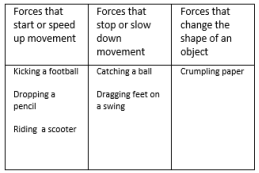
Year 3

	Energy - Light Notice light and dark including shadows	Forces: contact & non-contact Notice and compare simple contact and non-contact forces through friction and magnets	Alive (Structure and Function) Identify the structure and function of human skeleton and muscles and parts of a flowering plant.	Thrive and Survive Explore and investigate nutrition in plants and animals	Reproduction Explore the function of the flower in pollination and seed dispersal	Properties/changing materials Compare rocks and soils and describe fossil formation
Disciplinary conceptual progression (a summary)	**Children can identify DV in a given enquiry and know this is what they measure and record (e.g. features on diagrams)**	**Children can identify chosen CV** and DV in a given enquiry and know **that systematically changing the chosen CV gives us our process for collecting and recording the results on the DV**	Children can identify chosen CV and DV in a given enquiry and know the chosen CV give us a system for collecting and recording the results on the DV, **which we look for patterns and relationships in.** Research is used to answer questions.	Children can identify chosen CV and DV in a given enquiry and know the chosen CV gives us **our question** and our system for collecting and recording the results on the DV, which we look for patterns and relationships in. I know that the control variable is used to build the x-axis, while the dependent variable provides the data organised on the y-axis.	Children can identify chosen CV and DV in a given enquiry and know the chosen CV gives us our question **based on enquiry type** and our system for collecting and recording the results on the DV, which we explain the patterns and relationships in **and use to predict from.**	Children can identify chosen CV and DV in a given enquiry and know the chosen CV gives us our question based on enquiry type and our system for collecting and recording the results on the DV, which we explain the patterns and relationships.
Observing and measuring	• **I know that I observe / measure the dependent variable.** • **I know that the control variable is the variable that is changing**	• I know that I observe / measure the dependent variable. • I know that the independent variable is the variable that is changing • **I know that systematic observation is one that is controlled.** • **I know that force is measures in N using a Newton meter**	• I know that systematic observation is one that is controlled.	• I know that systematic observation is one that is controlled.		
Recording Data	• **I know that the control variable builds the table** • **I know that the dependent variable data is organised in a table.**	• I know that the control variable builds the table • I know that the dependent variable data is organised in a table.	• **I can label and identify features I have observed** • **I know that a diagram is simplified and contains key features**	• **I know that the control variable builds the x axis** • **I know that the dependent variable data is organised on the y axis**	• I know that a diagram is simplified and contains key features. • I can label and identify features I have observed	• I know how to use my careful observations in a given simple key to identify
Asking and exploring questions	• **I know there are different types of scientific enquiries.** • **I can identify the control and dependent variables**	• **I know that classifying involves sorting and grouping according to similarities and differences** • **I know that comparative and fair testing involves exploring cause and effect.** • **I can identify the control and dependent variables.** • **I can recognise a fair test.**	• **I know that my question is based on my variables** • **I know that researching involves using secondary sources to find answers to questions** •	• **I know that 'observations over time' focus on similarities and differences, patterns and change at regular intervals.** • I know that comparative and fair testing involves exploring cause and effect. • I know that my question is based on my variables	• I know that my question is based on my variables • **I know and give reasons for my choice of enquiry**	• I know and give reasons for my choice of enquiry
Performing Tests		• **I can make suggestions as to how to investigate**	• I can make suggestions as to how to investigate	• I can make suggestions as to how to investigate •	• I can make suggestions as to how to investigate	
Concluding, prediction, evaluating			• **I know how to describe the similarities and differences or changes in my data**	• **I know how to use tables and bar charts to look for patterns and relationships (cause and effect) and describe these in words**	• **I can use my scientific knowledge to explain my findings** • **I know how to use the relationship (cause and effect) or pattern to predict a future change**	• I know how to describe the similarities and differences or changes in my data • I can use my scientific knowledge to explain my findings

Applications & Communication		I can name an application of science and an associated scientist		• **I know relevant scientific language and can use that language to discuss and present my ideas**	• I know relevant scientific language and can use that language to discuss and present my ideas •	• I can name an application of science and an associated scientist • I know relevant scientific language and can use that language to discuss and present my ideas

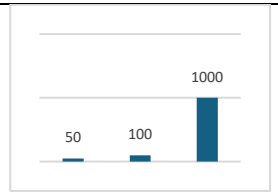
LKS2 Y3 A1	**BIG Q: How can we control light?** Pupils should explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves. They should think about why it is important to protect their eyes from bright lights. They should look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change. Pupils should be warned that it is not safe to look directly at the sun, even when wearing dark glasses. Pupils might 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.					
