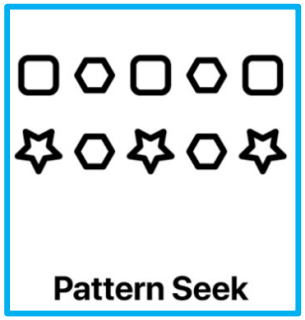
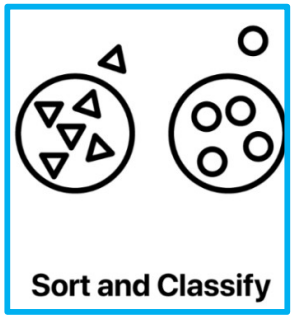
Science End Points

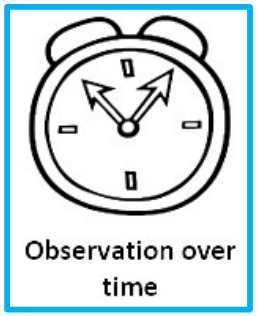
Working Scientifically Symbols

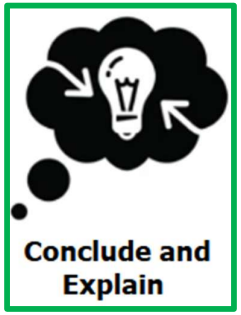
Throughout our curriculum, the symbols below are used in every lesson to identify the disciplinary knowledge to be practised.

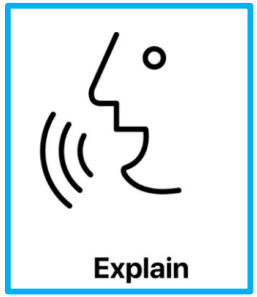
EYFS / KS1 Symbols	LKS2 Symbols (+ previous)	UKS2 Symbols (+ previous)

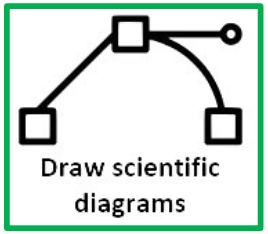












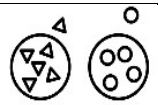
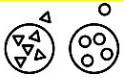
EYFS	End points/questions	Key Vocabulary
Animals Including Humans (Humans)	Understand that we change physically as we grow and a basic human life cycle. (How have you changed from being a baby? Can you tell me how you are different to a baby? What can you do that a baby cannot?)  Know the different parts of the body and what and what they are used for. (Teacher note – teach head, arms, legs, stomach, knees, fingers, toes, neck, eyes, ears, mouth, nose. Talk about the function of each but they don't need to know the 5 senses discreetly yet)  Identify foods that are a healthy choice. (What would be a healthy pudding choice? Teacher note – avoid use of word 'unhealthy' as everything is healthy in moderation. This will be explored higher up in school.) 	Head, arms, legs, stomach, knees, fingers, toes, neck, eyes, ears, mouth, nose healthy, baby, toddler, child, life cycle, function
Animals including Humans (Animals)	End points / questions Know some farm animals and their young. (Can you match the baby to its adult? What is a baby cow/sheep/dog called?) 	lifecycle, birth, order, growth, hatch. Pig: Piglet, Cow: Calf, Chicken: Chick, Horse: Foal, Duck: Duckling, Cat: kitten, dog: puppy
Living Things and Their Habitats	End points / questions Name animals that live in a woodland habitat. (What animal would live here? Can you name any minibeasts?)  Know the names of wildflowers and minibeasts in our school grounds and local environment. (What would we find in the grass? Under stones?)  Understand how to care for animals outside their natural habitat. (How can we care for our fish? How do we look after stick insects? Teacher note – children to ask questions about the ducks we get in the spring.) 	minibeast, insect, spider, beetle, caterpillar, ant, worm, woodlouse, birds, hedgehog, habitat, environment Wildflowers: buttercups, daisy, dandelion, white and red clover

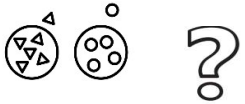
Plants	End points / questions	Seed, bulb, compost, flower, petal, stem, leaf root.
	Know the main parts of a plant. (Can you name the parts of this plant? Draw and label a plant in our grounds.)  Know how to care for a plant. (What does this plant need to grow? What will happen to this plant if you do not water it? Teacher note – Grow and care for sunflowers. Children should have responsibility for watering/placing them.)  Know that plants also go through life cycles. (What is the lifecycle of a sunflower?) 	
Earth and Space	End points / questions	World, star, space, planet, sun, Earth, land, water, life **Key Scientist:** Neil Armstrong (this will be knowledge reviewed in Y2 Geography)
	Know that the sun is at the centre of the solar system and the planets go around the sun (a star). (What is at the centre of our solar system? What do the planets orbit? Is the sun a planet of a star?)  Explain that the planet Earth is made up of land and water. (Can you draw a picture of the Earth? Can you colour the seas blue? Can you colour the land green? This supports geography.)  Know that planet Earth is the only planet to have life. (Why does Earth have living things on it? Can you breathe on the moon? Why not?)  Name 3 planets. (What planet do we live on? Can you name any others?) 	
	End points / questions	

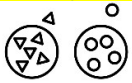
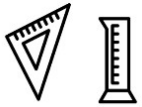
Seasonal Changes	Know there are four seasons. (What are the four seasons?)  Know that some animals hibernate to survive the winter. (What does hibernation mean? Why do hedgehogs hibernate? Teacher note – find a hibernation live stream online.)  Collect data about the daily weather. (Teacher note – Set up a daily weather station where children will collect data about rainy, windy, sunny, cloudy, snowy days. Talk about what the data shows. This could be done with cubes in a jar.) 	Winter, Spring, Summer, Autumn, rainy, windy, sunny, cloudy, snowy temperature, hibernation, weather
Light	End points / questions Understand that we get light from the sun, fire and electricity. (Where can we get light from?)  Know when shadows can be seen in the playground. (If we stand on the playground on a sunny day what can we see on the ground? What is it? Will it move if we move?)  Ask and answer questions about my shadow. (Why doesn't you shadow have a face?) 	Sun, fire, electricity, torch shadow
Materials	End points / questions Know the names of some common materials. (What is this toy made from? What is the window made from? What are the walls made from?)  Know that different materials have different properties. (What material is best to make a house for the Three Little Pigs? Teacher note – link this to your DT topic around boats.)	Ice, freeze, melt, mix, strong, brick, straw, sticks, waterproof, light weight, weak, float, sink, heavy.

