



Poulton Lancelyn Science Knowledge Progression Map

2020-21



	<u>Autumn1</u>	<u>Autumn2</u>	<u>Spring1</u>	<u>Spring2</u>	<u>Summer1</u>	<u>Summer2</u>
Year 1	<u>Parts of Animals</u> 1. Describe and compare the structure of a variety of common animals 2. Compare features of humans with other animals 3. Name and identify the main human body parts 4. Name the five senses 5. Identify and label the basic parts of the human body and say which part of the body is associated with each sense	<u>Types of Animals</u> 1. Identifying animals 2. Identifying animals needs and how they vary based on type of animal 3. Identify and name a variety of common animals that are carnivores, herbivores and omnivores 4. Know that animals can be sorted into groups by different factors such as what they eat	<u>Identify Materials</u> 1. Sorting materials based on their basic, obvious properties 2. Identifying objects made from specific materials 3. Distinguish between an object and the material from which it is made	<u>Comparing Materials</u> 1. Ensuring progression from identifying materials to begin to look at purpose of materials 2. Outline similarities and differences between two different materials 3. Comparing how materials react in situations (floating etc)	<u>Plants</u> 1. Know that plants are living things 2. Recognise that trees and grasses are plants 3. Identify and name the leaf, flower, root, and stem in plants 4. Understand the basic needs of caring for a plant 5. Identifying types of plants, leaves and trees (including evergreen and deciduous trees)	<u>Changing Seasons</u> 1. Understand and recognise weather symbols 2. Record observations of the daily weather using symbols 3. Describe changes in the weather across seasons 4. Compare how dark or light it is at different points of the day during different seasons 5. Understand that day length varies in each season

Humans

1. Understand the consequences of insufficient exercise, poor diet and poor personal hygiene.
(due to Covid-19)

Living Things/habitats

1. Know that most living things live within particular environments which best provide for their basic needs, e.g. food, shelter, safety
2. Understand that all living things share similar basic life processes (MRSGREN)
3. Identifying living and non-living things
4. Know that the scientific name for the 'home' of a living thing is habitat
5. Basic human and animal life cycles
6. Recognise that different plants and animals live in different habitats
7. Know that it would be difficult for some living things to survive in habitats to which they are not suited

Humans

1. Recap knowledge of living things
2. Recognise typical characteristics of and name distinct phases of human growth (baby, toddler, child, teenager and adult).
3. Know that humans and other animals change in appearance as they grow.
4. Understand the importance for humans of eating the right amount of different types of food.
5. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Materials

1. ensure progression from materials topic in Y1
2. Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses
3. Develop vocabulary of classification of materials from Y1 (waterproof, absorbent, brittle etc)
4. Design their own product out of a specific material with reasoning
Changing shapes of materials
1. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching
2. Compare materials that change their shape by squashing, bending, twisting or stretching
3. Classify materials according to their ability to bend, squash and twist

Habitats/ micro habitats

1. Recap from living things and habitats in Autumn.
2. Recognise that there are many different habitats.
3. Understand that within habitats there may be smaller habitats called micro-habitats.
4. Identify and name a variety of plants and animals in their habitats, including micro-habitats.

Animals (movement and feeding)

1. Link to MRSGREN (from living things and humans topic) about the needs of animals.
2. Know that animals, including humans, need to eat, drink and breathe to stay alive.
3. Understand that different animals eat different food. (omnivore, carnivore, herbivore) developed from Y1 understanding.
4. Life cycles of animals (progressed from life cycles of humans in preparation for life cycles in Y5) notice that animals, including humans, have offspring which grow into adults.
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Plants

1. Development of understanding in Y1, look in more sophisticated detail about the needs of a plant.
2. Know that seeds and bulbs come from plants.
3. Be able to sort seeds from non-seeds.
4. Understand that seeds and bulbs have the potential to grow into plants that are the same as their parent plant.
5. Understand that plant growth is a long process and that plants change their appearance over time as they grow.
6. Observe and describe how seeds and bulbs grow into mature plants.
7. Understand that plants can produce seeds and new plants without human intervention.