Lesson Qs	**Elicitation / Activate** Where is it light? Where is it not?	How does light affect what we see?	What are shadows?	How can we block the pathway of light?	How can we change the light pathway?	**Application / Assess** BIG Q: How can we control light?
Key Concepts Energy - Light	• Materials have properties • Properties of materials – see through, lets light through • The sun is source of light on earth • Light changes through seasons.	• Know that light is needed to see things • Know that dark is the absence of light. • Know that looking directly at the sun is dangerous.	• Know that an opaque object blocks light. • Know that shadows are forms when light is blocked. • Know that translucent materials allow light through.	• Know that the closer an object to the light source the larger the shadow.	• Know that light is reflected from surfaces.	• Light sources (apart from the sun) can be switched on and off • When there is an absence of light, this is dark. • Light can be blocked by opaque objects that create shadow • Light can be reflected
Disciplinary Concepts		**Observing & Measuring** • I know that I observe / measure the dependent variable. • I know that the control variable is the variable that is changing	**Observing & Measuring** • I know that I observe / measure the dependent variable. • I know that the control variable is the variable that is changing **Recording Data:** • I know that the control variable builds the table • I know that the dependent variable data is organised in a table.	**Recording Data:** • I know that the control variable builds the table • I know that the dependent variable data is organised in a table. **Asking & Exploring Qs** • I know there are different types of scientific enquiries. • I can identify the control and dependent variables	**Asking & Exploring Qs** • I know there are different types of scientific enquiries. • I can identify the control and dependent variables	**Children can identify DV in a given enquiry and know this is what they measure and record (e.g. features on diagrams)**
Key learning tasks	A light walk – Where is the light? How is it changing?	Comparative and fair testing enquiry: How does the amount of light affect the level of detail we can see? Identify the CV and DV – how does this relate to what we observe and measure and what CV we keep the same	Comparative and fair testing enquiry: How does the shape of the object affect the shape of the shadow? Identify the CV and DV – how does this relate to what we observe and measure and CV we keep the same. Chn use variables to build a table to record results.	Comparative and fair testing enquiry: How does the distance from the light source affect the size of the shadow? Identify possible CV and DV – how can we utilise to build a question. How does this relate to what we observe and measure and CV we keep the same. Chn explain why this is comparative and fair test using their knowledge of variables.	Comparative and fair testing – measure the light reflected from a range of materials; observe / measure the dependent variable (how reflective) – identify how these build the question.	How would you respond to these scenarios and justify reasons? "A baby is trying to sleep but the room is too bright from the window" "Someone is reading in bed but doesn't want to wake up their partner" "A cyclist needs to be seen clearly when riding at night" "A photographer wants to reduce harsh shadows on someone's face"

Generalisation	The sun is the main source of heat energy and light energy on earth.	Light (energy) gives us the capacity to see (work) We can control light through switching in on and off – light and dark	Shadows are the areas where light from a source does not reach	We can control light through blocking light with opaque objects Light travels from a source to an object and can be controlled by changing the journey.	Light (energy) gives us the capacity to see (work)	The sun is the main source of heat energy and light energy on earth. Light travels from a source to an object and can be controlled by changing the journey. Light (energy) gives us the capacity to see (work)
LKS2 Y3 A2	**BIG Q: How do forces affect objects?** Pupils should observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing). They should explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe). Pupils might work scientifically by: comparing how different things move and grouping them; raising questions and carrying out tests to find out how far things move on different surfaces, and gathering and recording data to find answers to their questions; exploring the strengths of different magnets and finding a fair way to compare them; sorting materials into those that are magnetic and those that are not; looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another; identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.					
Lesson Qs	**Elicitation / Activate** What are the properties of materials?	What are forces?	How do forces impact touching objects?	How do forces impact objects at a distance?	How are magnets useful?	**Application / Assess** BIG Q: How do forces affect objects?
