HAWES PRIMARY SCHOOL – SCIENCE KNOWLEDGE PROGRESSION DOCUMENT

CURRICULAR GOAL: for children to KNOW and develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics and develop an understanding of the nature, processes and methods of science – working scientifically - through different types of science enquiries that help them to answer scientific questions about the world around them; to know how science is used and the implications it holds today and for the future.

LIVING THINGS: Know how to develop contextual understanding of our natural environment. Know how to identify living things, how they function and how they survive and be able to justify/explain their answers using scientific vocabulary.

COMPONENT 1: Plants: Name and structure, Growth, Requirements

Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Explore the natural world around them, making observations and drawing pictures of animals and plants in the local environment. Know plant types: tree, grass, flower Know some basic parts of a plant: petal, stem, leaf Plant seeds and observe plants growing.	Name and identify a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a flowering plant and tree: flowers, blossom, fruit, trunk, branches	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 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, room to grow) and how they vary from plant to plant. Investigate the way water is transported in plants. Know the life cycle of a plant. Explore the part that flowers play in the life cycle of flowering plants: pollination, seed formation and seed dispersal - animals, explosion, water, wind.		Describe the life processes of reproduction in some plants: sexual and asexual reproduction.	

COMPONENT 2: Animals Including humans: Type, Structure, Requirements, Growth

Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Explore the natural world around them, making observations and drawing pictures of animals and plants in the local environment. Observe a tadpole turning into a frog and caterpillars into butterflies.	Identify and name a range of common animals: fish, amphibians, reptiles, mammals, birds Identify and name common animals that are carnivores, herbivores and omnivores.	Know that animals have offspring that grow into adults. Describe the basic needs of animals for survival: water, food, air	Identify that animals need the right types and amounts of nutrition and that they cannot make their own food. Know they get nutrition from what they eat. Identify that animals have skeletons and muscles for support, protection and movement.		Describe ways that nutrients and water are transported within animals.	

Know how we can look after animals including creating a minibeast shelter. Name some adult and baby animals familiar to them e.g. sheep/lamb	Compare the structure of a variety of common animals: fish, amphibians, reptiles, birds, mammals (and pets).					
	Identify, name, draw and label the basic parts of the human body. Say which part of the body is associated with each of the senses: sight, sound, touch, hearing, smell.	Humans have babies that grow into adults: baby, toddler, child, teenager, adult. Describe the basic needs of humans for survival: water, food, air Know that exercise, eating healthily and hygiene are important for humans and say why.	Identify that humans need the right types and amounts of nutrition and that they cannot make their own food. Know they get nutrition from what they eat. Identify that humans have skeletons and muscles for support, protection and movement. Describe the basic parts of the digestive system and their functions: mouth, oesophagus, stomach, long intestine, short intestine, bowel, Identify the different types of teeth and their functions: canines, incisors, molars		Describe the changes as humans develop to old age. Identify and name the main parts of the human circulatory system. Describe the function of the heart, blood vessels and blood. Recognise the impact of diet, exercise and drugs on the way bodies function. Describe ways that nutrients and water are transported within humans.	
		Describe how animals obtain their food from plants and animals. Create a simple food chain.	Construct food chains identifying producers, consumers, predators and prey.		Describe the life cycles of a mammal, amphibian, insect and bird. Describe the process of reproduction in some animals.	
COMPONENT 3: Living Things and Their Habitats: Group, Compare and Classify						
Reception	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Group animals: pets, wild animals, sea creatures	Group animals into herbivore, carnivore and omnivore. Describe and group things as living, dead or never been alive.	Group animals according to their structure: vertebrate, invertebrate Know that most living things are suited to their habitats: they provide food and shelter.	Recognise that living things can be grouped in a variety of ways. Use classification keys to group, identify and name a variety of living things in the local and wider environment.		Describe how living things are classified into broad groups according to observable characteristics. Divide broad groups including micro-organisms, plants, mammals, Use and create simple classification keys.	

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	Know what a habitat is and that it is different to a home. Identify and name a variety of animals and plants in their habitats.	Name some microhabitats and animals and plants that live there.	Know environments can change and that this can sometimes pose dangers to living things: littering/deforestation/polar ice caps		Learn about Carl Linnaeus. Give reasons for classifying plants and animals based on specific characteristics.	
COMPONENT 4: Evolution and Inheritance: know how it has changed animals and plants.						
Reception	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
					Know living things have changed over time: fossils provide evidence of this. Know living things produce offspring that are not identical to the parents: variety/inheritance Know that animals and plants are adapted to suit their environment and that adaptation may lead to evolution.	
MATERIALS AND THEIR PROPERTIES: Know how to identify, classify, compare and group every day materials, rocks, properties and state of matter, understanding that heat and pressure affect different materials including liquid, solids and gasses. (Everyday materials, rocks and states of matter)						
COMPONENT 5: Identify Materials and their Properties: Name and give properties, Compare						
Reception	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Explore the natural world around them, making observations and drawing pictures or materials in a familiar environment. Know items are made from different materials. Describe how objects feel: hard, soft, smooth	Know the difference between an object's name and what it is made from. Identify and name everyday materials: wood, plastic, glass, metal, water, rock Describe the physical properties of materials: hard/soft, stretchy/stiff, shiny/dull, rough/smooth	Identify and compare everyday materials: wood, metal, plastic, glass, brick, rock, paper, cardboard. Know uses for different materials. Know some materials can change shape: squashing, bending, twisting	Know and name rocks and identify their properties. Know how fossils are formed. Know how soil is made: rock and organic matter Know and explain the difference between igneous, sedimentary and metamorphic rock. Know what a solid, liquid and gas is.			

