Science Curriculum

Year A

Created by F.Bradley

EYFS Curriculum

Year A Topics: Ourselves, Autumn celebration, Transport, Traditional tales, Brown bear, Pirates.

Understanding the world

• Can recognise self and others,
• can activate buttons, flaps and simple mechanisms,
• can notice features in both the immediate and wider environment.
• can participate in cultural days through role play, songs and creative activities.

Informal

Red 2 Equals Scheme

Year A Topics: Knowing Me, 5,4,3,2,1 Blast Off, Pets, Over the rainbow, Octopus Garden, Ugly Bug ball.

PSED - Explore curriculum (linked to branches 1-4)
By the end of this curriculum pathway, pupils will be able to…
Self Care & Independence:
Pupils will be able to use some pre-intentional communication (crying, pulling at nappy) in order to have their needs met.
Pupils will show engagement in personal care and feeding tasks, by being more active in the process (pulling off hat, grasping their spoon or holding a cup).

Key Strategies and types of resources:
• Specialist equipment for feeding and dressing (wide-handled spoons, adapted cups etc).
• Consistent use of touch cues or objects of reference before self-care tasks, in order for pupils to anticipate the process.
• Backward chaining; adults to scaffold support to allow pupils to complete the final step of the task independently (pulling trousers up/down, pushing arms fully through sleeves).
•PD sessions: opportunities to participate in dressing (removal of shoes and socks, changing into PE kit).
• Snack and dinner time: opportunities for pupils to make choices and be active in the feeding process with the use of backward chaining and specialist equipment.
• Dinner hall: opportunities for children to engage in the feeding process to a level appropriate to their ability (self-feeding with some physical support).
• Edible messy play including different tastes and scents to be available in class-based play to encourage interest in food and safe tasting as per mealtime plan.
Community/Specialist provision:
• Occupational therapy: specific strategies and equipment as advised by the Occupational Therapist.
• Trips to local café: opportunities to consolidate self-feeding skills in a different environment.
• Trips to market: experiencing and responding to different tastes and smells (fruit, vegetables, spices).

Class	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2

Two Rivers Science Curriculum

Red 1 & Red 3 **KS1**	<u>Autumn Explorers</u> <u>Animals including Humans</u> Identify, name, draw and label the basic parts of the human body Identify which part of the body is associated with each sense Find out about and describe the basic needs of humans, for survival: water, food, air	<u>Winter Warmers</u> <u>States of matter</u> Identify solids and liquids Observe that some materials change state when they are heated or cooled	<u>To Infinity and Beyond</u> <u>Light</u> Identify sources of light, including the sun. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes Observe that light is required to see things and darkness is the absence of light Observe that shadows are formed when the light from a light source is blocked by an opaque object	<u>Knight Fever</u> <u>Seasonal Change</u> Observe and describe the weather associated with the seasons Observe how day length varies Observe changes across the 4 seasons	<u>Pirates</u> <u>Sound</u> Observe how sounds are made practically, Identify that our ears allow us to hear sounds Explore different types of sounds? Find the sound games Sound eggs Make own instruments using different materials (do they sound different to one another? Why?)	<u>The Land of Rhyme</u> <u>Plants</u> 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 flowering plants, including trees Observe and describe how seeds and bulbs grow into mature plants Observe how plants need water, light and a suitable temperature to grow and stay healthy
Informal Curriculum – EQUALS Yellow 2						

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Year A Topics: Planes, Trains and Automobiles, Lets celebrate, To the moon and back, We're going to the zoo, Do you believe in magic? Fun in the sun.

By the end of this curriculum pathway, pupils will be able to…

Scientific Enquiry

Pupils will explore simple scientific equipment in order to use them for a specific planned effect.

Pupils will have a growing awareness of their actions on objects and materials. They will experiment with changing/ repeating these actions to increase their problem-solving skills.

Pupils will be able to use simple scientific language and descriptive words to talk about their scientific exploration and experimenting so they can articulate their observations and communicate their ideas.

