



Science Policy

Date written / reviewed	October 2024
Date of next review	October 2026
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Chair of Governors	<i>J Goodwin</i>

Intent

At Friezland our science curriculum develops curiosity and the courage to think critically and ambitiously and encourages children to explore and investigate. Science teaches an understanding of natural phenomena. It aims to stimulate a child's curiosity in finding out why things happen in the way they do. It teaches methods of enquiry and investigation to stimulate creativity. Children learn to ask scientific questions and begin to appreciate the way science will affect their future on a personal, national and global level.

The National Curriculum 2014 states: 'A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics...through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena.'

The national curriculum for Science aims to ensure that all pupils:

- promote an understanding of the essential nature of science.
- promote curiosity; the spirit of enquiry; and enthusiasm for science.
- develop an awareness and respect for the environment.
- engage in activities that extend knowledge and deepen understanding.
- promote various ways of tackling tasks, recovering information, and communicating findings, thereby encouraging the development of children as independent learners.
- contribute to pupils' personal and social development.
- promote equal opportunities for all.

Implementation:

The Foundation Stage

We teach science in the reception class as an integral part of the topic work covered throughout the year. As the reception class is part of the Foundation Stage Early Years, we relate the scientific aspects of the children's work to the objectives set out in the Understanding the World aspect of the Early Years Foundation Stage (EYFS) document and the Early Learning Goals (ELGs) which underpin the curriculum planning for children aged 0-5 years. Science makes a significant contribution to developing a child's understanding of the world, for example through investigating what floats and what sinks when placed in water.

Key Stages 1 and 2

Class teachers are responsible for delivering the Science lessons to their class. We recognise that in all classes, children have a wide range of scientific abilities and we ensure that we provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this by:

- setting open ended tasks and investigations that can have a variety of responses;
- adapting tasks to ensure progression for all abilities;
- giving opportunities for children to work in a variety of groups e.g. mixed ability, adapted and friendship;
- using TAs to support individuals and groups of children as appropriate, and
- first hand experiences including use of the outdoor area, visits (e.g. Eureka and Castleshaw), virtual visitors (eg: Skype A Scientist) and visitors to school (e.g. SciTech).

Curriculum Planning

At Friezland we follow the 2014 National Curriculum for Science ensuring coverage over our two-year cycle. Where possible science is linked to the termly topics with investigative skills threaded throughout the year.

Curriculum planning is organised into three elements: long-term (appendix 1); medium-term and short-term.

- The long-term plan maps the contexts for learning and subject based units of work studied in each term and key stage.
- Medium-term plans record the detail to be taught over a block of time. They include learning 'hooks', overall objectives and subject-based key skill assessments for each week.
- Short-term planning is used by class teachers to identify how specific learning objectives, activities and success criteria are adapted to support access to our curriculum for every child.

Planning may also include:

- suggested activities, including the use of new technologies;
- investigations, including teaching the skills needed to plan an experiment in Key Stage 1 and progressing to writing up an experiment by Year 6 (see appendix 2 for proformas);
- safety notes;
- resources;
- cross-curricular opportunities;
- the use of support staff;
- teaching and grouping strategies which ensure appropriate activities for all pupils, and
- enrichment through the appropriate inclusion of community, local, global and current issues.

Cross Curricular Learning

English

Science contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. Some of the texts that the children study during English are of a scientific nature. The children develop oral skills in science lessons through discussions (for example of the environment) and through recounting their observations of scientific experiments. They develop their writing skills through writing reports and projects and by recording information.

Mathematics

Science contributes to the teaching of Mathematics in a number of ways. When the children use weights and measures, they are learning to use and apply number. Through working on investigations, they learn to estimate and predict. They develop accuracy in their observation and recording of events. Many of their answers and conclusions include numbers. They use their results to construct graphs and charts and learn to interpret graphical data.

Personal, Social, Health and Economic Education (PSCHE Ed)

Science makes a significant contribution to the teaching of PSCHE. This is mainly in two areas. Firstly, the subject matter lends itself to raising matters of citizenship and social welfare. For example, children study the way people recycle material and how environments are changed for better or worse. Secondly, the

subject gives children numerous opportunities to debate and discuss. Key Stage 2 children can organise campaigns on matters of concern to them, such as healthy lifestyles and drugs, alcohol and tobacco education. Science thus promotes the concept of positive citizenship.

Computing

Computing enhances the teaching of science in our school significantly, because there are some tasks for which computing is particularly useful. It also offers ways of impacting on learning which are not possible with conventional methods. Software is used to animate and model scientific concepts, and to allow children to investigate processes which it would be impracticable to do directly in the classroom. Children use computing to record, present and interpret data, to review, modify and evaluate their work, and to improve its presentation. They learn how to find, select, and analyse information on the Internet and on other media.

History

Science is enhanced through the study of famous scientists and discoveries from the past. These support children's understanding of scientific developments throughout History and make science learning 'real'. Children see how science has contributed to technologies that we use every day, such as the development of electricity and phones.

