Science at Antingham & Southrepps - We are Scientists

Our Curriculum Drivers:

Aspirations	**To have high aspirations for my future and know all of the available opportunities open to me**
Independence	**To have the independence to be able to reach my full potential and take responsibility**
Mental and Physical Health	**To value my own self-worth to be the best I can be**
Resilience	**To have the courage to bounce back from failure or challenges and grow as an individual**

Intent

At Antingham & Southrepps Primary School & Nursery children develop an enthusiasm for and enjoyment of science through a range of purposeful and engaging activities. We want the children to look at the world as Scientists. We believe that science is a body of knowledge built up through experimental testing of ideas. Science is also methodology, a practical way of finding reliable answers to questions we may ask about the world around us. Science in our school is about developing children's ideas, processes and skills and ways of thinking and working that enables them to make sense of the world through first hand investigation. We endeavour to make lessons thought-provoking and inspiring, leading children to wonder, ask questions, research and then discuss their learning at home. Ultimately, we aspire to ensure the children become successful, confident learners, enjoying the process of exploring ideas through science.

At Antingham & Southrepps Primary School & Nursery we aim to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop an understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge and skills required to understand the uses and implications of science, today and for the future
- recognise the work of famous scientists through history who have helped to shape our world
- use our forest school sessions to extend their scientific skills further

Working scientifically:

In line with the National Curriculum, pupils are taught to 'work scientifically'. The National Curriculum document defines this as:

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand. The notes and guidance give examples of how 'working scientifically' might be embedded within the content of biology, chemistry and physics, focusing on the key features of scientific enquiry so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data.

To support the well-structured and progressive curriculum, the school makes use of a range of engaging resources such as those provided by Science, Technology, Engineering and Mathematics (STEM), Association for Science Education (ASE) trips and residentials linked to learning in the classroom and the use of our extensive school grounds.

Implementation

EYFS

Science in EYFS is covered in the 'Understanding the World' area of the EYFS Curriculum. It is introduced indirectly through activities that encourage children to explore, problem solve, observe, predict, think, make decisions and talk about the world around them. Early Years Science also helps children with skills in other Foundation Stage areas of the National Curriculum, such as Physical Development and Expressive Arts and Design. During their first year at school children will explore creatures, people, plants and objects in their natural environments. They will observe and manipulate objects and materials to identify differences and similarities. For example, they may look at an egg whisk, sand, paper and water to learn about things that are natural and manmade and their different functions. They will also learn to use their senses, feeling dough or listening to sounds in the environment, such as sirens or farm animals. They will make observations of animals and plants and explain why some things occur and talk about changes. Children are encouraged to ask questions about why things happen and how things work. They might do activities such as increasing the incline of a slope to observe how fast a vehicle travels, or opening a mechanical toy to see how it works. Children will also be asked questions about what they think will happen to help them communicate, plan, investigate, record and evaluate findings.

Key Stage 1
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. Our big questions are asked at the start of each unit of learning for children to investigate and answer. These questions form the basis of our learning.

'Working scientifically' is described separately in the programme of study but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.
Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

Lower Key Stage 2 – years 3-4
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.

'Working 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. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. As in Key Stage 1, we continue to ask our big questions at the start of each unit of learning across Key Stage 2. These enable children to continue to investigate, research and present their answers, which form the basis of our learning.

Upper Key Stage 2 – years 5-6
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 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. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read, spell and pronounce scientific vocabulary correctly.

Impact

- Children will become resilient, independent, and curious scientists who ask questions and find things out for themselves.
- Children will be enthusiastic and motivated scientific learners.
- Our vast outdoor grounds will be utilised regularly throughout our science lessons.
- Parents and the wider community will support science learning through trips and visits on a regular basis.
- Children will have an awareness of the full range of scientific careers and pathways available to them and will be keen to pursue STEM subjects at secondary school.
- Children will leave for secondary school equipped with the scientific knowledge and skills needed to succeed in their further education.
- Children are aware of who some of the worlds great scientists are and why, this will help to inspire them think about a future career in science

Enhancing the Science Curriculum

- The school celebrates British Science Week with class taking part in their own STEM project which is then showcased to parents in an assembly.
- Trips and visits are used to enhance learning experiences. Science trips include local walks, residential trips and visitors.
- The school has substantial grounds for outdoor learning. The children take part in forest school which is led by Mrs de Neve our level 3 forest school teacher. The secret garden, field and woods across the road all have a great variety of plants, raised beds, den building resources, fire pits and a pond. This particularly enhances the teaching and learning in biology.
- Weekly Forest School sessions in EYFS and three half termly sessions per year for KS1 and KS2 enhance the children's knowledge and understanding of the world. This ensures all our children experience forest school throughout the year.
- As a school we feel passionately about our world. We have introduced one environmental whole school topic per year. These topics allow opportunities for children to deepen their existing knowledge and understanding alongside developing greater empathy for our world and how to protect and preserve it.
- Our whole school theme days and assemblies allow us to think about science and STEM beyond the classroom. We ensure we have a minimum of three whole school science and STEM themes per year.

