

**AJS Science Overview - Autumn**

Key Stage	Year Group	Topic Name	Key Questions	Sticky Knowledge	Key investigations/ activities	Where does this fit into the National Curriculum?
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Lower KS2	Year 3	<b>Plants</b>	<p>What are the functions of parts of a flowering plant?</p> <p>How are plants pollinated?</p> <p>How is water transported in a plant?</p> <p>What conditions does a seed need to germinate?</p>	<p>Plants are producers, they make their own food.</p> <p>Plants have roots, which provide support and draw water from the soil, leaves to make food, flowers for reproduction and stem/ trunk to transport water/ nutrients and for support.</p> <p>The flower’s job is to create seeds so that new plants can be grown.</p> <p>Water moves through a Plant:</p> <ol style="list-style-type: none"> <li>1. The roots absorb water from the soil.</li> <li>2. The stem transports water to the leaves.</li> <li>3. Water evaporates from the leaves.</li> <li>4. This evaporation causes more water to be sucked up the stem</li> </ol> <p>Seeds/bulbs require the right conditions to germinate.</p> <p>Seeds can be dispersed by: water, dropping, carrying, eating, shaking and bursting.</p>	<p>Observe flowers, seeds, berries and fruits outside throughout the year</p> <p>Observe the effect of putting celery in coloured water.</p> <p>Observe and investigate the effect of putting cut white carnations with varying stem lengths in coloured water.</p> <p>Observe flowers being visited by pollinators (videos/ pictures/ real life)</p> <p>Plant seeds and investigate requirements for germination.</p> <p>Research different types of seed dispersal.</p>	<p>Pupils should be taught to: identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>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</p> <p>Investigate the way in which water is transported within plants</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p>
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		<p><b>Animals Including Humans</b></p> <p>What different types of food are there?</p> <p>Why do we need a variety of different foods?</p> <p>What is our digestive system?</p> <p>What teeth do humans have and what do they do?</p> <p>What are the main bones in the human skeleton?</p> <p>Why do humans have skeletons and muscles?</p> <p>What food chains are there in our local environment?</p>	<p>Food contains a range of different nutrients – carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water – and fibre that are needed by the body to stay healthy.</p> <p>Humans have four types of teeth: incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing).</p> <p>Food is broken down by the teeth and further in the stomach and intestines.</p> <p>Humans, and some other animals, have skeletons and muscles which help them move and provide protection and support.</p> <p>Living things can be classified as producers, predators and prey according to their place in the food chain.</p>	<p>Create a collage of an Eatwell Plate by sorting foods into categories.</p> <p>Use food labels to explore the nutritional content of a range of food items.</p> <p>Create a model of the digestive system and label the parts.</p> <p>Classify animals as herbivores, carnivores or omnivores.</p> <p>Explore eating different types of food to identify which teeth are being used for cutting, tearing and grinding (chewing).</p> <p>Identify animals in a habitat and find out what they eat. Use food chains to identify producers, predators and prey within a habitat.</p>	<p>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</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</p> <p>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</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey</p>
		<p><b>Living things and Their habitats</b></p> <p>How can an environment change?</p> <p>How are changing environments a danger to specific habitats?</p> <p>How can we group living things in different ways?</p>	<p>Living things can be grouped (classified) according to their features. Classification keys can be used to identify and name living things.</p> <p>Living things live in a habitat which provides an environment to which they are suited.</p> <p>Environments change with the seasons; different living things can be found in a habitat at different times of the year.</p>	<p>Observe plants and animals in different habitats throughout the year</p> <p>Use classification keys to name unknown living things.</p> <p>Use fieldwork to explore human impact on the local environment e.g. litter, tree planting.</p>	<p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p>