Key Concepts Forces – Non contact and contact	Know that an object will fall when dropped. Know an object moves when you kick it, throw it To know how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	• Know that forces describe how objects affect each other. • Know a force is active power • To know that some forces need contact between two objects.	• To know that things move further on smoother surfaces.	• Know that magnets can attract and repel each other and that these are forces. • Know that magnets have a north and south pole. • Know that like poles repel and opposite poles attract. • Know that magnetic forces can act at a distance.	• Know that some materials are attracted to magnets. • Know that metals (except aluminium) are magnetic.	**Generalisation**: *Materials have properties (structure) which allow them to do different things (function),* this includes being magnetic. Forces describe how contacting and non-contacting objects affect each other. Magnetic forces affect objects at a distance.
Disciplinary Concepts	**Children can identify DV in a given enquiry and know this is what they measure and record (e.g. features on diagrams)**	**Observing and Measuring** • I know that I observe / measure the dependent variable. • I know that the independent variable is the variable that is changing **Asking and exploring questions** • **I know that classifying involves sorting and grouping according to similarities and differences**	**Observing and Measuring** • **I know that systematic observation is one that is controlled.** **Asking and exploring questions** • **I know that comparative and fair testing involves exploring cause and effect**. • **I can identify the control and dependent variables.** • **I can recognise a fair test.**	Performing Tests • **I can make suggestions as to how to investigate** **Recording Data** • I know that the control variable builds the table • I know that the dependent variable data is organised in a table	**Asking and exploring questions** • I know that classifying involves sorting and grouping according to similarities and differences **Applications & Communication** • I can name an application of science and an associated scientist	• **Children can identify chosen CV** and DV in a given enquiry and know **that systematically changing the chosen CV gives us our process for collecting and recording the results on the DV**
Key learning tasks	Identifying, classifying and grouping enquiry: How can I group objects based on the materials they are made from? How can I group materials based on their function? Key questions to answer: What is a material? What are the properties of materials? How can we investigate different materials?	Introduce the term **force –** describes the way objects affect each other, can be a push, pull or both. Forces can make things move, stop, speed up, slow down or change shape. Modelled enquiry: identifying, classifying, grouping – is each force a push, pull or both? Venn diagram. Independent enquiry: identifying, classifying, grouping. How can we group forces based on	Introduce the term 'contact forces' with demonstrations. Clarify: 'We call these contact forces because they happen when things touch. Today, we'll focus on one of them — friction.' Enquiry: comparative and fair test. How does the surface affect how far a toy car travels? Model repeating each test 3 times for more reliable results.	Show two magnets moving each other without touching. Ask: "If they aren't touching, how are they moving?" Introduce **non-contact force** = a force that can make something move without touching it. Explain: Magnets can attract (pull) and repel (push) other magnets and magnetic materials without touching them. - Magnets have two ends called **poles** – north and south. - Like poles **repel**. Demonstrate and ask chn to try as well. - Opposite poles attract. Demonstrate and record results.	Explain that magnets are used in lots of ways — to hold, move, or find things. Demonstrate quickly how a magnet only attracts some materials. **Modelled enquiry** (quick – disciplinary focus only. Should also help chn make link between metals and magnetism) **Enquiry type:** Identifying, classifying, grouping **Disciplinary focus:** performing tests; recording data Question: How can we group objects based on the material they are made from? - use as an opportunity to identify each of the	Enquiry: identifying, classifying, grouping How can we sort materials based on how they are affected by a magnetic force? Include a selection of materials including a range of metals and non-metals. Watch video showing how magnets are used for sorting materials at recycling plants/junk yards. Ask chn to use magnets to group the materials into a Carroll diagram: metals and non-metals, magnetic and non-magnetic.

