









Science components and Assessment checkpoints

If you have faith as small as a mustard seed, you can say to this mountain, move from here to there and it will move; nothing would be impossible. Matthew 17:20

| EYFS - Key knowledge and skills | |
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| Overview | Children begin their journey as scientists in Nursery and Reception, exploring the world around them and being encouraged to express what they observe in words, drawings and through the questions they ask. In the EYFS framework, this aspect of Understanding the World involves “guiding children to make sense of their physical world”. Whether that be through hands-on exploration of the natural world or different textures and materials, or exploring ideas about forces through simple investigations, children are given opportunities to share their ideas and ask questions to pursue the awe and wonder of finding out about our world. Our planning provides a framework for ensuring that the foundations of inquiry and investigation are embedded through practical experiences and activities. Alongside this, we always allow scope for children to develop their common interests building on these enthusiasms to ignite curiosity as we develop projects together to ‘find out more’. Central to all of this is our key focus on building vocabulary and communication skills which will enable the children to continue as scientists in KS1 and KS2. |
| What Science might look like in our classroom | Children will explore science through first-hand experience and all of their senses. They will talk about human processes, materials and their properties, living things and their habitats, seasonal changes and physical processes. Children will learn to observe, measure, record, compare and explain in many different contexts. They will learn about testing ideas and investigating processes. Children will discuss what they see and what they think and begin to record in pictures, diagrams and tables. |
| Key knowledge in EYFS | Choose the resources they need for their chosen activities and say when they do or don’t need help. Know about similarities and differences in relation to places, objects, materials and living things. Make observations of animals and plants. Explore a variety of materials, tools and processes. Select and use technology for specific purposes. Talk about the features of their own immediate environment and how environments might vary from one to another. Explain why some things occur and talk about changes. |
| Reception Year | PLANTS - Exploring our garden and school environment - Harvest celebrations - Autumn and Spring walks -Forest school. Topic SPRING 2 How does your garden grow? ANIMALS - All about me topic - Small world animal play - Role play families Health and self care activities (washing, teeth cleaning, healthy diets) |

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| | <p>Topics – AUTUMN 1 What makes me special? AUTUMN 2 What can you see in the dark? SPRING 1 Where would you like to explore? SUMMER 2</p> <p>SEASONS - Autumn changes -Spring changes - Looking at different types of places (hot/cold)</p> <p>Topics – AUTUMN 1 What happens in Autumn? SPRING 1 Where in the world would you like to explore? SUMMER 1 How does your garden grow?</p> <p>LIVING THINGS & HABITATS - Mini-beasts -Exploring our garden and school environment – Forest school –Autumn and Spring walks</p> <p>Topics – SPRING 1 Where in the world would you like to explore? SUMMER 2 How do we know about prehistoric creatures?</p> <p>MATERIALS - Exploring different materials , Art based collage materials. Sand, Water, Loose parts, Construction kits , Cooking (links to DT) activities, Ice, water beads, playdough.</p> <p>Topics – SPRING 2 Where in the world would you like to explore? SUMMER 1 How does your garden grow? SUMMER 2 How do we know about prehistoric creatures</p> <p>VOCABULARY: herbivore face carnivore hair omnivore leg human knee animal arm fish elbow birds back head toes ear hands eye fingers mouth nose tree petals trunk fruit branch roots leaves bulb flowers seed stem material metal wood rock plastic hard glass soft paper fabric material smooth shiny rough day dark light night, Earth, moon, sun, star, Summer Spring Autumn Winter,</p> |
| Early Learning Goal | Children know about similarities and differences in relation to places, objects, materials and living things |
| Early Learning Goal | They talk about the features of their own immediate environment and how environments might vary from one another. |
| Early Learning Goal | They make observations of animals and plants and explain why some things occur, and talk about changes. |
| EYFS: Understanding the world | |

