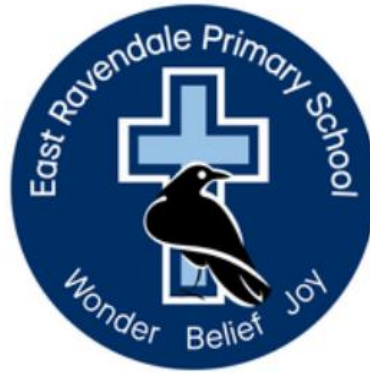




YEAR 3 AND 4 SCIENCE CURRICULUM CYCLE A

EAST RAVENDALE C OF E PRIMARY SCHOOL

At East Ravendale, we strive to develop independent, self-motivated and inquisitive learners of all ages. We celebrate our uniqueness and value all as God's children. We aim to give all members of our community opportunities to succeed, now and in the future, knowing they are safe and valued.

Our vision is underpinned by our core values of wonder, belief and joy.

"I can do all things through God who strengthens me." Philippians 4:13



Science at East Ravendale

At East Ravendale, our science curriculum reflects our vision to develop independent, self-motivated and inquisitive learners who feel valued, safe and inspired to succeed now and in the future. Rooted in our Christian ethos, we celebrate each child as unique and valued as God's creation. Guided by the belief that ***"I can do all things through God who strengthens me"*** (***Philippians 4:13***), we nurture confidence, curiosity and resilience. Through science, we bring our values of **wonder, belief and joy** to life while developing a strong understanding of the scientific world.

Wonder

We inspire a sense of wonder about the world God has created through engaging, hands-on experiences. Children are encouraged to question, explore and investigate through practical learning and outdoor opportunities. By building on prior knowledge across biology, chemistry and physics, pupils develop curiosity and become increasingly independent, inquisitive learners.

Belief

We foster belief by developing children's confidence in their ability to think scientifically and overcome challenges. Through carefully sequenced learning and working scientifically skills, pupils learn to trust in their abilities. By exploring science-related careers, children are encouraged to believe in their potential and aspire for the future.

Joy

We promote joy through exciting and engaging science experiences, including practical lessons, STEM events and cross-curricular learning. These opportunities create enthusiasm and help children retain knowledge. As a result, pupils develop a lasting love of science and a desire to continue exploring the world around them.

"I can do all things through God who strengthens me." Philippians 4:13



Year 3/4 Science Curriculum Cycle A

	<u>Autumn</u> <u>1</u>	<u>Autumn</u> <u>2</u>	<u>Spring</u> <u>1</u>	<u>Spring</u> <u>2</u>	<u>Summer</u> <u>1</u>	<u>Summer</u> <u>2</u>
Programme of Study	Light	Animals including Humans	Electricity	Plants		Animals including Humans & Living Things and their Habitats
Area of Science	Physics	Biology	Physics	Biology		Biology



Why this, why now?

<u>Year 3/4</u> <u>Cycle A</u>	<u>Why this, why now?</u>
Autumn 1 - Light	Pupils will use their knowledge of properties materials in KS1 to support their learning of light. As the weather during this term is still relatively good the children will be able to see shadows unlike at an alternative part of the year.
Autumn 2 – Animals including Humans	Pupils will develop their scientific understanding of the teeth, their function and link to staying healthy in relation to prior learning in PSHE.
Spring 1 - Electricity	Pupils will develop their understanding of electricity beyond that which they see or use around them. They will begin to investigate how electricity is conducted, and through what materials and be able to build simple circuits.
Spring 2/Summer 1 – Plants	Pupils will be able to measure a variety of plants and see first-hand clear parts of the plant due to many flowering plants being in bloom. This will therefore strengthen their learning comparing to at an alternative point of the year. As the learning is continued over two terms it will give the pupils the chance to watch plant growth in real time.
Summer 2 – Animals including Humans & Living Things and their Habitats	In this unit pupils will build on their learning from KS1 about animals and humans. Pupils will continue to expand their knowledge of food chains learnt in Y1/2 Cycle B. They will link their learning in science with maths skills through data handling.

