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| **Year Group** | | **National Curriculum**  *Being a Scientist* | **Sticky Knowledge**  **(what children need to know and remember)** | **Vocabulary** | **Skills/ Procedural Knowledge** |
| Y1 | | **Seasonal Changes** (Taught throughout the year) Pupils should be taught to:  • observe changes across the four seasons  • observe and describe weather associated with the seasons and how day length varies.  **Plants** Pupils should be taught to:  • identify and name a variety of common wild and garden plants, including deciduous and evergreen trees  • identify and describe the basic structure of a variety of common flowering plants, including trees.  **Materials**  Pupils should be taught to:  • distinguish between an object and the material from which it is made  • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock describe the simple physical properties of a variety of everyday materials  • compare and group together a variety of everyday materials on the basis of their simple physical properties.  **Animals**  Pupils should be taught to:  • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals  • identify and name a variety of common animals that are carnivores, herbivores and omnivores | Know the uses of different materials- • Glass is used for windows (transparent),  • Wood is used for furniture  • Metal is used for planes, cars, trains- strength  • Plastic is used to form any shape such as toys Brick is used to build houses (strong)  Know the parts of a plant including roots, stem, leaves, bud, flower, petals,  • That leaves can be many different shapes and they take in sunlight and use water and food from the roots to make the plant grow.  • Know the parts of a tree and their function- the trunk is the main body of the tree and the trunk is covered with bark which protects it from damage  • Know the names of a variety of common wild and garden plants  • Know the names of a variety of common trees  • Know the difference between deciduous and evergreen trees  • Know which plants grow within the school ground.  Know the uses of different materials- • Glass is used for windows (transparent),  • Wood is used for furniture  • Metal is used for planes, cars, trains- strength  • Plastic is used to form any shape such as toys Brick is used to build houses (strong)  -A mammal has live babies, breathe air, warm blooded and have a backbone  - A carnivore is an animal that eats meat and examples, lion, tiger, polar bears  - A herbivore is an animal that eat plant for examples; rabbit, giraffe and  - Omnivore is an animal that eats both plants and animal; humans,  - Know the key differences between humans, birds, amphibians, reptiles and mammals. | weather sunny  rainy  windy snowy seasons winter  spring summer Autumn  sun  sunrise sunset  day length monsoon thunderstorm  Leaf  flower blossom  bud  petal  berry  root  seed  stalk  trunk  branch  stem  bark fruit  Object material wood  plastic  glass  metal  water  rock  brick  paper  fabric  elastic  foil cardboard rubber  wool  clay  hard  soft  stretchy  stiff  bendy  floppy waterproof  absorbent rough smooth  shiny  dull see through  head  body  eyes  ears  mouth  teeth  leg  tail  claw  wing  fin  fur  feather scales  beak  paws  hooves | **Testing**  Perform simple tests (Year 1 focus)  **Scientific Questioning**  Ask simple questions and recognise that they can be answered in different ways e.g  • Why are flowers different colours?  **Measuring**  Use simple equipment to observe closely (Y1 focus  **Gathering and Recording**  Gather and record data to help in answering questions (Year 1 focus)  **Communicating Findings**  Make a simple written explanation about what has been learned from an investigation or what conclusions have been found.  **Classifying**  Identify and classify e.g. Mammals and birds (Year1 focus)  **Scientific Research**  **Concluding and Questioning**  **Using Scientific Evidence** |
|  | Local Interests and Links (online museums, local places to visit etc) | | | | |
| Y2 | | **Living things and their habitats**  Pupils should be taught to:  • explore and compare the differences between things that are living, dead, and things that have never been alive  • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other  • identify and name a variety of plants and animals in their habitats, including micro-habitats  • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.  **Uses of everyday materials**  • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses  • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.  **Animals including humans**  • notice that animals, including humans, have offspring which grow into adults  • find out about and describe the basic needs of animals, including humans, for survival (water, food and air)  • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.  **Plants**  • observe and describe how seeds and bulbs grow into mature plants  • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. | - To know that living things grow reproduce, produce waste (excrete) and need nutrition.  - To know a habitat is a natural environment or home of a variety of plants and animals-  -it provides the animal with food, water and shelter.  - To be able to name some different habitats and some animals you would find there.  - A microhabitat is a very small habitat, for example for woodlice under stones, logs or leaf litter.  - To know what a food chain is  . - To be able to name different sources of food.  identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses  - find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.  - To know humans have offspring that looks like them. Compare to animal caterpillar to butterfly. - To know that humans and animals need water food and air to survive. - To know keeping healthy means scaring for our body so we have enough energy to learn, play and grow. - Food contains nutrients (link to living things) which we need for our body to stay active. - What does 5 a day mean/look like? - Sugary foods are bad for your health. - We should have 30-60 minutes of exercise each day.  Trees and shrubs take in water and carbon dioxide and give out oxygenlink to humans.  - Trees can live for a very long time- the oldest known tree is over 5000 years old.  - Trees get their food and water from their roots in the ground  . - A trunk is the main body of the tree and is covered with bark to protect the tree.  - Leaves take in sunlight.  - To know what plants need to grow. | living  dead  never been alive  suited suitable  basic needs food  food chain shelter  move  feed  pond woodland beach.  opaque transparent translucent reflective  non reflective flexible  rigid  push  pull  twist  squash  bend  stretch  offspring reproduction growth  child  young  old  exercise heartbeat breathing hygiene germs disease  meat  Leaf  flower blossom  bud  petal  berry  root  seed  stalk  truck  branch  stem  bark  fruit  light  shade  sun  warm  cool  water  grow  healthy germinate | **Testing**  Perform simple comparative and fair tests (Yr 2 focus) e.g.  • Finding out how seeds grow best  **Scientific Questioning**  Ask simple questions and recognise that they can be answered in different ways including use of scientific language from the national curriculum  e.g. • Why do some trees lose their leaves in autumn and others do not?  • How long are the roots of tall trees?  • Why do some animals have underground habitats?  **Measuring**  Use simple equipment such as thermometers and rain gauges to observe closely changes over time (Y2 focus  **Gathering and Recording**  Gather and record data to help in answering questions including from secondary sources of information using drawings, labelled diagrams, block graphs or tables. (Year 2 focus)  **Communicating Findings**  Communicate his/her Ideas, what he/she does and what he/she finds out In a variety of ways e.g. simple written reports or write ups.  **Classifying**  Identify, group and classify according to a given criteria e.g. Deciduous and coniferous trees (Year 2 focus) e.g. using a Venn Diagram  **Scientific Research**  **Concluding and Questioning**  Use his/her observations and ideas to suggest answers to questions noticing similarities, differences and patterns  **Using Scientific Evidence**  Using scientific evidence Use straightforward scientific evidence to answer questions or to support his/her findings (Year 3 focus) |
| Local Interests and Links (online museums, local places to visit etc) | | | |
| Y3 | | **Rocks**  • Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties  • Describe in simple terms how fossils are formed when things that have lived are trapped within rock  Recognise that soils are made from rocks and organic matter.  **Animals including humans** **– nutrition**  • Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat  **Animals including humans – skeletons and muscles**  • Identify that humans and some other animals have skeletons and muscles for support, protection and movement.  **Plants**  • Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.  • Explore the requirements of plants for life and growth (air, water, nutrients from the soil, and room to grow) and how they vary from plant to plant.  • Investigate the way in which water is transported within plants  Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.  **Light**  • recognise that they need light in order to see things and that dark is the absence of light  • notice that light is reflected from surfaces  • recognise that light from the sun can be dangerous and that there are ways to protect their eyes  • recognise that shadows are formed when the light from a light source is blocked by an opaque object  • find patterns in the way that the size of shadows change.  **Forces and Magnets**  • compare how things move on different surfaces  • notice that some forces need contact between two objects, but magnetic forces can act at a distance  • observe how magnets attract or repel each other and attract some materials and not others • compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials  • describe magnets as having two poles  • predict whether two magnets will attract or repel each other, depending on which poles are facing. | - Know that rocks have different attributes  - have been used by humans for millions of years, to make early tools and weapons  - Know when magma cools and solidifies it forms igneous rock. Examples are granite and pumice.  - Explain that sediment deposited over time, often as layers at the bottom of lakes and oceans, forms sedimentary rocks.  Know that extreme pressure and heat over time forms metamorphic rocks. Examples are marble and slate.  - Recognise that fossils show creatures from millions of years ago  - Know that soil develops from rocks and organic matter.  Know how nutrients, water and oxygen are transported within animals and humans  - Recognise that different species have different nutritional requirements, e.g. human, cat, dog,  - Know the importance of a balanced diet.  - Be able to say some of the foods that will fit into each food group, e.g. pasta, rice, bread, vegetables and fruit, milk, cheese, meats, fish, crisps, chocolate etc. - Become familiar with the ‘eat well’ plate and nutrition pyramid.  Know the purpose of the skeletal system in the body  - Know how the skeleton is connected through joints, types of joint and begin to understand their movement. - Know the purpose of muscles and be able to identify some more familiar muscle by name.  - Know how muscles are connected to our bones for movement - Know that muscles work in pairs and begin to describe how they help the body to move.  - Know that there are different types of skeletons, e.g endo, exo and hydrostatic  Know the different parts of a flowering plant and their function in relation to keeping the plant alive.  - Know the conditions required for successful plant growth, and begin to explain the effects when needs are not met, e.g. water, light, air.  - Know how water is transferred around a plant.  - Identify different methods of seed dispersal  - Use diagrams and explanations to describe the life cycle of a flowering plant.  Know darkness is the absence of light. - Know that light is needed to be able to see and reflects off surfaces.  - Know the difference between natural and man-made light sources and be able to give examples, e.g torch, sun, stars, lights, fires  - Know that shadows are formed when the path of light is blocked by an opaque object and can change size and shape according to distance from the light source.  - Recognise opaque, transparent and translucent objects and the effect of light on them.  - Know that some animals are nocturnal and how their eyes differ from that of humans. - Know how to protect oneself from direct sunlight and the dangers of looking directly at the sun  Recognise forces as a push or a pull.  - Know that forces can be balanced and unbalanced  - Know that gravity is a force within the earth and has a north and south pole.  - Know that magnets have a north and south pole and opposites attract while same repel  - Know that some metal materials are magnetic, while other materials are not. | Rock  Stone  pebble boulder  grain  crystal  layers  texture  fossil  marble  chalk  granite sandstone  slate  sandy  chalky  clay sedimentary igneous metamorphic  magma  lava  sediment  permeable  impermeable  erosion  nutrients nutrition carbohydrates sugar  protein vitamin vitamins minerals  fibre fats  water  skeleton  bones  muscles support protect  move  skull  ribs  spine  joints  triceps  biceps  photosynthesis pollen pollination seed formation seed dispersal wind dispersal  animal dispersal water dispersal nutrients fertiliser  Light  light source dark  absence of light transparent translucent opaque  shiny  matt  surface shadow  reflect dangerous mirror  sunlight  force  push  pull  twist  contact force non contact force  magnetic force magnet  button magnet horseshoe magnet  attract  repel magnetic material metal iron steel poles  north pole south pole | **Testing**  Set up simple practical enquiries, comparative and fair tests e.g.  • Set up a fair test with different variables e.g. the best conditions for a plant to grow  **Scientific Questioning**  Ask relevant questions and use different types of scientific enquiries to answer them  e.g. • Why does the moon appear as different shapes in the night sky?  • Why do shadows change during the day?  • Where does a fossil come from  **Measuring**  Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers , rulers and data loggers (Year 3 focus)  **Gathering and Recording**  Gather, record, classify and present data in a variety of ways to help in answering questions drawings, labelled diagrams, keys and child constructed bar charts and tables (Year 3 focus)  **Communicating Findings**  Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions (Year 3 focus)  **Classifying**  Group information according to common factors e.g. plants that grow in woodlands/plants that grow in gardens. (Yr 3 focus) e.g. Venn Diagrams with bisecting sets or Carroll Diagrams  **Scientific Research**  Use research to find out a range of things e.g.  • What are the main differences between sedimentary and igneous rocks?  **Concluding and Questioning**  Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions (Year 3 focus)  **Using Scientific Evidence**  Use straightforward scientific evidence to answer questions or to support his/her findings (Year 3 focus) |