	 Understand that some materials can be changed. (What happens when we take an ice lolly out of the freezer? What happens when we bake bread? This can link to your art topic exploring different types of malleable materials and how they dry.) 	
Forces	End points/ questions Understand that some objects will either float of sink. (What happens if I put this boat in the water? What will happen to this stone if I drop it in the tanks? Teacher note – DT boat link)  Understand that a ball can bounce in different ways/heights. (If you bounce the ball gently will it bound high? Can you make your ball bounce higher than mine? How?) 	float, sink, surface, fly, turn, spin, fast, slow, faster, slower, fastest, slowest, further, furthest, blow, bounce
Sound	End points/questions Identify environmental sounds and describe them in terms of pitch and volume. (What is making that sound? What sounds can we hear on the playground? In the classroom?) 	Sound, noise, listen, hear, environment, pitch, volume

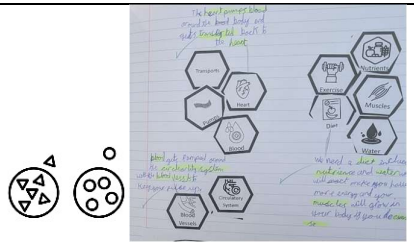
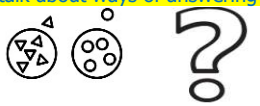
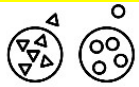
Year 1	End points / questions	Key Vocabulary
Animals including humans (humans)	Know and label the basic parts of the human (Head, arms, legs, stomach, knees, fingers, toes, neck, eyes, ears, mouth, nose. Here expand to include: elbow, shoulder, shin, chest, thigh, calf)  Know the function of basic body parts. (What would you use your _____ for? Focus on the functions of the new boys parts for Y1 as they should have good prior knowledge of the EY ones.)  Investigate which part of the body is associated with each sense. (Teacher note – in EY children learn about functions. This is their first encounter of the idea of 'senses'.)  Carry out a simple test to identify different smells. (What does your table show? Teacher note – children to complete a simple smell prediction table here, but you should extend this to find out which smell was the easiest/hardest to identify as a class. Can the chn articulate this? Collect words to describe the smells et... – sweet, strong, fruity, minty, flowery, smoky)  	Head, arms, legs, stomach, knees, fingers, toes, neck, eyes, ears, mouth, nose healthy, baby, toddler, child, life cycle, function elbow, shoulder, shin, chest, thigh, calf, five senses, hear, smell, sight, touch, taste
Animals including humans (animals)	End points / questions Prior learning – recap animals and their offspring names + animals that can be found in a woodland habitat from EY. Ask questions learn more about living things. (Teacher note – children could interview people about their pets or possibly have a visitor into school with reptiles etc... with a dedicated section for asking questions.)  Know a variety of common animals including: fish, amphibians, reptiles, birds and mammals (Can you name some groups that animals belong to? What is the name of the group that lions/snakes/frogs/parrots/clown fishes belong to?)	lifecycle, birth, order, growth, hatch, Pig: Piglet, Cow: Calf, Chicken: Chick, Horse: Foal, Duck: Duckling, Cat: kitten, dog: puppy, habitat, environment. wing, Claw, Tail, Beak, Fur, Feather, Fin, Scales, Amphibians, Reptiles, Mammals Carnivores, Herbivores Omnivores, diet, adult. raise awareness, nature, protect, endangered.

	 Know common animals that are carnivores, herbivores and omnivores (What differences exist between a herbivore and a carnivore? How can we group animals according to what we eat? Teacher Note - Pupils should use the local environment throughout the year to explore and answer questions about animals in their habitat. They should understand how to take care of animals taken from their local environment and the need to return them safely after study.)  Know the structure and features of a range of animals (Can you describe a fish etc using scientific words?)  Explore the work of David Attenborough and the impact he has had on the natural world. (Teacher note – key vocab for this lesson: raise awareness, nature, protect, endangered.) 	**Key scientists** David Attenborough
Everyday Materials	End points / questions Know the names of a wide range of everyday materials, including wood, plastic, glass, metal, water, rock, paper, brick, fabrics. (How many different materials can you name? Which of these can you find just as they are? Which ones has somebody had to make?) Teacher note - children need to be exploring a wide range of material and discussing their properties  Understand the difference between an object and the material from which it is made. (Show picture – What is this? What material is it made from? Can some objects be made from more than one material? Can you give an example?) Teacher note - Sorting and classifying – practical sorting activities using hoops etc.  Know the properties of everyday materials such as hard, soft strong weak etc (What words could you use to describe glass? Metal? Wood? Is it shiny, hard, bendy etc?) Teacher note – practical activity – children explore a wide range of material – there are materials in the science cupboard and a feely bag. They need to be holding, touching, feeling bending, squashing, pulling ect. Can children ask each other scientific questions here? 	Ice, freeze, melt, mix, strong, brick, straw, sticks, light weight, weak, float, sink, heavy. Hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent, sort and classify

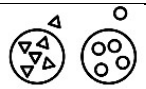
	Understand that everyday materials can be compared and grouped together based on their simple physical properties. (Can you sort these objects and explain why you have sorted in this way)  Test a materials suitability for a particular purpose. **Teacher note** –. They can **work scientifically** by carrying out simple tests to explore questions such as – **Which material is best for an umbrella… to line a dog's basket….to use for curtains?** 	
Plants	End points / questions **Prior knowledge – recap the main parts of a plant from EYFS.** Know a variety of common wild, garden plants. (How can we recognise a plant? Can you name and describe any plant that grows in the garden/wild? What is the difference between a wild and garden plant? Teacher note - U**se magnifying glasses, observational** drawings.)  Know a variety of common trees. (What type of trees can you find on our playground? Teacher note – the ones that can be found on the KS1 playground are: cherry tree, alder tree, sycamore tree, birch tree, hawthorn)  Know the difference between deciduous and evergreen. (How are deciduous trees different to evergreen trees) Keep records on how the trees/plants **change over time. Can children ask appropriate questions to help them categorise? For example – does this tree loose it's leaves?)**  Understand and know the **basic** structure of a variety of common flowering plants, including trees. (Name some of the different parts of a plant Teacher note – **pattern seek by comparing a range of plants and identifying common features.**) 	flower, petal, stem, leaf, root, trunk, branches, twigs, bark, buds. Trees: cherry tree, alder tree, sycamore tree, birch tree, hawthorn Wildflowers: red campion, vipers bugloss, buttercups, daisy, dandelion, white and red clover Garden plants: lavender, pulmonaria (lungwort), rose, marigolds

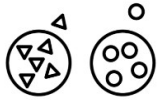
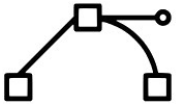
Seasonal Changes	End points/ questions **Teacher Note: This topic should be taught before the Y1 Geography unit – Climate Change. For knowledge review, please revise EYFS's topic on seasonal change and hibernation. Most of the observational work for this unit can be recorded in Nature Diaries.** Classify different weather types associated with each season. (How does the weather change in each season? Describe the weather in... Teacher note – possibly play a game of four corners here to classify and discuss. Remember to just stick to weather in lesson 1 as a stepping stone from EY. You may also link this to activities/clothing here.  Observe the changing plant life within each season. (Which season do we see buds appearing? Do all trees lose their leaves over Winter? Teacher note – this objective should be touched upon 4 times over the year using the school grounds or maybe a local walk. Avoid focussing on the cherry blossom tree specifically, as this is a Y2 focus. The idea is to give children a more general understanding of leaves falling in autumn, buds/bulbs growing in spring etc...)  Understand how day length varies throughout the year. (Which season has the shortest/longest day? Teacher note – Encourage children to seek patterns here, realising that the sun sets earlier in Winter and later in the summer. Use this to ask questions like – Will it be dark when you go out at Halloween? How do you know?)  Understand that humans change their behaviours in different seasons e.g. clothes worn/activities (Teacher note – to ensure children are practising their working scientifically skills of questioning here, children could hot seat someone to guess their favourite season. They should ask questions like, "Is it cold or warm in your favourite season?" "When does it go dark?" "Do you need to wear gloves etc...")  Know which months are in which seasons. (Can you name the months in summer?)  Read a thermometer to understand the changing temperatures. (Teacher note – this then feeds into your Y1 Geography topic – Climate Change where children compare summer temperatures now to 100 years ago to begin to understand global warming.) 	Winter, Spring, Summer, Autumn, rainy, windy, sunny, cloudy, snowy temperature, hibernation, weather Classify, observe, plant life, day length, months, temperatures, thermometer

