



Intent:

At Barley Croft we aim for the children to develop an enthusiasm for and enjoyment of Science. We want children to be confident learners and ask questions that they don't know the answer to and have a desire to want to discover things for themselves. We strive to develop their knowledge and understanding of important scientific ideas, processes and skills and encourage them to relate these to their everyday experiences. Our REAL projects allow children to see that science is part of their everyday world and we aim to teach children different ways of thinking, how to find out things and how to communicate their ideas effectively. We want children to develop a thirst for how things work by providing moments of fascination. We attempt to challenge stereotypes around science and that anyone can be a scientist.

Implementation:

Impact: *When children leave Barley Croft Primary School they will know that...*

1. Animals, humans and plants live and grow. In order to do this all things "eat" use a product and create "waste". All the things need to be looked after correctly and if you put the 'wrong' things into them they become damaged. E.G plants need the right amount of sunlight and water and humans and animals need the correct amount of food and exercise.
2. Classify foods in a range of ways and know that bodies needs different amount of food groups to remain healthy.
3. Exercise is a vital part of staying healthy, and how the circulatory system carries oxygen around the body during exercise.
4. All things are made of materials. Materials can be naturally occurring or man-made. Materials have different uses and can also be changed by heating or cooling.
5. The ability to observe and record the results of an investigation to help find something out.
6. The contribution of science to the wider world and that science can help us to explore and understand things better.
7. Create a simple circuit and draw it using scientific symbols.
8. Know that the UK has 4 seasons and that weather around the world is different.
9. Know that Earth is part of a series of planets in space. That the planets orbit the sun.
10. Ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen).

EYFS	Autumn Term	Spring Term	Summer Term
	<u>Understanding of the World - Science</u> - Understand the effect of the changing seasons on the natural world around them. - Explore the natural world around them. - Decide what they hear, see, feel, whilst outside.	<u>Understanding of the World - Science</u> - Describe what they see, hear, feel whilst outside. - Understand the effect of the changing seasons on the natural world around them. - Understand some important processes including changing states of matter	<u>Understanding of the World - Science</u> - Understand the effect of the changing seasons on the natural world around them. - Explain what they see hear and feel whilst outside. - Explore the natural world around them

	<u>Teaching and learning</u> -Autumn walk -Collect chestnuts and leaves and talk about the changes occurring around them. -Harvest the fruit and vegetables from the garden -Light and dark -Torches/light boxes -colours -magnets -shadows Themes – bonfire night, Diwali	• Explore the natural world around them <u>Teaching and learning</u> -melting -ice -Snow play -Spring walk, spring bulb and flowers, leaves on tree, birds and eggs new life -planting seeds -Life cycles – tadpoles and frogs etc	<u>Teaching and learning</u> -spring continued... -gardening – looking at planted seeds -mini beast hunts -life cycles -Farm visit (possible) - change in season - Summer - Water play - Floating and sinking - Under the sea creatures
A	Autumn Term	Spring Term	Summer Term
Year 1/2	<u>Living things and their habitats</u> • 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. <u>Animals, including Humans</u> • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals	<u>Plants</u> • 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 • 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 <u>Seasonal Change</u> • Observe changes across the 4 seasons • Observe and describe weather associated with the seasons and how day length varies	

	identify and name a variety of common animals that are carnivores, herbivores and omnivores		
Year 3/4	Living things and their habitats (Year 4) - 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.	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. Light and sound (light) - recognise that they need light in order to see things and that dark is the absence of light	Light and sound (Sound Year 4) - 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. Plants (yr 3) - 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

		- 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 a solid object - find patterns in the way that the size of shadows change.	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 5/6	<u>Living Things & their Habitats</u> 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. - Living Things & 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.	<u>Light and sound (light)</u> - 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. <u>Electricity</u> - associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit	<u>Everyday Materials</u> <u>Properties and changes of materials</u> - 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.

		• 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.	• 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.
B	Autumn	Spring	Summer
Year 1/2	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 (yr 1) • explore and compare the differences between things that are living, dead and things that have never been alive (yr1) • 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 food and hygiene.	Everyday materials • Identify and name a variety of everyday materials including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • Distinguish between an object and the material from which it is made • Describe simple properties 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 different uses	

		- Find out how the shapes of solid objects made from some materials can be changed (by squashing, bending, twisting and stretching) <u>Seasonal Changes</u> - Observe changes across the seasons (Winter) - Observe and describe weather associated with the seasons and how day length varies	
Year 3/4	Everyday materials States of matter (yr 4) - 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.	Forces and magnets (yr 3) - 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.	Animals including humans (yr3) - 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. (Yr 4) - 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.

