

content knowledge

Intent

Why do we teach this? Why do we teach it in the way we do?

At Milwards Primary school and Nursery, we aim to prepare our children for their future with a “hands –on”, inquiry-based science curriculum that enables them to confidently explore and discover the world around them. We will motivate and actively engage our children, to nurture and grow their curiosity. Core scientific knowledge and skills is taught through direct teaching, experimentation and exploration. Our intent is for all our children to be life- long learners who are: inquisitive, independent thinkers, confident to ask ‘Big Questions’ and who are well prepared for their future in the ever-changing world.

Implementation

What do we teach? What does this look like?

We teach the National Curriculum, supported by a clear skills and knowledge progression. This ensures that skills and knowledge are built on year by year and sequenced appropriately to maximise learning for all children. We use a range of resources to plan from including ASE planning. Specific Science units are taught in each year group, building on from previously taught units and skill coverage. Teachers are free to change the order areas are taught to make cross curricular links as long as all areas are covered over the year. The school has designed and implemented a contentious prevision map so previous skills and content is revisited, helping to support children with long term memory.

Impact

The successful approach at Milwards Primary School and Nursery results in a fun, engaging, high-quality science education, that provides children with the foundations for understanding the world. Our engagement with the local environment ensures that children learn through varied and first hand experiences of the world around them. So much of science lends itself to outdoor learning and so we provide children with opportunities to experience this. Through various workshops, trips and interactions with experts and local organisations, children have the understanding that science has changed our lives and that it is vital to the world’s future prosperity. Children learn the possibilities for careers in science as a result of our community links and connection with national agencies such as the STEM association. Pupil voice is used to further develop the Science curriculum, through questioning of pupil’s views and attitudes to Science to support the children’s enjoyment of science and to motivate learners.

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
N	my senses Autumn		life cycle of a frog Winter	life cycle of a frog growing Spring	life cycle of a butterfly growing Summer	life cycle of a butterfly Summer
R	Science: Seasons, exploring electricity and magnets, looking at zoo animals, science talk box, cooking		Science: Cooking, health and hygiene, seasons, plants, science talk box		Science: life cycles, chicks, floating and sinking, mini-beasts, seasons, exploring the school pond, science talk box	
	Throughout both the Nursery and Reception topics, ‘The World’ strand of EYFS is covered throughout the year.					
1	Season changes Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies.					
	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. 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 different uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	Animals including humans Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals (name of animal not names of groups) Identify and name a variety of common animals that are carnivores, herbivores and omnivores (not expected to use this terminology) Describe and compare the structure of a variety of common animals. <u>See feature list.</u>	Plants Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees (not expected to use this terminology) <u>See plant list</u> Identify and describe the basic structure of a variety of common flowering plants, including trees.	Animals including humans Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals (name of animal not names of groups) Identify and name a variety of common animals that are carnivores, herbivores and omnivores (not expected to use this terminology) Describe and compare the structure of a variety of common animals. <u>See feature list.</u>	Plants Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees (not expected to use this terminology) <u>See plant list</u> Identify and describe the basic structure of a variety of common flowering plants, including trees.	Animals including humans 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 based on their simple physical properties.
2	Animals – including humans: Notice that animals, including humans, have offspring which grow into adults. <u>See animal list</u> 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. Living things and their habitats: Explore and compare the difference 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		Animals – including humans Notice that animals, including humans, have offspring which grow into adults. <u>See animal list</u> 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. Living things and their habitats 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.		Living things and their habitats: - Explore and compare the difference 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 micro habitats. - 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. - Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Linked to art – clay) Plants	

	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 micro habitats. 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. Use of Everyday Materials: Identify and compare the suitability of a variety of everyday materials, including wood, metal, glass, brick, rock, paper and cardboard for uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.				- 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.	
3	Rocks and Soils Compare and group together different kinds of rocks based on their appearance and simple physical properties. Describe in simple terms how fossils are formed when things that have lived are trapped within rocks. Recognise that soils are made from rocks and organic matter.	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.	Bones 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.	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	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.	
4	Animal classification Food chains Recognise that living things can be grouped in a variety of ways (5 animal groups). 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.		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.	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.	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).	Digestion and teeth 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.

		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.	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.	Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	identifying producers, predators and prey.
5	Forces 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.	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.	Properties and changing of material 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.	All living things and their habitats Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.	Animals including humans Describe the life process of reproduction in some plants and animals. Describe the changes as humans develop to old age.
6	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 microorganisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics.	Electricity 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.	Animals, including humans 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.	Light 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	Evolution 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.

		Use recognised symbols when representing a simple circuit in a diagram.		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.	Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
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