SPECIAL EDUCATIONAL NEEDS

We teach Science to all children, whatever their ability and starting points and in accordance with the school curriculum policy of providing a broad and balanced education to all children which fosters a love of learning. For our lowest 20% of learners we make some of the following adaptions to support their learning to ensure achievement for all: more opportunities for adult scaffolding and support within the classroom; the pre-teaching of vocabulary, key people; use of images, and the outdoor environment and opportunities for discussions and pre-learning questioning.

SPIRITUAL, MORAL, SOCIAL & CULTURAL DEVELOPMENT

When teaching Science, we contribute to the children's spiritual development where possible. We provide opportunities through lessons, assemblies and whole school events to discuss moral questions, for example when focusing on Pollution we will look at the threats different communities around the world are facing. In History when learning about the Mayans children discuss Fairtrade and why being part of a community is so important. Moral issues too are discussed and considered. For example, how can we slow down the ice melting whilst still making technological progress? Studying scientists both living and non-living enables children to consider how their lives and discoveries have impacted on ours today.

ASSESSMENT & RECORDING

Teachers assess children's work in science by making informal judgements as they observe them during lessons as well as in their books. On completion of a piece of work, the teacher marks the work and comments as necessary. At the end of each unit of study the teacher makes a summary judgement about the work of each pupil in relation to the skills they have developed in-line with the National Curriculum. End of unit mini-assessments, odd oneout, PMI statements (positive, minus, interesting) a mind map representing what was known in comparison to what is now known and a knowledge test are al ways in which teachers make their assessment judgements. When a new unit od work begins, it always begins with recapping on prior learning. At the end of the year science is reported to parents as part of the child's annual school report. We use this as the basis for assessing the progress of the child and we pass this information on to the next teacher at the end of the year.

MONITORING & REVIEW

Individual teaches are responsible for the standard of children's work and for the quality of their teaching in science. It is planned once we have a science subject leader, they will monitor children's work, wall displays, planning and carries out pupil interviews, for the moment this is done by the SLT. The work of the science subject leader will be to also involve supporting colleagues in the teaching of science, ensuring there are always enough resources to match practical and engaging investigations and being informed about current developments in the subject.

A Journey Through Our Science Curriculum

CYCLE A						
Reception & Year 1	**Happy Healthy Me *Biology***	**Space *Physics***		**New Life and Life Cycles *Biology***	**Plants *Biology***	**Environmental Science Recycling & Plastics**
Year 2 & 3	**Animals & Human Growth Biology**		**Light Physics**	**Plants Biology**	**Rocks & Soils Chemistry**	**Environmental Science Recycling & Plastics**
Year 4, 5 & 6	**Light Physics**	**Circulatory System Biology**	**Sound Physics**	**Evolution Biology**	**Electricity Physics**	**Environmental Science Recycling & Plastics**
CYCLE B						
Reception & Year 1	**Marvellous Me Bilogy**	**Floating & Sinking Chemistry**	**Materials Chemistry**	**Living Things Minibeasts Biology**	**Living Things Australian Animals Biology**	**Pollution & Climate Change**
Year 2 & 3	**Diet and Exercise Healthy Living Biology**	**Muscles and Skeletons Biology**	**Electricity Physics**	**Living Things Biology**	**Forces Physics**	**Pollution & Climate Change**
Year 4, 5 & 6	**Earth and Space Physics**		**States of Matter Chemistry**		**Teeth and Healthy Eating Biology**	**Pollution and Climate Change**
CYCLE C						
Reception & Year 1	**Forces Physics**	**Materials Chemistry**		**Living Things Biology**		**Deforestation & Renewable Energy**
Year 7 KS3	**Classification, biodiversity, humans and health, force & motion, The seven characteristics of living things, The particle model of matter, energy, electrical circuits, ecosystems, astronomy, forces, respiration**					

Our Forest School opportunities allows children to further practice and consolidate their natural scientic enquiry skills and understanding.