Inclusion

At Friezland we teach Science to all children, whatever their ability. It is part of the School Curriculum Policy to provide a broad and balanced education to all children. We provide learning opportunities that are matched to the needs of children with learning difficulties and those learning English as an additional language, as well as providing appropriate, challenging planned work for those children who are working at Greater Depth and Mastery. Work in Science takes into account the targets set for individual pupils.

Equal Opportunities

Provision is made for all pupils regardless of ability, disability, special educational need, medical condition, gender, faith or ethnicity. All children have a right to be treated equally and the school will take measures against adults who do not abide by this ethos.

Health and Safety

It is important that all teachers are aware of the responsibility they have regarding health and safety both inside and outside the classroom. Teachers need to take account of both the children's and their own health and safety when involved in Science activities. Risk assessments for investigations are included with medium term planning.

If teachers are unclear as to whether a material can be used in school, they should refer to the school's Generic Science Risk Assessment (appendix 3) and CLEAPSS safety guides for permission to use a specific material and its methods of use. Teachers must also take into account the school's Health and Safety policy.

Impact

The class teacher will assess children's work in science by making informal judgements during lessons by questioning, observing and eliciting children's ideas. On completion of a piece of work, the teacher assesses it and uses this assessment to plan for future learning. Written or verbal feedback is given to the child to

help guide their progress. Older children are encouraged to make judgements about how they can improve their own work.

Reporting to Parents

Parents receive a written assessment of their child's ability in Science at the end of each academic year and have the opportunity to discuss their child's progress during the Autumn and Spring term parent's meetings.

Resources

Practical science equipment is kept centrally in labelled science trays on the main corridor. Teachers should collect resources as they need them and ensure they return them back to the cupboard when they have finished their experiment. Larger science equipment and class sets of resources are loaned by the DLP secondary school Saddleworth. These are collected and returned to Saddleworth school on a fortnightly basis, as required, throughout the school year.

Topic related science books and reference books are found in the non-fiction library.

Roles & responsibilities

Headteacher & Governing Board

The Headteacher and Governing Board are responsible for:

- involvement in focus groups to develop policy and practice;
- overseeing the standards of science, and
- approving the acquisition of new resources.

Subject Leader

The subject leader is responsible for:

- the audit and identifying of resources for purchase by the Business Manager;
- liaising with the Business Manager to ensure effective maintenance and ease of access to resources;
- monitoring and evaluating the implementation of the scheme of work;
- delivering relevant inset training to other members of staff;
- reviewing long, medium, and short-term planning;
- reporting to governors on standards, and
- writing, modifying and reviewing, in consultation with other staff and governors, the policy document for science.

Class teacher

The Class teacher is responsible for:

- planning and delivering the Science Curriculum;
- assessing children's work both formatively and summatively, and
- reporting to parents and science co-ordinator.

Monitoring & Evaluating

Policy and practice in Science are monitored and evaluated on a regular basis in accordance with the school development planning cycle. The provision of science will be monitored by the science co-coordinator in conjunction with the headteacher. Monitoring takes the form of lesson observation, planning and book scrutinies and pupil questionnaires. Feedback will be given to all staff along with recommendations to inform future policy and planning. Personal development of the science co-coordinator will be maintained to ensure that new initiatives and curriculum updates are fed back to staff and incorporated into regular practice. All staff are involved in the review and development of the science policy.

Data Protection Statement

The procedures and practice created by this policy have been reviewed in the light of our Data Protection Policy. All data will be handled in accordance with the school’s Data Protection Policy.

Data Audit for the Science Policy					
What?	Probable Content	Why?	Who?	Where?	When?
Pupil assessment data	Name D.O.B. Test data Teacher Assessment data	Monitor a child’s progress and identify next steps Well-Being of Your Child	All Staff (as necessary)	Staff electronic records Paper tests are stored in locked filing cabinets in each classroom / basement Data is deleted / shredded as necessary	Held on File throughout a child’s time at school Key data is passed onto a new School when moving on Some data is archived until the child is 25 (e.g. SEND pupil)

As such, our assessment is that this policy:

Has Few / No Data Compliance Requirements	Has A Moderate Level of Data Compliance Requirements	Has a High Level of Data Compliance Requirements
	✓	

This policy will be reviewed every three years or sooner if legislation / school assessment systems change.

Appendices:

1. Long Term Plan
2. Science Investigation Proformas
3. Generic Science Risk Assessment
4. Assessment Criteria (I can... statements)