		their effects on objects?  	Find different flat surfaces around school to test on, **or** create a ramp in the classroom and add different materials (sandpaper, foil etc) to change the surface.	Magnetic forces can act through space or through some materials (paper, card, fabric). (demonstrate with paper) In books, label the north and south poles. Use arrows to show repel (← →) and attract (→ ←). Modelled enquiry: Comparative and fair test Disciplinary focus: performing tests; recording data Question: How does the distance between the magnet and the paperclip affect whether it can attract the paperclip? Independent enquiry: Comparative and fair test Disciplinary focus: performing tests; recording data Question: How does the distance between the magnet and the paperclips affect how many paperclips it can attract	materials the children will be testing in the independent enquiry. **Independent enquiry:** Enquiry type: Identifying, classifying, grouping Disciplinary focus: performing tests; recording data; asking and answering questions Question: How can we group materials based on whether they are magnetic or not? Discuss results. What do you notice about the materials that are magnetic? • Are all metals magnetic? • Why do you think magnets are useful? Watch the video from **2.46** Chn make a mindmap in their books around the question "What are magnets used for?"	
Generalisation	Materials have properties (structure) which allow them to do different things (function)	Forces describe how contacting objects affect each other	Materials have properties (structure) which allow them to do different things (function) Forces describe how contacting objects affect each other	Magnetic forces affect objects at a distance	Materials have properties (structure) which allow them to do different things (function), this includes being magnetic.	Materials have properties (structure) which allow them to do different things (function), this includes being magnetic. Forces describe how contacting and non-contacting objects affect each other. Magnetic forces affect objects at a distance

LKS2 Y3 Sp1	**BIG Q: What structures keep plants and animals alive?** Pupils should be introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions. Pupils might work scientifically by: identifying and grouping animals with and without skeletons and observing and comparing their movement; exploring ideas about what would happen if humans did not have skeletons.					
Lesson Qs	**Elicitation / Activate**	What is the function of the skeletal structure of an animal?	What is the function of a muscular structure?	What structures and functions do plants have?	How does the structure of a plant enable it to stay alive?	**Application / Assess** How do some plants and animals stand up?
Key Concepts	• Know that Animals have different body parts (structure) which allow them to do different things (functions) e.g see, move and eat. Animal parts vary and this helps us identify what type of animal they are. • Animals need energy (food) and materials (air and water) to stay alive. • Our body parts (structure) works best (functions) when we are healthy (the right conditions).	• Know that humans and some animals have skeletons to: protect their vital organs and support the structure of their body	• Know that humans and animals have muscles which work in pairs to allow movement	• Know that a stem/trunk provides support and transport water • Know that flowers attract insects.	• Know that the leaf captures energy from the sun.	Animals and plants have different parts (structure) which enable them to function.
Disciplinary Concepts	**Children can identify chosen CV** and DV in a given enquiry and know **that systematically changing the chosen CV gives us our process for collecting and recording the results on the DV**	Recording Data • **I can label and identify features I have observed** • **I know that a diagram is simplified and contains key features** Asking and exploring questions • **I know that my question is based on my variables** • **I know that researching involves using secondary sources to find answers to questions**	. Recording Data • **I can label and identify features I have observed** • **I know that a diagram is simplified and contains key features** Asking and exploring questions • **I know that my question is based on my variables** • **I know that researching involves using secondary sources to find answers to questions** •	Recording Data • **I can label and identify features I have observed** • **I know that a diagram is simplified and contains key features** Asking and exploring questions • **I know that my question is based on my variables** • **I know that researching involves using secondary sources to find answers to questions** •	Observing and measuring I know that systematic observation is one that is controlled Performing Tests • I can make suggestions as to how to investigate Concluding, prediction, evaluating • **I know how to describe the similarities and differences or changes in my data**	Children can identify chosen CV and DV in a given enquiry and know the chosen CV give us a system for collecting and recording the results on the DV, **which we look for patterns and relationships in.** Research is used to answer questions.
Key learning tasks	Model: Group animal pictures into a venn diagram based on their habitat. Independent: group animals based on given or suggested criteria (number of legs, tail/no tail, fur/no fur etc) Chn label the body parts of three different animals. Notice the similarities and differences. Teacher led: Group animals based on whether or not they have a skeleton.	What does your skeleton do? – KS2 Science curriculum - BBC Bitesize Chn label a given diagram to show some key organs (brain, heart and lungs) and the parts of the skeletal structure that protect them. - Chn label (the skull protects the brain etc) Ask and answer questions such as "What if humans had no skull? What if we had no bones in our arms?" Etc.	https://www.bbc.co.uk/bitesize/articles/ztwcbqt#z8ryydm Following video and teacher input, chn label diagram of muscle pairs (biceps and triceps) and complete cloze procedure to explain how they act in conjunction to allow movement. Answer questions based on the video: How many muscles in the human body? Why do we have an even number of muscles (they work in pairs) Which muscles do you think we use the most? What if we did not have muscles?	Children closely observe a plant (real or image). Prompt questions: Which part holds the plant up? Which part might help insects find the plant? Children draw a simple scientific diagram of a flowering plant. **They label:** stem / trunk Flower Roots Children write short function next to each label.	Investigate the impact of light on plants as a comparative and fair test. Identify the CV and DV and use this to build the question and model how to use these to build the method. Either perform the test or give the children results to examine and make conclusions from.	