| Year 1/2 | Autumn 1 | | Spring 1 | | Summer 1 | |
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| Christian Values | Perseverance  | Compassion  | Respect  | Forgiveness  | Trust  | Courage  |
| Lead enquiry question. (Composite Outcome) | Animals incl humans-All about me Exploring everyday materials 1 | | Animals /humans -all about animals Seasonal Changes | | Plants – growing Exploring materials 2 | |
| Golden Threads | Belonging & Achieving | | Belonging & Achieving | | Belonging & Achieving | |
| Disciplinary knowledge | Animals, Including Humans (NC) Y1 - 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 Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) Notice that animals, including humans, have offspring which grow into adults | | All about animals Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) Notice that animals, including humans, have offspring which grow into adults Understand that offspring are very much (but not exactly) like their parents Understand that most animal babies need to be fed and cared for by their parents, especially human babies Recognise that pets have special needs and must be cared for Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene Seasonal changes Observe changes across the four seasons | | Plants Identify and name a variety of common wild and garden plants, including deciduous/evergreen trees Describe the basic structure of common flowering plants, including trees - seed, root, stem, branch, leaf flower 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 Materials Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, | |

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| | <p>Understand that offspring are very much (but not exactly) like their parents Understand that most animal babies need to be fed and cared for by their parents, especially human babies Recognise that pets have special needs and must be cared for Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</p> <p>Sort objects and living things into two group using a basic Venn diagram or simple table</p> <p>Everyday Materials (NC) Y1 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</p> | <p>Observe and describe weather associated with the seasons and how day length varies.</p> <p>Ask a yes/no questions to aid sorting. • Ask one/two simple research questions linked to a topic. • Choose a question to undertake a fair test. • Ask a question about what might happen over time or that is looking for a pattern. • Choose equipment to use and decide what to do and what to observe or measure in order to answer the question.</p> | <p>glass, brick, rock, paper and cardboard for particular uses. Compare how things move on different surfaces. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</p> <p>Compare objects based on obvious, observable features e.g. size, shape, colour, texture etc. • Make observations linked to answering the question</p> |
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| | <p>Compare objects based on obvious, observable features e.g. size, shape, colour, texture etc</p> | | |
| <p>Tier 3 Vocabulary</p> | <p>All about me Head , body , skeleton , limb, joint , brain, eyelash , eye, sight, pupil, sound, ear, sign language, vibration, deafness , tongue, mouth, taste, flavour, sweet, touch, fingertips, skin, organ ,brain, smell, odour, nose, nostril, nose hair</p> <p>Exploring everyday materials Material, fabric, wood, plastic, metal, object, glass, property, brick, elastic, opaque, transparent , dull, stiff, natural , manmade , factory , rubber, polyester, predict, float, sink , submerge, buoyant , absorbent , sponge, waterproof, umbrella, soak</p> | <p>Animals /all about animals Fish, amphibian, reptile, mammal, bird, feather, backbone, warm blooded, hatchling,gills, scales,cold blooded,herbivore, carnivore, omnivore, predator,canines,pet, wild, shelter,natural, similarities, differences,compare, unsuitable, climate</p> <p>Seasonal Changes Season, spring,summer,autumn, winter,hibernate,weather,protect, Harvest,frost, sleet, temperature,compare,grow, chick,warm,sun protection,heatwave,rainfall,measuring, record, results,graph</p> | <p>Plants Seed, plant,tree,soil, predict, stem, petal,leaf, root, flower,environment,weed, wild, deciduous,evergreen,seasons, branch , supermarket, fruit, vegetable,farm, tractor, growth, seedling,observe</p> <p>Everyday materials (building) Solid, strong,brick,clay, waterproof,absorbent, non absorbent, roof, slate,transparent , opaque, suitable, window pane/frame, cotton,soft,wool, evaluate,properties,</p> |
| <p>Learning Objectives (Components)</p> | <p>All about me</p> <ol style="list-style-type: none"> 1. What are the parts of the human body called? 2. How do we see? 3. How do we hear? 4. How do we taste? 5. Why is the sense of touch important? 6. Why is the sense of smell important? | <p>All about animals</p> <ol style="list-style-type: none"> 1. What are the different groups of animals? 2. What are the differences between mammals and birds? 3. What are the differences between amphibians, reptiles and fish? 4. What types of food do living things eat? 5. What are the differences between wild animals and pets? | <p>Plants</p> <ol style="list-style-type: none"> 1.How do seeds grow into plants? 2. What are the parts of a plant or tree? 3.How do plants grow in different environments? 4.What is the difference between deciduous and evergreen trees? 5. What makes fruit, vegetables and tree types of plant? 6.How did your beans grow? |

