Wishmore Cross Academy
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Curriculum intent (What children will learn):

The primary years are the period when children form their interests in STEM identities and careers. Science teaching at Wishmore Cross Academy aims to give all children a strong understanding of the world around them whilst acquiring specific skills and knowledge to help them to think scientifically; to gain an understanding of scientific processes; to understand the uses and implications of Science, both today and for the future.

Curriculum implementation (how we learn):

As part of this planning and teaching process:

- A 'Mastery Flow Model' for each objective is pre-planned, which outlines knowledge (including vocabulary) that all children must master, ensuring progression and depth.
- A low stakes quiz (Show Me What You Know), which is tested at the start and end of each unit, guides teaching and learning and targets misconceptions
- Challenge questions (Thinking tasks) and 'Further Extensions' (Explaining tasks) are provided for pupils to apply their learning in a philosophical/open manner
- Children are encouraged to formulate their own questions and lines of enquiry

Curriculum impact (Why we learn):

We measure the impact of our curriculum through the following methods:

- A reflection on standards achieved against the planned outcomes (taken from the National Curriculum objectives)
- Tracking of knowledge in pre and post learning quizzes
- Assessment for Learning in class and summative assessment twice yearly

Science Learning Journey - KS2

YEAR 6

Living things and their habitats

Students will 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

Evolution and inheritance

Students will 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

Electricity

Students will 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

Animals including humans

Students will 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

Students will 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

Properties and changes of materials

Students will 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

Living things and their habitats

Students will 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

Forces

Students will 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

YEAR 5

Earth and space

Students will 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

Animals including humans

Students will describe the changes as humans develop to old age

Animals including humans

Students will 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 function;s construct and interpret a variety of food chains, identifying producers, predators and prey

States of matter

Students will 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

Students will 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

Living things and their habitats

Students will recognise that living things can be grouped in a variety of way;s 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

YEAR 4

Electricity

Students will 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

Rocks

Students will 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

Animals including humans

Students will 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

Students will 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

Light

Students will 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

Plants

Students will 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.

YEAR 3

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Year 6 Curriculum implementation - Key knowledge:		
TERM	**TOPIC**	**KEY KNOWLEDGE**
AUT1	**Light and Perception**	• that we see when light is reflected from an object into our eyes • light travels (or appears to travel) in straight lines • the parts of the human eye and how the eye works • reflection is when light bounces off a surface and changes the direction of the ray of light • the angle of incidence is always equal to the angle of reflection • how light behaves in water (refraction) • clear white light is made of 7 colours • the colours we see are known as the visible spectrum • light waves can be absorbed, transmitted or reflected to create colour, white or black • how shadows are formed and that they are the same shape as the object that cast them • what light pollution is and its impact on both humans and animals
AUT2	**Classification of Species**	• who Carl Linnaeus was and how his work influenced the classification of living things • how to use the Linnaean System of classification • the six kingdoms used in classification are: kingdom archaea, Kingdom Bacteria, Kingdom Protista, Kingdom Fungi, Kingdom Plantae and Kingdome Animalia • how to classify vertebrates and invertebrates • how to classify plants – beginning with vascular and non-vascular • what microorganisms are and how they can be classified • the positive and negative impacts of microorganisms • how habitats are important for the conservation of species
SPR	**Evolution and Inheritance**	• why the information fossils give us is so important • who Mary Anning was and why her findings are significant • living things have adapted or changed over time to be able to survive in their environments • why animals need to adapt to their environments • natural selection is when living things are better adapted to their environments and have a greater chance of survival • evolution takes a very long time and animals do not simply chose to evolve • who Charles Darwin and Alfred Wallace were and why they are considered significant

		• why living things produce offspring of the same kind • why offspring vary and are not identical to their parents
SUM1	**Electricity and Circuits**	• electricity is a type of energy produced when electrons move around very quickly and create a current • electricity can be produced by generators which can be powered by renewable and non-renewable sources • electrical components in a circuit can be represented by symbols • the symbols for a bulb, cell, battery, buzzer, motor and switch (on and off) • what happens to the components in a circuit if a component is added to the circuit or a component is changed • the difference between a parallel and a series circuit • we measure electricity in volts (V)
SUM2	**Circulation and Lifestyle**	• the circulatory system consists of the heat, the lungs and the systemic system • the role the heart play in the circulatory system • the names of the different parts of the human heart • human blood consists of plasma, white blood cells and platelets and red blood cells • the role the lungs play in the circulatory system • how heart rate differs before and after exercise • how nutrients are moved around the body by the circulatory system after they are broken down by the digestive system • how diet, exercise and lifestyle impact the heat and the body • what drugs are (legal and illegal) and the impact of different drugs on the human body