<table>
<tr><td colspan="2"><u>working scientifically disciplinary knowledge (see accompanying PLAN progression document)</u>
Asking simple questions and recognising they can be answered in different ways.
Making observations and taking measurements
engaging in practical enquiries to answer questions
Recording and presenting evidence
Answering questions and concluding</td></tr>
<tr><td colspan="2"><u>Enquiry types</u>
Fair and comparative testing
observing over time
identifying and classifying
Ideas over time
research
fair test
pattern seeking</td></tr>
<tr><td colspan="2"><u>Year 1</u>
<u>Substantive knowledge</u></td></tr>
<tr><td><u>Plants</u>
Can they name the petals, stem, leaf, bulb, flower, seed, stem and root of a plant?
Can they identify and name a range of common plants and trees?
Can they recognise deciduous and evergreen trees?
Can they name the trunk, branches and root of a tree?
Can they describe the parts of a plant (roots, stem, leaves, flowers)?
<u>Exceeding</u>
<s>Can they name the main parts of a flowering plant?</s> not on NC</td><td><u>Animals including humans</u>
Can they point out some of the differences between different animals?
<s>Can they sort photographs of living things and non-living things?</s>
Can they identify and name a variety of common animals? (birds, fish, amphibians, reptiles, mammals, invertebrates)
<s>Can they describe how an animal is suited to its environment?</s>
Can they identify and name a variety of common animals that are carnivores, herbivores and omnivores?
Can they name the parts of the human body that they can see?
Can they draw & label basic parts of the human body?
Can they identify the main parts of the human body and link them to their senses?
Can they name the parts of an animal's body?
Can they name a range of domestic animals?
Can they classify animals by what they eat? (carnivore, herbivore, omnivore)
Can they compare the bodies of different animals?
<u>Exceeding</u>
Can they begin to classify animals according to a number of given criteria?
<s>Can they point out differences between living things and non-living things?</s>
Can they name some parts of the human body that cannot be seen?
<s>Can they say why certain animals have certain characteristics?</s>
<s>Can they name a range of wild animals?</s></td></tr>
<tr><td><u>Everyday materials – classifying and grouping</u>
Can they distinguish between an object and the material from which it is made?
Can they describe materials using their senses?
Can they describe materials using their senses, using specific scientific words?
Can they explain what material objects are made from?
Can they explain why a material might be useful for a specific job?
Can they name some different everyday materials? e.g. wood, plastic, metal, water and rock
Can they sort materials into groups by a given criteria?
<s>Can they explain how solid shapes can be changed by squashing, bending, twisting and stretching?</s>
<u>Exceeding</u>
Can they describe things that are similar and different between materials?
<s>Can they explain what happens to certain materials when they are heated, e.g. bread, ice, chocolate?</s></td><td><u>Seasonal Changes</u>
Can they observe changes across the four seasons?
Can they name the four seasons in order?
Can they observe and describe weather associated with the seasons?
Can they observe and describe how day length varies?
<u>Exceeding</u>
Can they observe features in the environment and explain that these are related to a specific season?
Can they observe and talk about changes in the weather?
<s>Can they talk about weather variation in different parts of the world?</s></td></tr>
</table>

~~Can they explain what happens to certain materials when they are cooled, e.g. jelly, heated chocolate?~~	

Year 2

Substantive knowledge	
Plants Can they describe what plants need to survive? Can they observe and describe how seeds and bulbs grow into mature plants? Can they find out & describe how plants need water, light and a suitable temperature to grow and stay healthy? Can they describe what plants need to survive and link it to where they are found? ~~Can they explain that plants grow and reproduce in different ways?~~ Living things and their habitats Can they match certain living things to the habitats they are found in? Can they explain the differences between living and non-living things? ~~Can they describe some of the life processes common to plants and animals, including humans?~~ Can they decide whether something is living, dead or non-living? Can they describe how a habitat provides for the basic needs of things living there? Can they describe a range of different habitats? Can they describe how plants and animals are suited to their habitat? Can they describe how animals obtain their food using a SIMPLE food chain? (E.g. grass- cow -human) Can they name some characteristics of an animal that help it to live in a particular habitat? Can they describe what animals need to survive and link this to their habitats?	Animals including humans Can they describe what animals need to survive? Can they explain that animals grow and reproduce? Can they explain why animals have offspring which grow into adults? Can they describe the life cycle of some living things? (e.g. egg, chick, chicken) Can they explain the basic needs of animals, including humans for survival? (water, food, air) Can they describe why exercise, balanced diet and hygiene are important for humans? ~~Can they explain that animals reproduce in different ways?~~

Uses of everyday materials – classifying and grouping
Can they describe the simple physical properties of a variety of everyday materials?
Can they compare and group together a variety of materials based on their simple physical properties?

~~Can they describe the properties of different materials using words like transparent or opaque, flexible, etc.?~~
Can they sort materials into groups and say why they have sorted them in that way?
~~Can they say which materials are natural and which are man-made?~~

Changing materials
Can they explore how the shapes of solid objects can be changed? (squashing, bending, twisting, stretching)
Can they find out about people who developed useful new materials? (John Dunlop, Charles Macintosh, John McAdam)
Can they identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper, cardboard for particular uses?
~~Can they explain how things move on different surfaces?~~

~~Can they explain how materials are changed by heating and cooling?~~
Can they explain how materials are changed by bending, twisting and stretching?
Can they tell which materials cannot be changed back after being ~~heated, cooled~~, bent, stretched or twisted?