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| | <p><u>Everyday Materials</u></p> <ol style="list-style-type: none"> 1. What are these everyday materials? 2. What is the object and what is it made from? 3. Can you describe the properties of everyday materials? 4. Which materials are natural or manmade? 5. Which of the objects will float or sink? 6. Which materials are absorbent and not absorbent? | <ol style="list-style-type: none"> 6. What are the characteristics of different animals? <p><u>Seasonal Changes</u></p> <ol style="list-style-type: none"> 1. How many seasons are there? 2. What happens in Autumn and how does it affect animals? 3. What changes take place in Winter and what is the weather typically like? 4. What changes take place in Spring and how is it different to Winter? 5. What is it like in Summer? 6. How can I explore the rainfall over five weeks? | <p><u>Use of everyday materials</u></p> <ol style="list-style-type: none"> 1. What are the properties and uses of different materials? 2. What materials are suitable to build a bridge? 3. How much can materials stretch without breaking? 4. How do materials change when you bend, twist, squash and stretch them? 5. Who is Charles Macintosh and what materials are 6. Who is John McAdam and how do you build a suitable road? waterproof? |
| <p>Assessment checkpoints</p> | <p>Children who are secure will be able to:</p> <p><u>All about me</u></p> <p>As a scientist I will know</p> <p>Identify the different parts of the human body and explain what they are used for</p> <p>Know the basic parts of the eye and their functions</p> | <p>Children who are secure will be able to:</p> <p><u>All about animals</u></p> <p>As a scientist I will know</p> <p>Name, describe and compare a variety of common birds and mammals</p> <p>Name, describe and compare a variety of common amphibians, reptiles and Fish</p> <p>Explain the difference between herbivores, carnivores and omnivores</p> | <p>Children who are secure will be able to:</p> <p><u>Plants</u></p> <p>As a scientist I know</p> <p>Identify a plant Explain how to plant a seed</p> <p>Predict what might happen to their seed</p> <p>Correctly label the parts of a plant</p> <p>Correctly label the parts of a tree.</p> |

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| | <p>Understand that our ears allow us to hear Know that our ears help us tell the direction sound is coming from Understand that sound is made up of vibrations Understand that our tongue allows us to taste Understand that our skin helps us to feel Know that our nose allows us to smell Understand that we can smell many different flavours.</p> <p><u>Everyday materials</u> As a scientist I will know Understand , describe and identify what a material is</p> <ul style="list-style-type: none"> • Understand that all objects are made from materials • Identify what material an object is made from • Understand that different objects can be made from the same material Give simple descriptions of everyday materials • Describe the properties of everyday materials • Explain why materials are chosen for objects. Understand that some materials are natural and some are manmade | <p>Sort animals into those that are wild and those that are suitable for a pet Draw and label an animal and write about its characteristics, using some scientific language Draw and label an animal and write about its characteristics, using some scientific language</p> <p><u>Seasonal changes</u> As a scientist I will know Understand what changes the four seasons bring Understand the different weather that happens in winter Observe changes across the 4 seasons Make comparisons between winter and spring Make comparisons about the amount of rainfall over 5 weeks</p> <ul style="list-style-type: none"> • Draw a graph to show the amount of rainfall over 5 weeks • Draw a graph and write a conclusion explaining my results <p>Perform simple tests</p> | <p>Make careful observations Group plants according to their features Make comparisons between a deciduous tree and an evergreen tree Understand that plants are a source of food Understand that plants grow over time Record the growth of a plant</p> <p><u>Use of everyday materials</u> As a scientist I will know</p> <ul style="list-style-type: none"> • Understand what a material is • Know the properties of a variety of everyday materials • Explain why some materials are suitable for specific uses <p>Understand that materials differ in strength and can be strengthened by changing their structure</p> <p>Compare how some objects change after stretching while other objects return to their original form</p> <p>Compare how the shapes of objects change when they are twisted, bent, squashed or stretched</p> |
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| | <p>Understand that some objects float, and some objects sink</p> <ul style="list-style-type: none">• Predict and identify if an object will float or sink <p>Understand that some materials soak up water</p> <ul style="list-style-type: none">• Compare materials that are absorbent and not absorbent | | <p>Understand the properties of materials that make them suitable or unsuitable for particular purposes</p> <p>Know that some materials can be melted and mixed with other materials to change their properties</p> |
| <p>When do Assessment checkpoints happen?</p> | <p><i>End of unit assessments</i></p> | <p>End of unit assessments</p> | <p>End of unit assessments</p> |

