

### "Through God's love, we are the rich soil where roots <u>grow and seeds lourish"</u>

## Intent

deprivation-lack of access to Museums etc Lack of diversity within the school community (predominantly white British) Children lack independence and confidence to communicate their ideas/oracy skills compared to their high academic outcomes Wide socio-economic gap within the school-Above national levels of PP in some cohorts Above national levels of SEND in some cohorts Children struggle to retain specific facts in the long term Decreased engagement from parents with children's learning since COVID

At Staindrop CE Primary, it is our intention that every pupil, irrelevant of needs, develops such a passion for Science that they harness their natural excitement and curiosity and in turn this inspires them to pursue scientific enquiry. We wish that every child is excited by scientific ideas and wants to learn to explain and analyse phenomena, make predictions and solve problems. **CURRICULUM AIM:** 

Through Science, we aim to support this philosophy by

- investigating problems both as groups and as an individual, using the 5 types of enquiry
- learning how science works through research, experts and being curious
- discovering why science matters in the world careers and opportunities
- enabling children to build up a body of key knowledge and an understanding of key scientific concepts through investigation
- Being scientists and developing the Working Scientifically skills
- enabling children to apply their scientific understanding to rationalise and explain new phenomena
- developing a sense of excitement and curiosity about science and natural phenomena
- Inspire children to read and seek to find out more through quality non-fiction texts, expert visitors and trips

At our school we know that children learn best when the curriculum is well sequenced to enable revisiting of core knowledge, skills and understanding to deepen conceptual awareness before demanding application across the whole curriculum.

Please see the Science Progression of Skills documents (held in school), which outline how the key skills are developed, revisited, assessed and built upon during EYFS and Year 1 to Year 6.

**CURRICULUM AIM:** 

**CURRICULUM AIM:** Meet people, go places & make things happen

Know more, Do more & Remember more

**CURRICULUM AIM:** Love of Reading

Happy Healthy Global Citizens









At Staindrop CE Primary School, we seek to discover new things, are critical thinkers and are inspired by the world around us.







evergreen trees. and garden plants, including deciduous and Y1 - Plants Summer 1 and 2
Identify and name a variety of common wild

including trees. a variety of common flowering plants, Identify and describe the basic structure of

## Y2 - Plants – Summer 2 **|**|-#<

- 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.



# Summer 1 Y2 - Animals including Humans –

- into adults. humans, have offspring which grow Notice that animals, including
- and air). Find out about and describe the humans, for survival (water, food basic needs of animals, including
- and hygiene. Describe the importance for humans of exercise, eating the right amounts of different types of food,

animals (fish, amphibians, reptiles, birds and mammals, including pets). structure of a variety of common omnivores.

Describe and compare the

carnivores, herbivores and common animals that are

Identify and name a variety of

mammals.

amphibians, reptiles, birds and common animals including fish, Identify and name a variety of

Spring 1

Y1 - Animals Including Humans



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#### parts of the human body and say which sense. and label the basic Humans – Autumn 1Identify, name, draw associated with each part of the body is

# Y2 - Living things and their habitats- Spring 1

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Explore and compare the differences things that have never been alive. between things that are living, dead, and

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- the basic needs of different kinds of habitats to which they are suited and describe how different habitats provide for Identify that most living things live in on each other. animals and plants, and how they depend
- microhabitats. animals in their habitats, including Identify and name a variety of plants and
- from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food Describe how animals obtain their food

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# Y6 - Animals including Humans Summer 2

parts of the human circulatory system, and describe the vessels and blood. functions of the heart, blood Identify and name the main

the way their bodies function. exercise, drugs and lifestyle on Recognise the impact of diet,

including humans. transported within animals, nutrients and water are Describe the ways in which



## Habitats – Summer 1 Y4 -Living Things and their

Recognise that living things can be grouped in a variety of ways.