Rocks

1. Know that there are different types of rock
2. Understand that different rocks have different observable features, e.g. colour
3. Be able to describe some properties of rocks, e.g. hardness
4. Be able to compare and contrast the properties of different rocks
5. Identify different rocks using research or by comparing to samples
6. Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
7. Know that rocks now cover the Earth but they haven't always been there
8. Be able to describe how sedimentary rock is formed
9. Describe in simple terms how fossils are formed when things that have lived are trapped within rock
10. Know that over time rocks can be broken down into smaller pieces

Movement and feeding

1. Progressive from year 1 - name some common bones
2. Describe how muscles and tendons contract and relax to help with movement
3. Identify that humans and some other animals have skeletons and muscles for support, protection and movement
4. Progression of Y2 - Know why we need different types of food to stay healthy
5. Detailed understanding of what makes a healthy lifestyle
6. Identify different food types and their importance in a balanced diet
7. 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

Plants

1. Progression of plants work in Y1 and 2
2. Continuation of what plants need – Know that without air, light, water and nutrients a plant will not thrive
3. Recognise that plants need the correct amount of water to grow well, e.g. that plants will not grow well if they have too much or too little water
4. Know that plants can outgrow their containers and become root bound
5. Understand that soil provides the nutrients to help plants grow
6. Understand that many plants grow from seeds
7. Know that seeds cannot form without a flower being pollinated
8. Know that after pollination the plant produces fruit containing seeds
9. Be able to sequence the life cycle of a flowering plant

Light

1. Recognise that they need light in order to see things and that dark is the absence of light
2. Know that light comes from a source
3. Recognise that shiny objects can reflect light
4. Distinguish between light sources and light reflectors
5. Notice that light is reflected from surfaces
6. Know that the Sun is a powerful source of light
7. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes
8. Know that some materials block light
9. Know that shadows are similar in shape to the objects forming them
10. Know that shadows can be formed when opaque objects block light
11. Be able to sort materials into transparent, translucent and opaque
12. Recognise that shadows are formed when the light from a light source is blocked by a solid object

Forces and Magnets

1. Notice that some forces need contact between two objects, but magnetic forces can act at a distance
2. Recall and use the terms 'attract' and 'repel' accurately
3. Identify materials that are magnetic and those which are non-magnetic
4. Observe how magnets attract or repel each other and attract some materials and not others
5. Know that not all metals are magnetic
6. 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
7. Recall that the poles of a magnet are described as North and South
8. Predict whether two magnets will attract or repel each other, depending on which poles are facing

Parts of plants

1. This needs to show development from Y1, 2 and earlier 3 work
2. Be able to identify the roots of a plant
3. Be able to describe the functions of the roots of plants
4. Describe how water moves from the soil into a plant's roots and up through the stem
5. Investigate the way in which water is transported within plants
6. Know that flowers are the parts of the plant where reproduction (new seed production) happens