Scientists

At East Ravensdale, children learn about a diverse range of scientists alongside their National Curriculum science studies. By exploring **historical** and **contemporary** scientists from a variety of backgrounds, including **underrepresented** groups, pupils develop science capital, see the relevance of science in everyday life, and recognise that science is for everyone.

“I can do all things through God who strengthens me.” Philippians 4:13



Autumn 1 – Light

Prior Knowledge	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)
Objectives to be taught	<u>Y3 Objectives</u> • 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 a solid object • Find patterns in the way that the size of shadows change
Core Knowledge	▪ To know that there are different light sources ▪ To know we need light to see ▪ To know the name of some parts of the eye ▪ To know that light travels in a straight line ▪ To know how a shadow is formed ▪ To know how/why shadows change in size ▪ To know how surfaces reflect light ▪ To know the definition and identify opaque, translucent and transparent objects



Working Scientifically Statements	○ Asking relevant questions and using different types of scientific enquiries to answer them ○ Using straightforward scientific evidence to answer questions or to support their findings ○ Making systematic and careful observations and where appropriate taking accurate measurements using standard units, using a range of equipment, including thermometers & data loggers (if appropriate) ○ Setting up simple practical enquiries; comparative and fair tests ○ Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ○ Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables ○ Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ○ Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ○ Use scientific vocabulary correctly and with some confidence
Vocabulary	light, shadow, dark, transparent, opaque, direction, light travels, translucent, shortest, longest, highest, object, material, light source, sun, night, day
TAPS Assessment	Make Shadows – click here
Scientists	Percy Shaw – inventor of the cat's eye
Suggested Resources	CLEAPSS Making and measuring shadows Investigating the shapes of shadows



Autumn 2 – Animals including Humans

Prior Knowledge	Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans) Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans) Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. (Y3 - Animals, including humans)
Objectives to be taught	<u>Y4 Objectives</u> • 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
Core Knowledge	▪ To know the name of different human teeth ▪ To know the functions of different human teeth ▪ To know what tooth decay is ▪ To know how to look after teeth ▪ To know the names of the basic parts of the human digestive system ▪ To know the basic functions of the human digestive system



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Vocabulary	teeth, incisor, premolar, molar, canine, root, decay, plaque, enamel, digest, tongue, saliva, salivary glands, oesophagus, stomach, liver, pancreas, gall bladder, small intestine, large intestine, rectum, anus, faeces, organ
TAPS Assessment	Teeth in Liquid – click here
Scientists	William Beaumont - Surgeon who first observed and studied human digestion as it occurs in the stomach Washington & Lucius Sheffield - Dentists who invented toothpaste in a tube Paul Sharpe - Bioengineer who studies how to regrow teeth if they become damaged



Suggested Resources

CLEAPSS

[Finding out about teeth](#)

[Identifying teeth](#)

[Modelling the effect of toothpaste on teeth](#)

[Modelling the effect of fizzy drinks on teeth](#)



Spring 1 - Electricity

Prior Knowledge	Children 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. They make observations of animals and plants and explain why some things occur and talk about changes. (Early Learning Goal)
Objectives to be taught	<u>Y4 Objectives</u> • 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 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 a lamp lights in a simple series circuit • Recognise some common conductors and insulators
Core Knowledge	▪ To know what defines an electrical appliance and name them ▪ To know which electrical items are mains or battery powered ▪ To know what the different circuit components are and explain their role ▪ To know how to build a series circuit ▪ To know whether a series circuit is complete or incomplete and explain why ▪ To know what electrical conductors are and give examples ▪ To know what electrical insulators are and give examples ▪ To know what switches are and explain how they work in a circuit



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Vocabulary	mains-powered, battery-powered, plug, appliances, devices, circuit, simple series circuit, complete circuit, incomplete circuit, bulb, cell, wire, buzzer, switch, motor, battery, conductor, insulator
TAPS Assessment	Electrical Conductors – click here



Scientists	Thomas Edison - Inventor of the lightbulb and power grid Joseph Swan - Physicist & Chemist who developed a primitive electric light 20 years before Thomas Edison Lewis Howard Latimer - Electronic Engineer who improved the design of Edison's light bulb and brought street lighting to the world Ronit Kanwar - Businessman who set up company to provide affordable, sustainable solar-powered lights for poor in rural India William Kamkwamba - Inventor who used wind turbines to bring electricity to his village in Malawi Zubera Iqbal - Chemist who explores sustainable ways to recycle electric vehicle batteries
Suggested Resources	<u>CLEAPSS</u> <u>Making a simple circuit to light a bulb</u> <u>Electrical conductors and insulators</u> <u>Electrical component dominoes</u>



