Ashbourne Primary School's
Science Scheme Of Work with skills and knowledge progression

Intent:

Science at Ashbourne Primary School encourages curiosity, develops inquisitive minds and fosters a fascination with how the world works. Through practical investigation and enquiry, pupils develop scientific knowledge alongside the skills needed to question, explore and understand the world around them.

Our curriculum is built upon our Golden Threads of Language and Literacy, Resilience and Regulation, and Belonging and Becoming, which underpin all teaching, learning and relationships across our school and ensure pupils develop secure knowledge alongside confidence, aspiration and readiness for life beyond school.

Our PRAISE aims bring these expectations to life in daily practice by teaching pupils to take pride in their work, show respect for all, act with kindness, become independent achievers, stay resilient and demonstrate excellent behaviour. These shared expectations shape how pupils approach learning, relationships and challenges, helping them develop confidence, responsibility and positive attitudes that support success across the curriculum and beyond.

At Ashbourne Primary School, pupils learn science through practical and investigative experiences. As they progress through the year groups, they develop and test their own hypotheses, create fair tests and understand how changing variables affects outcomes. Pupils are taught to use age-appropriate equipment safely and accurately, from magnifying glasses used to explore habitats to household acids and alkalis used to investigate the properties of materials.

Pupils first develop foundational knowledge of scientific concepts. As they move through school, they deepen their understanding and apply what they have learned across a range of investigations and topics. Planning the curriculum in this way allows pupils to establish secure foundations in long-term memory before advancing and applying scientific concepts more independently. This reflects our understanding that learning is secured when knowledge is retained over time and revisited regularly.

Our location provides valuable opportunities to use the natural environment as a learning resource, both within the school grounds and in the surrounding area. For example, a short walk to the local brook enables pupils to explore a water-based habitat and carry out river flow investigations, bringing learning to life through first-hand experience.

High expectations for all pupils are central to our curriculum. Teaching is adapted to remove barriers and ensure that every learner can access, participate in and succeed.

By the time pupils leave our school, they are equipped with the knowledge, skills and confidence to continue learning successfully at the next stage of their education and beyond.

National Curriculum 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 future.

KS1 Content	KS2 Content
Working Scientifically -ask simple questions and recognising that they can be answered in different ways -observe closely, using simple equipment -perform simple tests -identify and classify -use their observations and ideas to suggest answers to questions -gather and recording data to help in answering questions **Animals including humans**	**Working scientifically** • asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings. • planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

-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. **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. 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. **Seasonal changes** Observe changes across the four seasons Observe and describe weather associated with the four seasons and how the day length varies. **Plants**	• taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • using test results to make predictions to set up further comparative and fair tests • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations • identifying scientific evidence that has been used to support or refute ideas or arguments. **Plants** 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. **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 identify that humans and some other animals have skeletons and muscles for support, protection and movement. describe the simple functions of the basic parts of the digestive system in humans identify the different types of teeth in humans and their simple functions construct and interpret a variety of food chains, identifying producers, predators and prey describe the changes as humans develop to old age. identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function describe the ways in which nutrients and water are transported within animals, including humans **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. **Light** 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. **Forces and magnets** 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 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. **Living things and their habitats** 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.	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. **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 environment recognise that environments can change and that this can sometimes pose dangers to living things. describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird describe the life process of reproduction in some plants and animals. describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals give reasons for classifying plants and animals based on specific characteristics. **States of matter** 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. **Sound** 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. **Electricity** 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. **Properties and changes of materials** 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. **Earth and Space** 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. **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

			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.
EYFS: Understanding The World			
3 – 4 year olds	Communication and Language		Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"
	Personal, Social and Emotional Development		Make healthy choices about food, drink, activity and toothbrushing.
	Understanding the World		• 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
Reception	Communication and Language		• Learn new vocabulary. • Ask questions to find out more and to check what has been said to them. • Articulate their ideas and thoughts in well-formed sentences. • Describe events in some detail. • Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. • Use new vocabulary in different contexts.
	Personal, Social and Emotional Development		• 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
	Understanding the World		• Explore the natural world around them. • Describe what they see, hear and feel while they are 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.
ELG	Communication and Language	Listening, Attention and Understanding	• Make comments about what they have heard and ask questions to clarify their understanding.
	Personal, Social and Emotional Development	Managing Self	• Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.
	Understanding the World	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.