Subject Progression

EYFS					
Key stage 1 – Plants, Animals including humans, Materials, Seasonal changes, Living things and their habitats					
Age Band	**Area of Development**		**Statement**	**Enabling environments**	**Learning opportunities**
30-50 months	**Physical Development**	Health and Self-Care	• To observe the effects of physical activity on their bodies.	**Investigation area**: Variety of materials Mirrors Life cycle Life cycle jigsaw Texture cubes Torches Magnets Insects Magnifying glasses Kaleidoscopes Colour paddles Non-fiction books **Digging area**: Small garden resources Large garden resources Gloves Buckets Wellies Mud jackets **Mud kitchen**: Variety of kitchen equipment **Water/sand area**: Variety of measuring equipment Different texture (wet/dry sand) Scales **Natural objects Perfume area**: Variety of real plants and flowers Different scents Small bottles Pestle and mortar Variety of materials in creative area Wood bench Variety of materials used throughout indoor and outdoor areas Toy animals, including wild, farm, jungle, dinosaurs, sea Range of creatures outside Daily calendar including seasons A range of physical exercise equipment outside Daily fruit and discussion of healthy foods	Growing a variety of plants, fruit and vegetables during spring/summer How plants grow and what they need Doing experiments i.e. touching bread with clean/dirty hands, plants in sun/dark Butterfly houses Ant farm Wormery Lady bird house Learning body parts through songs Taking care of creatures found in the garden and how we do this, what their habitats are and what they eat Teaching of how to wash our hands properly and why its essential Ask Mr google discussions on animals Looking at extinction and animals that are now extinct How we stay healthy and safe Chick eggs, seeing them hatch and grow Observing seasonal changes/weather changes Story time around seasons, animals, growing, creatures PE sessions weekly, noticing the changes that happen to our body Animal bone/skeletons and how they differ to ours The difference between some animals and to us
	Understanding the World	The World	• To comment and ask questions about aspects of their familiar world, such as the place where they live or the natural world. • To talk about some of the things they have observed, such as plants, animals, natural and found objects. • To talk about why things happen and how things work. • To develop an understanding of growth, decay and changes overtime. • To show care and concern for living things and the environment.		
	Expressive Arts & Design	Exploring and Using Media and Materials	• To begin to be interested in and describe the texture of things.		
40-60 Months	**Physical Development**	Health & Self-Care	• To eat a healthy range of food stuffs and understand a need for variety in food. • To show some understanding that good practices with regard to exercise, eating, sleeping and hygiene can contribute to good health.		
	Understanding the World	The World	• To look closely at similarities, differences, patterns and change.		
ELG	**Physical Development**	Health & Self-Care	• To know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe.		
	Understanding the World	The World	• To know about similarities and differences in relation to places ,objects ,materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another.		
ELG EX	**Physical Development**	Health & Self-Care	• Children know about, and can make healthy choices in relation to, healthy eating and exercise		
	Understanding the World	The World	• Children know that the environment and living things are influenced by human activity. They can describe some actions which people in their own community do that help to maintain the area they live in. They know the properties of some materials and can suggest some of the purposes they are used for. They are familiar with basic scientific concepts such as floating, sinking, experimentation.		

Working Scientifically					
EYFS 1. I have my own ideas 2. I test my ideas 3. I notice changes as well as similarities and differences 4. I can use my senses and look closely 5. I can use equipment and tools carefully 6. I can create simple representations of people and objects 7. I can talk about things like plants, animals, natural and found objects 8. I can use some simple science words 9. I question why things happen					
Year 1	**Year2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
• Ask simple questions and recognise that they can be answered in different ways • Use simple equipment to observe closely • Perform simple comparative tests • Identify, group and classify • Use his/her observations and ideas to suggest answers to questions noticing similarities, differences and patterns • Gather and record data to help in answering questions including from secondary sources of information • Able to suggest what to change and keep the same for a fair test • Able to identify and verbalise skills used when completing end of unit tasks and questions		•Ask relevant questions and use different types of scientific enquiries to answer them •Set up simple practical enquiries, comparative and fair tests •Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers •Gather, record, classify and present data in a variety of ways to help in answering questions •Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables •Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions		· Plan different types of scientific enquiries to answer their own or others' questions, including recognising and controlling variables where necessary • Use appropriate techniques, apparatus and materials during fieldwork • Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Use test results to make predictions to set up further comparative and fair tests • Report and present 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	

	·Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions •Identify differences, similarities or changes related to simple scientific ideas and processes •Use straightforward scientific evidence to answer questions or to support his/her findings	· Report and present 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 • Use test results to make predictions to set up further comparative and fair tests • Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments • Describe and evaluate their own and other people's scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources

Animals Including Humans

EYFS:
Can talk about things they have observed (animals)
Developing an understanding of growth, decay and changes over time
Shows care and concern for living things and the environment
They make observations of animals and explain why some things occur, and talk about changes.
Know about similarities and differences in relation to living things.
Children know the importance of good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals & Humans	**Healthy Living**	**Muscles & Skeletons**	**Teeth & Healthy Eating**	**Circulatory System**	
What are our bodies and what can they do?	*How can living things stay healthy?*	*How do our bodies work?*	*What do our bodies do with the food we eat?*	*How do our choices affect how our bodies work?*	
	Significant Person Florence Nightingale	Significant Person Leonardo da Vinci	Significant Person Marie Curie	Significant Person Alexander Fleming	
• Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • Identify and name a variety of common animals that are carnivores, herbivores and omnivores • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	• Understand that animals, including humans, have offspring which grow into adults • 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	• 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	• 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	• Describe the changes as humans develop to old age	• 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
Vocabulary Names of common animals, Names of body parts, including animals (wing, claw, tail, beak, fur, feather, fin, scales) Carnivore, habitat, herbivore, omnivore, pets, senses, wild animals Hear/hearing, see/seeing/sight, touch/touching, taste/tasting **Adult should also use:** Amphibians, reptiles, mammals	**Vocabulary (Year 1 +)** Adult, baby, basic needs (water, food, air), carbohydrate, child, dairy, exercise, fats, fruit, grow, hygiene, infection, offspring, oils, protein, sugar, survival, vegetables, teenager, toddler, unhealthy **Adult should also use:** Develop, reproduction, life cycle, heart rate, nutrition	**Vocabulary (KS1+)** Backbone, balanced diet, blood vessels, bones, brain, carbohydrate, dietary fibre, heart, invertebrates, joints, movement, minerals, muscles, nutrients, nutrition, protection, ribs, sockets, skeleton, skull, spine, support, tendons, vertebrates, vitamins, **Adult should also use:** Endoskeleton, exoskeleton	**Vocabulary (As previous +)** Absorb, anus, blood stream, canines, consumer, decay, dentine, digestion, enamel, energy, faeces, gums, incisors, large intestine, molars, nerves, oesophagus, plaque, predator, prey, producer, saliva, small intestines, stomach, swallowing **Adult should also use**: chemical enzymes, gastric juices, reabsorption of water	**Vocabulary (As previous +)** Adolescence, adolescent, arthritis, gestation period, life expectancy, menstruation, pregnant, puberty	**Vocabulary (As previous +)** Addiction, aorta, artery, atrium, blood, bronchi, capillaries, carbon dioxide, circulatory system, deoxygenated, diaphragm, lifestyle, lungs, nicotine, oxygen, oxygenated, plasma, pulmonary vein/artery, pulse, red blood cells, respiration, vein, ventricles, white blood cells **Adult should also use:** gaseous exchange, aerobic respiration, trachea,

					haemoglobin, bronchioles, alveoli
PRIOR LEARNING EXPERIENCES					
In EYFS children learnt about some of their body parts and some common animals including chickens and pets.	Children learn about nutrition and food in Muscles & Skeletons and Plants.	Children learn about growth and basic body parts in Animals & Humans.	Children learn about food chains and animals in Animals and Humans, Healthy Living and Muscles and Skeletons.	Children learn about the digestive system in Teeth & Healthy Eating. They also learn about the importance of exercise in Healthy Living.	

Living Things and their Habitats

EYFS:
Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world
Can talk about some of the things they have observed such as plants, animals, natural and found objects
Shows care and concern for living things and the environment
Looks closely at similarities, differences, patterns and change
Know about similarities and differences in relation to living things and places
They talk about the feature of their own immediate environment and how environments might vary from one another

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Living Things		**Living Things**		
	What is alive, dead or never alive?		*Do all life cycles look the same?* *Are living things in danger?*		
	Significant Person David Attenborough		Significant Person David Attenborough		
	• 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		• 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 and have an impact on living things	• 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	• Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals • Give reasons for classifying plants and animals based on specific characteristics
	Vocabulary: (Some previously taught in year 1 animals, inc humans) Adaptation, alive, breathe, carnivore, conditions, characteristics, dead, excrete, feed, food chain, grow, heat, herbivore, living, micro-habitats, move, nonliving, omnivore, reproduce, shelter Names of habitats, micro-habitats and describe conditions Adult should also use: life processes, respire, producer, consumer, sources of food, depends on/suited to		Vocabulary (As KS1+) Amphibians, classify, classification keys, environment, mammals, human impact, invertebrates, pollution, reptiles, vertebrates Plant groups (trees, grasses, flowering and non-flowering plants) Adult should also use: organism, population, deforestation, development, variation characteristics.	Vocabulary (As previous +) Anther, asexual reproduction, carpel, external fertilisation, fertilisation, filament, germination, gestation, internal fertilisation, larva, metamorphosis, pollen, pollination, seed dispersal, seed formation, sepal, sexual reproduction, sperm, stamen, style, stigma Adult should also use: plantlets, runners	Vocabulary (As previous +) Bacteria, fauna, fermentation, flora, fungi/fungus, genus, microbes, micro-organism, organism, species Name invertebrates: arachnid, mollusc, insect and crustacean
	PRIOR LEARNING EXPERIENCES		**PRIOR LEARNING EXPERIENCES**		
	Children learn about growth and habitats in Animals and Humans.		Children learn about changing environments in pollution, climate change and deforestation. They also learn about life cycles in Animals and Humans. Children learn how animals and plants are adapted to suit their environment in Evolution.		