Overview: Long term			Class / Year groups: 1 / Reception			
Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Subject	UW – The World (Science + Geography)	UW – People and Communities (RE + History)	UW – The World + People and Communities (Science + History)	UW – The World (Science)	UW – The World (Science + Geography)	UW – The World (Geography, History + Science)
Theme / Topic	Animals	Festivals	Space	Superheroes	Our Garden	The Seaside and Holidays
Main Enquiry	Are all animals the same?	Which festivals do you celebrate?	What can we find in space?	What superpower would you like to have?	What grows in my garden?	Why do we go to hot places for our holidays?
Coverage	<ul style="list-style-type: none"> * Dinosaurs * Zoo/Wild/Jungle Animals * Pets 	<ul style="list-style-type: none"> * Bonfire Night * Remembrance Day * Finding out how people celebrate the religious festivals of Eid, Hanukkah, Diwali + Christmas. 	<ul style="list-style-type: none"> * Learn the names and order of the planets. * Finding out about people who have visited space. 	<ul style="list-style-type: none"> * Healthy eating * Exercise * Sorting natural and man-made materials. * Investigating which materials are attracted to magnets. 	<ul style="list-style-type: none"> * Finding out what plants need to grow. * Making fact files about minibeasts. * Learning facts about insects. 	<ul style="list-style-type: none"> * Finding countries on a World Map. * Find out how to travel to different holiday destinations. * Investigating which materials float and sink.
Key Knowledge	<ul style="list-style-type: none"> * Dinosaurs lived on Earth during the Jurassic and Cretaceous Periods. * Know which dinosaurs are herbivores and carnivores. 	<ul style="list-style-type: none"> * We celebrate Bonfire Night on 5th November by lighting fires and setting off fireworks. * We celebrate Remembrance Day on 11th November 	<ul style="list-style-type: none"> * Name and order the 8 Planets in our Solar System. * The Sun is a star. * The Sun reflects off the moon to light the night. * The Earth has one moon. 	<ul style="list-style-type: none"> * Sort food into healthy and unhealthy. * Exercise increases our heart rate. * Name and sort materials into man-made and natural. 	<ul style="list-style-type: none"> * Plants need sun, water and soil to grow. * Label the parts of a plant – roots, seed, stem, leaves, flower. * Slugs, worms + woodlice live in dark, damp places. 	<ul style="list-style-type: none"> * Know where England is on a World Map. * Find holiday destinations (Spain, France, America) on a World Map. * Know we travel abroad on an

	<ul style="list-style-type: none"> * Know the meaning of extinct. * Name animals that live in the jungle. * Know the difference between wild and tame. * Know how to care for pets. 	<ul style="list-style-type: none"> by wearing red poppies. * Muslims celebrate Eid after fasting during Ramadan. * Jews celebrate Hanukkah by lighting the Menorah. * Hindus celebrate Diwali by lighting Diva lamps. * Christians celebrate Christmas and the birth of Jesus. 	<ul style="list-style-type: none"> * Neil Armstrong walked on the moon on 21st July 1969. * Tim Peake was the first British Astronaut. He stayed on the International Space Station in 2015. 	<ul style="list-style-type: none"> * Know that magnets attract most metals but not aluminium. 	<ul style="list-style-type: none"> * Insects always have 6 legs. * Learn the life cycle of a butterfly. 	<ul style="list-style-type: none"> aeroplane or on a ship/ boat. * Know wood and plastic float and metal and glass sink. * To compare holidays now and in the past.
Additional Enquiries	<ul style="list-style-type: none"> * Science - Health and Hygiene * RE – Which stories are special and why? 	<ul style="list-style-type: none"> * RE – Which times are special and why? 	<ul style="list-style-type: none"> * RE - Chinese New Year * RE – What is so special about our world? 	<ul style="list-style-type: none"> * RE – Easter * RE – Which people are special and why? 	<ul style="list-style-type: none"> * Which places are special and why? 	<ul style="list-style-type: none"> * RE – Where do we belong? * History - Windrush

Year A

Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Subject	Physics		Biology		Biology	
Theme / Topic	Seasonal Change (Autumn & Winter)		Animals including Humans (Classifying & Lifecycles)	Animals including Humans (Exercise, Healthy eating & Hygiene)	Plants (Identifying Trees, Plants & their Parts)	Plants (Growing Healthy Plants)
Main Enquiry	Why are there so many leaves on the floor?		Why are humans not like tigers?	How will 5 a day keep me healthy?	Which plants and birds would we find in our park?	How quickly do plants grow?
Coverage	Knowing about seasonal changes.		Classifying and life cycles.	Exercise, healthy eating and hygiene.	Identifying trees, plants and their parts.	Growing healthy plants.
Key Knowledge	<ul style="list-style-type: none"> *Know the names and characteristics of each season. *Know about the weather associated with each season. *Know about and observe the changes in the seasons including how day length varies. *Know some familiar symbols associated with weather maps. 		<ul style="list-style-type: none"> *Classify a range of animals according amphibian, reptile, mammal, fish and birds. *Know how to classify animals by what they eat (carnivore, herbivore and omnivore). *Know how to describe the structure of a variety of animals. *Know how to name the parts of the human body that can be seen. *Know how to link the correct part of 	<ul style="list-style-type: none"> *Know the basic stages of a life cycle for animals (including humans). *Know why exercise, a balanced diet and good hygiene are important for humans. *Know what is reasonable for someone of their age to do with regard to exercise. *Know that certain people can be very good at certain sports but not others. *Know why certain foods may taste nice 	<ul style="list-style-type: none"> *Know and name a variety of common, wild and garden plants. *Know and name the petals, stem, leaves and root of a plant. *Know and name the roots, trunk, branches and leaves of a tree. *Name the difference between deciduous and evergreen trees. *Know the names of our common birds, including sparrow, starling, robin, blackbird etc. 	<ul style="list-style-type: none"> *Know and explain how seeds and bulbs grow into plants. *Know what plants need in order to grow and stay healthy (water, light and suitable temperature). *Recognise some seeds and associate them with trees e.g. horse chestnut.