Year 5/6	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.	Animals including humans (body) - 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 Evolution & 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.	Animals including humans Describe the changes as humans develop to old age.

Vocabulary Progression Map

Science Topic	EYFS	Year 1-2		Year 3-4		Year 5-6	
Working scientifically	Comment Question Ideas Choose Equipment Technology Look closely Similarity Difference Change Talk about Draw Create Why How Experience Environment Explain	Experience observe changes patterns grouping compare identify (name) equipment questions test investigate diagram magnifying glass / hand lens same different	Explore Find out Research Sort Change over time Measure Record Gather Data Contrast Discover Classify	develop fair test comparative test relationships conclusion accurate thermometer data logger estimate data diagram table chart Present Answer Decide Recognise	bar chart results predictions explanation reason similarity difference question evidence information findings criteria values properties characteristics key (identifying) Graph Interpret Analyse	variables evidence justify accuracy precision scatter graphs bar graphs line graphs Construct Demonstrate Precision Represent Give reasons Use evidence Determine Indicate	Systematically Independent Dependent (variable) Repeat readings Develop Average Associate Hypothesis Extend Degree of trust
	EYFS	Year 1-2		Year 3-4		Year 5-6	
Animals, including humans	Animal Human Body Grow Baby Child	names of common animals: fish, amphibians, reptiles, birds, mammals carnivores herbivores omnivores	feet fingers toes elbows knees hair	nutrition diet skeleton muscles protection support	Humans Digestive system Functions Mouth Teeth Tongue Salivary glands	puberty gestation period circulatory system heart	Human Animal Functions Internal organs Digestive system Muscular system Skeletal system Circulatory

	Adult Exercise Food Healthy Eating Sleeping Clean Health	human body senses see hear feel smell taste habitat local environment pet wild animal insect minibeast food eat head neck body arms legs ears eyes nose mouth tongue hands	teeth grow healthy offspring adults young water air survive exercise hygiene egg chick chicken caterpillar pupa moth butterfly tadpole frog frog spawn lamb sheep calf cow foal horse Food chain Sun Predator Prey Hunt	movement bones skull shell digestive system stomach small intestine large intestine oesophagus types of teeth: molar, pre-molar, incisor, canine saliva Humans Animals Nutrition Malnutrition Diet Meals Eat Water Hydrated Dehydrated Food groups Carbohydrates Protein Fibre Fats Vitamins Minerals	Oesophagus Stomach Small intestines Large intestines Rectum Colon Anus Liver Pancreas Gallbladder Appendix Acids Enzymes Swallow Chew Waste Canine Incisor Premolar Molar Milk teeth Gums Enamel Root Dentine Pulp Sugary foods Healthy foods Dentist Toothbrush Toothpaste Floss Damage Plaque Decay Filling Food chain Sun Energy Producer Consumer Predator	lungs blood vessels blood lifestyle disease water transportation nutrient transportation oxygen air breathing exercise diet drugs Old age Growth Baby Toddler Child Teenager Adolescent Adult Ageing Life expectancy Changes Development Puberty Hormones	system Respiration Heart Valve Left Right Atrium Ventricle Pulmonary Blood White blood cells Red blood cells Plasma Water, Salt, Protein Platelets Blood vessels Artery Vein Capillaries Lungs Oxygenated Deoxygenated Trachea Bronchus Bronchiole Air sacs (alveoli) Diaphragm Absorbed Oxygen Carbon Dioxide
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					Prey Hunt Decomposer Scavenger		
	EYFS	Year 1-2		Year 3-4		Year 5-6	
Plants	Plant Tree Grow Fruit Vegetable Water Light Warmth Soil	plants wild plants garden plants evergreen trees deciduous trees common flowering plants flowers vegetables leaf/leaves flower blossom petal stem trunk branch root local environment leaf fall water	seed bulb bud growth grow habitat light temperature healthy growth survive soil germinate stages of growth	functions support anchor nutrients nutrition reproduce make own food life water air	transport (water) life cycle pollination seed formation seed dispersal fertiliser xylem vessel evaporation seedling		