Science skills and knowledge progression from Y1-Y6

Year Group	Animals, including humans	Everyday materials	Plants	Living things and their habitats	Key Vocabulary
KS1 **Year 1**	I can name some common animals. I can name some carnivores, herbivores and omnivores. I can describe the structure of some common animals. I can name and identify basic parts of the human body. I can name each sense. I can notice that animals have offspring. I can find out about the basic needs of animals, including humans.	I can distinguish between an object and its material. I can name a variety of different materials. I can name simple physical properties of everyday materials. I can compare everyday materials. I can identify the suitability of everyday materials for particular uses. I can find out how the shape of solid objects can be changed.	I can name common wild and garden plants. I can identify the basic structure of common flowering plants. I can observe how seeds and bulbs grow into mature plants. I can find out how plants need water, light and a suitable temperature to grow.	I can explore the differences between living and dead things. I can identify living things with their habitats. I can name some plants and animals in their habitats. I can identify and name different sources of food.	Material Object Property Fabric Meat Plants Offspring Senses Seasons
	Animals, including humans	**Everyday materials**	**Plants**	**Living things and their habitats**	**Key Vocabulary**
KS1 **Year 2**	I can identify and name common animals including fish, amphibians, reptiles, birds and mammals. I can identify and name carnivores, herbivores and omnivores. I can describe and compare the structure of a variety of common animals. I can name, identify, draw and label basic parts of the human body. I can say which body part is associated with each sense. I can notice the offspring of different animals.	I can distinguish between an object and the material from which it's made and give examples. I can name and identify a variety of everyday materials, including wood, plastic, glass, metal, water and rock. I can describe the physical properties of a variety of everyday materials. I can compare and group together a variety of everyday materials.	I can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. I can identify and describe the basic structure of a variety of common flowering plants, including trees. I can observe and describe how seeds and bulbs grow into mature plants. I can investigate the best conditions for plants to grow and stay healthy.	I can explore the differences between things that are living, dead and things that have never been alive. I can describe how different habitats provide the basic needs of different animals and plants and say how they depend on each other. I can identify and name a variety of plants and animals in their	Material Object Property Flexible Waterproof Rough Carnivore Herbivore Omnivore Offspring Senses Seasons Autumn

	I can find out about and describe the basic needs of animals, including humans. I can describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene.	I can identify and compare the suitability of a variety of everyday materials for particular uses. I can investigate how the shapes of solid objects can be changed by squashing, bending, twisting and stretching.		habitats, including microhabitats. I can describe how animals obtain their food using simple food chains.	Winter Summer Spring
	Plants	**Animals, including humans**	Rocks	Light	Forces and Magnets	Key Vocabulary
LWKS2 **Year 3**	I can identify and describe different functions of a flowering plant. I can state what plants need for life and growth. I can investigate the way water is transported in plants. I can explain the role flowers play in the life cycle of a flowering plant.	I can explain why animals need to get their nutrition from what they eat. I can identify that humans and some animals have skeletons and muscles and explain why.	I can compare and group together different types of rocks based on physical appearance. I can explain how fossils have formed. I can recognise that soils are made from rocks and organic matter.	I can recognise that light is needed to see. I can notice that light is reflected from surfaces. I can recognise that light from the sun is dangerous. I can recognise that shadows are formed when light is blocked. I can find patterns in the way the size of a shadow changes.	I can compare how materials move on different surfaces. I can recognise that magnetic forces act at a distance. I can recognise that magnets attract some materials but not others. I can group together magnetic materials. I can name the two poles of a magnet. I can predict which poles will attract or repel.	Carnivore Omnivore Herbivore Diet Skeleton Magnetic force Attraction Repulsion Poles Root Stem Life Cycle Germination Pollination Fossils Reflection Shadow Darkness
	Living things and their habitats	Animals, including humans	States of Matter	Sound	Electricity	Key Vocabulary
LWKS2 **Year 4**	I can group living things in different ways. I can use classification keys to group living things. I can name a variety of living things. I can recognise that environments can change.	I can name basic parts of the human digestive system. I can describe simple functions of the digestive system. I can name different types of teeth and explain their function.	I can group materials into solids, liquids and gases. I can observe that some materials change state. I can measure the temperature at which materials change state. I can explain the role of evaporation and	I can explain how sounds are made. I can recognise that vibrations travel though different mediums. I can find patterns between the pitch and the object the sound came from.	I can identify common electrical appliances. I can construct a simple series electrical circuit. I can name basic parts of a circuit. I can recognise complete and incomplete circuits.	Skeleton Muscles Exoskeleton Magnetic Force Attraction Poles Charge Repulsion Stem Root Life Cycle