Key strategies and types of provision/resources:

- All pupils to have access to their AAC, updated with relevant scientific vocabulary.
- Staff modelling scientific language using communication systems with pupil and others
- Communication boards with specific science vocab to be out at scientific enquiry play set ups
- Open ended play set ups that provoke simple science investigation such as magnetism, forces, heating and cooling and changing materials.
- A range of scientific tools to explore during free-play, including scientific role play such as magnifying glasses, test tubes, pipettes, magnets etc.
- Outdoor music wall available for children to practice playing instruments loud/quiet, fast/slow
- Parallel Play: children develop play skills by sharing resources and learning through mirroring actions
- Playground: Large scale scientific enquiry activities - crates, cardboard boxes, swing, large blocks, tyres, carpet rolls, cable reels to encourage children to explore forces, deconstruction, and commenting and describing their actions/ observations.
- Cooking sessions to practice using specific tools to cut, heat, cool, mix, separate/combine
- Children to have daily access to messy play with a range of tools available
- PE lessons using a range of equipment to explore forces, speed and trajectory.

Community/Specialist Provision:

- Nature reserve/forest schools to explore simple tests on objects, rolling, pulling, deconstruction
- Science week activities to explore exciting experiments
- Bowling, boccia, curling
- Regular community visits exploring properties of objects and animals.

Two Rivers Science Curriculum

Yellow 1 & Yellow 3 & Yellow 4 **Lower KS2: Years 3 & 4**	<u>Journeys</u> <u>Forces and Magnets</u> Observe how magnets attract or repel each other and attract some materials and not others Describe magnets as having 2 poles 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 Predict whether two magnets will attract or repel each other, depending on which poles they were facing Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance	<u>Frozen Planet</u> <u>Living things and their habitats</u> Recap and identify that most living things live in habitats to which they are suited Describe how different kind of habitats provide for the basic needs of different kinds of animals and plants and how they depend on each other Recognise that environments can change and that this can sometimes pose dangers to living things 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	<u>Amazing Animals</u> <u>Animals including Humans</u> 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)	<u>Out of this World</u> <u>Light</u> Recognise that light is needed to see things and that darkness is the absence of light Notice that light is reflected from surfaces 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 *Links to seasonal change (KS1) and Earth and Space (upper KS2): movement of the sun; day and night; seasons	<u>Terrific Time Travellers</u> <u>Rocks and Soils</u> Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties Recognise that soils are made from tocks and organic matter Describe in simple terms how fossils are formed when things that have lived are trapped within rock	<u>Colour, Shimmer and Shine</u> <u>Super Science!</u> Carry out scientific observations, record simple findings and perform simple investigations. Discuss/research inventions and their inventors Link investigations to topics taught across the two-year curriculum for yellow phase.

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Informal Curriculum – EQUALS
Blue 2

Year A Topics: Journeys, Winter festivals of light, Magic Carpet Ride, Amazing Animals, Who do you think you are? We're all going on a summer holiday.

By the end of this curriculum pathway, pupils will be able to… **Scientific Enquiry** Pupils will be able to carry out a simple science investigation to find something out, choosing and collecting appropriate tools, collecting and recording data and saying what they might do differently next time. Pupils will be able to make simple predictions within new experiments and will make an informed prediction based on their past experience when repeating science experiments. Pupils will begin to experiment with electrical components, developing their understanding of electricity in order to build a simple working circuit. Pupils will begin to sort objects according to specific scientific attributes to help them in understanding scientific enquiry.	**Key strategies and types of provision/resources:** • Pupils to have constant access to their AAC, including key scientific vocab. • Symbols to introduce new scientific vocabulary • Visual schedules to allow pupils to follow a set of instructions to complete the task. • Structured sequence board or other appropriate template to allow pupils to plan their actions more independently. • Cooking sessions planned by the pupils (choose recipe, write shopping list, plan instructions etc) to make predictions, practice using tools and discuss physical processes • A simple structure for pupils to say what they liked/didn't like or what they want to do differently. • Modelling simple science experiments for pupils to copy and plan themselves in play set ups – supported by visuals • Adult commenting rather than questioning to develop language. • A group of pupils at a similar level in order that they can engage in cooperative/associative play and learning. • Object hunts in school/ playground made of different objects to discuss and sort • Simple visual safety instructions modelled by adults. • Exciting play set ups that provoke children to explore forces and experiment with objects • Regular access to the dark den to explore electronics • A wider range of functional tools to explore during free-play, including scientific measuring tools e.g. stop watch, measuring jugs, thermometers, scales, tape measures, Swimming sessions which focus on forces, floating and sinking