	EYFS	Year 1-2		Year 3-4		Year 5-6	
Living things and their habitats (including evolution and inheritance)	Wildlife Animals Insects Plants People Environment	pond garden field park woodland sea shore river ocean forest rainforest stones rocks logs leaf litter growth healthy	habitat micro-habitat living dead not living alive healthy food food chain depend source of food shelter grow	environment non-flowering plants ferns mosses flowering plants grasses vertebrate animals: fish, birds, mammals, amphibians, reptiles	human impact – litter, deforestation, population increase, nature reserves invertebrate animals: snails, worms, slugs, spiders, insects	life cycles reproduction life processes sexual and asexual root cuttings classification evolution evolve adaptation variation inherit inheritance	reproduction (plants) Receptacle Male Stamen Anther Filament Female Pistil Stigma Style Ovary Ovule Phloem Xylem microorganisms organisms
	EYFS	Year 1-2		Year 3-4		Year 5-6	
Materials	Material Natural Object Texture Made from Build Construct Use	everyday materials wood paper plastic metal glass water	Uses Suitability Suitable Unsuitable Properties Various uses Purposes			properties hardness solubility transparency electrical conductivity thermal	

		rock brick stone fabric material foil elastic dough rubber card cardboard clay object make/made hard/soft shiny/dull stretchy/stiff rough/smooth bendy/not bendy waterproof/not waterproof transparent/opaque absorbent/not absorbent	squash twist bend stretch		conductivity magnetism dissolve solution substance separating mixing filtering sieving reversible change burning rusting reactions irreversible change	
	EYFS	Year 1-2	Year 3-4		Year 5-6	
Rocks and soils			rock soil fossil organic matter grains crystals rock Sedimentary limestone, chalk, sandstone, conglomerate, coal Igneous basalt, granite, obsidian, pumice Metamorphic			

			quartzite marble, slate, schist Formed Trapped Sediment Erosion Weathering			
	EYFS	Year 1-2	Year 3-4	Year 5-6		
States of matter				water cycle evaporation condensation melting freezing solid liquid gas temperature heat (heating) cool (cooling) Water cycle Water Sun Heat Evaporation Cools Condensation Water droplets Clouds Water vapour Precipitation		

	EYFS	Year 1-2		Year 3-4		Year 5-6	
Earth and space	Weather Sun Rain Wind Snow Cold Warm Hot Day Earth World Space Stars Rocket Astronaut Sun Moon Planets	Seasons Spring Summer Autumn Winter Year Months Change Day length Daylight Weather Sunrise Sunset Moon Night Dark	Temperature Hot Cold Sunny Wind Rain Overcast Hail Sleet Fog Cloud Snow			moon Phases New Full Crescent stars satellite Earth Planets Sun Solar System Spherical Movement Orbit Rotation Axis	Stars Constellations Sundial Shadow Mercury Venus Mars Jupiter Saturn Uranus Neptune
	EYFS	Year 1-2		Year 3-4		Year 5-6	
Electricity	Electricity Plug Safety Energy On Off Wire			electricity electrical appliance simple circuit light bulb cell wire	conductor insulator Metals Copper Aluminium Gold Silver	voltage components symbols circuit diagram	

			buzzer switch motor battery series circuit	Insulators Glass Plastic Rubber Wood		
	EYFS	Year 1-2	Year 3-4		Year 5-6	
Forces	Magnet Push Pull		move movement surfaces forces push pull contact distance magnet bar magnet ring magnet horseshoe magnet magnetic materials	Distance Attract Repel Pole North South Strength	Force Newtons Earth Fall Gravity theory Gravitation Air resistance Water resistance Friction	Opposing Surfaces Faster Slow down Stop Movement Machines Mechanisms Smaller/Greater levers pulleys gears springs
	EYFS	Year 1-2	Year 3-4		Year 5-6	
Light	Light Dark Sun Eyes See		light dark (absence of light) reflect shadow opaque mirror reflective surface blocked distance changes		Light Travel Straight lines Direction Visible Reflect Reflection Eye Light sources Natural Artificial Emits	Opaque Transparent Translucent Reflective Shadows Cast Absorb Scatter Mirrors Periscope Rainbows Coloured filters Spectrum
	EYFS	Year 1-2	Year 3-4		Year 5-6	
Sound	Sound Noise Loud Quiet			Sound Vibration Wave Travel		

	Whisper Shout Sing Music			Ear Pitch High Low Volume Loud Quiet Decibels Sound source Distance Fainter Louder Insulation Instruments		
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