		the human body to each sense.	but eating too much of it can be unhealthy. *Know which fruits grow naturally in the UK.	*Know where birds make their nests.	
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Year B

Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Subject	Chemistry		Biology		Physics	
Theme / Topic	Everyday Materials	Uses of Everyday Materials	Living Things and their Habitats (Habitats & Simple Food Chains)		Seasonal Change (Spring & Summer)	
Main Enquiry	Which materials should the three little pigs have used to build their houses?	What is our school made of?	Why would a dinosaur not make a good pet?		How do the seasons impact on what we do?	
Coverage	Naming and sorting different materials.	Using different materials for different tasks.	Habitats and simple food chains.		Knowing about seasonal changes.	
Key Knowledge	*Identify and name a range of materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard. *Compare and group everyday materials. *Describe the physical properties of a variety of everyday materials.	*Know how materials can be changed by squashing, bending, twisting and stretching. *Know why a material might or might not be used for a specific job.	*Know how to classify things as living, dead or never lived. *Know how a specific habitat provides for the basic needs of things living there (plants and animals). *Know how to match living things to their habitat. *Know about and can explain a simple food chain. *Know how animals find their food. *Name some different sources of food for animals. *Identify and name plants and animals in a range of habitats.		*Know the names and characteristics of each season. *Know about the weather associated with each season. *Know about and observe the changes in the seasons. *Know some familiar symbols associated with weather maps.	

Year A

Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Subject	Biology	Biology	Chemistry	Physics	Physics	
Theme / Topic	Animals including humans <i>Nutrition skeletons, muscles</i>	Animals, including Humans <i>Digestive system and food chains</i>	States of matter <i>Materials, states of matter (link to Topic)</i>	Forces and magnets <i>Friction and magnetism</i>	Light <i>Reflection and shadows</i>	
Main Enquiry	How can Usain Bolt run so fast?	What happens to the food we eat?	How would we survive without water?	How does my fridge magnet stick to my fridge?	How far can you throw your shadow?	
Coverage	<ul style="list-style-type: none"> • Skeleton • Muscles • Exercise • Health 	<ul style="list-style-type: none"> • Digestive system • Teeth 	<ul style="list-style-type: none"> • Solids • Liquids • Gases • The water cycle 	<ul style="list-style-type: none"> • Different forces • Magnets 	<ul style="list-style-type: none"> • Reflections • Shadows 	
Key Knowledge	<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. 	<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 	<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. 	<ul style="list-style-type: none"> • Compare how things move on different surfaces. • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Observe how magnets attract or repel each other and attract some materials and not others. • 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 two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing. 	<ul style="list-style-type: none"> • 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. 	

Year B

Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Subject	Physics	Biology	Physics		Biology	Physics
Theme / Topic	Rocks (Link to topic) Fossils and classifying rocks	Living things and their habitat (Link to topic) Changing environments and classifying animals	Electricity Simple circuits and switches, conductors and insulators		Plants Functions of the parts of a plant, importance of flowers	Sound Vibrations and volume
Main Enquiry	What do rocks tell us about the way the earth was formed?	Why is the Sea Turtle an endangered animal?	How would you cope for a day without electricity?		Which plants thrive in our local environment?	Why is the sound made by Justin Bieber enjoyed by so many?
Coverage	<ul style="list-style-type: none"> Fossil formation Compare and group rocks Soil 	<ul style="list-style-type: none"> Classification of animals 	<ul style="list-style-type: none"> Simple circuits and switches Conductors and insulators 		<ul style="list-style-type: none"> Basic structure and functions Lifecycle and transportation of water Classification of plants 	<ul style="list-style-type: none"> Sound vibrations Pitch and volume
Key Knowledge	<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. 	<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. 	<ul style="list-style-type: none"> 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. How to work safely with electricity. 		<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. 	<ul style="list-style-type: none"> 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.

Year A

Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Theme / Topic	PHYSICS: Forces (Gravity, Resistance & Friction)	PHYSICS: Earth & Space	PHYSICS: Electricity (Changing Circuits)	BIOLOGY: Living Things & Their Habitats (Classifying Plants & Animals)	BIOLOGY: Animals Inc Humans (Circulatory System, Nutrients & Healthy Lifestyle)	
Main Enquiry	What goes up must come down... why?	Is there anybody out there?	How can I see without streetlights?	What's the same, what's different?	Why is the heart the most important pump we own?	
Coverage	Gravity, water resistance, Air resistance, Friction	Our Solar System, day & night	Changing circuits & measuring electricity	Classifying plants and animals	Circulatory system, nutrients & healthy lifestyle	
Key Knowledge	<p>Explain that objects fall towards the Earth because of the force of gravity.</p> <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.</p> <p>Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.</p>	<p>Describe the movement of the Earth, and other planets.</p> <p>Describe the movement of the Moon.</p> <p>Use the idea of the Earth's rotation to explain day and night.</p> <p>Identifying scientific evidence that has been used to support or refute ideas or arguments.</p>	<p>Link brightness of a lamp or volume of a buzzer with number and voltage of cells used in the circuit.</p> <p>Compare and give reasons for variations in how components function, including the brightness, loudness and on/off position of switches.</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p> <p>Know about two of the most important scientific inventors in the field of electricity – Thomas Edison and Nikola Tesla.</p>	<p>Sort and group animals based on their features.</p> <p>Describe Carl Linnaeus and his development of his classification system.</p> <p>Place animals into given groups based on certain characteristics.</p> <p>Name types of microorganism.</p> <p>Set up an investigation into harmful micro-organisms.</p>	<p>Identify the main parts of the circulatory system.</p> <p>Explain the main functions of the heart, lungs and blood vessels in the circulatory system.</p> <p>State how the digestive system breaks down nutrients.</p> <p>Explain what constitutes a healthy lifestyle.</p> <p>Describe how drugs and alcohol can impact negatively on the body.</p> <p>Take accurate measures of the pulse rate.</p> <p>Record results and write a report which includes a conclusion.</p>	

