge and skill development of the previous years to ensure that new learning builds on prior experiences. Additionally, as the children's knowledge and understanding increases, they become more proficient in selecting, using scientific equipment, collating and interpreting results; they become increasingly confident in their growing ability to come to conclusions based on real evidence. The oracy skills displayed by our pupils will embed the technical skills and knowledge further, and will increase the level of knowledge displayed in a variety of formats; our pupils are constantly asked why, what if, explain and build on, as well as being encouraged to challenge and question each other. This display of skills and knowledge can be collated through diagrams, descriptions, discussions, quizzes, formal write-ups and physical investigations developed over time from EYFS through to the end of KS2. Science is taught in planned and arranged blocks by the class teacher, with a discrete approach. This strategy enables the achievement of a deeper knowledge. Working Scientifically skills are embedded into lessons to ensure that skills are systematically developed throughout the children's school career; new vocabulary



Jennett's Park - Empowering our children to flourish and achieve under God's love



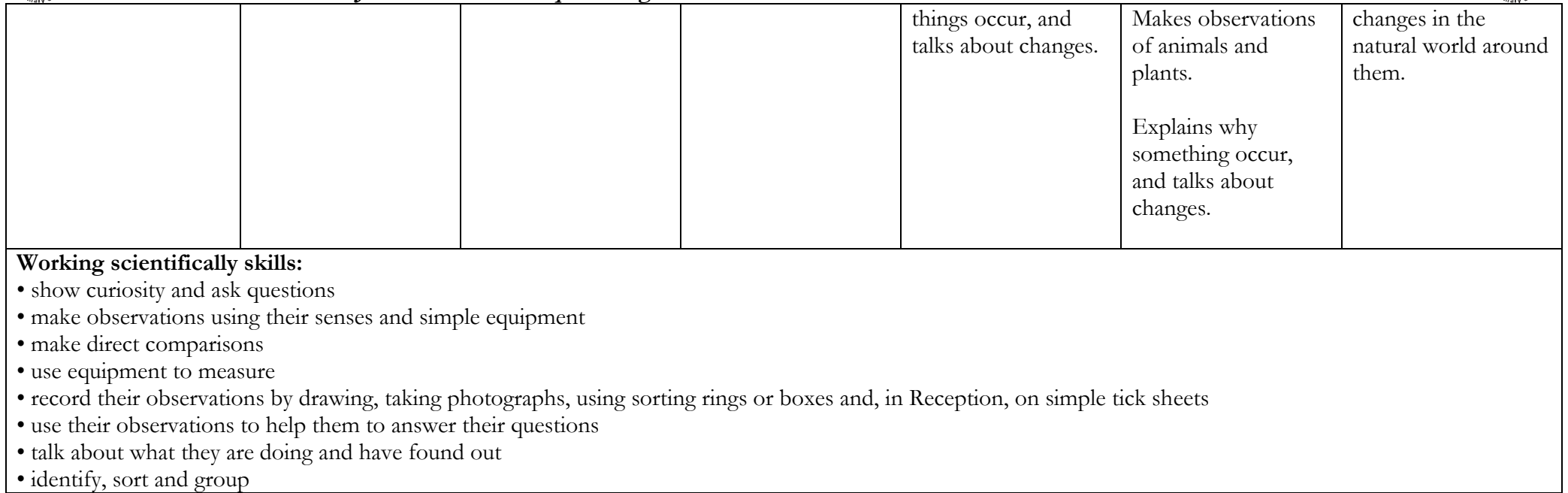
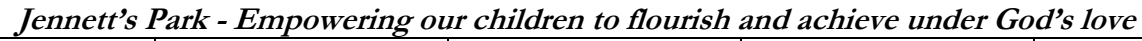
and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the programme of study. At the end of each unit, key knowledge is reviewed by the children, rigorously checked by the teacher and consolidated as necessary.

We encourage further interest in science through our annual science week, which is accessible to all years from nursery through to year 6.

Impact

Pupils will talk positively about science and themselves as scientists, feeling empowered to ask questions and investigate. Pupils will be able to articulate ways in which they can answer questions using the five key methods of scientific enquiry: comparative and fair testing; observation over time; research; classifying and observing changes over time and pattern seeking. Our pupils will leave our school with an avid interest, knowledge and the skills required to enable them to further develop as scientists and pursue further education with a view to future employment in the science industry. This variety of teaching, learning and reviewing of knowledge and skills enables all our pupils to achieve the best possible outcomes.