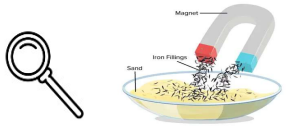
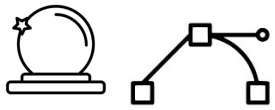
Year 2	End points / questions	Key Vocabulary
Animals including humans (Humans)	Teacher Note – Prior learning should be linked to body parts/their functions and senses. Understand the importance for humans of exercise (Why is exercise important for keeping healthy? Teacher note – children to keep an exercise log here. Possibly do 10 mins of exercise a day on the playground for a week and see the effects. Does it get easer over time? How does it make us feel? Children should help the teacher to think of appropriate questions to include on the log.)   Understand that it is important for a human to have a balanced diet (Which food group does cereal go into? Does all cereal fit into this group? Teacher note – this builds on Y1 knowledge of identifying if something is a fruit or a vegetable in DT – use this for knowledge review. This will be recapped in Y3)  Understand that it is important for humans to have a good level of oral hygiene (What would happen if you didn't brush your teeth? Teacher note – compete the 'Growing Plaque' experiment here.)  Understand the importance of hand hygiene (Teacher Note - cover in Autumn to reinforce the importance of handwashing – particularly during winter months when germs spread easily. Link to Florence nightingale (Daily Review) and how she realised a link with hygiene and the spreading of diseases. Complete the glitter investigation where children shake hands.) 	Head, arms, legs, stomach, knees, fingers, toes, neck, eyes, ears, mouth, nose, healthy, baby, toddler, child, life cycle, Function, elbow, shoulder, shin, chest, thigh, calf, five senses, hear, smell, sight, touch, taste, Healthy, exercise, balanced diet, oral hygiene, hand hygiene **Key scientists** Florence Nightingale (links to Y1 History)
Animals including humans (Animals) Teach in spring term to link to birth of animals during farm trip.	Teacher Note – Prior learning should cover elements of the Y1 curriculum including grouping animals (fish, amphibians, reptiles, birds and mammals). Know that animals including humans have offspring which grow into adults (What is a baby sheep/pig/cow called? How long will it take them to grow? Teacher note – Farm trip links to this objective. Animals to match are - Cattle: Calf, Chicken: Chick, Donkey: Foal, Duck: Duckling, Goat: Kid, Goose: Gosling, Horse: Foal, Llama: Cria, Pig: Piglet, Rabbit: Kit or Kitten Sheep: Lamb.)   Understand the basic needs of animals including humans for survival (water, food, air) (What would happen if a basic need wasn't met? Teacher note – hexagon categorising style activity will work well here, sorting key facts into the different needs.)	Pig: Piglet, Cow: Calf, Chicken: Chick, Horse: Foal, Duck: Duckling, Cat: kitten, dog: puppy, Goat: Kid, Goose: Gosling, Donkey: Foal, Llama: Cria, Rabbit: Kit or Kitten Sheep: Lamb, alpaca: crias fish, amphibians, reptiles, birds and mammals, survive, basic needs, offspring

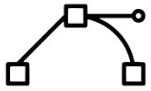
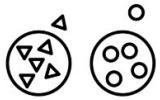
		
Living things and their habitats	End points / questions Teacher Note – Prior learning should cover elements of the Y1 curriculum including carnivores, herbivores and omnivores. Also cover the names of minibeasts listed in EY vocab. Know and understand the differences between things that are living, dead and have never lived (How can you tell if something is living or non-living? Teacher note - They should describe how they decided where to place things, exploring questions for example: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions.)  Know that most living things live in a habitat to which they are suited (Teacher note – a habitat a natural environment or home of a variety of plants and animals. It is the total habitat for a region, not a micro-habitat. Examples of habitats include: costal, polar, forest, desert.)  Know a variety of plants and animals in habitats, including micro-habitats (Name a micro-habitat in the school grounds. Teacher note – children should explore their school grounds here and observe different micro-habitats. For daily review – can children name the minibeasts from EY?)  Understand a simple food chain, and name different sources of food. (What's the same about all food chains? Do all animals eat meat? Teacher note – recap the difference between carnivores, herbivores and omnivores from Y1 again here.) 	minibeast, insect, spider, beetle, caterpillar, ant, worm, woodlouse, birds, hedgehog, habitat, environment habitat, environment, mini beasts, living, non-living, never-lived, dead, move, grow, feed, breathe, have young, shelter, conditions, adaptation, survive, food-chain, consumer, producer, omnivore, herbivore, carnivore, costal habitat, polar habitat, forest habitat, desert habitat, micro-habitat (such as a tree trunk, pond etc...)
Plants To be completed throughout the year due to lots of observations over time.	End points / questions Know how plants germinate from a seed. (What equipment will you need? What will you do with the seed? How do we look after it? Teacher note – germinate seeds in water/wet paper towels rather than soil so that chn can observe. Use CD cases to see the early growth of seedlings – Complete in Summer 1)	flower, petal, stem, leaf, root, trunk, branches, twigs, bark, buds, germinate, seedling, bulb, conditions, conclusion, mature plant

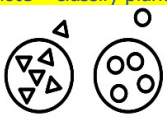
	  Observe and describe how bulbs grow into mature plants. (Which season should we plant bulbs in? Why do they stay in the ground all winter?) Teacher note – this links to RE, planting daffodils in Autumn 2 and then observing through Spring.  Understand that a plant grows differently under different conditions. (What happens to a plant if it is kept in the dark? Teacher note – keep 4 plants (well established, such as spider plants bought from the shop) in the classroom and give them different conditions. Do not grow from seed for this objective. Start in Autumn 1 and observe over the year)  Know that plants need light, water, soil and suitable temperature to grow. (What do plants need in order to grow? Teacher note – this is the conclusion of the previous objective. Children will conclude the best growing conditions. They could possibly create a help sheet etc... Summer term after observing the spider plants over the year.)  Understand how plants change throughout the seasons. (How would a tree look different in Autumn compared to Spring?) Teacher note – this will be done as a nature diary observing changes of the Cherry Tree outside the Y2 classrooms and is a recap of the Y1 seasons unit. Complete a diary over the course of the year. Lesson 1 in Autumn 1 (summer season) draw the tree and label.) 	**Prior Knowledge Vocab:** Trees: cherry tree, alder tree, sycamore tree, birch tree, hawthorn Wildflowers: red campion, vipers bugloss, buttercups, daisy, dandelion, white and red clover Garden plants: lavender, pulmonaria (lungwort), rose, marigolds
Materials	End points / questions Understand that the shapes of solid objects made from different materials can be changed by squashing, bending, twisting and stretching. (What will happen if you stretch an object too much?)  Know the name of an object and what material it is made from. (What is X made from?)	Ice, freeze, melt, mix, strong, brick, straw, sticks, light weight, weak, float, sink, heavy. Hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent, sort and classify, recycle, reuse, rigid, flexible, bend, bouncy, elastic, squashy, stretchy, stiff, rigid,

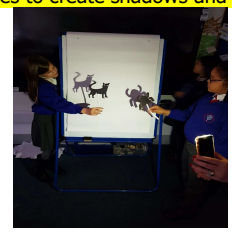
	 Understand why a material was chosen for a specific object. (What makes glass suitable for windows? Teacher note – Venn diagram and make conclusions)  Compare the suitability of materials. (Teacher note – paper v plastic v metal straw comparison weighing up pros and cons)  Collect data by conducting a comparative investigation. (What does your bar chart show? Teacher note – bouncy ball experiment) 	