Plants

EYFS:
Can talk about some of the things they have observed such as plants
Shows care and concern for living things and the environment Looks closely at similarities, differences, patterns and change
They talk about the feature of their own immediate environment and how environments might vary from one another
They make observations of plants and explain why some things occur, and talk about changes.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plants					
What plants can we eat?					
Significant People Charles Darwin and Beatrix Potter					
• 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	• Observe and describe how seeds and bulbs grow into mature plants • Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	• Identify and 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			• Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
Vocabulary Berry, blossom, bud, bulb, branch, flower, fruit, habitat, identify, leaf/leaves, petal, plant, root, seed, stem, tree, trunk Include names of locally found plants **Adult should also use**: Wild plant, garden plant, flowering plant, deciduous, evergreen	**Vocabulary (As year 1 +)** Earth, fully grown, growth, healthy, light, nutrients, seed, seedling, shoot, soil, water **Adult should also use**: Mature plant, germinate/germination, pollination, seed dispersal, temperature	**Vocabulary (As KS1 +)** Absorb, fertiliser, plant life cycle, pollination, seed dispersal, seed formation, temperature, transported **Adult should also use**: Structure, function, plant tissues, pores, competition for resources			
PRIOR LEARNING EXPERIENCES					
Children learn about plants and the natural world in EYFS and through their forest school sessions. When learning about Living Things children learn to describe the basic needs of animals, including humans, for survival (water, food and air).					

Children will use our local environment to observe plants, seasons, weather, animals and life cycles throughout the year

Materials and States of Matter

EYFS:
They safely use and explore a variety of materials in art and design (children are encouraged to notice changes in properties)
Know about similarities and differences in relation to objects and materials.
They talk about changes over time e.g. melting ice

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Materials	**Materials**		**Materials**	**States of Matter**	
Do all metals rust?			*Is water always wet?*	*Can we change materials?*	
Significant Person Stephen Perry	Significant Person Charles Macintosh & John Dunlop		Significant Person Joseph Aspdin	Significant Person Louis Pasteur	
Floating and Sinking through CP • Distinguish between an object and the materials from which it is made	• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses		• 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	· 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	

• Describe the simple physical properties of a variety of materials • Group and compare a variety of everyday materials on their basic properties and whether they float or sink	• Describe how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching		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	• Recognise 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	
Vocabulary Absorbent, bendy, dull, hard, gas, glass, liquid, material, metal, object, plastic, rock, rough, shiny, smooth, soft, solid, stiff, transparent, water, waterproof, wood, Changes, concrete, elastic, fabric, flexible, man-made, material, natural, opaque, properties, reflective, rigid, rubber, shape, squash, stretch, strong, suitable, translucent, transparent, twist, use/useful, weak **Adult should also use**: properties, reflection, characteristics, suitability, purpose			**Vocabulary (As previous Year 1 +)** Air, boiling point, boiling, condensation/condensing, degree Celsius, energy transfer, evaporation/evaporating, freezing, freezing point, gaseous, grain, matter, melting, melting point, oxygen, particles, powder, water cycle, water vapour **Adult should also use:** solidify, precipitation, transpiration, forces of attraction	Vocabulary (As previous +) Burning, dissolve, electrical conductor, filter, insoluble, irreversible change, mixture, reversible change, rust, sieving, soluble, solute, solution, solvent, thermal conductor, thermal insulator Adult should also use: combustion, oxidisation, chemical reaction, residue, filtrate	
PRIOR LEARNING EXPERIENCES			**PRIOR LEARNING EXPERIENCES**	**PRIOR LEARNING EXPERIENCES**	
In EYFS children have learnt about the properties of some materials and can suggest some of the purposes they are used for. They are familiar with basic scientific concepts such as floating, sinking, experimentation. Children learn about natural materials during their forest school sessions and Plastics and recycling in environmental science.			Children learn about properties of a variety of everyday materials in Materials unit of study in Cycle C. They also learn about plastics and recycling in our environmental science units. Forest school sessions help to build an understanding of natural material and their uses.		