| Year 3/ 4 | Autumn 1 | | Spring 1 | | Summer 1 | |
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| Christian Values | Perseverance  | Compassion  | Respect  | Forgiveness  |  Trust | Courage  |
| Lead enquiry question. (Composite Outcome) | Animals incl humans-Food and digestion Classifying living things and their habitats | | States of matter Sound | | Electricity Living things and their habitats- Nature and the environment | |
| Golden Threads | Belonging & Achieving | | Achieving | | Belonging & Achieving | |
| Disciplinary knowledge | Animals incl humans Describe the simple functions of the basic parts of the digestive system in humans Describe the functions and parts of the excretion system in humans Identify the different types of teeth in humans and functions Understand how to take care of your body with a healthy diet, including the ‘food pyramid’, vitamins and minerals Construct and interpret a variety of food chains, identifying producers, predators and prey Classifying living things and their Habitats Recognise that living things can be grouped in a variety of ways | | States of matter Compare and group materials together according to whether they are solids, liquids or gases Observe that some materials change state when heated or cooled, and measure or research the temperature at which this happens in degrees Celsius Identify the part played by evaporation and condensation in the water cycle: associate the rate of evaporation with temperature Sound Identify how sounds are made, associating some of them with something vibrating | | Electricity Identify common appliances that run on electricity Make simple series circuit - cells, wires, bulbs, switches and buzzers Identify if a lamp will light in a simple circuit, based on being part of a complete loop with a battery Recognise that a switch opens/closes a circuit and associate this with whether or not a lamp lights in a series circuit Recognise conductors & insulators Nature and the environment Recognise that environments can change and that this can sometimes pose dangers to living things | |