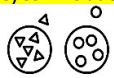
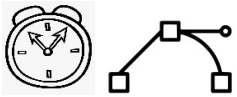
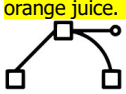
Year 3	End points / questions	Key Vocabulary
Rocks and Soils	Know that rocks have different characteristics. (How could you sort rocks into groups? How are these rocks similar or different? What could you use this rock to build? Why?) Teacher note – this should include rocks founds in the locality. E.g. Coal due to Wigan's history as a major coal mining area, and sandstone which is commonly found in river deltas (River Douglas)  Understand how fossils are formed. (How do fossils help to tell us about the past?) Teacher note – students should make their own fossils. Link understanding to that of artefacts with man-made items, fossils can tell us about living things from the past (making links to pre-history) Look at Mary Anning here and draw/label scientific diagrams to show the stages.   Know that soils are made from rocks and organic materials. (What can we see in this soil sample? Why are some soils darker? What is organic material?) Teacher note - Pupils will need to explore a range of soil samples to observe and compare texture/colours. (The darker the soil, the more organic matter is present)   Understand how to make compost (What do we need to make compost? Why should we do this?) Teacher note – this will become an observation over time that pupils can continue to monitor throughout the year. They could use this to plant seeds during plant topic in summer. 	Rock, soil, fossil, texture, granite, marble, sandstone, slate, sharp, soft, rough **Key Scientist** Mary Anning
Forces and Magnets	End points / questions Compare how things move on different surfaces. (Would a toy car travel faster on the grass or in the corridor? What is friction?) Teacher note – They can **work scientifically** by carrying out simple tests to explore questions such as – Which surface does the car travel the fastest on? Push thinking by considering which surfaces are best for our roads and why etc... E.g. Why do you think we use tarmac for our roads?	float, sink, surface, fly, turn, spin, fast, slow, faster, slower, fastest, slowest, further, furthest, blow, bounce, recycle, reuse, rigid, flexible, bend, bouncy, elastic,

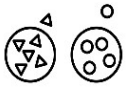
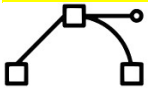
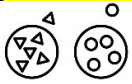
	 Know that some forces need contact between two objects, but magnetic forces can act at a distance. (How could you make a paperclip move without touching it?) Teacher note – Build on pupils knowledge from Year 2 that forces make things move – they have explored push and pull forces. Explore magnetic forces (non-contact force) with the paper clip experiment to show that this force can act without touch. Look at sand/iron filling experiment. Children should also have opportunity to explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe).  Know that magnets have two poles and attract and repel each other. (Can you predict what would happen if you pushed two south poles together?) Teacher note - Use bar magnets to demonstrate how opposite poles attract and like poles repel. Students can test various pairs of magnets and record their observations, encourage predictions before testing and draw scientific diagrams.  Compare and group together a variety of everyday materials based on whether they are attracted to a magnet and identify some magnetic materials. (How do you test that materials are magnetic? How do you know this material is not magnetic?) Teacher note – allow children to test a variety of materials. What do they notice about all the magnetic materials? Were all the metal objects attracted to the magnet? Address misconception here that sometimes pupils assume all metals are magnetic. 	squashy, stretchy, stiff, rigid, rough, smooth, friction, push, pull, strength, attract, repel, magnet, magnetic, magnetic force, metal, poles, North Pole, South Pole.
Animals including Humans (Animals and Humans)	End points / questions Teacher note: Prior knowledge sessions should link the 5 senses, oral/hand hygiene, and the functions of body parts. Please also touch on how to stay healthy linking to balanced diet and exercise. Know and understand why humans have a skeleton. (What would happen if you did not have a skeleton? What is your skeleton for?) (Teacher note – complete this over two lessons, one focused on support and one focused on protection. For support lesson: make a Mr Floppy, why can he not stand up? Children predict what would happen without their own skeleton. For protection lesson, give pupils a range of pictures of bones and organs, can they match the bone to the organ it protects?) 	Head, arms, legs, stomach, knees, fingers, toes, neck, eyes, ears, mouth, nose, healthy, baby, toddler, child, life cycle, Function, elbow, shoulder, shin, chest, thigh, calf, five senses, hear, smell, sight, touch, taste, Healthy, exercise, balanced diet, oral hygiene, hand hygiene, skeleton, skull, rib, backbone, bicep, triceps, joints, bones, tendons, heart, vitamins, minerals, food

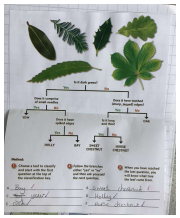
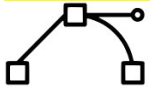
	Know why humans have muscles. (Can you explain how your arm moves? How would you move if you did not have muscles? Teacher note – label a scientific diagram.)   Understand that humans need the right types and amount of nutrition. (What does a human need to live? Why is important to eat food from different food groups? Teacher note – Recap Fruits/Vegetables from Y1 DT. Read 'Burger Boy' from Y2 and then introduce the other food groups here. Children should plan healthy meals)  Know that we cannot make our own food; we get nutrition from what we eat. (Which food groups helps to keep bones strong?) Teacher note – here, they might compare the diets of different animals (including their pets)  Know that not all animals have a skeleton. (Can you tell me an animal that doesn't have an internal skeleton?) Teacher note – here children will look at animals and their features. They can fill in the chart and look for common themes/patterns.  Know that our bones grow as we get older (Teacher note – children **work scientifically** here by carrying out research to find out if the length of our femur changes depending on our age.) 	groups, support, protection, organs, nutrition
Plants Spring term unit	End points / questions Prior Knowledge – recap which months are in which seasons and talk about how plant life changes through the year. See previous seasonal change topics. Know the functions of different parts of flowering plants. (Name and label this plant. What are the jobs of the various parts of the plants? How does a plant take in water? Teacher note – this builds on labelling parts of plants in Y1.)  Understand that plants need room to grow. (What will happen if we plant things too close together? Teacher note – plant some seeds in 2 types of conditions. One tightly packed in, one with plenty room to grow. Observe over time and write conclusions)	flower, petal, stem, leaf, root, trunk, branches, twigs, bark, buds, germinate, seedling, bulb, conditions, conclusion, mature plant transported, pollination, seed formation, seed dispersal, insect, nectar, pollen, room to grow

	 Understand what specific plants needs to survive and how they vary from plant to plant. (How do 2 plants require different growing conditions? Teacher note – this builds on from Y2 when they investigate growing plants in different conditions [eg – without water/in the cupboards]. In Y3, the purpose is to look more closely on how different plants grow best by looking at recommendations on pots/seed packets etc... A good option is a cactus v a parlour palm.)  Investigate the way in which water is transported within plants. (How does water transport through plants? Teacher note – flower transportation investigation)   Understand the pollination process. (Why are insects important for pollination? How does a plant make seed? Teacher note – the 'wotsit' activity is a good demonstration here.)  Explore different methods of seed dispersal. (How do plants disperse their seeds? Can you work out, by looking at a plant, how it is disperses its seeds? Teacher note – classify plants based on how they disperse their seeds. If possible, use plants learnt about in KS1 [see vocab]) 	Trees: cherry tree, alder tree, sycamore tree, birch tree, hawthorn Wildflowers: red campion, vipers bugloss, buttercups, daisy, dandelion, white and red clover Garden plants: lavender, pulmonaria (lungwort), rose, marigolds
Light	End points / questions **Recap the Sun and the Stars for EYFS Earth and Space and how these can give us light. Also, look at how shadows are formed.** Know that we need light to see and dark is the absence of light. (Can you name a light source that would help you to see in the dark?) Teacher note – start with a box with a hidden item inside. Poke one hole through, ask pupils to look inside. Can they see the item? No. Keep poking holes through the box until enough light is in to reveal the hidden item. Reiterate that this is because we need light to see. 	Sun, fire, electricity, torch shadow, reflective, non-reflective, opaque, translucent, Light source, dark / darkness, reflect, mirror, block / absorb, direction of light, bright, dim, light beam, sunlight.