Spring 2 & Summer 1 - Plants

Prior Knowledge	Observe and describe how seeds and bulbs grow into mature plants. (Y2 - Plants) Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Y2 - Plants)
Objectives to be taught	<u>Y3 Objectives</u> • Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. • Explore the requirements of plants for life & growth (air, light, water, nutrients from soil, & room to grow) & 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 a flowering plant, including pollination, seed formation and seed dispersal.
Core Knowledge	▪ To know the names of different parts of flowering plants ▪ To know the functions of different parts of flowering plants ▪ To know the main stages of a lifecycle of a flowering plant ▪ To know and be able to explain the role flowers have in pollination and fertilisation ▪ To know the needs for a plant to grow and to be able to explain these ▪ To know how water travels in a plant



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Vocabulary	transport, evaporation, nutrients, absorb, pollination, pollen, nectar, pollinator, seed dispersal, air, light, water, space, warmth, roots, stem/trunk, fertilisation, stamen, anther, filament, carpel, stigma, style, ovary, ovule, sepal, carbon dioxide
TAPS Assessment	How Much Water Do Plants Need? – click here Close Observation of Flowering Plants – click here



Scientists	Jan Inglehousz – Doctor & Scientist who discovered the process of photosynthesis Carl Linnaeus – Botanist who studied the conditions for successfully growing bananas and developed a method to reproduce them in Europe Charles Henry Turner – Zoologist who made groundbreaking discoveries about insect behaviour Jagadish Chandra Bose – Biophysicist who measured plant response to different stimuli George Washington Carver – Agricultural scientist who encouraged the planting of different crops to prevent soil degradation Dr Kelsey Byers – Biologist who studies flower smells and how they attract insects
Suggested Resources	CLEAPSS Ink flowers Papier Mache Leaves



Summer 2 – Animals including Humans & Living Things and their Habitats

Prior Knowledge	Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans) Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. (Y3 - Animals, including humans) Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants) Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans) Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans) Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats)
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Objectives to be taught	<u>Y4 Animal including Humans Objectives</u> • Construct and interpret a variety of food chains, identifying producers, predators and prey. <u>Y4 Living Things and their Habitats Objectives</u> • Recognise that living things can be grouped in a variety of ways. • Explore and use classification keys to help group, identify & name a variety of living things in their local & wider environment • Recognise that environments can change and that this can sometimes pose dangers to living things.
Core Knowledge	▪ To know how to construct a food chain ▪ To know how to interpret a food chain ▪ To know the producer, prey and predator in a food chain ▪ To know how to sort into a Venn Diagram ▪ To know how to sort into a Carroll Diagram ▪ To know characteristics of living things and use them to sort them by a classification key ▪ To know dangers to wildlife in local and wider environments ▪ To know how changes to environments affect living things within them



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Vocabulary	producer, consumer, prey, predator, decomposer, food web, organisms, specimen, species, classification, characteristics, key, wing, abdomen, thorax, antenna, segments, mandible, environment, dangers, climate change, natural changes, deforestation, pollution, urbanisation, invasive species, endangered, extinct, fish, bird, mammal, amphibian, reptile, vertebrate, invertebrate
TAPS Assessment	Local Survey Plan – click here



East Ravensdale C of E Primary School

Scientists	Jacques Cousteau - Oceanographer and co-inventor of the aqualung Rachel Carson - Aquatic Biologist who wrote about environmental pollution Wangari Maathai - Biologist & Environmental Activist awarded the 2004 Nobel Peace Prize for her contribution to sustainable development Kelsey Archer Barnhill - Deep Sea Ecologist who sends robots to the seafloor to collect samples of different animals to study Liz Bonnin - TV Presenter & Wildlife Conservationist
Suggested Resources	<u>CLEAPSS</u> Food Chain activity Make a simple key to name common yellow flowers

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