	<p>by processes such as weathering</p> <p>11. Know that over time rocks can be broken down into smaller pieces by processes such as weathering.</p> <p>12. Understand that soil contains small parts of rocks</p> <p>13. Know that different soils can have different characteristics, e.g. that they can be different colours and textures</p>			<p>13. Make and record observations and measurements of shadows</p> <p>14. Find patterns in the way that the size of shadows change</p>		
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	<u>Sound</u> <ol style="list-style-type: none"> 1. Know that sounds can travel 2. Know that sound can travel through solids, liquids and gases 3. Recognise that vibrations from sounds travel through a medium to the ear 4. Identify a variety of sounds 5. Know that sounds come from a source 6. Recognise that sounds can be classified in different ways, e.g. loud, quiet, high, low 7. Understand the term 'vibrate' (to move very quickly from side to side) 8. Understand and identify that all sounds are made by something vibrating 9. Know that the highness or lowness of a sound is called the pitch of the sound 10. Recognise that there are high and low pitched sounds 11. Understand that the pitch of sounds can be changed 12. Identify features of an object that can be changed to alter its pitch, e.g. length of tube, 	<u>Animals including humans</u> <ol style="list-style-type: none"> 1. Know that the human body has organs and be able to name some 2. Understand that some groups of organs work together in a system 3. Recognise that humans have a body system which digests (breaks down) food 4. Be able to name and describe the main organs of the digestive system: teeth, mouth, tongue, oesophagus, stomach, small and large intestines, rectum and anus 5. Know that teeth are part of the digestive system 6. Recognise that human teeth are not all the same size or shape 7. Be able to identify and name the main types of teeth in humans: incisor, canine, pre-molar, molar 8. Understand that the shape of a tooth is linked to its function, e.g. slicing, tearing, chewing or grinding food 	<u>Living Things and their Habitats</u> <ol style="list-style-type: none"> 1. Recognise that there is a vast array of living things 2. Recall the term 'environment' 3. Understand that environments can be changed in positive ways, e.g. the creation of nature reserves, and in negative ways, e.g. deforestation 4. Identify ways in which humans can reduce the effects of environmental change 5. Record the effects of small scale change on living things in a local environment 6. Recognise that environments can change and that this can sometimes pose dangers to living things 7. Recognise that all food chains start with a plant and that arrows show the direction of the energy (food) being transferred, i.e. 'gets eaten by...' 8. Know that green plants are producers because they make their own food 	<u>Classifying</u> <ol style="list-style-type: none"> 1. Classifying animals needs to progress from Y2, where they have classified living and non-living things 2. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment (in preparation for branching in Y6) 3. Know that living things can be grouped according to features that they share 4. Use more than one way to sort the same group of living things 5. Recall and use appropriately the term 'classification' 6. Use a simple classification key to identify and name a living thing 	<u>States of matter</u> <ol style="list-style-type: none"> 1. Know that solids, liquids and gases are groups of materials with different general properties 2. Be able to describe and name some solids, liquids and gases 3. Know that collectively, solids, liquids and gases are called the states of matter 4. Be able to identify the state of matter of a material by its physical properties 5. Know that materials can exist as solids, liquids or gases 6. Understand that the state of a material can be changed 7. Know that heating a solid can change it to a liquid and that this process is called melting 8. Know that heating a liquid can change it to a gas and that this process is called evaporation 9. Know that cooling a gas can change it to a liquid and that this process is called condensation 10. Know that cooling a liquid can change it to a solid and that this 	<u>Electricity</u> <ol style="list-style-type: none"> 1. Understand that electricity is needed to make some appliances work 2. Identify common appliances that run on electricity 3. Explore making bulbs light and buzzers buzz 4. Record in their own way how to make a bulb light and/or a buzzer buzz 5. Describe how to use a switch to turn off a light or to stop a buzzer buzzing 6. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers 7. 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 8. Explore placing a switch in a circuit that lights a lamp and describe what happens when it is used 9. Explain what an electrical conductor and insulator are
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	length of string, tension of string 13. Know that volume refers to how loud a sound is 14. Know that the volume of sounds can be measured with a sound meter (data logger) 15. Know that the unit of measurement of volume is a decibel (dB) 16. Recognise that sounds get fainter as the distance from the sound source increases		9. Recognise that there is only one herbivore in a food chain 10. Define a predator as an animal that eats another animal and prey as an animal that gets eaten by another animal 11. Recognise that the same animal can be both a predator and prey 12. Construct and interpret a variety of food chains, identifying producers, predators and prey 13. Know that food is a basic need and the availability of food affects the animals found in an environment		process can be called freezing (or solidification) 11. Understand that melting and freezing are processes that can be reversed 12. Know that temperature is a measure of how hot or cold something is and is measured in degrees Celsius using a thermometer (°C) 13. 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) 14. Recognise that changes of state require changes of temperature 15. Understand that evaporation is the process in which liquid water is changed to water vapour by heating 16. Be able to describe the changes of state in the water cycle 17. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	10. Test and then classify objects as those that conduct electricity and those that do not 11. Recognise some common conductors and insulators, and associate metals with being good conductors
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Earth and Space