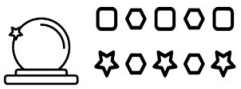
	Know that light can be reflected off surfaces. (Why do people have reflectors on their bikes?) Teacher note – complete the 'shiny' experiment where children use black cardboard, an object and a torch to see how well different objects reflect light.   Understand that the light from the sun can be dangerous. (Why do we wear sunglasses in the summer? Why do we not look at the sun?) Teacher note – make UV bead bracelets with pupils to show UV rays are always around even though we can't see them. Take children outside to explore how beads change colour in the light. Also discuss dangers with using torches here e.g. why we can't shine torches in our eyes etc...   Know that shadows are formed when the light, from a light source, is blocked by a solid object. (What happens when I put a book in front of this torch beam? What can you see on the ground when we stand on the playground on a sunny day? Why?) Teacher note – puppet show. Children make their own puppets and then use torches to create shadows and put on a show.   Know that shadows change shape and size depending how close/far away the light source is. (What would happen to a shadow puppet if it were moved closer to a light and away from a light? If we measured our shadows on the playground during the day what changes do you think you would see?) Teacher note – pupils can **work scientifically** by looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.  	 Teacher note – risk assessment may be needed when using torches or if lesson is taken place outside with long exposure to sun.

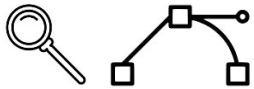
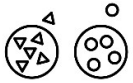
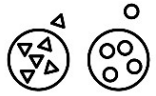
Year 4	End points / questions	Key Vocabulary
States of Matter (Materials)	Prior learning – Discuss/explore properties of materials (see blue vocab) explaining that these words apply to only solid materials. This is a great segway to introduce the additional 2 states of matter. Compare and group materials together, according to whether they are solids, liquids or gases. (Can you name the three states of matter? How can you tell if something is a liquid? A solid? A gas? What are the properties of the three states of matter? Can you draw a simple diagram to explain the particles in the three states of matter?) Teacher note – practical sorting investigation - have a large variety of different materials on tables for children to explore with hands and eyes. Include solids that look as though they pour (lentils, sand etc).  Observe that some materials change state when they are heated or cooled, and measure the temperature at which this happens in degrees Celsius (°C). (How can water change state? What are the different states of water? What is boiling point? What is freezing point? Do any other materials change state when heated / cooled? Can you name any?) Teacher note – practical activity/investigation. Water to be observed as solid, liquid, gas. Have ice, water and a boiling kettle or hot water to show steam. Teachers can compare other melting points e.g. butter, chocolate  Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature (Can you draw and label a simple diagram of the water cycle? What evidence is there that evaporation and condensation are involved in the water cycle? When does water start to evaporate?) Teacher note - Practical activity – set up a simple water cycle in the classroom – bowl with coloured water, beaker in the middle, bowl covered in clingfilm. Children to draw and label a scientific diagram to show this process. 	Ice, freeze, melt, mix, strong, brick, straw, sticks, light weight, weak, float, sink, heavy. Hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent, sort and classify, recycle, reuse, rigid, flexible, bend, bouncy, elastic, squashy, stretchy, stiff, rigid, liquid, solid, gas, boiling point, changes state, particles, water vapour, water cycle, heating /cooling, degree Celsius, melt, freeze, boil, evaporation, condensation, variables  Teacher note – risk assessment needed when working with hot water.
Teeth and Digestion (Animals including humans)	End points / questions Teacher note: Prior knowledge sessions should link to grouping animals (fish, amphibians, reptiles, birds and mammals) and carnivores, herbivores and omnivores. Human food groups will also be relevant here.) Know the parts of the digestive system. (Describe the journey a grape takes when you eat it. Teacher note – practical activity – 'make poo' weetabix and orange juice. Draw and label this as a scientific diagram afterwards.)  Know the functions of the digestive system. (Do the stomach and the large intestine do the same job? Teacher note: The word 'function' is prior knowledge.)	healthy, baby, toddler, child, life cycle, function, fish, amphibians, reptiles, birds, mammals taste, healthy, exercise, balanced diet, oral hygiene, carnivores, herbivores, omnivores, food chain, diet, consumer, producer, digestive system, digestion, saliva, oesophagus, stomach, small intestine, large intestine, rectum, predator, prey, canines, incisors, molars, cavities, plaque, fluoride, tooth decay, gums, nerves, enamel.

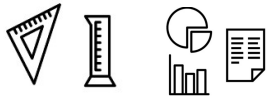
	  Know the names of the teeth. (What are the three types of teeth humans have?) Teacher note – children can work scientifically by comparing carnivore and herbivore teeth.   Know the functions of the teeth. (Which teeth do you use when eating an apple / a chicken drumstick / a raisin?) Teacher note – children can work scientifically by finding out what damages teeth and how to look after them – egg in liquid experiment.   Know the parts of the food chain. (Can you name any producers? Why can a fish be a predator and prey?) Teacher note – lots of practical activities to create food webs etc. use string, cards and make a physical web outside. This builds on from simple food chains in Y2. Children should also draw food chains.    	
Classification (Living Things and Their Habitats)	End points / questions Teacher note – please be mindful of the difference between habitats and micro-habitats in this unit. Children will have an awareness of both from KS1. Prior learning - Know that living things can be grouped in a variety of ways. (How can living things be sorted?) Teacher note – sorting games in science cupboard (animal cards etc). This could be a prior learning lesson as children will already have an understanding of grouping animals (fish, amphibians, reptiles, birds and mammals) and carnivores, herbivores and omnivores from KS1. They are also able to group animals based on their habitat (polar, forest, costal, desert – this could also be a nice link to biomes in Y4 geography) and living/non-living using the Mrs Gren acronym.   Know the difference between vertebrates and invertebrates. (How are vertebrates different to invertebrates?) Teacher note – children should experience living things in their environments – conduct an invertebrate hunt in our science garden. Children will also be able to name a range of minibeasts in the school grounds from EY – see vocab.  	minibeast, insect, spider, beetle, caterpillar, ant, worm, woodlouse, birds, hedgehog, habitat, environment habitat, environment, mini beasts, living, non-living, never-lived, dead, move, grow, feed, breathe, have young, shelter, conditions, adaptation, amphibians, fish reptiles, birds, mammal, survive, food-chain, consumer, producer, omnivore, herbivore, carnivore, costal habitat, polar habitat, forest habitat, desert habitat, micro-habitat (such as a tree trunk, pond etc...) classification keys, human impact, natural disasters, vertebrates, invertebrates

