BERROW PRIMARY Church Academy

THE PRIORY LEARNING TRUST

Progression in Science

Lighting up a love of learning

End of Year Expectations

Science Intent

At Berrow, we recognise the importance of offering a high-quality Science Curriculum that provides the children with both the knowledge and the skills that they need to be successful at school and in the wider world. We have worked hard to develop a culture where the children can be naturally curious, ask questions and to suggest answers to these. The Science learning at Berrow is fun, child-centered and interactive and allows children to make links across the curriculum and to their own lives. Children are provided the key knowledge they need and we follow the National Curriculum objectives to support teaching and learning. We ensure that there is clear progression in vocabulary and that we carefully build on prior learning. We aim to allow the children to understand the world around them whilst giving them the skills and knowledge to think like a scientist. We believe children should be given the skills to work like a scientist and we have an emphasis on 'working scientifically'. We deepen the understanding of knowledge that the children have through the use of scientific enquiry skills. The children are regularly given the opportunity to answer scientific questions through experiments, investigations and through real -life experiences. We believe it is important to teach the children these key skills and to use these experiences to consolidate the Scientific knowledge that they are learning. At Berrow, we use TAPS as a way of assessing and evaluating the scientific skills the children have learnt.

EYFS	**Development Matters** 2 year-olds will be learning to:	**Development Matters** 3 & 4-year-olds will be learning to:	**Development Matters** Children in Reception will be learning to:	**Statutory Framework** Early Learning Goals
Development Matters and Statutory ELGs are not the EYFS curriculum. This outlined a top-level view of how children develop and learn. Children's early learning is not neat and orderly, as such these are used as a pathway to help practitioners assess each child's level of development and make informed decisions about what a child needs to learn and be able to do next.				
Understanding the world	• Explore and respond to different natural phenomena in their setting and on trips.	• Use all their senses in hands-on exploration of natural materials. • Explore collections of materials with similar and/or different properties. • Talk about what they see, using a wide vocabulary. • Begin to make sense of their own life-story and family's history. • Explore how things work. • Plant seeds and care for growing plants. • Understand the key features of the life cycle of a plant and an animal. • Begin to understand the need to respect and care for the natural environment and all living things. • Explore and talk about different forces they can feel. • Talk about the differences between materials and changes they notice.	• Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Recognise some environments that are different to the one in which they live. • Understand the effect of changing seasons on the natural world around them.	**The Natural World:** • Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Communication and Language	• Recognise and point to objects if asked about them. • Understand simple questions about 'who', 'what' and 'where' (but generally not 'why').	• Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"	• Learn new vocabulary. • Ask questions to find out more and to check what has been said to them. • Use talk to work out problems and organise thinking and activities. Explain how things work and why they might happen. • Use new vocabulary in different contexts.	**Listening Attention & Understanding:** • Make comments about what they have heard and ask questions to clarify their understanding.
PSED	• Establish their sense of self • Feel confident when taken out around the local neighbourhood and enjoy exploring new places with their key person. • Manage own personal hygiene	• Make healthy choices about food, drink, activity and toothbrushing.	• Know and talk about the different factors that support their overall health and wellbeing: regular physical activity, healthy eating, toothbrushing, sensible amounts of 'screen time', having a good sleep routine, being a safe pedestrian.	**PSED - Managing Self:** • Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.
Aims	**The national curriculum for science aims to ensure that all pupils:** ♣ develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics ♣ develop 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 required to understand the uses and implications of science, today and for the futur			

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plants	• 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. **From Y2- Living things and their habitats:** • Identify and name a variety of plants and animals in their habitats, including microhabitats.	• 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.	**From Y4 - Living things and their habitats:** • 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 world. • Recognise that environments can change and that this can sometimes pose dangers to living things.	**From Y5 - Living things and their habitats:** • Describe the life process of reproduction in some plants and animals.	**From Y6 - Living things and their habitats:** • 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. • Give reasons for classifying plants and animals based on specific characteristics.
Seasonal Changes	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	• Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies.		**From Y3 – Light:** • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.		**From Y5 - Earth and space:** • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.	

Living Things and Their Habitats

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
From Y1 – Plants: • 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. **From Y1 - Animals including humans:** • 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). **From Y1 - Seasonal changes:** • Observe changes across the four seasons.	• 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. **From Y2 - Animals including humans:** • Notice that animals, including humans, have offspring which grow into adults.	**From Y3 – Plants:** Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	• Recognise that living things can be grouped in a variety of ways. • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. • Recognise that environments can change and that this can sometimes pose dangers to living things. **From Y4 - Animals, including humans:** • Construct and interpret a variety of food chains, identifying producers, predators, and prey.	• 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.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals including Humans	• 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.	• Notice that animals, including humans, have offspring which grow into adults. • Find out about and 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. **From Y5 - Living things and their habitats:** • 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.	• 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. **From Y6 - Living things and their habitats:** • 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. (Y6 - Living things and their habitats) • Give reasons for classifying plants and animals based on specific characteristics.

	Year 1	Year 2	Year 3	Year 4	Year 5	• Year 6
Evolution and Inheritance		**From Y2 - Living things and their habitats:** • 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.		**From Y3 – Rocks:** • Describe in simple terms how fossils are formed when things that have lived are trapped within rock. **From Y4 - Living things and their habitats:** Recognise that environments can change and that this can sometimes pose dangers to living things.		• 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.