Year 3

Substantive knowledge

Plants Can they identify and describe the functions of different parts of flowering plants? (roots, stem/trunk, leaves and flowers)? Can they explore the requirement of plants for life and growth (air, light, water, nutrients from soil, and room to grow)? Can they explain how they vary from plant to plant? Can they investigate the way in which water is transported within plants? Can they explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal? Can they classify a range of common plants according to many criteria (environment found, size, climate required, etc.)?	Animals including humans Can they explain the importance of a nutritionally balanced diet? Can they describe how nutrients, water and oxygen are transported within animals and humans? Can they identify that animals, including humans, cannot make their own food: they get nutrition from what they eat? Can they describe and explain the skeletal system of a human? Can they describe and explain the muscular system of a human? Can they explain how the muscular and skeletal systems work together to create movement? ~~Can they classify living things and non-living things by a number of characteristics that they have thought of?~~ ~~Can they explain how people, weather and the environment can affect living things?~~ ~~Can they explain how certain living things depend on one another to survive?~~
Rocks Can they compare and group together different rocks on the basis of their appearance and simple physical properties? Can they describe and explain how different rocks can be useful to us? Can they describe and explain the differences between sedimentary and igneous rocks, considering the way they are formed? Can they describe in simple terms how fossils are formed when things that have lived are trapped within rock? Can they recognise that soils are made from rocks and organic matter? Can they classify igneous and sedimentary rocks? Can they begin to relate the properties of rocks with their uses?	Forces and magnets Can they compare how things move on different surfaces? Can they observe that magnetic forces can be transmitted without direct contact? Can they observe how some magnets attract or repel each other? Can they classify which materials are attracted to magnets and which are not? Can they notice that some forces need contact between two objects, but magnetic forces can act at a distance? Can they compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet? Can they identify some magnetic materials? Can they describe magnets have having two poles (N & S)? Can they predict whether two magnets will attract or repel each other depending on which poles are facing? Can they investigate the strengths of different magnets and find fair ways to compare them?

	Light Can they recognise that they need light in order to see things? Can they recognise that dark is the absence of light? Can they notice that light is reflected from surfaces? Can they recognise that light from the sun can be dangerous and that there are ways to protect their eyes? Can they recognise that shadows are formed when the light from a light source is blocked by a solid object? Can they find patterns in the way that the size of shadows change? ~~Can they explain why lights need to be bright or dimmer according to need?~~ Can they explain the difference between transparent, translucent and opaque? ~~Can they explain why lights need to be bright or dimmer according to need?~~ ~~Can they make a bulb go on and off?~~ ~~Can they say what happens to the electricity when more batteries are added?~~ Can they explain why their shadow changes when the light source is moved closer or further from the object?

Year 4

Substantive knowledge	
Living things and their habitats Can they recognise that living things can be grouped in a variety of ways? Can they explore and use a classification key to group, identify and name a variety of living things? (plants, vertebrates, invertebrates) ~~Can they compare the classification of common plants and animals to living things found in other places? (under the sea, prehistoric)~~ Do they recognise that environments can change and this can sometimes pose a danger to living things? Can they give reasons for how they have classified animals and plants, using their characteristics and how they are suited to their environment? Can they explore the work of pioneers in classification? (e.g. Carl Linnaeus) Can they name and group a variety of living things based on feeding patterns? (producer, consumer, predator, prey, herbivore, carnivore, omnivore)	Animals including humans Can they identify and name the basic parts of the digestive system in humans? Can they describe the simple functions of the basic parts of the digestive system in humans? Can they identify the simple function of different types of teeth in humans? Can they compare the teeth of herbivores and carnivores? Can they explain what a simple food chain shows? Can they construct and interpret a variety of food chains, identifying producers, predators and prey? Can they classify living things and non-living things by a number of characteristics that they have thought of? ~~Can they explain how people, weather and the environment can affect living things?~~ ~~Can they explain how certain living things depend on one another to survive?~~

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Electricity Can they identify common appliances that run on electricity? Can they construct a simple series electric circuit? Can they identify and name the basic part in a series circuit, including cells, wires, bulbs, switches and buzzers? Can they 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? Can they recognise that a switch opens and closes a circuit? ~~Can they associate a switch opening with whether or not a lamp lights in a simple series circuit?~~ Can they recognise some common conductors and insulators? Can they associate metals with being good conductors? ~~Can they explain how a bulb might get lighter?~~ Can they recognise if all metals are conductors of electricity? ~~Can they work out which metals can be used to connect across a gap in a circuit?~~ Can they explain why cautions are necessary for working safely with electricity?	Sound Can they describe a range of sounds and explain how they are made? Can they associate some sounds with something vibrating? ~~Can they compare sources of sound and explain how the sounds differ?~~ Can they explain how to change a sound (louder/softer)? Can they recognise how vibrations from sound travel through a medium to a ear? ~~Can they find patterns between the pitch of a sound and features of the object that produce it?~~ Can they find patterns between the volume of the sound and the strength of the vibrations that produced it? Can they recognise that sounds get fainter as the distance from the sound source increases? ~~Can they explain how you could change the pitch of a sound?~~ Can they investigate how different materials can affect the pitch and volume of sounds? Can they explain why sound gets fainter or louder according to the distance? ~~Can they explain how pitch and volume can be changed in a variety of ways?~~ Can they work out which materials give the best insulation for sound? States of matter Can they compare and group materials together, according to whether they are solids, liquids or gases? Can they explain what happens to materials when they are heated or cooled? Can they measure or research the temperature at which different materials change state in degrees Celsius? ~~Can they use measurements to explain changes to the state of water?~~ Can they identify the part that evaporation and condensation has in the water cycle? ~~Can they associate the rate of evaporation with temperature?~~ ~~Can they group and classify a variety of materials according to the impact of temperature on them?~~ Can they explain what happens over time to materials such as puddles on the playground or washing hanging on a line? ~~Can they relate temperature to change of state of materials?~~