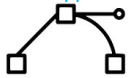
	Understand how to use a classification key to identify living things. (How could you find out which group a living thing belonged to? (How are living things in our area similar / different to each other?) Teacher note – explore different ways to group living things in our local environment including flowering and non-flowering plants, animals, trees. Children will have an awareness of 'branching trees' from Y2 Computing, but not applied to a scientific context. Children can then classify trees at Haigh Hall withing the annual orienteering trip. See Y4 file for planning.   Know that environments can change and this can sometimes pose dangers to living things (How do humans / natural disasters affect plant and animal habitats?) Teacher note – consider the impact climate change could have on our local Flashes. Can the Lancashire Wildlife Trust come in and do an activity? Collect/review and analyse data 	
Electricity	End points / questions Teacher note – Complete this topic in Autumn term due to the length of the unit and to provide a basis of prior knowledge for your DT in summer term – electrical systems. For prior learning lesson – focus on categorising materials into metals and non-metals. Know what electricity is and identify appliances which are powered by electricity. (Who is Thomas Edison? Which appliances use electricity to produce light / heat / sound / movement?)  Use precautions when working with electricity and electrical devices. (Why do we need to be careful when working with electricity? What precautions might we take?)  Build and draw a simple series electrical circuit. (Can you identify and name the basic parts of an electrical circuit, including cells, wires, bulbs, buzzers. Teacher note – don't introduce switches until later in the topic.)  Know which materials are used for common conductors and insulators. (Why is it important for us to know which materials conduct or insulate electricity? How do you know if a material is a good conductor or insulator? Teacher note – practical lesson where children test and record a range of different materials in a circuit.)	material, metal, light, electricity, electrical device / appliances, mains, plug, components, conductor, insulator, circuit symbol, cell, battery, wire, bulb, switch, buzzer, simple circuit, positive, negative, crocodile clip, precautions **Key Scientist** Thomas Edison (learnt about in DT also)  Teacher note – risk assessment needed when working with electrical devices.

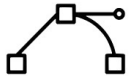
	 Understand that a switch is a controlled break which stops electricity flowing to all parts of the circuit. (What happens to the lamp when we turn off the switch? Why are switches needed in a circuit?)  Predict whether or not a bulb will light up in a simple series circuit. (Teacher note – give children a range of images and a carousel set up of circuits with a range of errors. For example, break in the circuit, croc clip not touching metal, battery wrong way round etc... This is a great assessment lesson for the end of the topic to see what they children have retained.)  	
Sound	End points / questions Know how sounds are made, associating some of them with something vibrating (When is a sound produced?)  Understand that vibrations from sounds travel through a medium to the ear (How do we hear sounds?)  Understand that there are patterns between the pitch of a sound and features of the object that produced it (How can you change the pitch of an instrument?)  Understand there are patterns between the volume of a sound and the strength of the vibrations that produced it (How can you make a sound louder?)  Understand that sounds get fainter as the distance from the sound source increases (What happens to sound as you move further away from it? Teacher note – present data in a bar chart and then conclude what the results show. Consider how to make sure this is a fair test.) 	Sound, noise, listen, hear, traffic, sirens, thunder, high, low, loud, quiet, soft, volume, crackle, thunder, hum, buzz, roar Vibrate / vibration, travel, sound wave, pitch, tune, echo, tuning fork, insulation, instrument, percussion, string, brass, woodwind, tunes instrument, variables.

Year 5	End points / questions	Key Vocabulary
Animals including Humans (Humans)	Prior knowledge – link to vertebrates/invertebrates (Y4) building on from what children know from KS1 about amphibians, fish reptiles, birds and mammal. Can they notice a correlation between the two? Explain that we are going to be focusing on humans alone for the rest of the topic, setting the backdrop that we are vertebrates and mammals. Know the changes that humans go through as they develop to old age. (What are the changes a human goes through as they age? How does this affect their way of life?)  Know and understand the stages in the growth and development of humans. (What are the stages of human development? How does the human body change physically over time? How can you tell how old somebody is? How have you changed since you were born? What has stayed the same?) Teacher note – contact a mum who has had a baby – are they willing to share weight and height charts? Create graphs and answer questions on data.  Know about the life cycle stage of puberty in girls. (What are the signs of puberty? Can you name three changes a girl goes through during puberty?) Teacher note - this is taught through PSHE in the summer term.  Know about the life cycle stage of puberty in boys. (What are the signs of puberty? Can you name three changes a boy goes through during puberty?) Teacher note - this is taught through PSHE in the summer term.  Know what gestation is and understand that different mammals have different lengths of gestation. (How fast does a human baby grow in the womb compared to another mammal? Why do animals have different gestation periods? If all animals had the same gestation period how would this affect different species?) Teacher note – find patterns between the size of a mammal and its gestation period and then predict with different sized animals. 	healthy, baby, toddler, child, life cycle, function, offspring, survive, amphibians, fish reptiles, birds, mammal, vertebrates, invertebrates, pre-teen, teenager, old age, life expectancy, childhood adolescence, early/middle/late adulthood, gestation period, pregnancy, puberty, menstruate.

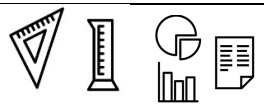
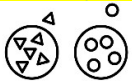
Living things and their habitats.	End points / questions Prior Knowledge – Recap life cycles from Y4 and EYFS. Also recap the difference between habitats and micro habitats EYFS/KS1. Know the differences between the life cycles of mammals, amphibians, insects and birds. (Can you compare the life cycle of a bird with a dog? What is different about the life cycles of insects and amphibians to mammals? Can you explain the process of metamorphosis in amphibians?) Teacher note – observe tadpoles from the pond and record the development/metamorphosis.   <u>Plants:</u> Understand how flowering plants reproduce. (What is reproduction? Can you name the key parts of the flower which support reproduction? [Stamen, Stigma, anther, filament, style, sepal] Teacher note – dissect a flower)  Understand that not all plants reproduce by producing seed. (What is asexual reproduction? Teacher note – Grow a plant from cuttings. Take cuttings from the plants growing on the grounds, or use mint plants. You might also grow potatoes from seed potatoes.) 	flower, petal, stem, leaf, root, trunk, branches, twigs, bark, buds, germinate, seedling, bulb, conditions, conclusion, mature plant transported, pollination, seed formation, seed dispersal, insect, nectar, pollen, room to grow, stamen, Stigma, anther, filament, style, sepal, plantlets, sexual, asexual, metamorphosis, mammal, amphibian, insect, bird Trees: cherry tree, alder tree, sycamore tree, birch tree, hawthorn Wildflowers: red campion, vipers bugloss, buttercups, daisy, dandelion, white and red clover Garden plants: lavender, pulmonaria (lungwort), rose, marigolds
Materials: Properties of materials.	End points / questions **Teacher notes -** Pupils should build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials, including relating these to what they learnt about magnetism in year 3 and about electricity in year 4. Compare and group together everyday materials on the basis of their properties. (What properties can different materials have? E.G Tell me the properties of glass, paper, brick, fabric. What criteria could you use to group everyday materials?) Teacher note – large table with wide selection of materials (look back to Y4) Children take notes, photos, draw, sort, create their own sorting charts.  Know how different materials react to magnets. (How can you tell if an object is magnetic or not? Since you can't see magnetism how can you tell if materials react to it?) Teacher note – this can be part of prior learning activities as they will have used magnets in Y3 and also In Y5 Forces. Use magnets and children have objects to test. Mixture of sand and paper clips. This is a Y3 national curriculum objective covered in Y3 forces unit. 	Ice, freeze, melt, mix, strong, brick, straw, sticks, light weight, weak, float, sink, heavy. Hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent, sort and classify, recycle, reuse, rigid, flexible, bend, bouncy, elastic, squashy, stretchy, stiff, rigid, attract, repel, magnet, magnetic. Hardness, solubility, transparency, conductivity (electrical and thermal), characteristics, suitability, purpose.