EYFS - Nursery						
	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Understanding the World	<p>Remembers where objects belong.</p> <p>Enjoys small world play.</p>	<p>Notices features and details of objects.</p> <p>Can talk about what they have observed.</p> <p>Enjoys playing with small world reconstructions.</p>	<p>Builds and constructs small world reconstructions.</p>	<p>Notices and talks about features.</p> <p>Enjoys small world reconstructions.</p> <p>Talks about why things happen.</p> <p>Shows care and concern for living things.</p>	<p>Comments and asks questions about the world.</p> <p>Talks about why things happen and how things work.</p> <p>Begins to understand growth, decay and changes over time.</p> <p>Shows care and concern for living things and the environment.</p>	<p>Comments and asks questions.</p> <p>Talks about why things happen and how things work.</p> <p>Developing understanding of growth and change.</p> <p>Shows care and concern for the environment and begins to understand effect their behaviour has on environment.</p>
EYFS - Reception						
Understanding the World	<p>Talk about the places in our local environment that we are familiar with – home, school, park, shop.</p> <p>Observe the changes that occur during Autumn.</p>	<p>Recognise the changes in different seasons.</p> <p>Recognise the changes that happen to ingredients when baking bread.</p>	<p>Looks closely at similarities, differences, patterns and change in nature.</p> <p>Knows about similarities and differences in relation to places, objects, materials and living things.</p>	<p>Talks about the features of their own immediate environment and how environments might vary from one another</p> <p>Makes observations of animals and plants and explains why</p>	<p>Talks about the features of their own immediate environment.</p> <p>Talks about how environments might vary from one another.</p>	<p>Makes observations of the natural world.</p> <p>Knows similarities and differences in the natural world around them and a contrasting environment.</p> <p>Understands processes and</p>




Year 1						
	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Science Curriculum theme	Who am I? - Animals including Humans	Celebrations - Everyday materials <i>Wonderful Weather - Weather and seasonal changes</i>	On Safari - Animals including Humans	Holiday – Everyday materials and Animals including Humans <i>Wonderful Weather - Weather and seasonal changes</i>	Treasure Island - Plants	Polar adventure - Everyday materials and Animals including Humans <i>Wonderful Weather - Weather and seasonal changes</i>
Comparative and fair testing	What instrument will be the most effective to get children's attention on the playground?	Do all materials make shadows?	What is the best hiding place for invertebrates? Do invertebrates always prefer the dark? Which colour is the best for warning other animals?	What is the best way to keep a bottle of water cool on a hot day?	Can you make a seaworthy raft? What materials are best to shade you from the sun? What is the best material to build a shelter?	
Observation over time		<i>How do the seasons effect the weather? What changes can we see around us as the seasons change? How does day length vary throughout the year?</i>		<i>How do the seasons effect the weather? What changes can we see around us as the seasons change? How does day length vary throughout the year?</i>		<i>How do the seasons effect the weather? What changes can we see around us as the seasons change? How does day length vary throughout the year?</i>
Research	Which smell do you like the best? Which smell do you not like?	How many sources of light are there around our school?			Why did sailors need to make really dry biscuits? How can we survive on a desert island?	What materials will keep a polar adventurer warm?
Pattern seeking	What is the most effective material for a stress ball?	What materials make the best instruments to show we are celebrating?				How can you tell if an animal is the hunter or hunted?

Jennett's Park - Empowering our children to flourish and achieve under God's love

Identifying, classifying and grouping	What parts of my body can I name? Identify and name basic body parts	Can I list the main parts of a flower? How many everyday materials can I name?	Which invertebrates am I aware of? Can I name any? Can I list animals that are carnivores, herbivores and omnivores?	Which common animals including fish, amphibians, reptiles, birds and mammals do I know the name of? Can I list animals that are carnivores, herbivores and omnivores? How many everyday materials can I name and identify?	What common flowers can I recognise and name? Can I identify and name a variety of animals including fish, amphibians, reptiles, birds and mammals?	Which birds, fish and mammals can I name? Can I list animals that are carnivores, herbivores and omnivores?
Working scientifically skills	To observe things using simple equipment. To identify and sort different things. To collect and record data to help answer questions.	To observe things using simple equipment. To identify and classify. To perform simple tests. To use observations and ideas to suggest answers to questions. To gather and record data to help in answering questions.	To ask simple questions and recognise that they can be answered in different ways. To observe closely. To perform simple tests. To identify and classify. To gather and record data to help in answering questions. To describe the simple physical properties of a variety of everyday materials.	To ask simple questions and recognise that they can be answered in different ways. To observe closely, using simple equipment. To perform simple tests. To identify and classify. To use observations and ideas to suggest answers to questions. To gather and record data to help in answering questions.	To ask simple questions and recognise that they can be answered in different ways. To observe closely, using simple equipment. To perform simple tests. To identify and classify. To use their observations and ideas to suggest answers to questions. To gather and record data to help in answering questions.	To ask questions and recognise that they can be answered in different ways observing closely To perform simple tests. To identify and classify different materials and animals.