Electricity					
EYFS: EYFS Children recognise that a range of technology is used in places such as homes and schools. Talks about why things happen and how things work.					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Electricity			**Electricity**		
How do batteries get their electricity?			*Can we control electricity?* *Can we vary the effects of electricity?*		
Significant person Thomas Eddison			Significant Person Elon Musk and Sir James Dyson		
Know that electricity is needed to make something work, links made to Toys History unit of study and Katie Morag and lighthouses in Geography.	*Know that electricity is needed to make something work*		• 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		• Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit

	Know that electricity is needed to make something work *Know that some appliances need batteries and some use mains electricity to work.*		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 conductor		• 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
			Vocabulary (As previous +) Battery, bulb, buzzer, cell, circuit, closed circuit, components, complete circuit, conductor, connection, crocodile clip, electricity, electrical device/appliance, insulator, mains, motor, negative, open circuit, plug, positive, rechargeable, simple circuit, symbol, switch, terminals, wires **Adult should also use**: series circuit, terminal		**Vocabulary (As previous +)** Current, electrons, filament, fuse, resistance series circuit, terminal, voltage volume **Adult should also use**: Parallel circuit
PRIOR LEARNING EXPERIENCES			**PRIOR LEARNING EXPERIENCES**		
In the History topic My School Then and Now children have learnt about life in Victorian times and how people living in this period of time lived without electricity. Children learn about different types of (non electrical light sources) in Light unit of study. Children learn about plant based energy sources in Plants unit of study.			Children learn about modern day appliances which need electricity to work in Electricity unit of study Cycle B. They would have learnt how people through history have lived and settled without the need for electricity through some of their history and geography unit of study. They will discuss and investigate sources of electrical pollution in our whole school pollution project.		

Forces and Magnets					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Explore floating and sinking, pushes and pulls. Sort objects using a magnet – links to Floating and Sinking Unit in Cycle B for Reception and Year 1.	*Explore cars moving quicker on different surfaces. Links made to Materials unit (see above)*	**Forces** *Do all metals stick to magnets?* Significant Person Robert Boyle		**Forces** *How do things move?* Significant Person Isaac Newton	
		• Compare how things move on different surfaces • Notice that some forces need contact between two objects, but magnetic forces can act at a distance • 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		• 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	Floating, sinking and density is explored in the enquiry unit, 'The titanic'.
		Vocabulary Air resistance, attract, bar magnet, button magnet, compass, contact, float, force, force-meter, friction, gravity, horse shoe magnet, iron, magnet, magnetic, magnetic North, non-contact, non-magnetic, North pole, poles, repel, ring magnet, sink, South pole, strength **Adult should also use:** Constant force, Newton meter, Newton		**Vocabulary (As previous +)** Drag forces, gears, levers, mechanisms, Newton, non-contact force, pulleys, reliable, springs, transference of force and motion, water resistance, weight	
		PRIOR LEARNING EXPERIENCES		**PRIOR LEARNING EXPERIENCES**	

		Children learn about how things move in our Electricity unit of study. They learn about magnets in our whole school recycling project.		Children learn about how things move in the Forces unit of study in Cycle C. They also learn about forces in Earth & Space as well as in Electricity when discussing the work of Elon Musk.

Light

EYFS:
Talks about why things happen and how things work.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Light used as a context for working scientifically in unit 'Celebrations' Vocabulary: illuminate, light source, opaque, reflect, translucent, transparent, shadow		**Light** *What is the dark?* Significant Person Benjamin Franklin • Recognise that he/she needs 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 eyes • Recognise that light from the sun can be dangerous and that there are ways to protect eyes • Find patterns in the way that the size of shadows change **Vocabulary** Absorb, beam, block, direction of light, bright, dim, dull, light source, mirror, opaque, reflect, reflective, shadow, shiny, sun light, translucent, transparent Names of light sources **Adult should also use**: Speed of light, emit, light spectrum **PRIOR LEARNING EXPERIENCES** Children learn about the importance of light for some people when learning about Christmas, Diwali and Chinese New Year. In EYFS children learnt to talk about the features of their own immediate environment and how environments might vary from one another.			**Light** *How do we see?* Significant Person Benjamin Franklin • 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 **Vocabulary (As previous +)** Absorption, cornea, lenses, iris, light ray, optics, pupil, prism, rainbow, refraction, symmetry, spectrum, transmission **PRIOR LEARNING EXPERIENCES** Through some of their history unit of work, children learn how people through history have lived and settled without the need for electric light sources. Children learn how light is reflected from surfaces in Light Cycle A.