		I can interpret different food chains.	condensation in The Water Cycle.	I can find patterns between the volume of sound and the strength of vibration. I can recognise that sounds get fainter with greater distance.	I can recognise that a switch can open or close a circuit. I can recognise common conductors and insulators.	Germination Pollination Reflection Opaque Transparent Source Fossils Igneous Sedimentary Metamorphic
	Living things and their habitats	Animals, including humans	Properties and Changes of Materials	Earth and Space	Forces	Key Vocabulary
UPKS2 **Year 5**	I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. I can describe the life processes in some plants and animals.	I can describe changes as humans develop to old age.	I can compare and group together everyday materials on the basis of different properties. I can state materials that dissolve in a liquid to form a solution. I can explain how solids, liquids or gases might be separated. I can give reasons for the use of everyday materials. I can demonstrate reversible changes. I can explain irreversible changes.	I can describe the movement of Earth and other planets in relation to the sun. I can describe the movement of the moon relative to Earth. I can describe the sun, Earth and moon as spherical bodies. I can explain day and night.	I can explain why objects fall towards Earth. I can explain the effects of air resistance, water resistance and friction. I can explain how a smaller force can have a greater effect.	Mammals Amphibians Insects Reproduction Life Cycle Buoyancy Water Resistance Air Resistance Gravity Streamline Foetus Planets Solar System Moon Orbit Transparency Solubility Dissolve Conductivity
	Living things and their habitats	Animals, including humans	Evolution and Inheritance	Light	Electricity	Key Vocabulary
UPKS2 **Year 6**	I can describe how living things are classified into broad groups based on common observable characteristics.	I can identify and name the main parts of the circulatory system. I can describe the functions of the heart, blood vessels and blood.	I can recognise that living things have changed over time. I can recognise that fossils provide information about living things.	I can recognise that light travels in straight lines. I can explain how objects can be seen. I can explain how we can see objects.	I can associate the brightness of a lamp/loudness of a buzzer with the voltage of cells in the circuit.	Microorganisms Classification Bacteria Virus Circulatory System Red blood cells

	I can give reasons for classifying plants and animals based on specific characteristics.	I can recognise the impact of diet, exercise, drugs and lifestyle on the way our bodies function. I can describe how nutrients and water are transported.	I can recognise that living things produce offspring that vary. I can explain how plants and animals have adapted to suit their environment. I can explain how adaptation may lead to evolution.	I can explain why shadows have the same shape as the object that cast them.	I can compare and explain how different components function. I can use recognised symbols in a diagram of a circuit.	Nutrient Drug Adaptations Offspring Fossils Evolution Reflection Opaque Transparent Translucent Light source

Impact:

We assess the impact of our curriculum by checking that our children know more and remember more. Teachers ensure pupils regularly revisit prior learning over time. This ensures learning is embedded into pupils' long-term memory. Teachers and leaders monitor the impact of the curriculum through:

- Key questioning
- Observations within lessons
- Outcomes from tasks/topics
- Flashback Friday
- Flashback 4
- Lesson quizzes
- Pupil voice
- Learning walks
- Curriculum monitoring
- Data analysis