Generalisation	Animals have different body parts (structure) which allow them to do different things (functions) Our body parts (structure) work best (functions) when we are healthy (the right conditions).	Some animals have a skeletal structure that supports the structure of their body and protects their organs.	Animals have muscular structures to enable the function of movement.	Plants have different parts (structure) that carry out different functions.	Plants have a structure that carries out the functions needed for nutrition.	Animals and plants have different parts (structure) which enable them to function.

LKS2 Y3 Sp2	**BIG Q: What do plants and animals need to thrive and survive?** Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support and leaves for nutrition. Note: pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens. Pupils might work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.					
Lesson Qs	**Elicitation / Activate**	How do animals survive?	What do animals need to eat to thrive?	What do plants need to survive and thrive?	How do plants use water?	**Application / Assess**
Key Concepts	Animals need energy (food) and materials (air and water) to stay alive. Plants need energy (light), and materials (air and water) to stay alive. The energy allows their parts (structure) to do their job (function). The parts (structure) works best (functions) when we are healthy (the right conditions). Living things have shared functions which keep them alive Animals and plants have different parts (structure) which enable them to function.	• Know that nutrition provides the body with energy. • Know that animals need to source food from another animals or plant.	• Know the role of carbohydrate, protein, fats and vegetables in maintaining a balanced of diet.	• Know that plants need nutrients from the soil and room to grow • Know that different plants need different conditions	• Know that water is transported in plants from the roots to the stem and excreted through the leaves.	Animals and plants need nutrition (energy supply and materials from different food types) to survive and grow (function / work). Living things are healthy (thrive) when they have the right conditions. Different food types provide different nutrition as they have different structure and function.
Disciplinary Concepts	Children can identify chosen CV and DV in a given enquiry and know the chosen CV give us a system for collecting and recording the results on the DV, **which we look for patterns and relationships in.** Research is used to answer questions.	**Recording Data** • **I know that the control variable builds the x axis** **I know that the dependent variable data is organised on the y axis** **Applications & Communication** • **I know relevant scientific language and can use that language to discuss and present my ideas**	**Recording Data** • I know that the control variable builds the x axis • I know that the dependent variable data is organised on the y axis **Applications & Communication** **I know relevant scientific language and can use that language to discuss and present my ideas**	**Asking and exploring questions** • I know that comparative and fair testing involves exploring cause and effect. • I know that my question is based on my variables **Concluding, prediction, evaluating** • **I know how to use tables and bar charts to look for patterns and relationships (cause and effect) and describe these in words**	**Asking and exploring questions** • **I know that 'observations over time' focus on similarities and differences, patterns and change at regular intervals**. • I know that my question is based on my variables **Concluding, prediction, evaluating** • **I know how to use tables and bar charts to look for patterns and relationships (cause and effect) and describe these in words**	Children can identify chosen CV and DV in a given enquiry and know the chosen CV gives us **our question** and our system for collecting and recording the results on the DV, which we look for patterns and relationships in. I know that the control variable is used to build the x-axis, while the dependent variable provides the data organised on the y-axis.