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- environment. their local and wider variety of living things in group, identify and name a classification keys to help Explore and use
- things. and that this can sometimes pose dangers to living environments can change **Recognise that**

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# Humans -Spring 1

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- system in humans. functions of the basic parts of the digestive Describe the simple
- functions. Identify the different and their simple types of teeth in humans
- Construct and interpret a variety of food chains, identifying producers, predators and prey.





# Y6 - Living Things and their Habitats – Spring 1

- ٠ differences, including observable characteristics and according to common Describe how living things are animals microorganisms, plants and based on similarities and classified into broad groups
- Give reasons for classifying specific characteristics. plants and animals based on



# び、マン・Living things and their Habitats ・ マー・マー・ - Summer 2

- amphibian, an insect and a bird. life cycles of a mammal, an Describe the differences in the
- reproduction in some plants and animals. Describe the life process of

# Y5 - Animals including Humans – Summer 1

Describe the changes as humans develop to old



Spring 1 Y6 - Evolution and Inheritance

- Recognise that living things have things that inhabited the Earth changed over time and that fossils provide information about living millions of years ago.
- not identical to their parents. but normally offspring vary and are Recognise that living things produce offspring of the same kind,
- adaptation may lead to evolution. in different ways and that adapted to suit their environment Identify how animals and plants are

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- flowers. stem/trunk, leaves and of flowering plants: roots, Identify and describe the functions of different parts
- plants for life and growth (air, light, water, nutrients from plant to plant. grow) and how they vary from soil, and room to Explore the requirements of
- plants. Investigate the way in which water is transported within
- of flowering plants, Explore the part that flowers play in the life cycle dispersal. formation and seed including pollination, seed

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# **Y3** - Animals including humans Summer 1

Identify that animals they get nutrition from what cannot make their own food; nutrition, and that they right types and amount of including humans, need the

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they eat

movement. support, protection and skeletons and muscles for some other animals have Identify that humans and



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# PHYSICS



**Reception – Light** 

• Describe what they see, hear and feel whilst outside.

#### **Reception – Seasonal Change**

- Explore the natural world around them.
- Describe what they see, hear and feel whilst outside.
- Understand the effect of changing seasons on the natural world around them.

#### Nursery – Sound

Explore how things work. •

#### Nursery – Forces

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- Explore how things work.
- Explore and talk about different forces they can feel.
- Talk about the differences between materials and changes they notice.



#### **Reception – Sound**

 Describe what they see, hear and feel whilst outside.



#### Y3 - Light – Autumn 2

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.

#### Y3 - Forces – Spring 1

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.



Describe what they

**Reception – Forces** 

Explore the natural

world around them.

 Observe and describe weather associated with the seasons and how day length





varies

# PHYSICS







#### Y4 - Sound – Autumn 1

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.



#### Y4 - Electricity – Summer 2

- 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



#### Y6 - Light – Spring 1`

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.

#### Y5 - Earth and Space – Autumn 1

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.



#### Y5 - Forces – Autumn 2

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.



#### Y6 - Electricity – Summer 1

Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.

• Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.

• Use recognised symbols when representing a simple circuit in a diagram.





# chemistry

#### Nursery - Materials

- Use all their senses in hands-on exploration of natural materials.
- Explore collections of materials with similar and/or different properties.
- Talk about the differences between materials and changes they notice.



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#### Reception – Materials

- Explore the natural world around them.
- Describe what they see, hear and feel whilst outside

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#### Y1 - Materials – Autumn 2

Distinguish between an object and the material from which it is made.

- Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.
- Describe the simple physical properties of a variety of everyday materials.
- Compare and group together a variety of everyday materials on the basis of their simple physical properties.



- 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.

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#### Y2 - Materials – Autumn 1 and 2

- Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.



#### Y4 - States of matter– Autumn 2

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.
- Recognise some common conductors and insulators, and associate metals with being good conductors. (Y4 - Electricity)

#### Y5 - Properties and changes of materials- Spring 1

Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.

- Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.
- Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.
- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.
- Demonstrate that dissolving, mixing and changes of state are reversible changes.
- Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

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Identify and compar



### Science Subject Story - Yearly Coverage



	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Biology Animals Including Humans (Human body and senses)	Chemistry Everyday Materials	Biology Animals Including Humans (animal classification)	BRITISH SCIENCE WEEK WORKING SCIENTIFICALLY FOCUS	Biology Plants	
			Seasonal changes covered throughout	ut the year		
Year 2	Chem Everyday materials a	nistry and their properties	Biology Living things and their habitats	2024 Theme is TIME	Biology Biology Animals Including Humans Plants	
Year 3	Chemistry Rocks and Soils	Physics Light and Shadow	Physics Forces and Magnets		Biology Animals Including Humans	Biology Plants
Year 4	Physics Sound	Chemistry Materials (states of matter)	Biology Animals Including Humans (Digestive system and teeth)		Living things Biology Living things and their habitats (classification)	Physics Electricity
Year 5	Physics Earth and Space	Physics Forces	Chemistry Properties and Changing Materials		Biology Animals Including Humans (growth)	Biology Living things and their habitats (life cycles and reproduction)
Year 6	Physics Light	Physics Electricity	Biology Animals including Humans (Circulatory System)		Biology Living things and their habitats (Classification)	Biology Evolution and Inheritance Puberty Talk 9in line with PSHE curriculum)



# Scientists across the curriculum





## Scientists Across the Curriculum

Research has shown that, while learning science can be interesting and enjoyable, many children find that what they learn at school is abstract and they cannot see how it relates to their own lives. Consequently, they see science as something that is not for them. Studies have shown that these perceptions can start early in a child's primary school career. Children who think or feel this way have low science capital. One way of increasing children's science capital is for them to learn about scientists that they can identify with.

As Staindrop Scientists, our aim is to expose children to a wide variety of scientists who:

- are relevant to the topics
- illustrate how scientific knowledge has developed over time
- children can identify with and whose work they can relate to.

For each topic in each year-group, a scientist has been chosen as a focus. The scientist will meet the following three criteria:

- historical figures who illustrate the development of scientific knowledge over time
- scientists from under-represented groups
- modern scientists whose work is relevant to children and who reflect their world and backgrounds.

As well as these specific scientists that are covered during topics, other relevant and key scientists will be explored through other areas of the curriculum, such as whole school enrichment, British Science Week, Maths and The Big Bird Watch.

#### A SCIENTIST JUST LIKE ME

Introducing children to a diverse range of scientists and people who work in science-related jobs



A Scientist Just Like Me is designed to raise awareness of diversity in science-related jobs and to provide illustrated examples of a wide range of science-based careers. It consists of a series of short slideshows, each one 'telling the story' of a particular scientist or person working in a science-related job. The people included share details of their work and their everyday lives, making their stories relatable to children. They describe their job, what they like about it, and the challenges they have faced on their career journeys.

The resources focus on the skills, attitudes and habits that are needed to carry out the work, rather than on any expert knowledge, which may be daunting or seem out of reach to children. At the end of each slideshow, the children are encouraged to imagine and discuss what it might be like to do that job.