| Local Interests and Links (online museums, local places to visit etc) | | | |
| Y4 | | **The Digestive System** Pupils should be taught to:  • describe the simple functions of the basic parts of the digestive system in humans  • identify the different types of teeth in humans and their simple functions • construct and interpret a variety of food chains, identifying producers, predators and prey  **States of Matter**  Pupils should be taught to:  • compare and group materials together, according to whether they are solids, liquids or gases  • observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)  • identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.  **Sound** Pupils should be taught to:  • dentify how sounds are made, associating some of them with something vibrating  • recognise that vibrations from sounds travel through a medium to the ear  • find patterns between the pitch of a sound and features of the object that produced  • recognise that sounds get fainter as the distance from the sound source increases.  **Electricity**  Pupils should be taught to:  • identify common appliances that run on electricity  • construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers  • identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery  • recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit  • recognise some common conductors and insulators, and associate metals with being good conductors.  **Living things and their habitat.**  Pupils should be taught to: recognise that living things can be grouped in a variety of ways explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment recognise that environments can change and that this can sometimes pose dangers to living things. | - Know the names and functions of the following parts of the digestive system: mouth, tongue, teeth, oesophagus, stomach, and small and large intestines.  - Know the three types of teeth in carnivores and herbivores and the specific jobs that they do.  - Know that teeth are covered in enamel which protects them.  - Know how to keep teeth healthy, recognising which foods can be harmful to teeth.  - Know the difference between carnivores, omnivores and herbivores. - Be able to give an example of a food chain that includes a producer, predator and prey.  - Recognise and give examples of food chains within the local area.  Know that the sun heats rivers, lakes and seas.  - Know that water then evaporates into the air and is called water vapour. - Know that the water vapour rises, cools and condenses to form clouds. - Know that the droplets in the clouds become too heavy and fall as rain, snow or hail, which runs into the rivers, lakes, seas and the whole process starts again.  - Name the three states of matter and give examples of each.  - Know solids hold a shape, liquids form a pool and gasses escape. - Explain how water changes when it is heated and cooled.  - Explain the effects of temperature of substances such as chocolate, butter and cream (to make cakes)  - Explain that sound is made when something vibrates.  - Explain that those vibrations travel through the air to the ears so it can be heard.  - Know the correlation between pitch and the object producing a sound.  - Know the correlation between volume of a sound and the strength of the vibrations that produced it.  - Know that a sound gets fainter as it travels away from a sound source  Name common appliances that run on electricity.  - Know how to construct a simple series electrical circuit.  - identify and name parts of a circuit including cells, wires, bulbs, switches, buzzers.  - Know that a switch opens and closes and circuit.  - Name a common conductor and a common insulator.  - Know that metals are good conductors.  - Draw a picture of a circuit.  - Explain how to work safely with electricity.  - Talk about patterns they notice such as bulbs getting brighter when more cells are added and that some materials can and some cannot be used to close the gap in a circuit.  Pupils should  -use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat.  -They should identify how the habitat changes throughout the year. Pupils should explore possible ways of grouping a wide selection of living things that include animals, flowering plants and non-flowering plants.  -Pupils could begin to put vertebrate animals into groups, for example: fish, amphibians, reptiles, birds, and mammals; and invertebrates into  snails and slugs, worms, spiders, and insects. Pupils should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation | digestive system digestion mouth teeth saliva oesophagus stomach small intestine large intestine nutrients rectum anus incisor canine molar premolars herbivore carnivore omnivore producer predator prey food chain  Solid  liquid  gas  state  change melting freezing melting point boiling point evaporation temperature water cycle water vapour precipitation oxygen molecules  Sound source vibrate  Travel  Pitch  High  Low  Volume  Faint  Loud  quiet insulation  soundwaves decibels  electricity electrical device mains plug  electrical - circuit component cell battery positive negative connect loose connection short circuit  Crocodile clip bulb switch buzzer motor conductor insulator metal non-metal symbol.  