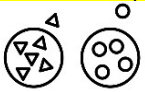
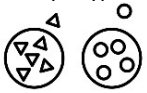
	 Understand that materials can take different forms, that the same material (like metal) can be used for a variety of purposes and the reasons why. (Why might a radiator be made from metal?) Teacher note – children to search for objects made with metal around school (for example, radiators, chair legs, magnets). Discuss why each object was made with that material (e.g. for strength? For heat conduction? For magnetism etc…) Draw conclusions about why certain materials have been used based on these properties.)  Measure the temperature of an object wrapped in different materials over time, presenting and recording the data. (Teacher note – use a pre heated jacket potato for this. Children to measure themselves and record the data on a line graph.) Pupils could use 2Calculate on PurpleMash to record this. 	
Materials: States of matter	End points / questions **Teacher notes –** children need to understand that **melting and dissolving are different processes** – this is often a misconception. **Prior knowledge – Y4 States of Matter.** Know that some materials will dissolve in liquid to form a solution. What does dissolving mean? What is a substance? What is a solution? What is the connection between mixing and dissolving?) (Teacher note – Children to stir dissolving and non – dissolving solutions into water of the same temperature to decide if a solution is made or a mixture. Consider hot to make this a fair test (temperature/quantity of materials and liquid.)   Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. (How are the processes filtering, sieving and evaporating different? How would we set an experiment to demonstrate evaporation?) Teacher note – practical activity. Kitchen Cupboard Conundrum. Filter sand and water, flour and water, sugar and water. Can we get the material back? 	Ice, freeze, melt, liquid, solid, gas, boiling point, changes state, particles, water vapour, water cycle, heating /cooling, degree Celsius, melt, freeze, boil, evaporation, condensation, variables, solution, solvent, solute substance, filtering, sieving, dissolving, mixing, reversible, irreversible, chemical reaction.

	Know that dissolving, mixing and changes of state are reversible changes. (What happens if you put sugar in water? How can we reverse the change and get the sugar back? If sugar 'disappears' when added to water, how come we get it back?) Teacher note – set up practical activity – observation over time – evaporating the sugar solution. Set up jam jars, coloured solution, string.   Know 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. (What is a chemical reaction? Toast a slice of bread. In how many ways has the bread changed? Are these reversible or non-reversible changes?) Teacher note – children have examples of irreversible change – toast, cake and cake mixture, egg and hardboiled egg. Discuss what has happened. – chemical change. Set up balloon and bottle with bicarb and vinegar. Light and candle and place flame under a mirror – carbon.  	
Earth and Space	End points / question Prior Learning – Please look back to EY to see what the children have already been taught. Children will also have wider knowledge from our biannual Space Week, keeping this knowledge bubbling until it is officially taught in Y5. Know how the Earth, and other planets in the solar system move relative to the Sun. (What does orbit mean? How long does it take for the Earth to orbit the sun? Approximately what shape are the planets orbits?)  Know the name of the planets in our Solar System. (How many planets are in our solar system? Can you name them in order?) Teacher notes - The Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). Make a solar system for Bridge Builders  Know how the moon moves in relation to the Earth and understand why the moon has different shapes at different times of the month. (Does the Moon move around the Earth or does the Earth move around the moon? How long does it take for the Moon to orbit the Earth? What shape is the moon? Why does the moon appear to change shape?) Teacher notes - A moon is a celestial body/satellite that orbits a planet (Earth has one moon; other planets also have moons and more than one.) Observe the phases of the moon – homework – keep a moon diary for one month.  Understand that the Sun, Earth and Moon are approximately spherical bodies. (What shape is the Sun/Earth/Moon? What evidence is there that that the Sun/Moon/Earth are spherical?) Teacher notes - Football and car activity. Move the car around the football (Earth) recording how it disappears over the curve of the Earth. Children to write a conclusion about what this activity shows. 	World, star, space, planet, sun, Earth, land, water, life, days, hours, months, year. North Pole, South Pole. Spherical, elliptical orbit, axis, rotation, phases of the moon, solar system. **Key Scientist** Neil Armstrong (Y2 knowledge review – great explorers) Eileen Collins

	Understand that the Earth's rotation explains day and night and the apparent movement of the sun across the sky. (Why do we have day and night? Is it daytime everywhere in the world now? Explain your answer. Why is it light and warmer in the day? Why is it dark and colder at night?) Teacher note - Use polystyrene ball and have torches to see how the earth spins and day and night is caused. Afterwards, compare the time of day at different places on the Earth through internet links.  Explore the work of astronauts and space exploration. (Who is Eileen Collins?) Teacher note – Make a link here to Y2 Geography 'Great Explorers' where children learn that space exploration is now a possibility because of increased technology and knowledge of the world. Christopher Columbus showed the world that the Earth isn't flat! Look at how far we have come. 	
Forces	End points / Question Know that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. (What is gravity? Who is Issac Newton? Can you see gravity? How do you know it exists? I dropped a crumpled piece of paper and flat piece of paper- which one will reach the ground first? If it had the same mass, would the weight change based on the gravitational pull?) Teacher note – cannisters and clay experiment – which one drops the fastest? Understand meter used the Y3 car  that friction is a force that acts between moving surfaces. What is friction? How do I measure friction? What is a Newton for? Teacher note – test a weighted tub on various surfaces – pull with a Newton meter. Measure the force. This builds upon ramp investigation.  Understand that air resistance and water resistance are forces that act between moving surfaces. (What is air resistance? What is water resistance If I dropped a flat piece of paper and a scrunched-up piece of paper which one would reach the ground first? Explain why? How do we know air/water resistance exists? What would happen if a human jumped from an aeroplane without a parachute? What would happen if they had a parachute?) Teacher note - drop sheets of paper of various sizes and time the drop.  Understand that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. (What is a lever, pulley, gears? How can they show forces? Describe how they work and the force that acts upon it. How are pulleys and gears useful?) Teacher note – children create pulleys using a broom handle, rope and large filled milk cartons. Children experience gears – can bring n a bike, have gears to use in class. Levers – children can create their own levers – catapults in class using lolly sticks – links to the Greeks and warfare.  Draw scientific diagrams to illustrate how a mechanism allows a smaller force to have a greater effect. (How can we draw a gear, pulley, or leaver?) 	fastest, slowest, further, furthest, blow, bounce, recycle, reuse, rigid, flexible, bend, bouncy, elastic, squashy, stretchy, stiff, rigid, rough, smooth, friction, gravity, force, push, pull, strength, attract, repel, magnet, magnetic, metal, poles, North Pole, South Pole, Air resistance, water resistance, mechanisms: gears, pulleys, levers, Newton/Force Meter, newtons. **Key scientists:** Isaac Newton