	Community/Specialist Provision: • Trips to science museums to observe/ take part in science experiments with forces • Nature reserve/forest schools to carry out simple planned investigations and collect data • Science week activities to take part in/ observe exciting experiments • Yoga • bowling, boccia, curling

Two Rivers Science Curriculum

Blue 1, Blue 3 & Blue 4 **Upper KS2: Years 5 & 6**	<u>Egyptians</u> <u>Animals including Humans</u> Identify that humans and some other animals have skeletons and muscles for support, protection and movement Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood Describe the ways in which nutrients and water are transported within animals, including humans Recognise the impact of diet, exercise, drugs and lifestyle on the ways their bodies function	<u>Lights, Camera, Action!</u> <u>Electricity</u> Use recognised symbols when representing a simple circuit in a diagram 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	<u>Space – 5, 4, 3, 2, 1</u> <u>Earth and Space</u> Describe the sun, Earth and moon as approximately spherical bodies 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 Use the idea of Earth's rotation to explain day and night and the apparent movement of the sun across the sky	<u>Righteous Royals</u> <u>Evolution and Inheritance</u> Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents Describe the changes as humans develop to old age Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	<u>Magic</u> <u>Sound</u> Recognise that vibrations from sounds travel through a medium to the ear Find patterns between the pitch of 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	<u>Groovy Greeks</u> <u>Materials</u> 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 Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic

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Science Curriculum

Year B

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EYFS Curriculum **Year A Topics:** Ourselves, Autumn celebration, Transport, Traditional tales, Brown bear, Pirates.						
Understanding the world • Can recognise self and others, • can activate buttons, flaps and simple mechanisms, • can notice features in both the immediate and wider environment. • can participate in cultural days through role play, songs and creative activities.						
Informal **Red 2 Equals Scheme** **Year B Topics:** Nursery rhymes, winter wonderland, bucketful of dinosaurs, tickets please transport, Food glorious food, down in the jungle.						
PSED - Explore curriculum (linked to branches 1-4) **By the end of this curriculum pathway, pupils will be able to…** **Self Care & Independence:** Pupils will be able to use some pre-intentional communication (crying, pulling at nappy) in order to have their needs met. Pupils will show engagement in personal care and feeding tasks, by being more active in the process (pulling off hat, grasping their spoon or holding a cup).		**Key Strategies and types of resources:** • Specialist equipment for feeding and dressing (wide-handled spoons, adapted cups etc). • Consistent use of touch cues or objects of reference before self-care tasks, in order for pupils to anticipate the process. • Backward chaining; adults to scaffold support to allow pupils to complete the final step of the task independently (pulling trousers up/down, pushing arms fully through sleeves). •PD sessions: opportunities to participate in dressing (removal of shoes and socks, changing into PE kit). • Snack and dinner time: opportunities for pupils to make choices and be active in the feeding process with the use of backward chaining and specialist equipment. • Dinner hall: opportunities for children to engage in the feeding process to a level appropriate to their ability (self-feeding with some physical support). • Edible messy play including different tastes and scents to be available in class-based play to encourage interest in food and safe tasting as per mealtime plan. **Community/Specialist provision:** • Occupational therapy: specific strategies and equipment as advised by the Occupational Therapist. • Trips to local café: opportunities to consolidate self-feeding skills in a different environment. • Trips to market: experiencing and responding to different tastes and smells (fruit, vegetables, spices).				
Class	**Autumn 1**	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**