Year 2

	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
	<i>Jennett's Park - Empowering our children to flourish and achieve under God's love</i>					
 Science Curriculum theme	Animals including humans	Materials	Plants	Move it	Living things and their habitats	Little MasterChefs
Comparative and fair testing	How does exercise effect my body?	What are the best materials to build a house that will withstand a fire?	What do seeds need for germination? What do plants need to stay healthy?	How can a force help an object move further? How do different surfaces effect the speed of a moving object?		How do different ingredients change the taste of food?
Observation over time			How do seeds grow? How does light effect growing plants?			How can we keep bread fresh?
Research	How do animals produce offspring? What do humans need to survive? Why is exercise important? How to keep healthy?	Which materials are used in my house? Why is a material better for one job than another?	Research a variety of plants from around the world such as Venus Fly trap and Mimosa pudica		How do living things grow, move and get nutrients? What living things can you find in your local area? How do animals adapt to their habitat and the weather? How do living things survive?	What does a balanced diet mean? Where does food come from?
Pattern seeking	Is there a pattern between the reproduction of different types of animals?		How can different conditions effect how plants grow?		Is there a pattern between types of animals and the climate they live in?	

Jennett's Park - Empowering our children to flourish and achieve under God's love

Identifying, classifying and grouping		How can we classify materials by their uses and properties?	Identifying the parts of a plant	How can objects move in different ways (e.g bent and squashed or pulled)?	Sorting living things into whether they are alive, dead or never alive	
Working scientifically skills <ul style="list-style-type: none"> - To observe things using simple equipment. - To identify and sort different things. - To collect and record data to help answer questions. 	To collect and record data to find out what happens to our heart rate when we do a variety of exercise.	Identifying and sorting a variety of different materials	To observe how changing the environmental variables affects how a plant grows To identify the parts of a plant and explain their function To collect data and use it to describe what a plant needs to grow well	To observe how an object moves by using a different intensity of force. To gather and record data to show what makes a toy car travel further. To sort objects into the way they can move.	To identify a variety of different habitats	To observe how and why muffins rise To observe and record the best way to keep bread fresh To sort types of foods into food groups.

Year 3						
	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Science Curriculum theme	Rocks and Soils	Light Mirror, mirror	Forces and magnets Opposites attract?	Animals including humans Food and our bodies		Plants How does your garden grow?
Comparative and fair testing	Testing rocks. Which rocks are best for various purposes? Testing hardness and permeability.	Are some surfaces more reflective than others? Test and put into order. How are shadows formed? Can they change size?	Prediction focus on magnetic poles – Will they attract or repel?			How do plants take on water? Celery/carnation investigation What is the best medium for growing plants? Soil or sand? Cotton wool?
Observation over time	How are fossils made? What is a fossil? How are they so well preserved over time?	Make a timeline of the history of mirrors showing the major dates involved.		Keeping food diaries over a period of time		How much water do plants need to live?

		Research two of the key landmarks in the history of mirrors in detail and put them on a timeline			What do plants need to grow? Light, space and depth
Research	Do we eat rocks? Researching amounts of (rocks) minerals in our food	Produce a map of the world showing where mirrors were first used and the dates Produce a flowchart of how mirrors are made today. Research how mirrors were first used by astronomers to make telescopes and space discoveries.	How do you make a strong magnet? Are magnets found in nature? Do magnets lose their magnetism? Research on the Maglev Train.	Research a range of animal diets to compare and contrast Human and animal skeletons – naming main bones and describing joints What muscles make up our body?	Naming parts and functions of parts of plants and trees. How are plants pollinated?
Pattern seeking	What is soil like? Collect various soil samples for investigation. Is all soil the same?	What happens to shadow length when we change the distance between the light source and the object?	Are bigger magnets stronger than smaller magnets?	How do muscles work in pairs?	
Identifying, classifying and grouping	Where can rocks be found around us? Rock hunt to identify, name and recognise properties of rocks Exploring different rock families - Igneous, metamorphic, sedimentary and man made	What are sources of light around our school?	To name some materials that magnets can attract and some they cannot. Are all magnets the same? Investigation different types, strengths and shapes of magnets. Which materials can a magnetic force pass through?	identify different food groups and how they make up a balanced diet identify and group animals with and without skeletons. Which popular drinks contain the most sugar? Which foods contain the most fats?	
Working scientifically skills	Investigation – Testing hardness and permeability of rocks.	Investigation - Do all objects make shadows? Which materials create the darkest shadows?	Children to plan their own investigations from one of the following questions.	- Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	The very thirsty cactus investigation. Watching and measuring a cactus from