Year 6	End points / questions	Key Vocabulary
Living Things and Their Habitats – Evolution and Inheritance	Teacher note – prior learning should be heavily focused on fossils from Y3. Also recap Y4 content on how habitats can change due to environmental factors which can lead to adaptation. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents (Do offspring always look identical to the parent?) Teacher note – Link this to Y2 unit of animal offspring. Can they match farm animals to the name of their offspring for daily review? see vocab  Understand how animals have adapted to their environment over time and how this leads to evolution. (How can adaptation lead to evolution?) Teacher note – Let children explore archaeological evidence here for how animals have adapted and evolved over time. Look at images of fossils like sources of information.  Identify how plants have adapted to suit their environment in different ways and that adaptation may lead to evolution. (Teacher note – Look at African Mangrove forests here (Y4 geography review). They are a great example of plant adaptation. You could also compare with a local plant – such as the sundew which grows on Formby Beach and is very well adapted.)  Understand how some adaptations make animals less likely to survive in a particular environment. (Teacher note – explore the ancient short neck giraffes here and how they didn't survive because they couldn't get food from the trees. Also, the brown furred arctic fox which didn't have camouflage, leading to a large population of white furred arctic foxes – link to Y2 Arctic topic in Geography).  Find out about the work of Charles Darwin. (Who was Charles Darwin? What did he find out?) Teacher note – Children learn about Mary Anning in Y3. Use this as a daily review and build on from this. 	**Animals:** Pig: Piglet, Cow: Calf, Chicken: Chick, Horse: Foal, Duck: Duckling, Cat: kitten, dog: puppy, Goat: Kid, Goose: Gosling, Donkey: Foal, Llama: Cria, Rabbit: Kit or Kitten Sheep: Lamb, alpaca: crias Habitat, environment, conditions, adaptation, survive, fish, amphibians, reptiles, birds and mammals, survive, basic needs, offspring invertebrates, vertebrates, adaptation, fossil, adaption, human impact, natural disasters characteristic. Evolution, genes, inherit, natural selection, survival of the fittest, trait.
Animals – Exercise, health and the Circulatory System	End points / questions Prior Knowledge - Understand that diet, lifestyle and exercise have an impact on our bodies? Teacher note – this acts as a knowledge recap of everything pupils have learnt related to this area. This objective covers your prior knowledge session and may carry over into 2 lessons. It should touch on: food groups, impact of exercise and hygiene – particularly relating to teeth [Y2/Y4] and puberty [Y5]) Explore the link between exercise and heart rate. (What happens to your heart rate when you exercise?) Teacher note – possibly compare 2 different exercised here running v walking for example to make it more challenging. Record the data accurately and compare the results in an appropriate graph. To make it a fair test, it will have to be the same child. One per group or in pairs?	healthy, life cycle, function, exercise, balanced diet, oral hygiene, diet, food chain, digestive system, digestion, saliva, oesophagus, stomach, small intestine, large intestine, rectum, canines, incisors, molars, cavities, plaque, fluoride, tooth decay, gums, nerves, enamel, nutrients,

	 Know what the circulatory system is? (Why is it called circulatory?) Teacher note – you could complete the drawing game here – in groups have to draw and label the system, one at a time looks at a hidden image and has to draw a part.  Understand what the functions of the heart, blood vessels and blood are. (Do all parts of the circulatory systems do the same job? How are they different?) Teacher note – there are models and the hearth that pump in the science cupboard.  Know what blood is and what its role is in the human body. (Which parts of the heart pump blood? Where to?) Teacher note – Making blood activity. Photo their activity and then children then plot and label the key components.  Understand how nutrients and water are transported within animals and humans? (How do nutrients get into our blood? What waste products does blood transfer?) Teacher notes – recap the digestive system from y4 as daily review. STEM Learning – good for resources with diagrams etc. Children could complete lots of demonstrations here to help them with their understanding. 	circulatory system, Blood vessels, capillaries, arteries, Veins, Red blood cells, white blood cells, oxygen, carbon dioxide, ventricles, aorta, pulmonary vein / artery
Living Things and Their Habitats – Classification	End points / questions Prior Knowledge - Pupils should build on their learning about grouping living things in year 4 by looking at the classification system in more detail. Understand that living things are classified into groups. (Why are you grouping those organisms together? Here, recap living/non-living using the Mrs Gren acronym, carnivores/herbivores/omnivores, amphibians, fish reptiles, birds, mammal – may span more than one lesson)  Know how to classify vertebrates and invertebrates (Why do some animals have a backbone and some do not? Teacher note – children will have an understanding of vertebrates/invertebrates from Y4. Now they add the additional layer of using this to classify.) 	minibeast, insect, spider, beetle, caterpillar, ant, worm, woodlouse, birds, hedgehog, habitat, environment habitat, environment, mini beasts, living, non-living, never-lived, dead, move, grow, feed, breathe, have young, shelter, conditions, adaptation, amphibians, fish reptiles, birds, mammal, survive, food-chain, consumer, producer, omnivore, herbivore, carnivore, costal habitat, polar habitat, forest habitat, desert habitat, micro-habitat (such as

	Understand the significance of the work of Carl Linnaeus (Why was his work so important to science?) Students could produce a collage/fact file to celebrate the work of this famous scientist.  Understand that plants are classified based on specific characteristics (What is similar or different about these organisms?) Teacher note – Children have done lots of work so far on classifying animals. Here recap features of flowing/ non-flowering plants, evergreen etc... to make a classification key of the plants in the local environment.  Understand what a microorganism is and identify them. (Teacher note – children should grow fungi by passing a slice a bread around the classroom and letting unwashed hands touch it. Seal the bread in a see-through Tupperware and observe the mould growing over time. You could also put an unhandled slice of bread in another box as a control. Risk assessment needed)  Classify 3 types of microorganisms. (What is the difference between bacteria and fungi? What is the difference between bacteria and viruses?) 	a tree trunk, pond etc...) classification keys, human impact, natural disasters, vertebrates, invertebrates, organism, micro-organism, bacteria, fungi, viruses **Key Scientist** Carl Linnaeus  Teacher note – risk assessment needed when completing investigations involving microorganisms. Please ensure key rules are displayed with the investigation.
Electricity	End points / questions Prior Knowledge – Recap Y4 content and in particular the work of Thomas Edison Know that the brightness of a lamp or the volume of a buzzer is associated with the number and voltage of cells used in the circuit. (If you put a second battery in a simple circuit, how will it affect the volume of a buzzer? Teacher note – test and record data here. Possible draw a table with voltages down one side and a Likert scale across the top for brightness. Children to then transfer this data into a bar chart.)  riations in how components function. (Ruby has connected two bulbs in a simple circuit. How can she make the bulbs brighter? Why will this happen?)  Draw and label a simple circuit in a diagram using scientific symbols (from memory). (Which symbol represents a bulb etc...?) 	material, metal, light, components, conductor, insulator, circuit symbol, cell, battery, wire, bulb, switch, buzzer, simple circuit, positive, negative, crocodile clip, precautions, voltage, volume, current, parallel circuits. **Key Scientist** Thomas Edison (recap from Y4) 

	Know how to construct simple series and parallel circuits. (How can you make this simple series become parallel?) 	Teacher note- risk assessment may be needed when electrical circuits.
Light	End points / questions Teacher note – prior knowledge should build on the work on light in year 3, exploring the way that light behaves, including light sources, reflection and shadows. They should talk about what happens and make predictions. There are torches, prisms and a dark den in the science cupboard Know the parts of the eye (How is your eye connected to your body?) Teacher note – this is not national curriculum but will help with subsequent lessons. You will only need to focus on the 3 parts: iris, pupil and optic nerve)  Know that light appears to travel in straight lines. (Can light travel round corners? How could you prove or disprove your answer?)  Understand that light takes a specific path from a light source to our eyes. (Does light reflect off all objects the same? Which objects reflect the most light?)  Understand that shadows have the same shape as the objects that cast them because light travels in straight lines. (Why don't shadows have features?) Teacher note – use the playground – draw shapes. Use the sun. Re enforces the learning from Y3 shadows and Y5 earth and Space. 	Sun, fire, electricity, torch shadow, reflective, non-reflective, opaque, translucent, Light source, dark / darkness, reflect, mirror, block / absorb, direction of light, bright, dim, light beam, sunlight, lenses, prism, rainbow, refraction, spectrum, iris, pupil, optic nerve, path, straight lines  Teacher note- risk assessment may be needed when using torches.