1. Recognise the term 'spherical'
 2. Know that the Earth, Sun and Moon are part of the solar system
 3. Know that Earth has one moon
 4. Know that the Sun is a star
 5. Know that the Earth is a planet
 6. Know that the Earth, the other planets and their moons form our solar system
 7. Know that the planets, including Earth, move around the Sun
 8. Understand that the Sun does not move in space
 9. Understand the term 'orbit' and be able to describe what a planetary orbit is
 10. Know that Earth has an axis
 12. Understand that Earth spins on its axis
 13. Understand that by spinning on its axis, some parts of the Earth are in daylight when other parts are in darkness (link to seasons work in Y1 and light/shadows work in Y4/6)

Types of change

1. Should already have an understanding of this from Y2 in how to manipulate materials into new shapes
 2. Link to Y4 changes of state when melting
 3. Describe the observation of the apparent disappearance of a soluble solid when it dissolves in a liquid
 4. Explain what a solution is
 5. Explain that when a solution is left exposed to the air the liquid will evaporate into the air leaving the dissolved solid behind
 6. Explain how sieving solids is possible because of the comparative size of the pieces of solid and the holes in the sieve
 7. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
 8. Recall the terms 'dissolving', 'mixing', 'melting', 'freezing', 'evaporation' and

Materials

1. Show development from Y1 and 2 through use of new vocabulary
 2. Understand what is meant by a material's hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
 3. Describe materials and identify materials from their description
 4. 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
 5. Know that a variety of materials may be suitable for an object based on the properties of the materials
 6. Test properties of a material to establish their suitability or not for a given purpose

Forces

1. Recap of basic forces knowledge from Y3 - Understand that a force is needed to make things move
 2. Know that gravity is an invisible force that pulls falling objects back to Earth
 3. Describe how friction acts on moving objects to slow them down
 4. Understand how friction can be used to improve how well an object grips to a surface
 5. Recognise that air resistance is a force
 6. Describe how air resistance reduces the speed at which objects fall
 7. Recognise that water resistance is a force
 8. Describe how water resistance slows down moving objects
 9. Describe how the shape of objects can be used to reduce the effects of water resistance
 10. Recall the terms 'spring', 'lever', 'pulley' and 'gear' ('cog')
 11. Describe how the use of levers, pulleys and other simple

Living Things/Life Cycles

1. Know that humans have a life cycle (developed from Y2 life cycles work)
 2. Know that humans change in appearance and capabilities as they age
 3. Recognise that all living things have a life cycle (developed from Y2 and Y4 living things work)
 4. Know that all life cycles have distinct stages
 5. Be able to describe the process of metamorphosis
 6. Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
 7. Be able to describe and sequence parts of plant and animal life cycles
 8. Understand that sexual reproduction in plants and animals requires fertilisation to occur, i.e. between two parents
 9. Know that some plants can reproduce without other plants

Extreme weathers

1. Not necessarily part of the National Curriculum but a beneficial learning opportunity
 2. Making a cloud in a jar (links to water cycle which can be developed from previous year groups) links to evaporation which is part of NC
 3. Rainbow in a jar (looks into densities of liquids which is linked to NC and links to Y4 changes of state)
 4. Making secure structures in an earthquake (jelly and sticks – excellent STEM and working scientifically opportunity)

		<p>'condensation' from earlier work</p> <p>9. Define reversible change</p> <p>10. Understand that dissolving is a reversible change based on observations of a soluble solid dissolving in water and then being recovered by evaporating the water</p> <p>11. Demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>12. Define irreversible change</p> <p>13. List some of the new substances formed through burning a familiar substance such as wax or wood and combining vinegar and bicarbonate of soda</p>		<p>machines reduces the amount of effort needed to move things</p>	<p>10. Describe the life process of reproduction in some plants and animals</p>	
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Light