Materials	• 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.	• 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.	**From Y3 - Forces and magnets:** • Notice that some forces need contact between two objects, but magnetic forces can act at a distance.	**From Y3 – Rocks:** • 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. • 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.	• 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.	

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Rocks	**From Y1 - Everyday materials:** • 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.	**From Y2 - Uses of everyday materials:** • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.		**From Y3 – Rocks:** • 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.		**From Y6 - Evolution and inheritance:** • Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.

	Year 1	Year 2	• Year 3	Year 4	Year 5	• Year 6
Light	**From Y1 - Animals, including humans:** • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense		• 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.			• 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.

	Year 1	Year 2	Year 3	• Year 4	Year 5	Year 6
Sound	**From Y1 - Animals, including humans:** Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.			• Identify how sounds are made, associating some of them with something vibrating. • Recognise that vibrations from sounds travel through a medium to the ear. • Find patterns between the pitch of a sound and features of the object that produced it. • Find patterns between the volume of a sound and the strength of the vibrations that produced it. • Recognise that sounds get fainter as the distance from the sound source increases.		

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Forces		**From Y2 - Uses of everyday materials:** • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	• 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.		• Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. • Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

Electricity			**From Y4 – Electricity:** • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. • Identify common appliances that run on electricity. • 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.			• 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

	Year 1	Year 2	Year 3	Year 4	• Year 5	Year 6
Earth and Space	**<u>From Y1 - Seasonal changes:</u>** • Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies.				• 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.	

Berrow Working Scientifically Progression

At Berrow, the 'working scientifically' skills as outlined in the National Curriculum are woven throughout all of our enquiries and assessed once a term using the TAPS framework and activities. We believe in providing children with the skills and awareness to carry out all the steps of scientific enquiries to enable them to ask questions and seek answers through collecting, analysing and presenting data.

	Plan		**Do**		**Review**	
	Ask questions and plan enquiries	**Set up enquiries**	**Observe and measure**	**Record**	**Interpret and report**	**Evaluate**
EYFS	<u>Communication and language development:</u> • Answer 'how' and 'why' questions about their experiences and in response to stories or events. <u>Understanding of the world:</u> • 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.					
EYFS TAPS	*Healthy Me: Brown apples* *Travelling: Teddy zipline*		*Changing materials: Frozen balloons* *Living things: Senses walk* *Materials: Scavenger sort* *Materials: Icy shelter*		*Materials: Bubble snake* *Senses: Taste test*	
KS1 **(Key Focus: Develop close observational skills)**	• Ask simple Qs and recognise that they can be answered in different ways*.	• Perform simple tests	• Observe closely, using simple equipment.	• Gather and record data to help in answering questions.	• Identify and classify. • *Use appropriate scientific language to communicate ideas.*	• Use their observations and ideas to suggest answers to questions.
Y1 TAPS	*Materials: Transparency/Reflection Test*	*Materials: Floating and sinking*	*Plants: Plant structure and leaf look*	*Seasonal change: Seasonal change (across the year)*	*Animals inc. humans: Animal classification*	
Y2 TAPS	*Materials: Waterproof*	*Materials: Rocket Mice*	*Plants: Comparing plant growth*	*Living things: Woodlice habitat*	*Living things: Nature spotters*	*Animals inc. humans: Handspans*

Lower KS2 **(Key Focus: Develop systematic approach)**	• 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. • Identify differences, similarities or changes related to simple scientific ideas and processes.	• Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. • Use straightforward scientific evidence to answer questions or to support their findings.
Y3 TAPS	*Animals inc. humans: skeleton questions*	*Forces and magnets: Strongest magnet*	*Plans: How much water do plants need?*	*Light: Making shadows*	*Electricity: Conductors*	*Plants: Functions of a plant stem*
Y4 TAPS	*Sound: Investigating pitch* *Materials: Cornflour slime*		*Living things: Local environment study*		*Sound: String telephones* *Rocks: Rock report* *Animals inc humans: teeth in liquid*	*Materials: Dunking biscuits*
Upper KS2 **(Key Focus: Develop independence)**	• Plan different types* of scientific enquiries to answer their own questions, including recognising and controlling variables where necessary	• Use test results to make predictions to set up further comparative and fair tests.	• 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.	• Report and present findings from enquiries, inc conclusions and causal relationships, in oral and written forms such as displays and other presentations, using appropriate scientific language.	• Explain degree of trust in results. Identify and evaluate scientific evidence (their own and others') that has been used to support or refute ideas or arguments
Y5 TAPS	*Materials: Separating colours* *Forces: Paper planes*	*Earth and Space: Space travel questions*	*Materials: Insulating layers* *Animals inc. humans: Growth survey*	*Earth and Space: Space craters*	*Earth and Space: Aquadynamics* *Living things: Life cycle research*	

Y6 TAPS	*Electricity: bulb brightness* *Animals inc. humans: Reaction catches* *Living things: Growing Yeast*		*Animals inc. humans: heart rate pose* *Living things: Outdoor keys* *Forces: Formula 1 tubs*	*Light: Investigating shadows*	*Evolution and inheritance: Fossil habitats* *Living things: Invertebrate research*	*Materials: Cleaning coins*

*****Types of enquiry including: observing changes over time, noticing patterns, grouping and classifying, comparative and fair tests, using secondary sources.

Highlighted TAPS activities are suggested for Y6 Transition