	<ul style="list-style-type: none"> - Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions 	<p>Focus on fair testing</p> <p>How far can we make light reflect? Creating mirror mazes</p> <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 	<p>Are different magnets equally strong?</p> <p>How far does the magnetic force spread away from a magnet?</p> <ul style="list-style-type: none"> - Using straightforward scientific evidence to answer questions or to support their findings. 	<ul style="list-style-type: none"> - Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions - Identifying differences, similarities or changes related to simple scientific ideas and processes 	<p>needing water to well saturated.</p> <ul style="list-style-type: none"> - Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
--	---	--	--	--	---

Year 4

	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Science Curriculum theme	States of matter	Electricity	Living things and their habitats	The digestive system	Sound	Scientists and Inventors
Comparative and fair testing	Do gases have weight? Investigating which fizzy drink has the most gas in.	Which materials conduct electricity? Investigating which materials are conductors and which are insulators/	Creating classification keys – comparing vertebrates and invertebrates	Which liquids can affect our teeth? Test using hard boiled eggs in different liquids (orange juice, water, cola, vinegar, Lucozade) to see how they can affect teeth over time	How does distance from the source effect the volume of the sound? Including predictions and need for measurable data. What material makes the most effective sound proofing?	

Jennett's Park - Empowering our children to flourish and achieve under God's love

					Use an alarm clock inside a container and wrap different materials around.	
Observation over time	Where is the best place to dry washing? Investigating the time it takes for tea towels to dry in different places.		Investigating environmental changes and endangered species	Eggsperiment		
Research		Where does electricity come from? Investigating renewable and non-renewable energy sources How do switches work and why do we need them?	How are vertebrates grouped.	What are the different parts of our digestion system and what do they do?	How can pitch be changed?	Hero of Alexandria – invented the first steam engine. Look at steam propelled vehicles Investigate the Astrolabe of Antikithira (computer) Erathosthenis and how he calculated the circumference of the earth Archimedes
Pattern seeking		What type of items are powered by mains and what use batteries.			How can pitch be explained?	
Identifying, classifying and grouping	Children learn the properties of solids, liquids and gases and explore their environments, identifying and sorting		How can we organise objects (biscuits, animals, plants) based on common, observable characteristics			

	items into the three states.					
Working scientifically skills -	Investigation – do gases have weight Investigating the changes in state of water	Children use equipment to complete and incomplete circuits, comparing the two.		Scientific vocabulary related to the digestive system.		

Year 5						
	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Science Curriculum theme	Earth and Space Forces (gravity and air resistance)	Earth and Space Forces (friction and water resistance)	Properties and changes of materials	Properties and changes of materials	Forces (levers and pulleys)	Living things and their habitats Animals including humans
Comparative and fair testing		Which material creates the least amount of friction? (so we can effectively transport a space shuttle) Which shape creates the least water resistance for a dingy? Weight stays the same, but the shape changes / sinking?	Which metal is the most effective electrical conductor? Which material would be the most effective to use in a World War One trench? (chosen variable is the material)	Which material would be most suitable for a British soldier's uniform when in the trenches? Changing the material around the cup full of ice.	Which pulley system is the most efficient (simple pulley or block and tackle pulley)?	How have humans changed over time? How do lifecycles vary between animals? What is reproduction in animals?
Observation over time	How do our shadows change as the Earth rotates? Rotation of the Earth via recording direction	The phases of the moon: homework		Which material would be the most suitable for a British soldier's uniform in the trenches? - looking		