	Plants	Animals, Including Humans	Everyday Materials	Seasonal Change	Senses		
Year 1	Maria Sibylla Merian German artist, scientific illustrator, and naturalist Arit Anderson - Garden Designer and presenter of Gardeners World Arborist (cares for and manages trees) Botanist (studies plants)	Joan Beauchamp Procter Herpetologist and Curator of Reptiles, London Zoo Malaika Vaz (Wildlife Videographer and National Geographic Explorer) Zoologist (studies animals) Wildlife photographer (takes pictures of animals and plants)	Charles Macintosh Chemist and inventor of waterproof clothing Dr Pearl Agyakwa (Materials scientist)	Jim Cantore Meteorologist and storm tracker Liam Dutton (Weatherperson/Meteorologist) (Weatherperson/Meteorologist) (Weatherperson/Meteorologist) (Weatherperson/Meteorologist) (Weatherperson/Meteorologist) (Weatherperson/Meteorologist) (Weatherperson/Meteorologist) (Weatherperson/Meteorologist) (Weatherperson/Meteorologist)	Miller Hutchinson Electrical engineer – invented the first electrical hearing aid		
	Plants	Animals, Including Humans	Everyday Materials	Living Thinks and Their Habitats			
Year 2	Angie Burnett Plant Biologist who grows plants and sees how they react to different conditions that make it more difficult for them to grow George Washington Carver (Botanist)	Dr Kelly Blacklock Veterinary Surgeon Bear Grylls (Survival Expert) Animal behaviourist (studies animal interactions) Exercise physiologist (a doctor who helps people improve their fitness)	John McAdam Inventor of the modern road surface Danial Azahan (Mechanical engineer)	William Kirby (Father of modern entomology, the study of insects) Tanesha Aleen (Zoologist)Tanesha Aleen (Zoologist)Image: State of the study image: State of the study image: State of the study of insects)Image: State of the study image: State of the study image: State of the study image: State of the study of insects)Image: State of the study image: State of the state o			
Historical Figures Under-represented groups Modern Scientists Careers							

Year 3       Drickiewy persis Biologist who studies flower sine damaged insects and multiple and how they strated insects and multiple and how they strated insects and how they strated insects and how they st		Plants	Animals, Including Humans	Rocks and Soils	Light	Forces and Magnets
Image: NoundSoundStates of MatterDigestive SystemLiving ThingsElectricityYear 4Saa Newto MAthematician & Physicist who measured the speed of sound Evelyn Glennie (Deaf percussionist)Saa Newto MAthematician & Physicist who measured the speed of sound Evelyn Glennie (Deaf percussionist)Saa Newto MAthematician & Physicist who measured the speed of sound Evelyn Glennie (Deaf percussionist)Saa Newto MAthematician & Physicist who measured the speed of sound and how it ischer in the speed of sound engineer the speed of the speed	Year 3	Dr Kelsey Byers Biologist who studies flower smells and how they attract insects Ahmed Mumin Warfa (Somali Botanist) Horticulturist (an expert in garden cultivation and management) Irrigation engineer (creates and develops water systems)	Marie Curie Physicist who invented the first mobile x-ray machine to treat soldiers wounded on the battlefield in WWI Zubair Haleem (Academy physio at Arsenal) Physiologist (a scientist who studies how plants and animals function) Dietician (developes nutrition advice to improve people's diets)	Mary Anning Fossil hunter who developed the theory that dinosaurs had become extinct a long time ago Christopher Jackson (geologist)	Percy Shaw Inventor of the cat's eye CV Raman (Physicist)	Eric Laithwaite Electrical Engineer who developed the technology behind the Maglev train Jyoti Sehdev (Senior civil engineer)
Year 4Isaac Newton Mathematician & Physicist who measured the speed of sound Evelyn Glennie (Deaf percussionist)Daniel Fahrenheit Physicist Anders Celsius Dr Fangxian Fang (Earth scientist) Dr Fangxian Fang (Earth scientist)Washington & Lucius Sheffield Dentists who invented southpaste in a tube Charlotte Armah (nutritional percussionist)Rachel Carson Aquatic Biologist who wrote about environmental pollution Prem Singh Gill (Polar scientist)Lewis Howard Latimer Electronic Engineer who improved the design of Edison's light bulb and brought street lighting to the worldAudiologist (studies sound and its properties) Sound engineer (deals with sound for broadcasts or musical performances)Daniel Fahrenheit Physicist Anders Celsius Dr Fangxian Fang (Earth scientist)Washington & Lucius Sheffield Dentists who invented southpaste in a tube Charlotte Armah (nutritional health)Rachel Carson Aquatic Biologist who wrote about environmental pollution prem Singh Gill (Polar scientist)Rachel Carson Aquatic Biologist who wrote about environmental pollution Dichodontist (a doctor who about science)Rachel Carson Aquatic Biologist who wrote about scienceRachel Carson Aquatic Biol		Sound	States of Matter	Digestive System	Living Things	Electricity
	Year 4	Isaac Newton Mathematician & Physicist who measured the speed of sound Evelyn Glennie (Deaf percussionist) Audiologist (studies sound and its properties) Sound engineer (deals with sound for broadcasts or musical performances)	Daniel Fahrenheit Physicist Anders Celsius Dr Fangxian Fang (Earth scientist) Image: Science teacher (teaches others about science)	Washington & Lucius Sheffield Dentists who invented toothpaste in a tube Charlotte Armah (nutritional biochemist - looking at the effect of diet on human health) Orthodontist (a doctor who looks after people's teeth and gums) Nutritionist (studies nutrition in food and how it affects our bodies)	Rachel Carson Aquatic Biologist who wrote about environmental pollution Prem Singh Gill (Polar scientist) Conservationist (works for the protection and preservation of living things and the environment) Ecologist (studies interactions between living things and their environments)	Lewis Howard Latimer Electronic Engineer who improved the design of Edison's light bulb and brought street lighting to the world Hertha Ayrton (Electrical engineer and sufragette) Electrical engineer (works with equipment that uses electricity)