Evolution and Inheritance

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Animals inc humans: *Understand that animals, including humans, have offspring which grow into adults* **Living things and their habitat:** *Understand that living things are suited to their habitat*	**Rocks:** Describe in simple terms how fossils are formed when things that have lived are trapped within rock compare and group together different kinds of rocks on the basis of their appearance and simple physical properties recognise that soils are made from rocks and organic matter	**Animals inc humans:** *Recognise that environments can change and that this can sometimes pose dangers and have an impact on living things*		**Evolution** *Do living things change over time and place?* Significant People Charles Darwin and Rosalind Franklin • 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 **Vocabulary** Adaptation, chromosomes, competition, DNA, evolution, evolutionary change features, environmental conditions, environmental variations, fossil records, genes, natural selection, reproduction, survival of the fittest, variation **Adult should also use:**

		A study of the type of rocks and soils found in our local environment.			Dominance, recessive **PRIOR LEARNING EXPERIENCES** Children have learnt how fossils are formed when things that have lived are trapped within rock in Rocks and Soils unit of study. They have learnt about animals, life cycles and humans and growth in some of their science units of study in Years 1, 2 and 3. In Geography children learn about living in extreme climates and how animals and humans adapt to living in these conditions.

Seasonal Changes

EYFS:
Forest school sessions throughout the year allow them to experience the changes in the environment across the four seasons. They answer how and why questions about their experiences

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Seasons					
Do living things change or stay the same?	*How does our school grounds change throughout the year?*				
• Observe changes across the four seasons • Observe and describe weather associated with the seasons and how day length varies	Forest school sessions again provide another opportunity to observe and describe changes across the four seasons.				
Vocabulary Autumn, dark, light, moon movement, season, shadow, spring, summer, winter Names common types of weather and features Adult should also use: Day length					
Babylonians					
PRIOR LEARNING EXPERIENCES					
In EYFS children learnt that the environment and living things are influenced by human activity. They described some actions which people in their own community do that help to maintain the area they live in. They also spoke about the features of their own immediate environment and how environments might vary from one another. When learning abut Plants children will look at different plants that grow across a year and the conditions they need to grow and thrive. Forest school provides opportunities to look at seasonal changes in more depth throughout the year.					

Earth and Space

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Why can we not always see the Moon?				*Sun, Earth and Moon, what is moving?*	
Significant People Neil Armstrong				Significant People Tim Peak and Stephen Hawking	
Know the Earth orbits the sun. Know that the Moon orbits the Earth. Know the sun is a star Name the planets				• 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	
Vocabulary Sun, star, Earth, planet(s), Moon, orbit, rotate, position, galax, solar system, names of all planets, sky, seasons, distance, miles,				**Vocabulary** Asteroids, axes/Axis, celestial body, comets, galaxy, light years, meteors, orbit, phases of the moon, planet, revolve, rotation, shadow clocks, spherical, spin, solar system, star, sun, sundials, time zone Name of planets **Adult should also use:** Geocentric model, Heliocentric model, elliptical orbit	
				PRIOR LEARNING EXPERIENCES	
				Children learn about how things move in the Forces unit of study in Cycle C. They also learn about forces in Earth & Space as well as in Electricity when discussing the work of Elon Musk. Children learn about the sun in Light unit of studies in both Cycle A's.	

Sound

EYFS:
Listening and attention skills developed. Opportunities given to listening to environmental sounds and discussion about different types of sounds e.g. long, short, high and low

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Sound used as a context for working scientifically in unit 'Celebrations' **Vocabulary** *Sound, source of sound, vibration*		*Exploring how to change the volume and pitch of a sound during music lessons.*	*How do we hear different sounds?* Significant Person Alexander Graham Bell • 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 **Vocabulary** Brass, echo, insulation, instrument, percussion, pitch, sound source, sound wave, string, travel, tune, tuning fork, vibration, volume, woodwind **Adult should also use:** Strength of vibrations, reflection of sound **PRIOR LEARNING EXPERIENCES** Children learn about sound throughout their music unit of studies, Children learn about different sources of sounds being made with and without the need for electricity.		