Year B

Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Theme / Topic	BIOLOGY: Living Things & Their Habitats (Life Cycles inc Reproduction of Plants & Animals)	CHEMISTRY: Materials (Properties & Changes of Materials)	PHYSICS: Light (How Light Travels)	BIOLOGY: Animals inc Humans (Changes in Humans from Birth to Old Age)	BIOLOGY: Evolution & Inheritance (Adaptation, Inheritance & Evolution)	
Main Enquiry	Do all living things start life as an egg?	Can you unscramble an egg?	How can you see round a corner?	What will I look like when I'm as old as my grandparents?	Have we always looked like this?	
Coverage	Life cycles of plants & animals	Reversible & Irreversible changes	How light travels	Changes in humans from birth to old age	Adaptation, Inheritance & Evolution	
Key Knowledge	<p>Know the life cycle of different living things e.g. mammal, amphibian, insect & bird. Know the differences between different life cycles.</p> <p>Know the process of reproduction in plants. Know the process of reproduction in animals.</p>	<p>Know and explain how a material dissolves to form a solution. Know and show how to recover a substance from a solution.</p> <p>Know and demonstrate how some materials can be separated (e.g. through filtering, sieving and evaporating). Know and demonstrate that some changes are reversible and some are not.</p> <p>Know how some changes result in the formation of a new material and that this is usually irreversible.</p>	<p>Know how light travels Know and demonstrate how we see objects.</p> <p>Know why shadows have the same shape as the object that casts them. Know how simple optical instruments work e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.</p>	<p>Describe the changes as humans develop to old age. Know the stages in the growth & development of humans.</p> <p>Know the differences in capabilities of newly born humans e.g. in movement, feeding. Recognise the length of time humans are dependent upon parents.</p>	<p>Know how the Earth and living things have changed over time.</p> <p>Know how fossils can be used to find out about the past. Know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents).</p> <p>Know how animals and plants are adapted to suit their environment. Link adaptation over time to evolution.</p> <p>Know about evolution and can explain what it is.</p>	



Our Planning
House

What will we
find out?

What equipment will we need?

What things will we test?

How can we make it fair?

What will we do?

What happened?

What does this mean?



My Planning
House

What will I
find out?

What equipment will I need?

What things will I test?

How can I make it fair?

What will I do?

What happened?

What does this mean?

Name:

Date:



Science Investigation Plan

W.A.L.T.

Question - What do we want to find out?

We want to find out...

Equipment - What equipment will we use?

We will use:

Variables - What could we change?

We could change...

We are only going to change:

Fair test - What will we keep the same?

We will keep...

Method - What are we going to do?

Firstly we will...

Then we will...

Measure - How are we going to record our results?

We could record our results by using...

diagrams bar charts drawings tables tally sheets writing lists pictograms

Prediction - What do you predict will happen?

I predict that...

Results

What has happened?

Conclusion - Why do we think this has happened?

I think this has happened because...

W.W.W.

E.B.I.

Name:

Date:



Science Investigation Plan

W.A.L.T.

Question to investigate

I will measure

Variables - I will change

Fair test - I will keep these things the same

Equipment

Prediction

Method

Results table

Results graph

Conclusion

W.W.W.

E.B.I.

Risk Assessment: Science

Original Assessment by:	C Butterworth	Sep-15		
Review by:	L. Baulk	Aug-24		
Date of Review	Reviewed by	Comments/changes		
Sep-24	R Hill	Removed iron filings - no longer in use		
Aug-24	L. Baulk	No Changes		
Dec-23	R Hill	No Changes		
Sep-22	L.Baulk	Minor Layout changes		
Oct-21	C Butterworth	No Changed		
Nov-20	C Butterworth	No Changed		
Oct-19	C Butterworth	No Changed		
Jan-18	C Butterworth	Minor amendments moving further actions to 'what's already in place' column.		
Nov-16	C Butterworth	No Changed		
What are the hazards? (e.g. heavy box)	Who might be harmed and how? (e.g. staff, visitors, etc)	What control measures are in place to minimise any risk?	Is there any further action required? By who / when?	Date completed
Burning hands with boiling liquid or a hot object.	Staff	Teacher demonstrates experiments which use boiling water or excessive heat.	No	NA
		Children reminded to stay seated during any demonstration involving boiling liquids.		
		Hot objects not touched directly with hands. Metal tongs used.		
		Containers with heated liquids not overfilled.		
		Heat sources always placed on a heat-resistant surface.		
Cutting fingers with a craft knife.	Children Staff	Teacher demonstrates the correct use of craft knives.	No	NA
		Cutting always done onto a board placed on a table.		