Two Rivers Science Curriculum

Red 1 & Red 3 **KS1**	<u>Africa</u> <u>Animals including Humans</u> Find out about and describe the basic needs of animals for survival: water, food, air Notice that animals, including humans, have offspring which grow into adults Identify and name a variety of common animals, including fish, birds and mammals (EXT. amphibians and reptiles) Sort animals according to their classification of birds, fish or mammals	<u>Celebrations</u> <u>Electricity</u> Identify common appliances that run on electricity Construct a simple series electrical circuit (EXT. identify the basic parts of a series circuit, including cells, wires, bulbs) Sorting objects according to those that do use electricity and those that do not use electricity Discuss the dangers of electricity	<u>Once Upon a Time</u> <u>Materials</u> Explore a variety of everyday materials, including wood, plastic, glass, metal, water and rock (EXT. Identify and name these different materials) 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 Distinguish between an object and the material from which it is made	<u>The Land Before Time</u> <u>Forces and Magnets</u> Observe that forces effect movement through investigations linked to push and pull Compare how objects move on different surfaces Observe how magnets attract or repel each other and attract some materials and not others Observe how magnets have two poles	<u>Starry Night</u> <u>Living Things and their Habitats</u> Identify and name a variety of plants and animals in their habitats, including microhabitats. Explore and compare the differences between things that are living, dead and things that have never been alive. 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. Identify that most living things live in habitats to which they are suited.	<u>Under the Sea</u> <u>Super Science!</u> Carry out scientific observations, record simple findings and perform simple investigations. Discuss/research inventions and their inventors Link investigations to topics taught across the two year curriculum for red phase.
Informal Curriculum – EQUALS **Yellow 2** **Year B Topics:** Outdoor Adventure, Around the world, Winter Warmers, Growing up, Teddy bears picnic, Beside the seaside.						

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By the end of this curriculum pathway, pupils will be able to… Scientific Enquiry Pupils will explore simple scientific equipment in order to use them for a specific planned effect. Pupils will have a growing awareness of their actions on objects and materials. They will experiment with changing/ repeating these actions to increase their problem-solving skills. Pupils will be able to use simple scientific language and descriptive words to talk about their scientific exploration and experimenting so they can articulate their observations and communicate their ideas.	**Key strategies and types of provision/resources:** • All pupils to have access to their AAC, updated with relevant scientific vocabulary. • Staff modelling scientific language using communication systems with pupil and others • Communication boards with specific science vocab to be out at scientific enquiry play set ups • Open ended play set ups that provoke simple science investigation such as magnetism, forces, heating and cooling and changing materials. • A range of scientific tools to explore during free-play, including scientific role play such as magnifying glasses, test tubes, pipettes, magnets etc. • Outdoor music wall available for children to practice playing instruments loud/quiet, fast/slow • Parallel Play: children develop play skills by sharing resources and learning through mirroring actions • Playground: Large scale scientific enquiry activities - crates, cardboard boxes, swing, large blocks, tyres, carpet rolls, cable reels to encourage children to explore forces, deconstruction, and commenting and describing their actions/ observations. • Cooking sessions to practice using specific tools to cut, heat, cool, mix, separate/combine • Children to have daily access to messy play with a range of tools available • PE lessons using a range of equipment to explore forces, speed and trajectory. **Community/Specialist Provision:** • Nature reserve/forest schools to explore simple tests on objects, rolling, pulling, deconstruction • Science week activities to explore exciting experiments • Bowling, boccia, curling Regular community visits exploring properties of objects and animals.