Jennett's Park - Empowering our children to flourish and achieve under God's love

	of shadow on a sundial, using a compass.			into thermal insulation and recording this over several minutes		
Research	Video clip on the rotation of the Sun and how this affects day and night.	Planetarium visit: planet features, our solar system construction and the rotation of the Earth affecting day and night Satellite developer visit: discussing the features of space and how this affects the materials used when Building satellites Website: Images taken from websites of space shuttles and dinghies		Website links: effective trenches in World War One and their properties and materials used (and why).	How do you make an effective lever? Website links and videos: on Egyptian methods used to manoeuvre pyramid blocks into place using pulleys and how a shaduf works How do you make an effective lever?	Video clips on animal life cycles (Option: children to use websites for research into life cycle)
Pattern seeking	What is the most effective shape for a space shuttle? The larger the wingspan, the longer an object will be up in the air. The wider an object, the quicker it will land as it is less aerodynamic.	Which material creates the least amount of friction? The smoother an object the less friction is created Which shape creates the least water resistance for a dingy? The narrower an object, the more streamlined it is.				
Identifying, classifying and grouping			Properties of materials investigation: which materials could we use to improve the conditions of the	Which material would be the most suitable for a British soldier's uniform in the		Grouping animals via similarities and differences in lifecycles.

			trenches for the British soldiers?	trenches- looking into thermal insulation How do I separate different properties?		
<p>Working scientifically skills</p> <p>-Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p> <p>-Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</p> <p>-Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p>-Identifying scientific evidence that has been used to support or refute ideas or arguments</p>	<p>How do our shadows change as the Earth rotates? - scientific enquiry</p> <p>Measurements taken using compass of the direction of the Sun</p> <p>Tables and graph drawn to show the link between time and direction of the sun</p> <p>Mention of heliocentric model,</p>		<p>Discussing variable of using different metals when investigating the most effective electrical conductor</p> <p>Grading strength of scratches on hard materials, gauging brightness of conductors, transparency of materials</p> <p>Diagram drawn of circuit created when testing for best electrical conductor</p>	<p>Planning investigation to investigate best thermal insulator and variables</p> <p>Temperature taken when investigating insulation, and time recorded</p> <p>Graph recorded to show temperature and time when measuring insulation</p> <p>Diagram drawn of experiment, when mixing substances together to inflate a balloon</p>	<p>Children varying the level and pulley used, to create an effective system that can lift water</p>	

Jennett's Park - Empowering our children to flourish and achieve under God's love

-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	<p>discovered by Galileo and Copernicus</p> <p>Recording investigation into books</p> <p>Presentation on Seesaw on the features of the planets</p>			<p>Written investigation for thermal investigation and for substances being mixed to inflate balloon</p> <p>Seesaw recorded presentation on trenches and materials chosen because of their properties</p>	<p>Recording and presenting a lever and a pulley, as well as a shaduf in a cross-sectional diagram.</p>	<p>Drawing a lifecycle of the animal, and a labelled timeline of how humans change over time.</p>
--	--	--	--	---	---	---

Year 6

	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Science Curriculum theme	Evolution and Inheritance	Light	Living things and their habitats	Animals including humans	Plants	Electricity
Comparative and fair testing	Which bird 'beak' has adapted best for which type of bird food?			How does smoking affect the body? How can lung capacity be measured?		Does increasing the voltage affect the brightness of the bulb?
Observation over time	How did the dominant species of moths change in the 1800s?		What conditions are needed for bread to go mouldy?	How are nutrients and water transported around the body?		

			Is yeast a living thing?			
Research	How have animals adapted to live in their habitat? Who was Charles Darwin?		Who was Edward Jenner and what did he discover?			Making circuits using symbols – will they work?
Pattern seeking	Are all animals/plants adapted to their environment?	How does light travel? What is the link between an object's distance from a light source and its shadow?		How do energy drinks impact exercise endurance?		
Identifying, classifying and grouping			How can we group animals?		What are the functions of different parts of the flower?	
Working scientifically skills	-Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary – bird beak type and seeds investigation, only changing one variable at a time -Identifying scientific evidence that has	-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 Create periscopes	-Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary – changing one variable to recognise different conditions that impact mould growth	-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	-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 – accurate scientific diagrams	-Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate

Jennett's Park - Empowering our children to flourish and achieve under God's love

	<p>been used to support or refute ideas or arguments – Darwin's Theory of Evolution</p>		<p>-Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs – linking to maths and recording mould growth as a percentage</p> <p>-Identifying scientific evidence that has been used to support or refute ideas or arguments</p>	<p>-Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</p> <p>Smoking investigation using straws</p> <p>Dissect a heart</p>	<p>Revisit of prior learning</p>	
--	---	--	---	--	----------------------------------	--