		Objects for cutting held firmly with one hand and children instructed to cut away from fingers. Children reminded to stay seated when cutting.		
		Ratio of 1:1 maintained when using craft knives.		
Slipping on a wet floor.	Children Staff	Children are informed about the importance of keeping water in the sink where possible.	No	NA
		Adults check sink area during session and assist in mopping up spilt water as it occurs. Area checked again at the end of the session.		
Cutting hands on broken glass.	Children Staff	Children reminded to report breakages straight away.	No	NA
		Children reminded not to touch broken glass.		
		Adults are responsible for picking up broken glass and then disposing of it safely.		
Dropping weights on your foot.	Children Staff	An empty open box is placed underneath the weights to stop feet getting in the way.	No	NA
Snapping an elastic band in someone's eye.	Children Staff	Elastic bands pointed away from your and other people's eyes.	No	NA
		Children reminded about the safe use of elastic bands.		
Poisoned with a toxic chemical.	Children Staff	Teacher is responsible for using any toxic chemicals (eg soil testing).	No	NA
		Hands washed immediately after using chemicals.		
Electrical shock or electrocution.	Children Staff	All appliances are PAT tested annually.	No	NA
		Electrical equipment not interfered with whilst connected to an electrical supply (battery or main).		
		Sockets always switched off before plugs removed.		
Breathing in spores from fungi on rotting food.	Children Staff	All rotting food kept in tightly sealed bags and containers and not opened.	No	NA
		Children reminded to keep bags sealed when making observations.		
Electrocution from flying kite near electricity lines.	Children Staff	Adults check for overhead cables before children are allowed outside with kites.	No	NA
		Children are directed to safe areas for flying kites and supervised throughout the activity.		

Friezland School Progression Document for Science



Key Stage 1 Year A

Working Scientifically	Biology	Biology	Physics
<ul style="list-style-type: none"> * I know how to ask simple scientific questions. * I know how to use simple equipment to make observations. * I know how to carry out simple tests. * I know how to identify and classify things. * I know how to explain to others what I have found out. * I know how to use simple data to answer questions. 	<p style="text-align: center;">Spr 1 - Animals, including humans (Classifying and Lifecycles)</p> <ul style="list-style-type: none"> * I know and name a variety of animals including fish, amphibians, reptiles, birds and mammals. * I classify and know animals by what they eat (carnivore, herbivore and omnivore). * I know how to name the parts of the human body that I can see. * I know how to link the correct part of the human body to each sense. 	<p style="text-align: center;">Sum 1 – Plants (Identifying Trees, Plants and their Parts)</p> <ul style="list-style-type: none"> * I know and name a variety of common, wild and garden plants. * I know and name the petals, stem, leaves and root of a plant. * I know and name the roots, trunk, branches and leaves of a tree. 	<p style="text-align: center;">Aut 1+2 - Seasonal changes (Autumn + Winter)</p> <ul style="list-style-type: none"> * I observe and know about the changes in the seasons. * I name the seasons and know about the type of weather in each season and how day length varies.
	<p style="text-align: center;">Spr 2 - Animals, including humans (Exercise, Healthy Eating and Hygiene)</p> <ul style="list-style-type: none"> * I know the basic stages in a lifecycle for animals, including humans. * I know what animals and humans need to survive. * I know why exercise, a balanced diet and good hygiene are important for humans. 	<p style="text-align: center;">Sum 2 – Plants (Growing Healthy Plants)</p> <ul style="list-style-type: none"> * I know how seeds and bulbs grow into plants. * I know what plants need in order to grow and stay healthy (water, light and suitable temperature). 	

KS1 Year B

Working Scientifically	Biology	Chemistry	Physics
<ul style="list-style-type: none">* I know how to ask simple scientific questions.* I know how to use simple equipment to make observations.* I know how to carry out simple tests.* I know how to identify and classify things.* I know how to explain to others what I have found out.* I know how to use simple data to answer questions.	<p>Spr 1+2 - Living Things and their Habitats (Habitats and Simple Food Chains)</p> <ul style="list-style-type: none">* I identify things that are living, dead and never lived.* I know how specific habitat provides for the basic needs of living things there (plants and animals).* I identify and name plants and animals in a range of habitats.* I match living things to their habitat.* I know how animals find their food.* I name some different sources of food for animals.* I know and can explain a simple food chain.	<p>Aut 1 - Everyday Materials</p> <ul style="list-style-type: none">* I distinguish between an object and the material it is made from.* I know the materials that an object is made from.* I know the difference between wood, plastic, glass, metal, water and rock.* I know about the properties of everyday materials.* I group objects based on the materials they are made from.* I identify and name a range of materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard.	<p>Sum 1+2 - Seasonal Changes (Spring + Summer)</p> <ul style="list-style-type: none">* I observe and know about the changes in the seasons.* I name the seasons and know about the type of weather in each season and how day length varies.
		<p>Aut 2 - Uses of Everyday Materials</p> <ul style="list-style-type: none">* I know why a material might or might not be used for a specific job.* I know how materials can be changed by squashing, bending, twisting and stretching.	