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Sort objects according to the material.	Compare and group everyday materials based on their properties.	Compare and group everyday materials based on their suitability for a purpose: e.g waterproof	Compare and group rocks based on their appearance and physical properties. Group rocks into igneous, sedimentary and metamorphic. Compare and group materials according to their magnetic properties.		Compare and group materials according to their properties: hardness, solubility, transparency, electrical and thermal conductivity, magnetic response.	
COMPONENT 6: Know and Explain how Materials Change						
			Know that some materials can change state and the temperatures at which some materials change state. Know about the water cycle: evaporation, condensation, precipitation Know that temperature and the rate of evaporation link.		Know some materials will dissolve in a liquid to form a solution. Know how to recover a substance from a solution: evaporation. Decide how to separate mixtures using filtering, sieving and evaporating Know dissolving, mixing and changes of state can be reversible and irreversible (when a new material is formed) e.g. burning.	
PHYSICAL PROCESSES: Know how to build on contextual understanding of the study of matter in space, time and all around them and how they are related to each other (Seasons, light, sound, forces, Earth and Space).						
COMPONENT 7: Forces and their effects						
Reception	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
			Know some forces need contact between two objects: push/pull/friction Know magnetic forces can act at a distance. Know things move differently on different surfaces. Know magnets have 2 poles that attract or repel each other Know magnets attract some materials and not others		Know unsupported objects fall to Earth due to the force of gravity. Know the effects of water resistance, air resistance and friction between moving surfaces. Know that mechanisms: levers, gears, pulleys, allow a smaller force to have a greater effect.	
COMPONENT 8: Seasonal Change and how it affects daily life.						
Reception	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**

Identify the weather: cold, windy, wet, sunny	Name the four seasons and what changes occur: trees leaves Explain how the weather changes through the seasons	Know how day length changes through the seasons.				
COMPONENT 9: Light and Sound: know how they are created						
Reception	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
			Know that they need light in order to see things and that dark is the absence of light Know light is reflected from surfaces Know light from the sun can be dangerous and that there are ways to protect their eyes Know that shadows are formed when the light from a light source is blocked by an opaque object Know how to change the size of a shadow.		Know that light appears to travel in straight lines Know that objects are seen because they give out or reflect light into the eye Know we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes Know why shadows have the same shape as the objects that cast them.	
			Know how sounds are made by something vibrating Know 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 Know that sounds get fainter as the distance from the sound source increases.			
COMPONENT 10: Electricity: Appliances and Danger, Function, Constructing Circuits, Uses						

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Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			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		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	

COMPONENT 11: The Solar System and how it Affects our lives.						
Reception	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
					Know what the solar system is: name the 8 planets. Give key features of the 8 planets. Know scientists have changed their view of the solar system: geocentric and heliocentric Know how the Earth moves relative to the sun. Know how the moon moves relative to the Earth. Know how the Earth rotates to create night and day.	

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COMPONENT: **WORKING SCIENTIFICALLY** – Know and develop an understanding of scientific ideas, using different types of scientific enquiry to answer questions by observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests, and finding things out using secondary sources of information.			
EYFS	KS1	LKS2	UKS2
• Exploring Science and developing an understanding of their physical world and community through play	• Know how to ask simple questions, recognising that they can be answered in different ways • Know how to observe closely, using simple equipment • Know how to perform simple tests • Know how to identify and classify • Know how to use observations and ideas to suggest answers to questions • Know how to gather and record data to help in answering questions	• Know how to ask relevant questions and using different types of scientific enquiries to answer them • Know how to set up simple practical enquiries, comparative and fair tests • Know how to make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Know how to gather, record, classify and present data in a variety of ways to help in answering questions • Know how to record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Know how to report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Know how to use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Know how to identify differences, similarities or changes related to simple scientific ideas and processes • Know how to use straightforward scientific evidence to answer questions or to support their findings.	• Know how to plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • Know how to take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. • Know how to record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • Know how to use test results to make predictions to set up further comparative and fair tests. • Know how to report and present 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. • Know how to identify scientific evidence that has been used to support or refute ideas or arguments.