Key learning tasks		Revise food chains from habitats year 2. Introduce the term nutrition – how your body uses food -how the energy in food transforms to energy for the body to function. Revisit the difference between herbivores, carnivores and omnivores. Provide a bar chart of animals in a countryside habitat of omnivores, herbivores and carnivores. How does the type of eater affect the numbers in square kilometre of countryside habitat? – ID CV – type of eater, DV – numbers. Remind chn that CV organises the table and DV records the data. Now build on this through presenting the results as a bar chart without axis labels – which is the x axis – CV and which is the Y – DV – how do we know? (herbivores, 1000, omnivores, 500, carnivores – 50)	Teach and explore the role of carbohydrates, proteins, fats and vegetables in maintaining structure and function in animals Provide children bar chart (with x axis – food groups and y axis amount per day for humans. What is the CV and DV – how do we know (recap from last lesson) Use the bar chart to make a conclusions about a balanced diet, e.g. a balanced diet should have larger portions of vegetables and carbohydrates and much smaller amounts of fats and proteins. Chn can then apply this to making a balance food plate.	Comparative and fair testing- comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser. Design investigation as a class establishing the CV – light OR water OR fertiliser etc and DV effect seen- generate question. Use CV and DV to decide how to record results (table, bar chart) Chn conclude. (teacher model the conclusion to a factor not investigated)	Observation over time- observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers. Design investigation as a class establishing the CV – time intervals and DV effect seen- generate question. Use CV and DV to decide how to record results (table, bar chart) Chn conclude. (teacher model the conclusion to a similar investigation using celery)	

		 • Are they all getting the same amount of energy form their diet? • How does the type of food affect the amount of calories (energy available)? • Identify the CV – food type, identify the DV – energy. How could we investigate this? – discuss. How would organise on a bar chart? X axis , y axis. Provide bar chart – chn label axes and add data labels using the provided table to the bars. • Animals survive by eating the right amount of food for the energy they need. Herbivores eat lots of food as plants have less energy, Carnivores eat less food as meat has lots of energy.				
Generalisation		Animals need nutrition to provide energy to survive and grow (function / work).	Different food types provide different nutrition as they have different structure and function.	Plants need nutrition (energy supply and materials from different food types) to survive and grow (function / work). Living things are healthy (thrive) when they have the right conditions.	Plants need nutrition (energy supply and materials from different food types) to survive and grow (function / work).	Animals and plants need nutrition (energy supply and materials from different food types) to survive and grow (function / work). Living things are healthy (thrive) when they have the right conditions.

LKS2 Y3 Su1	**BIG Q: How do flowering plants reproduce?** Pupils should continue to understand the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of flowers for reproduction. Pupils might work scientifically by discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed.					
Lesson Qs	**Elicitation / Activate**	What is the function of the flower?	How do animals enable pollination?	How are seeds dispersed?	How does seed structure affect dispersal?	**Application / Assess**
Key Concepts	Living things have shared functions which keep them alive Animals and plants have different parts (structure) which enable them to function.	• Know that plants mature and create flowers • Know that pollen is in - flowering plants • Know that the flower attracts pollinators.	• Know that pollinators carry pollen from one plant to another causing pollination to occur. • Know that pollination is a function in the life cycle of a flowering plant. • Know that animals are attracted to flowers • Know that a seed forms as a result of pollination	• Know that plants mature and create flowers and seeds • Know that seeds disperse by wind, explosion, animals and water. • Know that seeds disperse to find room to grow new plants	• .	Plants have different parts (structure) which enables the function of reproduction. This allows the species to continue.
Disciplinary Concepts	Children can identify chosen CV and DV in a given enquiry and know the chosen CV gives us **our question** and our system for collecting and recording the results on the DV, which we look for patterns and relationships in. I know that the control variable is used to build the x-axis, while the dependent variable provides the data organised on the y-axis.	**Observing and measuring** • I know that systematic observation is one that is controlled. **Recording data** • I know that a diagram is simplified and contains key features • I can label and identify features I have observed **Performing tests** • I can make suggestions as to how to investigate **Asking and exploring questions** • I know that my question is based on my variables • **I know and give reasons for my choice of enquiry**	**Application and communication** • I know relevant scientific language and can use that language to discuss and present my ideas **Recording data** • I know that a diagram is simplified and contains key features • I can label and identify features I have observed	**Application and communication** • I know relevant scientific language and can use that language to discuss and present my ideas **Recording data** • I know that a diagram is simplified and contains key features • I can label and identify features I have observed	**Concluding, prediction, evaluating** • **I can use my scientific knowledge to explain my findings** • **I know how to use the relationship (cause and effect) or pattern to predict a future change**	Children can identify chosen CV and DV in a given enquiry and know the chosen CV gives us our question **based on enquiry type** and our system for collecting and recording the results on the DV, which we explain the patterns and relationships in **and use to predict from.** •
Key learning tasks		Observation over time – How does a bulb change throughout a year? Model planning this investigation identifying the CV (time) and DV changes seen. Use these to collect the data using images from different parts of the year. Repeat and chn investigate a flowing shrub or tree.	Chn represent the process of pollination and seed formation in life cycle of a flowering plant in diagrammatic form with scientific labels.	Model investigation – how can we classify seeds? Identify the CV as size and the DV as the emergent groups that the seeds will be sorted into. Teach function of seed – reproduce the plant and so needs dispersal efficiency. Teach methods of dispersal. Children investigate How can we classify features of seeds? CV features of seeds, DV dispersal methods	Model the sycamore seed investigation)paper helicopters) Choose a CV to investigate, e.g. length of tail. Model how to use data to find relationship and make future prediction. Children repeat for a different cv e.g. no. of paper clips.	