Lower KS2 Year A

Working Scientifically	Biology	Chemistry	Physics
<ul style="list-style-type: none"> * I know how to ask relevant scientific questions. * I know how to use observations and knowledge to answer scientific questions. * I know how to set up a simple enquiry to explore a scientific question. * I know how to set up a test to compare two things. * I know how to set up a fair test and explain why it is fair. * I make careful and accurate observations, including the use of standard units. * I know how to use equipment, including thermometers data loggers to make measurements. * I gather, record, classify and present data in different ways to answer scientific questions. * I know how to use diagrams, keys, bar charts and tables; using scientific language. * I know how to use findings to report in different ways, including oral and written explanations, presentations. * I know how to draw conclusions and suggest improvements. * I know how to make a prediction with a reason. * I know how to identify differences, similarities and changes related to an enquiry. 	<p>Aut 1 - Animals, Including Humans (Nutrition, Skeletons and Muscles)</p> <ul style="list-style-type: none"> * I know about the importance of a nutritious, balanced diet. * I know how nutrients, water and oxygen are transported within animals and humans. * I know about the skeletal system of a human. * I know about the muscular system of a human. * I know about the purpose of the skeleton in humans and animals. 	<p>Spr 1 - States of Matter (Materials and States of Matter)</p> <ul style="list-style-type: none"> * I group materials based on their state of matter (solid, liquid, gas). * I know how some materials can change state. * I explore how materials change state. * I measure the temperature at which materials change state. * I know about the water cycle. * I know the part played by evaporation and condensation in the water cycle. 	<p>Spr 2 - Forces and Magnets (Friction and Magnetism)</p> <ul style="list-style-type: none"> * I know about and describe how objects move on different surfaces. * I know how some forces require contact and some do not, giving examples. * I know about and explain how objects attract and repel in relation to objects and other magnets. * I predict whether objects will be magnetic and carry out an enquiry to test this out. * I know how magnets work. * I predict whether magnets will attract or repel and give a reason.
	<p>Aut 2 - Animals, Including Humans (Digestive System and Food Chains)</p> <ul style="list-style-type: none"> * I identify and name the parts of the human digestive system. * I know the functions of the organs in the human digestive system. * I identify and know the different types of teeth in humans. * I know the functions of different human teeth. * I use food chains to identify producers, predators and prey. * I construct food chains to identify producers, predators and prey. 		<p>Sum 1+2 - Light (Reflection and Shadows)</p> <ul style="list-style-type: none"> * I know what dark is (the absence of light). * I know that light is needed in order to see. * I know that light is reflected from a surface. * I know and demonstrate how a shadow is formed. * I explore shadow size and explain the changes. * I know the danger of direct sunlight and describe how to keep protected.

LKS2 Year B

Working Scientifically	Biology	Chemistry	Physics
<ul style="list-style-type: none"> * I know how to ask relevant scientific questions. * I know how to use observations and knowledge to answer scientific questions. * I know how to set up a simple enquiry to explore a scientific question. * I know how to set up a test to compare two things. * I know how to set up a fair test and explain why it is fair. * I make careful and accurate observations, including the use of standard units. * I know how to use equipment, including thermometers data loggers to make measurements. * I gather, record, classify and present data in different ways to answer scientific questions. * I know how to use diagrams, keys, bar charts and tables; using scientific language. * I know how to use findings to report in different ways, including oral and written explanations, presentations. * I know how to draw conclusions and suggest improvements. * I know how to make a prediction with a reason. * I know how to identify differences, similarities and changes related to an enquiry. 	<p style="text-align: center;">Aut 2 - Living things and their habitats (Changing Environments and Classifying Animals)</p> <ul style="list-style-type: none"> * I group living things in different ways. * I use classification keys to group, identify and name living things. * I create classification keys to group, identify and name living things (for others to use). * I know how changes to an environment could endanger living things. 	<p style="text-align: center;">Aut 1 – Rocks (Fossils and Classifying Rocks)</p> <ul style="list-style-type: none"> * I compare and group rocks based on their appearance and physical properties, giving a reason. * I know how fossils are formed. * I know how soil is made. * I know about and explain the difference between sedimentary, metamorphic and igneous rocks. 	<p style="text-align: center;">Sum 2 – Sound (Vibration and Volume)</p> <ul style="list-style-type: none"> * I know how sound is made. * I know how sound travels from a source to our ears. * I know how sounds are made, associating some of them with vibrating. * I know the correlation between pitch and the object producing a sound. * I know the correlation between the volume of a sound and the strength of the vibrations that produced it. * I know what happens to a sound as it travels away from its source.
	<p style="text-align: center;">Sum 1 – Plants (Functions of the Parts of Plants and the Importance of Flowers)</p> <ul style="list-style-type: none"> * I know the function of different parts of flowering plants and trees. * I know what different plants need to help them survive. * I know how water is transported within plants. * I know the plant cycle, especially the importance of flowers 		<p style="text-align: center;">Spr 1+2 – Electricity (Simple Circuits and Switches, Conductors and Insulators)</p> <ul style="list-style-type: none"> * I identify and name appliances that require electricity to function. * I construct a series circuit. * I identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers). * I know how to draw a circuit diagram. * I predict and test whether a lamp will light within a circuit. * I know the function of a switch in a circuit. * I know the difference between a conductor and an insulator; giving examples of each.