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Lower KS2	Year 4	<b>Plants</b>	<p>What would happen if you took all the leaves off a plant?</p> <p>What do plants need to grow and survive?</p> <p>Is it possible to change the colour of celery or a flower?</p> <p>How can seeds be dispersed?</p> <p>Why will a flower that is not pollinated not reproduce?</p>	<p>Plants are producers, they make their own food- their leaves absorb sunlight and carbon dioxide</p> <p>Flowering plants have specific adaptations which help it to carry out pollination, fertilisation and seed production</p> <p>Plants require the right conditions to survive and grow. Water, light, nutrients from the soil, air and room to grow.</p> <p>Different plants vary in how much of these things they need. For example, cacti can survive in areas with little water, whereas water lilies need to live in water.</p> <p>Flowering plants have a life cycle which includes seed dispersal, germination, growth, pollination and fertilisation.</p> <p>Seed dispersal improves a plants chance of successful reproduction.</p>	<p>Investigate what happens to plants when they are put in different conditions e.g. in darkness, in the cold, deprived of air, different types of soil, different fertilisers, varying amount of space.</p> <p>Dissect flowers carefully to observe and label the pollen/ reproductive parts.</p> <p>Observe/ describe the life cycle of a flowering plant (re-visited in year 5).</p>	<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>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</p> <p>Investigate the way in which water is transported within plants</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p>
		<b>Animals Including Humans</b>	<p>Do all organisms eat the same things?</p> <p>Why do some people need different diets?</p>	<p>Different animals are adapted to eat different foods.</p> <p>Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. Humans need to eat a varied balanced diet.</p>	<p>Plan a daily diet to contain a good balance of nutrients.</p> <p>Compare, contrast and classify skeletons/teeth of different animals.</p>	<p>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</p>

		<p>What happens to the food we swallow on its journey through the body?</p> <p>How do the teeth of animals differ and why?</p> <p>Are all skeletons the same?</p> <p>What are the main joints/muscles in the human body?</p> <p>How does energy move through the food chain?</p> <p>How does the removal of one species from an environment affect others?</p>	<p>Food is broken down by the teeth and further in the stomach and intestines where nutrients go into the blood. The blood takes nutrients around the body.</p> <p>Muscles are connected to bones and move them when they contract. Movable joints connect bones.</p> <p>Nutrients produced by plants move to primary consumers then to secondary consumers through food chains.</p> <p>Different food chains occur in different habitats.</p>	<p>Investigate the effect different substances have on an egg shell.</p> <p>Research the function of the parts of the digestive system.</p> <p>Explore muscles contracting and relaxing.</p> <p>Construct food chains including primary and secondary consumers.</p>	<p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</p> <p>Describe the simple functions of the basic parts of the digestive system in humans</p> <p>Identify the different types of teeth in humans and their simple functions</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey</p>
		<p><b>Living things and Their habitats</b></p> <p>Can an animal be classified into more than one group?</p> <p>How can the effects of changes to an environment be compared/ categorised?</p> <p>How are conservation groups trying to preserve habitats?</p>	<p>Living things can be divided into different groups based upon their Characteristics.</p> <p>Classification keys can be used to identify and name living things.</p> <p>Environments may change naturally e.g. through flooding, fire, earthquakes etc. Humans also cause the environment to change. This can be in a good way (i.e. positive human impact, such as setting up nature reserves) or in a bad way (i.e. negative human impact, such as littering).</p> <p>Different organisms are affected differently by environmental change.</p>	<p>Classify living things found in different habitats based on their features.</p> <p>Create a simple identification key based on observable features.</p> <p>Find out about how environments may naturally change.</p> <p>Use secondary sources to find out about human impact, both positive and negative, on environments.</p>	<p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things</p>

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Upper KS2	Year 5	<b>Evolution and Inheritance</b>	<p>Why are we all different?</p> <p>What is variation, and why is it important?</p> <p>What is evolution?</p>	<p>Life cycles have evolved to help organisms survive to adulthood.</p> <p>Plants and animals have characteristics that make them suited (adapted) to their environment.</p> <p>All living things have offspring of the same kind, as features in the offspring are inherited from the parents. Due to sexual reproduction, the offspring are not identical to their parents and vary from each other.</p> <p>Organisms reproduce and offspring have similar characteristic patterns. Variation exists within a population (and between offspring of some plants)</p>	<p>Design a new plant or animal to live in a particular habitat</p> <p>Make observations of fossils to identify living things that lived on Earth millions of years ago.</p> <p>Observe and describe differences between living things and their offspring</p> <p>Identify features in animals and plants that are passed on to offspring and explore this process by considering the artificial breeding of animals or plants e.g. dogs.</p>	<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</p>
		<b>Animals Including Humans</b>	<p>Which organs of the body make up the circulation system, and where are they found?</p> <p>How does blood get around the body?</p> <p>Is the air you breathe out, the same as that you breathe in?</p> <p>Why do we need a balanced diet?</p> <p>Why should we exercise?</p>	<p>The heart pumps blood around the body. Oxygen is breathed into the lungs where it is absorbed by the blood.</p> <p>Oxygen is taken into the blood in the lungs; the heart pumps the blood through blood vessels to the muscles; the muscles take oxygen and nutrients from the blood.</p> <p><b>Diet and lifestyle</b> have an impact on the way our bodies function.</p>	<p>Create a role play model for the circulatory system</p> <p>Explore how water and nutrients are transported through the body.</p> <p>Create 'healthy living' advert/ leaflet / poster for good <b>diet and lifestyle</b> choices.</p>	<p>Describe the changes as humans develop to old age</p> <p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p>