Generalisation		Plants have different parts and pollen is found in the flower. Pollinators are attracted to the flower due to the smell and colour.	Pollination is a process of reproduction. A seed forms as result of pollination.	Seeds are adapted in different ways to aid dispersal to find room to grow new plants.		Plants have different parts (structure) which enables the function of reproduction. This allows the species to continue.

LKS2 Y3 Su2	**BIG Q: How do rocks and soils change?** Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment. Pupils might work scientifically by: observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. Pupils might research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. Pupils could explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water. They can raise and answer questions about the way soils are formed.					
Lesson Qs	**Elicitation / Activate**	How can we identify different types of rocks?	How do rocks change over time?	How are fossils formed?	How is soil formed?	**Application / Assess**
Key Concepts Properties/changing materials Compare rocks and soils and describe fossil formation	Materials have properties (structure) which allows them to do different things and therefore impacts how you use them to make objects. If you change the material's properties (structure) you change its use (function)	• Know that rocks can be grouped based on what they look like and how they feel. • Know that different rocks have different properties. • Know that sedimentary rocks are formed of layers		• Know that fossils are found in sedimentary rocks • Know that fossils are formed when things that have lived are trapped in layers of rock • Know that a fossil is the imprint of something that was once living (plants/animals) • Know that the fossil is the imprint of the hardest material in the living thing	• Know that organic matter is the remains of something that was once living • When organic matter is subjected to large forces (squashed) it forms a soil •	
Disciplinary Concepts	Children can identify chosen CV and DV in a given enquiry and know the chosen CV gives us our question **based on enquiry type** and our system for collecting and recording the results on the DV, which we explain the patterns and relationships in **and use to predict from.**	**Recording Data** • I know how to use my careful observations in a given simple key to identify **Asking and exploring questions** • I know and give reasons for my choice of enquiry	**Asking and exploring questions** • I know and give reasons for my choice of enquiry **Concluding, prediction, evaluating** • I know how to describe the similarities and differences or changes in my data • I can use my scientific knowledge to explain my findings	**Recording Data** • I know how to use my careful observations in a given simple key to identify **Applications & Communication** • I can name an application of science and an associated scientist		Children can identify chosen CV and DV in a given enquiry and know the chosen CV gives us our question based on enquiry type and our system for collecting and recording the results on the DV, which we explain the patterns and relationships.
Key learning tasks		Investigate the properties of rocks looking at crystals, texture, etc. Introduce a simple key – and model how to use to identify a rock. Children use to identify other samples, making detailed observations.	observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time ;Identify the CV and DV. Look at the changes that have occurred over time. Model how to find the similarities and differences, e.g. breaking apart and jagged, or rounding and smoothing.	Research the simplified process of fossil formation. Link to Mary Anning and her discoveries. Investigate – how can we classify fossils?	Pupils could explore different soils and identify similarities and differences between them	
Generalisation		Materials and living things have properties which allow them to do different things (structure and function). These vary and help us to identify what type of material it is.	Materials and living things have properties which allow them to do different things (structure and function). These vary and help us to identify what type of material it is.	Forces on materials can cause them to change their appearance and properties (structure and function) Forces describe how objects affect each other.	Forces describe how objects affect each other.	Materials and living things have properties which allow them to do different things (structure and function). These vary and help us to identify what type of material it is. Forces describe how objects affect each other. Forces on materials can cause them to change their appearance and properties (structure and function)