Rocks

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		Are all rocks the Same? Significant Person Mary Anning • 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 **Vocabulary** Absorb, extinct, crystals, fossils, granite, grains, humus, igneous, impermeable, layers, magma, metamorphic, mineral, molten, palaeontology/palaeontologists, permeable, rock, sediment, sedimentary, soil Name of rocks: granite, marble, sand, clay, limestone, chalk **Adult should also use:** Erosion, particles, physical properties, porous **PRIOR LEARNING EXPERIENCES** Children learn about different plant environments in Plants. They also learn about soils in Seasons and throughout their forest school sessions. Children look at and discuss the impact of plastics in our oceans and on our land in our whole school Plastics, recycling and Pollution projects.			• Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago *Covered in Evolution*

Environmental Science
Whole School Projects

EYFS:
Can talk about some of the things they have observed such as plants
Shows care and concern for living things and the environment
Looks closely at similarities, differences, patterns and change
They talk about the feature of their own immediate environment and how environments might vary from one another

	Cycle A	Cycle B	Cycle C

Focus	Recycling & Plastics	Pollution & Climate Change	Deforestation & Renewable Energy *(Year 4, 5 & 6 only)*
Reception and Year 1 **Progression of skills** **Use Eco Schools and STEM plastic challenges**	**Why are plastics a problem for our planet?**	**What is pollution?**	
	Make comments about what they have heard and ask questions to clarify their understanding. Offer explanations for why things might happen, making use of recently introduced vocabulary when appropriate Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary. Record and communicate findings in a range of different ways using simple scientific language.		
Year 2 & 3 **Progression of skills** **Use Eco Schools and STEM plastic challenges**	**What is the impact of plastics in our seas and on our land?** *Significant person* *Lily Platt*	**How is pollution effecting our planet?** **Significant Person:**	
	Ask simple questions and recognise that they can be answered in different ways. Gather and record data to help answer questions. Gather, record, classify and present data in a variety of ways to help answer questions. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. Begin to notice changes over time, patterns and relationships. Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. understand that humans can have a positive impact on the environment and natural world through conservation.		
Year 4, 5 & 6 **Progression of skills** **Use Eco Schools and STEM plastic challenges**	**Why is it important to recycle and reduce our use of one time plastics?** *Significant Person* *Greta Thunberg*	**How is our climate changing?** Significant Person:	**How have human beings impacted the environment of the rainforest?** **How can renewable energy support the future of our planet?** *Significant People* *Prince Charles and David Attenborough*
	Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Use straightforward scientific evidence to answer questions or support findings. Look for different causal relationships in data and identify evidence that refutes or supports ideas Make predictions using results and identify when further observations, comparative and fair tests might be needed.		

	Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in a variety of forms and presentations. understand the impact of changes in the environment to the balance of nature in the local environment understand that humans can have a positive impact on the environment and natural world through conservation and 'rewilding'.
	The message of Reduce, Reuse and Recycle is ongoing throughout the school year and across all classes

ASPIRATIONS FOR THE FUTUE

Pupils develop an understanding of how subjects and specific skills are linked to future jobs. Here are some of the jobs you could aspire to do in the future as a Scientist:

Aquatic Vet	**Astronaut**	**Animal Researcher**
Marine Biologist	**Weather Presenter**	**Meteorologist**
Microbiologist	**Chemist**	**Crime Scene Investigator**

Our Feeder High Schools KS3 Year 7 Geography Curriculum Snapshot			
Cromer Academy	Classification. Substances and Particles and the Atom. Forces Cells, Isotopes and Electronic Structure. Force and Motion	Biodiversity and ecology, Periodic Table, Newton's laws Biodiversity and Ecology, Ions molecules, macromolecules and mixtures, speed/distance/time graphs	Humans and health, Physical properties, Hooke's law Chemical Formulae and Pressure
North Walsham High School	The seven characteristics of living things Animal, plant and bacterial cells Specialised cells Diffusion/Respiration Cells, tissues, organs and systems Skeletal system/antagonistic muscles Sexual reproduction Heart and circulatory system Respiratory system Digestive system Nervous system End of topic assessment Analytically chemistry activity in humans and plants	The particle model of matter. Properties of solids, liquids and gases. Physical and chemical changes. Oxidation - rusting Conservation of mass Density Solutes, solvents, solutions and solubility Atomic structure Elements, compounds and mixtures Periodic table Separation techniques Reactions of acids	Energy Useful and non-useful energy pathways Thermal energy transfer Renewable and Non-renewable energy sources Generating electricity. Electricity in the home. Electrical circuits Measuring current and voltage Resistance Electromagnets & motors Wave Sound/ultrasound Light and properties of EM Spectrum
Aylsham High School	**Biology** Cells and Body Systems Respiration Genetics Ecosystems	**Chemistry** Atoms and The Periodic Table Particle Theory Chemical Reactions Earth Sciences Particle Theory	**Physics** Forces Motion Energy Waves Electricity and Magnetism Astronomy