					Describe the ways in which nutrients and water are transported within animals, including humans.
	<b>Living Things and Their Habitats</b>	<p>What is a life cycle?</p> <p>What types of life cycles are there?</p> <p>Are all life cycles the same?</p> <p>Do plants reproduce in the same ways as us?</p> <p>Is there a relationship between a mammal's size and its gestation period?</p>	<p>Different animals mature at different rates and live to different ages. Some organisms reproduce sexually where offspring inherit information from both parents. Some organisms reproduce asexually by making a copy of a single parent.</p> <p>Environmental change can affect how well an organism is suited to its environment.</p> <p>Different types of organisms have different lifecycles</p>	<p>Explore different ways of sorting animals according to their life cycles.</p> <p>Use secondary sources and, where possible, first-hand observations to find out about the life cycle of a range of animals/plants.</p> <p>Research the differences between the life cycle of an insect and a mammal.</p> <p>Research the process of pollination.</p> <p>Compare the gestation times for mammals and look for patterns e.g. in relation to size of animal or length of dependency after birth.</p>	<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>Describe the life process of reproduction in some plants and animals</p> <p>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</p> <p>Give reasons for classifying plants and animals based on specific characteristics</p>

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Upper KS2	Year 6	<b>Evolution and Inheritance</b>	<p>What evidence is there for evolution?</p> <p>How are animals/plants adapted to their environments?</p> <p>How does adaptation lead to evolution?</p>	<p>Organisms best suited to their environment are more likely to survive long enough to reproduce. Organisms best adapted are more likely to reproduce.</p> <p>Life cycles have evolved to help organisms survive to adulthood.</p> <p>Over time the characteristics that are most suited to the environment become increasingly common.</p> <p>Scientists such as Darwin and Wallace observed how living things adapt to different environments to become distinct varieties with their own characteristics.</p>	<p>Describe how animals and plants are suited to the environments in which they are found.</p> <p>Find out about how the population of peppered moths changed during the industrial revolution.</p> <p>Use models to demonstrate evolution e.g. 'Darwin's finches' bird beak activity.</p>	<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</p>
		<b>Animals Including Humans</b>	<p>Why do we have blood?</p> <p>How does our heart work?</p> <p>How does exercise effect our pulse rate?</p>	<p>Muscles need oxygen to release energy from food to do work. (Oxygen is taken into the blood in the lungs; the heart pumps the blood through blood vessels to the muscles; the muscles take oxygen and nutrients from the blood.</p> <p><b>Exercise and drugs</b> have an impact on the way our bodies function.</p>	<p>Create a model of blood and its components.</p> <p>Carry out a range of pulse rate investigations:            fair test – effect of different activities on my pulse rate            pattern seeking – exploring which groups of people may have higher or lower resting pulse rates            observation over time - how long does it take my pulse rate to return to my resting pulse rate (recovery rate)</p>	<p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p>

				Explain both the positive and negative effects of diet, exercise, drugs and lifestyle on the body.		
		<b>Living things and Their Habitats</b>	<p>Why do we need to classify living things?</p> <p>How do we classify living things?</p> <p>What are the difficulties with classification? (penguins, whales, platypus)</p> <p>What are microorganisms?</p> <p>What do different types of microorganisms do?</p> <p>Are they always harmful?</p>	<p>Some organisms reproduce asexually by making a copy of a single parent.</p> <p>Different types of organisms have different lifecycles.</p> <p>Living things are sorted and grouped according to their similarities and differences.</p> <p>Microorganisms are viruses, bacteria, moulds and yeast.</p> <p>Microorganisms are very tiny living things that can only be seen using a microscope. They can be found in and on our bodies, in the air, in water and on objects around us.</p>	<p>Grow and observe plants that reproduce asexually e.g. strawberries, spider plants, potatoes.</p> <p>Take cuttings from a range of plants</p> <p>Classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals).</p> <p>Use classification systems and keys to identify some animals and plants in the immediate environment.</p> <p>Research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.</p> <p>Research and observe the effect of microorganisms (Yeast/ observation over time of a slice of bread)</p>	<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>Describe the life process of reproduction in some plants and animals</p> <p>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</p>