	Earth and Space	Forces	Animals, Including Humans	Living Things	Properties and Changing Materials
Year 5	Tim Peake (Astronaut who was the first British person to walk in space)Valentina Tereshkova Astronaut and first woman in space Dr Helen Mason (Solar scientist)Image: Stress of the stress of the stress of the stress of the space to carry out research) Astronautical engineer (develops spacecraft) 	Archimedes Mathematician who developed theories about how levers and pulleys can lift and move heavy objects Rafsan Chowdhury (Mechanical Engineer) (Mechanical Engineer) Aeronautical engineer (designs, develops, manufactures and maintains aircraft) Builder (builds structures) Mechanical engineer (designs, analysis and manufactures mechanical systems)	Virginia Apgar Doctor & Medical Researcher who developed a method of evaluating the well-being of new-born babies Olive Guthrie Smith (physiotherapist) Physiotherapist (helps people affected by illness, injury or disability thorough movement and exercise) Psychiatrist (a doctor who specialists in mental health)	David Attenborough Naturalist & TV Presenter)Image: State of the state	Spencer Silver & Arthur Fry Chemical Engineer & Chemist respectively who invented the post-it note Becky Schroeder (Inventor of the glow sheet)

Historical Figures

Under-represented groups

<mark>Modern Scientists</mark>

Careers

Ev	volution and Inheritance	Light	Electricity	Living Things	Circulatory System
Year 6 Cha Nat device Ros the	arles Darwin tural Historian who veloped the theory of olution by natural selection salind Franklin (Discovered e structure of DNA)	Colin Webb Professor of Laser Physics Patricia Bath (Ophthalmologist and inventor) Architect (designs buildings) Ophthalmologist (a doctor specialising in vision and eye health)	Alessandro Volta Physicist who developed the electric battery Mo Ibrahim (Pioneer in the mobile phone industry)	Carl Linnaeus Botanist & Zoologist who developed a taxonomy for classifying organisms Nazifa Tabassum (Microbiologist and Science Communicator)	Ruth Ella Moore Bacteriologist who researched immunology, blood groups and tuberculosis Elizabeth Anionwu (Sickle cell and thalassemia specialist) Cardiologist (a doctor specialising in the heart and circulatory system) Haematologist (studies blood and its diseases)

Historical Figures

Under-represented groups

<mark>Modern Scientists</mark>

**Careers**