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| | <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>Become familiar with and recognise basic characteristics of: fish, amphibians, reptiles, birds and mammals</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things</p> <p>Understand how ecosystems can be affected by changes in environment (for example, rainfall, food supply, etc.) and by man-made changes Understand man-made effects of the environment</p> <p>Ask a range of Yes/No questions to aid sorting •</p> <p>Ask a range of research questions linked to a topic. •</p> <p>Ask a range of question to undertake a fair test. •</p> <p>Ask a range of question about what might happen over time or that is looking for a pattern</p> <p>Sort objects and living things into groups using intersecting Venn and Carroll diagrams</p> <p>Spot patterns in the classification data, particularly two criteria with no</p> | <p>Recognise that vibrations from sounds travel through a medium to the ear, and that sound waves are slower than light waves</p> <p>Find patterns between the pitch of sounds and features of the object/speed of vibration</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it Recognise that sounds get fainter as distance from source increases</p> <p>Compare objects based on more sophisticated, observable features and present observations in labelled diagrams. •</p> <p>Make a range of relevant observations linked to the question.</p> | <p>Understand how ecosystems can be affected by changes in environment (for example, rainfall, food supply, etc.) and by man-made changes</p> <p>Understand man-made effects of the environment</p> <p>Compare objects based on more sophisticated, observable features and present observations in labelled diagrams. • Make a range of relevant observations linked to the question.</p> |
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| | examples - e.g. there are no living things with wings and no legs | | |
| Tier 3 Vocabulary | <p><u>Animals incl humans</u> Digestive system, esophagus, stomach, small intestine, large intestine, saliva, peristalsis, absorb, liver, gall bladder, incisors, canines, molars, jaw, enamel, plaque, tooth decay, cavity, fluoride, ecosystem, producer, consumer, prey, predator</p> <p><u>Classifying living things and their habitats</u> Habitat, microhabitat, conditions, adapted, camouflage, coastal, grassland, environment, climate, exposure, classify, characteristics, vertebrate, invertebrate, species, sub-groups, identify, criteria, organism, adapted, region, features, blubber, ecosystem, oxygenized, flowering/nonflowering plant, pond dipping</p> | <p><u>States of matter</u> Matter , solid, liquid, gas, volume, particle, bond, arranged, cooled, heated, melting, melting point, temperature, thermometer, freezing, reverse, sublimation, deposition, evaporation, condensation, absorb, Water vapor, process, water cycle, precipitation, transpiration, groundwater.</p> <p><u>Sound</u> Vibration, waves, eardrum,signals, source, energy,particles, echo, vacuum, reflect, absorb,insulate,defenders, volume, decibels,amplitude,pitch, high/low pitch, orchestra, sound source,fade.</p> | <p><u>Electricity</u> Batteries, mains electricity, appliances, socket, circuit, series circuit, component, cell, voltage, current, power, wire, bulb, conductor, insulator, metal, copper, rubber, switch, control, complete/incomplete circuit, non renewable energy, wind turbines, solar panels, hydropower</p> <p><u>Living things and their habitats – nature and environment</u> monsoon • ecosystem • Northern Hemisphere • migrate • Southern Hemisphere drought • recycling • deforestation • biodiversity • rainforest greenhouse gases • fossil fuels • emissions • pollution • climate change sewage • chemicals • pesticides • water treatment plant • contaminate freshwater • pure • drought • conserve recycling • endangered • conservation areas</p> |
| Learning Objectives (Components) | <u>Animals including humans –Food and digestion</u> | <p><u>States of matter</u> 1. What is the difference between a solid, liquid and gas?</p> | <p><u>Electricity</u> 1. How can we stay safe with electrical appliances? 2. How can I create a simple circuit?</p> |

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| | <ol style="list-style-type: none"> 1. What is the digestive system and what does each organ do? 2. What is the function of each organ in the digestive system? 3. What are the different types of teeth and what is their function? 4. How can we plan and carry out a fair test about the effect of different liquids on our teeth? 5. What are the different parts of a food chain? 6. How can I create a food web for a specific eco system? <p><u>Classifying living things and their habitats</u></p> <ol style="list-style-type: none"> 1. How are animals suited to their environment? 2. How can I research a habitat? 3. How are animals organized into different classification groups? 4. What is a classification tree? 5. How can I consider specific features that suits an animal to its habitat? 6. What life can be found in a pond habitat? | <ol style="list-style-type: none"> 2. How can temperature change the state of a material? 3. How can I explore melting points? 4. What are the freezing and boiling points of different substances? 5. How can I plan a fair test about evaporation? 6. What is the water cycle? <p><u>Sound</u></p> <ol style="list-style-type: none"> 1. How is sound made? 2. How does sound travel? 3. How and why can sound be muffled? 4. How can we explore volume? 5. How can pitch be altered? 6. What is the relationship between distance and volume? | <ol style="list-style-type: none"> 3. Can I identify if a circuit is complete or incomplete? 4. What materials make good electrical conductors and insulators? 5. How can I make a switch? 6. How can I explore the components in a circuit? <p><u>Living things and their habitats- nature and environment</u></p> <ol style="list-style-type: none"> 1. What are ecosystems and how are seasons different around the world? 2. What is deforestation and how does it affect biodiversity? 3. What is air pollution and what effects does it have? 4. How can water be purified? 5. How can we conserve water? 6. Why is animal conservation important and how can we help |
| <p>Assessment checkpoints</p> | <p>Children who are secure will be able to: <u>Animals including humans –Food and digestion</u> <u>As a scientist I will know</u></p> | <p>Children who are secure will be able to: <u>States of matter</u> <u>As a scientist I will know</u> Identify the 3 states of matter</p> | <p>Children who are secure will be able to: <u>Electricity</u> <u>As a scientist I will know</u></p> |