1. Know that light comes from a source and be able to name some sources of light (recap from Y3)
2. Know that light can be reflected from shiny surfaces and be able to name some reflectors (developed from Y3)
3. Recognise that light appears to travel in straight lines
4. Know that without light we cannot see
5. 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
6. Know that light is more scattered when it is reflected off a dull surface
7. Know that smooth and shiny surfaces reflect light well
8. 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
9. Understand that when opaque materials block the path of light a shadow can be cast

Electricity

1. Explore and describe how to construct circuits with a very dim bulb and others with very quiet buzzers (developed from creating circuits in Y4)
2. Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
3. Explore the variation in how different electrical components function, constructing different circuits and describing findings
4. 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 (application of this through making a burglar alarm)
5. Understand the need for universally recognised symbols for electrical component (developed from Y4 identifying circuits)
6. Identify recognised electrical component symbols for a bulb,

Evolution

1. Know that geological time spans millions of years
2. Know that some living things that were on Earth millions of years ago, e.g. dinosaurs, are no longer inhabiting Earth. They are extinct
3. Understand that evolution is the process of change in living things over time
4. Understand that some fossils are examples of living things that were once alive on Earth but are no longer living
5. Know that humans are a relatively recent species on Earth
6. Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
7. Know that living things reproduce offspring similar to themselves
8. Recognise that small inherited changes in physical characteristics, e.g. colour, size, shape of limbs etc. over time lead to variation in species

Humans

1. Know that the human body contains organs (developed from Y3 and 4)
2. Know that the heart is the organ that pumps blood around the body through blood vessels
3. Know that together the heart, blood vessels and blood form the circulatory system (link back to digestive system in Y4)
4. Understand that blood picks up oxygen from the lungs and transports it through blood vessels to all of our organs
5. Know that the substances in food that help us to grow and repair our bodies are termed 'nutrients' (developed from healthy lifestyle in Y2, 3 and 4)
6. Understand that it is the circulatory system that transports water and nutrients around our bodies
7. Know that body systems respond to a person's physical needs, e.g. to run faster, to digest food
8. Understand that some aspects of a person's lifestyle, e.g. lack of exercise, taking narcotics, will have an effect on the way their body functions (developed from healthy lifestyle in Y2, 3 and 4)

Living Things

1. Recognise common observable characteristics that can be used to group/classify living things (developed from classification in Y4)
2. Know that germs and bacteria are living organisms called micro-organisms (developed from previous living things learning)
3. Identify the conditions needed to support the growth of micro-organisms
4. 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
5. provide information about living things that inhabited the Earth millions of years ago. Y6 EAI L1 Know that there is a scientific system for classifying living things (learning about Carl Linnaeus)
6. Identify the observable characteristics used to identify local plants

	<p>10. Know that shadows are similar in shape to the objects which make them (developed from shadows work in Y3)</p> <p>11. Know that some materials let light pass through them</p>	<p>buzzer, battery (cell), wire, switch and motor</p> <p>7. Use recognised symbols when representing a simple circuit in a diagram (recap from Y4)</p> <p>8. Link renewable energy via environment topic</p>	<p>9. Know that animals and plants exist and live in different environments</p> <p>10. Know that not all animals or plants will survive to reproduce</p> <p>11. Understand that variation in offspring over time can make animals and plants more or less able to survive in particular environment</p> <p>12. Know that some adaptations to the environment in plants or animals can be advantageous if they keep the species alive for long enough to reproduce and pass on their features to a new generation</p> <p>13. Know that living things start from a common ancestor but have evolved to suit the environmental conditions</p>		<p>7. Identify the observable characteristics to classify a specific species of animal, e.g. an earthworm</p> <p>8. Give reasons for classifying plants and animals based on specific characteristics</p>
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