classification keys environment habitat human impact positive negative migrate hibernate environment | **Testing**  Set up simple practical enquiries, comparative and fair tests e.g.  Which of two instruments make the highest or lowest sound and does a glass of ice weigh more than a glass of water.  **Scientific Questioning**  Ask relevant questions and use different types of scientific enquiries to answer them e.g.  • Why are steam and ice the same thing?  • Why is the liver important in the digestive system?  • What do we mean by pitch when it comes to sound?  **Measuring**  Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers (Year 4 focus).  **Gathering and Recording**  Gather, record, classify and present data in a variety of ways to help in answering questions drawings, labelled diagrams, keys and child constructed bar charts and tables (Year 4 focus)  **Communicating Findings**  Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions (Year 4 focus)  **Classifying**  Group information according to common factors e.g. materials that make good conductors or insulators. (Yr4 focus) e.g. Venn Diagrams with bisecting sets or Carroll Diagrams.  **Scientific Research**  Use research to find out a range of things  e.g. • Which materials make effective conductors and insulators of electricity?  • How much time it takes to digest our food.  **Concluding and Questioning**  Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions (Year 4 focus)  **Using Scientific Evidence**  Use straight forward scientific evidence to answer questions or to support his/her findings  (Year 4 focus) |
|  | | Local Interests and Links (online museums, local places to visit etc) Local dentist visit. | | | |
| Yr5 | | Earth and Space  • Describe the movement of the earth, and other planets, relative to the sun in the solar system  • Describe the movement of the moon relative to the earth  Describe the sun, earth and moon as approximately spherical bodies  • Use the idea of the earth’s rotation to explain day and night and the apparent movement of the sun across the sky  **Forces**  • Explain that unsupported objects fall towards the earth because of the force of gravity acting between earth and the falling object  • Identify the effects of air resistance, water resistance and friction, that act between moving surfaces  • Recognize that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect  **Properties and Changes of Materials**  • Compare and group together everyday materials on the basis of properties (e.g. their hardness, solubility, transparency, conductivity (electrical/thermal) and response to magnets  • Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution  • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating  • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic  Demonstrate that dissolving, mixing and changes of state are reversible changes  • Explain 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  **Living Things and Their Habitats**  • Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird  • Describe the life process of reproduction in some plants and animals (sexual/asexual)  **Animals Including Humans** (Part of topic is covered by School nurse – date dependent on availability)  • Describe the changes as humans develop to old age (link to school policy on sex education) | The sun is considered to be an average size star.  - Earth is the third planet from the sun and is the only world known o support an atmosphere with free oxygen, oceans of liquid water on the surface and life.  - The Earth and other planets orbit the Sun.  - The Earths position and where abouts on the earth in relation to the Sun gives us day and night.  - 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).  A moon is a celestial body that orbits a planet (Earth has one moon;  Jupiter has four large moons and numerous smaller ones).  - Day and night are a result of the Earth’s rotation/position.  All forces are either a push or a pull.  - Gravity is a pulling force acting between Earth and a falling objects.  - Frictional force is any force that is caused due to friction.  - Surface resistance is the force on objects moving across a surface such as an ice skater, skating on ice.  - Air resistance is the force on an object moving through air.  - Water resistance is the force on objects floating on or moving in water. - Magnetic force is an invisible force created by electrons. Magnetic force controls magnetism and electricity.  - Some forces can be measured using a newton metre  - List the different uses of a pulley, lever and springs  Irreversible changes, like burning cannot be undone. Reversible changes, like melting and dissolving ca be changed back again  - Mixtures can be separated out by methods like filtering and evaporating. A change is called irreversible if it cannot be changed back again.  - Examples of reversible changes: Melting is when a solid converts into a liquid after heating. An example of melting is turning ice into water. Freezing is when a liquid converts into a solid.  - A cooked egg cannot be changed back to a raw egg again.  - Mixing substances can cause an irreversible change. For example, when vinegar and bicarbonate of soda are mixed, the mixture changes and lots of bubbles of carbon dioxide are made.  - Burning is an example of an irreversible change.  Many insects have four stages in their life cycle: egg or the unborn stage; larva  – young stage; pupa – inactive (no feeding) stage; and adult stage.  - In general, the life cycles of plants and animals have three basic stages including a fertilised egg or seed, immature juvenile, and adult. However, some organisms may have more than three life cycle stages, and the exact names of each stage can slightly differ depending on the species. (Mammal, amphibian and Insects)  - The difference between sexual and asexual reproduction in plants.  Draw a timeline to indicate stages in the growth and development of humans.  - Be able to describe some of the changes experienced in puberty.  - Children can compare the gestation periods of other animals and comparing them with humans  - Describe what happens when people get old and the changes to their bodies | Earth  sun moon spherical  solar system rotates  star  orbit  planets  galaxy hemisphere lunar calendar revolve  sundial  Force  Gravity  Earth  air resistant water resistance friction mechanisms levers  pulleys  gears  balance  drag  forces  mass  springs  force meter newton meter floats  thermal electrical insulator conductor change of state mixture dissolve solution soluble insoluble filter sieve reversible change irreversible change burning rusting new material pure impurity  life cycle reproduce sexual  asexual  l sperm  fertilise  egg  live  young metamorphosis plantlets runners  bulbs  cuttings gestation  adolescent adult asexual reproduction sexual reproduction fertilisation death teenager elderly toddler reproduction | **Testing**  Set up an investigation when it is appropriate e.g. finding out which materials dissolve or not  **Scientific Questioning**  Plan different types of scientific enquires to answer given questions.  **Measuring**  Take measurements using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate (Y5 maths focus)  **Gathering and Recording**  Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs (Year 5 focus)  **Communicating Findings**  Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations (Year 5 focus  **Classifying**  Group and classify things and recognise patterns using appropriate ways of presenting e.g. classification keys.  **Scientific Research**  Find things out using a wide range of secondary sources of information  **Concluding and Questioning**  Use results to draw conclusions. Is evaluative when explaining findings from scientific enquiries and is clear about what has happened in recent enquiries and can relate this to other enquiries where appropriate (Year 5 focus  **Using Scientific Evidence**  Identify scientific evidence that has been used to support or refute ideas or arguments (Year 5 focus) |
|  | | Local Interests and Links (online museums, local places to visit etc)Centre of life | | | |
| Yr6 | | **Light**  **Pupils should be taught to**:  • Recognise that light appears to travel in straight lines.  • Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.  • Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.  • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them  **Evolution and Inheritance**  **Pupils should be taught to:**  • Recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago.  • Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.  • Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution  **Living things and their habitats**  **Pupils should be taught to**:  • Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals  • Give reasons for classifying plants and animals based on specific characteristics.  **Animals including humans** Pupils should be taught to:  • Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.  • Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.  • Describe the ways in which nutrients and water are transported within animals, including humans.  **Electricity** **Pupils should be taught to**:  • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.  • Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.  • Use recognised symbols when representing a simple circuit in a diagram | Know that light travels in straight lines.  - Understand that because light travels in straight lines, objects are seen because they give out or reflect light into the eye.  - Know that we see things because light travels from light sources to objects then to our eyes.  - Know that light travels in straight lines and therefore shadows have the same shape as the objects that cast them.  - Know that light will travel in a completely straight line until it hits an object that will reflect it.  - Know that light doesn’t travel as fast when it has to pass through mediums that are different, such as: air, water or glass.  -Know the light that we see from the sun actually leaves the sun ten minutes before we see it.  - Know that light can be controlled and produced in so many ways.  - Know that light is a type of energy named electromagnetic radiation.  Know that evolution is a scientific theory used by biologists. It explains how living things changed over a long time, and how they have come to be the way they are.  - Know that living things have changed over time because we see their remains in rocks.  - Know that animals and plants of today are different from those of long ago.  - Know that evolution is ongoing and is still being actively researched by biologists today.  - Know about Charles Darwin and the Galapagos Islands case study concerning finches.  Know how to classify living things into broad groups according to observable characteristics and based on similarities and differences.  - Know how living things have been classified.  - Give reasons for classifying plants and animals based on specific characteristics.  - Know that an invertebrate is an animal that does not have a backbone; 97% of all animal species are invertebrates.  - Vertebrates tend to be much more intelligent than invertebrates.  - Vertebrate animals can be either warm or cold-blooded (a cold-blooded animal cannot maintain a constant body temperature as this is determined by its outside surroundings).  - Know that a wide range of ocean animals are invertebrates: sponges, corals, jellyfish and starfish are some examples.  - Know about the Linnaean system of classification. - Know that the genus and species of humans is homo sapiens.  Know the main parts of the circulatory system and their functions (heart, blood vessels, blood and lungs).  - Know that the heart will beat around 115,000 times each day, pumping around 2,000 gallons of blood.  - Know that the entire trip around the body only takes blood about 20 seconds in total.  - Know the ways in which nutrients and water are transported in animals, including humans.  - Know who William Harvey was.  - Know that the circulatory system is vital for fighting diseases and maintaining temperature.  - Know that the heart affects every part of the body and the impact that diet, exercise, drugs, alcohol, overall lifestyle and emotional well-being can have on it.  - Know that because the heart is crucial to human survival, it is essential that it is kept healthy with a well-balanced diet, regular exercise and the avoidance of things that can damage it, such as smoking.  Know that the brightness of a bulb is associated with the voltage.  - Compare and give reasons for variations in how components function.  - Use recognised symbols when representing a simple circuit in a diagram.  - Construct simple series circuits. - Answer questions about what happens when different components are used: switches, bulbs, buzzers and motors.  - Know that electricity travels at the speed of light.  - Know that electricity can come from power stations, the wind, the sun, water and even an animal’s waste.  - Know that coal is the biggest source of energy for producing electricity.  - Know that electric fields can either attract or repulse. | Light  light source dark  absence of light transparent translucent opaque  shiny  matt  surface  shadow  reflect  mirror  sunlight dangerous straight lines light ray  offspring sexual reproduction vary characteristics suited adapted environment inherited species fossils survival evolution  Vertebrates fish amphibians reptiles birds invertebrates  mammals insects spiders snails worms flowering non-flowering microorganism  Heart  Pulse  Rate  Pumps  Blood  blood vessels transported  lungs  oxygen  carbon dioxide nutrients  water muscles cycle circulatory system diet exercise lifestyle  circuit complete circuit  circuit diagram circuit symbol cell  battery  switch  bulb  buzzer  motor  voltage  fuse  terminal | **Testing**  Know which type of investigation is needed to suit a particular scientific enquiry e.g.  • Looking at the relationship between pulse and exercise. Set up a fair test when needed e.g.  • Does light travel in straight lines? Know how to set up an enquiry based investigation e.g.  • What is the relationship between oxygen and blood?  **Scientific Questioning**  Plan different types of scientific enquiries to answer their own or others' questions.  **Measuring**  Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate (Y6 focus including capacity, mass, ratio and proportion  **Gathering and Recording**  Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs (Year 6 focus)  **Communicating Findings**  Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations (Year 6 focus  **Classifying**  Group and classify things and recognise patterns using appropriate ways of presenting e.g. classification keys.  **Scientific Research**  Find things out using a wide range of secondary sources of information  **Concluding and Questioning**  Use results to draw conclusions. Is evaluative when explaining findings from scientific enquiries and is clear about what has happened in recent enquiries and can relate this to other enquiries where appropriate (Year 6 focus)  **Using Scientific Evidence**  dentify scientific evidence that has been used to support or refute ideas or arguments (Year 6 focus) |
|  | | Local Interests and Links (online museums, local places to visit etc) | | | |