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| | <ul style="list-style-type: none"> • Identify the main organs of the human digestive system • Create an accurate diagram of the main organs of the human digestive system • Explain the role of the digestive system and the organs within <p>Describe the functions of the organs in the digestive system</p> <ul style="list-style-type: none"> • Use a model of the digestive system to explain the journey of food • Explain how the equipment used in the model relates to the digestive system <p>Identify the different types of human teeth</p> <ul style="list-style-type: none"> • Explain the functions of the different types of human teeth • Explain why humans have 2 sets of human teeth • Observe and record the effect of each liquid • Draw conclusions from the investigation • Explain how to care for your teeth <p>Identify the key parts of a food chain</p> <ul style="list-style-type: none"> • Create a food chain within a chosen ecosystem • Explain why it is important to keep food chains balanced <p>Research living things within a chosen ecosystem</p> | <p>Describe the properties of the 3 states of matter</p> <p>Classify substances based on their state of matter</p> <p>Describe how particles behave in each state of matter</p> <p>Explain how substances change state</p> <p>State the temperature at which water changes state</p> <p>Understand melting points</p> <p>Observe and accurately record the temperature at which food changes state</p> <p>Predict the melting point of different foods</p> <p>Describe freezing and boiling points</p> <p>Create an accurate bar chart</p> <p>Research freezing and boiling points</p> <p>Define evaporation and condensation</p> <p>Investigate the effect of temperature on the rate of evaporation</p> <p>Raise further questions to be investigated</p> <p>Explain the water cycle</p> | <p>Identify common appliances that run on electricity</p> <ul style="list-style-type: none"> • Understand the dangers of using electrical appliances <p>Identify electrical components</p> <ul style="list-style-type: none"> • Create a simple electrical circuit • Explain how a simple electrical circuit works <p>Create a simple electrical circuit</p> <ul style="list-style-type: none"> • Predict if a simple electrical circuit will work • Know the difference between a complete and an incomplete circuit <p>Understand the difference between an insulator and a conductor</p> <ul style="list-style-type: none"> • Investigate which objects are conductors and which are insulators • Give examples of insulators and conductors in everyday appliances <p>Understand how a switch works</p> <ul style="list-style-type: none"> • Explain how an electrical switch works • Apply knowledge of how a switch works to create a switch • Pose an investigation question and make a prediction • Set up an investigation to prove or disprove a prediction • Set up an investigation to prove or disprove a prediction and provide a detailed conclusion |
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| | <ul style="list-style-type: none"> • Create a food web for a chosen ecosystem • Identify threats to living things within their chosen ecosystem <p><u>Classifying living things and their habitats</u></p> <p><u>As a scientist I will know</u></p> <p>Understand that living things are suited to different environments Group living things according to the environment they are suited to Identify the similarities between animals that live in the same habitat</p> <p>Describe habitats that are found in the UK Research key facts about a habitat and report on the climate, temperature and type of soil and water they would typically find there Research and describe habitats that are found in the UK and the threats that living things face</p> <ul style="list-style-type: none"> • Organise animals into different classification groups. • Identify which groups some animals can be classified as. <p>Know different ways we can classify animals into groups.</p> | <p><u>Sound</u></p> <p><u>As a scientist I will know</u></p> <p>Understand that sound is created by vibrations</p> <ul style="list-style-type: none"> • Explain how sound is created and how it travels from an object to the ear • Explain how sound is created, travels and is interpreted by the brain <ul style="list-style-type: none"> • Explain how sound waves travel through air, liquids and solids • Compare how sound waves travel through air, liquids and solids <p>Understand that materials that absorb sound are sound insulators</p> <ul style="list-style-type: none"> • Explain why some materials absorb sound <p>Understand that the volume of sound is measured in decibels</p> <ul style="list-style-type: none"> • Understand that the volume of a sound is dependent on how much energy or power the sound source is given • Understand that as the volume of sound increases so too does the | <p><u>Living things and their habitats – nature and the environment</u></p> <ul style="list-style-type: none"> • <u>As a scientist I will know</u> <p>Understand that ecosystems are affected by changes in the seasons • Understand that habitats around the world experience different seasons which changes their ecosystem • Understand that it is not just the seasons which cause ecosystems to change</p> <p>Understand human impact on the environment through deforestation • Use scientific evidence to present your findings about deforestation • Explore the measures humans can take to protect the rainforests</p> <p>Understand what air pollution is • Explore what contributes to air pollution • Identify the</p> |
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| | <p>Understand how to interpret a classification key Create a classification key using a series of questions Create a complex classification key using a series of questions that group animals into sub-groups before identifying the species Understand that animals adapt to suit their environment Describe how animals adapt to their environment Apply knowledge of adaptations to create a classification key for a 'new' species Name some plants that live in a pond habitat Describe plants that live in a pond habitat Classify and sort plants that live in pond habitat</p> | <p>amplitude, or height, of the sound waves Understand that pitch is how low or high a sound is <ul style="list-style-type: none"> • Understand that pitch is caused by the speed of the sound source's vibrations • Understand how a sound wave is different for a high pitch and a low pitch • Understand that sound fades as it travels • Understand why sound fades as it travels • Explain the relationship between distance and volume </p> | <p>impact air pollution has on the environment and human health Understand how water pollution is caused <ul style="list-style-type: none"> • Explain the impact of different kinds of water pollution <ul style="list-style-type: none"> • Identify how to prevent water pollution Understand that there are ways humans can protect the environment • Suggest ways in which humans can protect the environment • Explain how humans can protect the environment in our everyday life</p> |
| <p>When do Assessment checkpoints happen?</p> | <p><i>End of unit assessments</i></p> | <p>End of unit assessments</p> | <p>End of unit assessments</p> |