Two Rivers Science Curriculum

Yellow 1 & Yellow 3 **Lower KS2: Years 3 & 4**	<u>Happy Healthy Me</u> <u>Animals including Humans</u> Identify that animals, including humans, need the right types of nutrition and they cannot make their own food – they get nutrition from what they eat Identify the different types of teeth in humans and their simple functions Describe the simple functions of the basic parts of the digestive system in humans Construct and interpret a variety of food chains, identifying producers, predators and prey	<u>Victorian Wonderland</u> <u>Electricity</u> Recap: Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit 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 some common conductors and insulators, and associate metals with being good conductors	<u>Let it Grow</u> <u>Plants</u> Recap: Identify and describe the basic structure of plants. Identify and describe how plants need water, light and a suitable temperature to grow and stay healthy Explore the requirements of plants for life and growth and how they vary from plant to plant: air, light, water, nutrients from soil, room to grow Identify and describe the functions of: roots, stem/trunk, leaves and flowers Investigate the way in which water is transported within plants	<u>Chocoholics</u> <u>States of Matter</u> Measure or research the temperature at which some materials change state when they are heated or cooled in degrees Celsius Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature Explore how that some materials will dissolve in liquid to form a solution	<u>The Great Outdoors</u> <u>Materials</u> Recap: Identify and name a variety of everyday materials, including wood, plastic, metal, glass, water and rock 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	<u>The Big Top</u> <u>Sound</u> Identify how sounds are made, associating some of them with something vibrating Recognise that sounds get fainter as the distance from the sound source increases Recognise that vibrations from sounds travel through a medium to the ear

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Informal Curriculum – EQUALS
Blue 2

Year B Topics: Autumn witches and wizards, Festival of lights, the circus is coming, how does your garden grow? A pirate life for me, Food glorious food.

By the end of this curriculum pathway, pupils will be able to…	**Key strategies and types of provision/resources:**
Scientific Enquiry Pupils will be able to carry out a simple science investigation to find something out, choosing and collecting appropriate tools, collecting and recording data and saying what they might do differently next time. Pupils will be able to make simple predictions within new experiments and will make an informed prediction based on their past experience when repeating science experiments. Pupils will begin to experiment with electrical components, developing their understanding of electricity in order to build a simple working circuit. Pupils will begin to sort objects according to specific scientific	• Pupils to have constant access to their AAC, including key scientific vocab. • Symbols to introduce new scientific vocabulary • Visual schedules to allow pupils to follow a set of instructions to complete the task. • Structured sequence board or other appropriate template to allow pupils to plan their actions more independently. • Cooking sessions planned by the pupils (choose recipe, write shopping list, plan instructions etc) to make predictions, practice using tools and discuss physical processes • A simple structure for pupils to say what they liked/didn't like or what they want to do differently. • Modelling simple science experiments for pupils to copy and plan themselves in play set ups – supported by visuals • Adult commenting rather than questioning to develop language. • A group of pupils at a similar level in order that they can engage in cooperative/associative play and learning. • Object hunts in school/ playground made of different objects to discuss and sort • Simple visual safety instructions modelled by adults. • Exciting play set ups that provoke children to explore forces and experiment with objects • Regular access to the dark den to explore electronics • A wider range of functional tools to explore during free-play, including scientific measuring tools e.g. stop watch, measuring jugs, thermometers, scales, tape measures, Swimming sessions which focus on forces, floating and sinking **Community/Specialist Provision:** • Trips to science museums to observe/ take part in science experiments with forces • Nature reserve/forest schools to carry out simple planned investigations and collect data • Science week activities to take part in/ observe exciting experiments

attributes to help them in understanding scientific enquiry.	• Yoga • bowling, boccia, curling

Two Rivers Science Curriculum

Blue 1, Blue 3 & Blue 4 **Upper KS2: Years 5 & 6**	<u>Roald Dahl</u> <u>Properties and changes to Materials</u> Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating Demonstrate that dissolving, mixing and changes of state are reversible changes Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution 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	<u>World War 2</u> <u>Light</u> 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 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 Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	<u>Vikings and Anglo Saxons</u> <u>Plants</u> Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal Describe the process of reproduction in some plants	<u>Scientists and Inventors</u> <u>Super Science</u> Carry out scientific observations, record findings and perform investigations using appropriate equipment. Discuss/research inventions and their inventors Link investigations to topics taught across the two-year curriculum for Blue phase.	<u>Superheroes</u> <u>Forces</u> 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 Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.	<u>What do you Sea?</u> <u>Living things and their habitats</u> Give reasons for classifying plants and animals based on specific characteristics Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals *Describe the process of reproduction in some animals?*

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