Upper KS2 Year A

Working Scientifically	Biology	Physics	Physics
<ul style="list-style-type: none"> * I know how to plan different types of scientific enquiry. * I know how to control variables in an enquiry. * I measure accurately and precisely using a range of equipment. * I know how to record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. * I use the outcome of test results to make predictions and set up a further comparative and fair tests. * I report findings from enquiries in a range of ways. * I know how to explain a conclusion from an enquiry. * I explain causal relationships in an enquiry. * I know how to relate the outcome from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory. * I read, spell and pronounce scientific vocabulary accurately. 	<p style="text-align: center;">Spr 2 - Living things and their habitats (Classifying Plants and Animals)</p> <ul style="list-style-type: none"> * I classify living things into broad groups according to observable characteristics and based on similarities and differences. * I know how living things have been classified. * I give reasons for classifying plants and animals in a specific way. 	<p style="text-align: center;">Aut 1 – Forces (Gravity, Resistance and Friction)</p> <ul style="list-style-type: none"> * I know what gravity is and its impact on our lives. * I identify and know the effect of air resistance. * I identify and know the effect of water resistance. * I identify and know the effect of friction. * I explain how levers, pulleys and gears allow a smaller force to have a greater effect. 	<p style="text-align: center;">Spr 1 – Electricity (Changing Circuits)</p> <ul style="list-style-type: none"> * I know how the number and voltage of cells in a circuit link to the brightness of a lamp or the volume of a buzzer. * I compare and give reasons for why components work and do not work in a circuit * I draw circuit diagrams using correct symbols.
	<p style="text-align: center;">Sum 1+2 - Animals, including humans (Circulatory System, Nutrients and Healthy Lifestyle)</p> <ul style="list-style-type: none"> * I identify and name the main parts of the human circulatory system. * I know the function of the heart, blood vessels and blood. * I know the impact of diet, exercise, drugs and lifestyle on health. * I know the ways in which nutrients and water are transported in animals, including humans. 	<p style="text-align: center;">Aut 2 - Earth and space</p> <ul style="list-style-type: none"> * I know about and explain the movement of the Earth and other planets relative to the Sun. * I know about and explain the movement of the Moon relative to the Earth. * I know and demonstrate how night and day are created. * I describe the Sun, Earth and Moon (using the term spherical). 	

UKS2 Year B

Working Scientifically (Y5 and Y6)	Biology	Chemistry	Physics
<ul style="list-style-type: none"> * I know how to plan different types of scientific enquiry. * I know how to control variables in an enquiry. * I measure accurately and precisely using a range of equipment. * I know how to record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. * I use the outcome of test results to make predictions and set up a further comparative and fair tests. * I report findings from enquiries in a range of ways. * I know how to explain a conclusion from an enquiry. * I explain causal relationships in an enquiry. * I know how to relate the outcome from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory. * I read, spell and pronounce scientific vocabulary accurately. 	<p style="text-align: center;">Aut 1 - Living things and their habitats (Life Cycles Including Reproduction of Plants and Animals)</p> <ul style="list-style-type: none"> * I know the life cycle of different living things, e.g. mammal, amphibian, insect, bird. * I know the difference between different life cycles. * I know the process of reproduction in plants. * I know the process of reproduction in animals. 	<p style="text-align: center;">Aut 2 - Properties and Changes of Materials (Reversible and Irreversible Changes)</p> <ul style="list-style-type: none"> * I compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical and thermal], and response to magnets). * I know how a material dissolves to form a solution; explaining the process of dissolving. * I know and show how to recover a substance from a solution. * I know how some materials can be separated (e.g. through filtering, sieving and evaporating). * I know and can demonstrate that some changes are reversible and some are not. * I know how some changes result in the formation of a new material and that this is usually irreversible. * I know about reversible and irreversible changes. <p>I give evidenced reasons why materials should be used for specific purposes.</p>	<p style="text-align: center;">Spr 1 – Light (How Light Travels)</p> <ul style="list-style-type: none"> * I know how light travels. * I know and demonstrate how we see objects. * I know why shadows have the same shape as the object that casts them. * I know how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.
	<p style="text-align: center;">Spr 2 - Animals, including humans (Changes in Humans from Birth to Old Age)</p> <ul style="list-style-type: none"> * I create a timeline to indicate stages of growth in humans. 		
	<p style="text-align: center;">Sum 1+2 - Evolution and inheritance</p> <ul style="list-style-type: none"> * I know how the Earth and living things have changed over time. * I know how fossils can be used to find out about the past. * I know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents). * I know how animals and plants are adapted to suit their environment. * I link adaptation over time to evolution. * I know about evolution and can explain what it is. 		