| Year 5 | | Autumn 1 | | Spring 1 | | Summer 1 | |
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| Christian Values | Perseverance  | Compassion  | Respect  | Forgiveness  | Trust  | Courage  | |
| Lead enquiry question. (Composite Outcome) | Properties of materials Changes of materials | | Forces Earth and Space | | Studying living things Animals incl humans- The human life cycle | | |
| Golden Threads | Achieving | | Belonging, Aspiring & Achieving | | Belonging & Achieving | | |
| Disciplinary knowledge | <p>Compare and group together everyday materials on the basis of their properties</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution (solute/solvent)</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated</p> <p>Give reasons for the particular uses of everyday materials, including metals, wood and plastic</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible</p> | | <p>Forces</p> <p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object Identify the effects of air resistance, water resistance and friction, that act between moving surfaces Recognise that some mechanisms, including levers, pulleys, gears, inclined planes, wedges and screws allow a smaller force to have a greater effect</p> <p>Understand how a gear works and some of its common uses</p> <p>Use test results to make predictions for further investigations</p> <p>Earth and Space</p> <p>Describe the movement of the Earth, and other planets, relative to the Sun</p> | | <p>Studying living things</p> <p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>Describe the life process of reproduction in some plants and animals</p> <p>Animals and humans – human life cycle</p> <p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>Describe the life process of reproduction in some plants and animals</p> <p>Understand the growth stages of a human: embryo, foetus, new-born, infancy, childhood, adolescence,</p> | | |







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| | <p>Use test results to make predictions for further investigations</p> <p>Put appropriate headings onto intersecting Venn and Carroll diagrams.</p> <ul style="list-style-type: none"> • Choose a research source from a range provided • Decide what to change and what to measure or observe • Decide how often to take a measurement <p>Ask a range of Yes/No questions to aid sorting and decide which ways of sorting will give useful information.</p> <ul style="list-style-type: none"> • Ask a range of questions recognising that some can be answered through research and others may not • Ask a range of questions and identify the type of enquiry that will help to answer the questions. Ask further questions based on results | <p>in the solar system (revision and development of yr2)</p> <p>Describe the movement of the Moon relative to the Earth and understand the moon's phases (revision and development of yr2)</p> <p>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</p> <p>Understand Big Bang theory and the universe Understand how seasons are caused by Earth's orbit and rotation</p> <p>Ask a range of Yes/No questions to aid sorting and decide which ways of sorting will give useful information.</p> <ul style="list-style-type: none"> • Ask a range of questions recognising that some can be answered through research and others may not • Ask a range of questions and identify the type of enquiry that will help to answer the questions. Ask further questions based on results | <p>adulthood, old age Understand external fertilisation of some animals Understand internal fertilisation of some animals (e.g. birds and mammals)</p> <p>Understand development of an embryo - egg, zygote, embryo, growth in uterus, foetus, new-born</p> <p>Create branching databases (tree diagrams) and keys to enable others to name living things and objects</p> <ul style="list-style-type: none"> • Present what they learnt in a range of ways e.g. different graphic organisers, line graphs and scatter graphs <p>Ask a range of Yes/No questions to aid sorting and decide which ways of sorting will give useful information.</p> <ul style="list-style-type: none"> • Ask a range of questions recognising that some can be answered through research and others may not • Ask a range of questions and identify the type of enquiry that will help to answer the questions. Ask further questions based on results <p>Explain using evidence that the branching database or classification key will only work for the living things or materials it was created for.</p> <ul style="list-style-type: none"> • Talk |
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| | | | <p>about their degree of trust in the sources they used. • Explain their degree of trust in their results (e.g. precision in measurements, variables that may not have been controlled, and accuracy of results.</p> |
| <p>Tier 3 Vocabulary</p> | <p><u>Properties of materials</u> Conductive,magnetic,durable, transparent,versatile, thermal, conduction,molecules, insulator, force,dissolve, solute,insoluble,soluble,solvent, saturation,evaporation <u>Changes of materials</u> Solvent , solution,evaporate,reversible,physical change, irreversible, effervesence,fair test,variable,control variable,corrosion,rusting,combustion, extinguish, smother , predict, acid, carbon dioxide</p> | <p><u>Forces</u> Gravity, astronomy,weight, mass, air resistance, opposing,streamlines, water resistance,upthrust,buoyant,sink, friction, lubricant,Newton meter,lever,pivot,fulcrum,pulley, mechanism, gear, bevel gear <u>Earth and space</u> Terrestrial planet,Solar system, spherical, orbit,astronomy , heliocentric,geocentric, dwarf planet ,axis, poles, hemisphere,gnomon,shadow,moon phase, waxing,waning,eclipse,rocky/gas planet</p> | <p><u>Studying living things</u> Reproduction , asexual , genes, tuber, fertilisation , placental mammal, monotreme mammal, marsupial , pouch, amphibian, metamorphosis, larva, caterpillar, pupa, egg, fledgling, egg tooth, embryo, hatch, primatologist, endangered, naturalist <u>Animals incl humans the human cycle</u> Adolescent, foetus, reproduce, puberty, gestation, pregnant, duration, embryo, trimester,womb, bloodstream, hormone, growth</p> |
| <p>Learning Objectives (Components)</p> | <p><u>Properties of materials</u> 1. How can the properties and uses of different materials be compared? 2. How do thermal conductors and thermal insulators differ? 3. How can we compare the hardness of materials?</p> | <p><u>Forces</u> 1. What is gravity and who was Sir Isaac Newton? 2. What is gravity and air resistance? 3. What is friction and water resistance? 4. What are the effects of friction on different surfaces?</p> | <p><u>Studying living things</u> 1. What are the life processes of a plant? 2. What are the different lifecycle of mammals? 3. How are the lifecycles of insects and amphibians different?</p> |

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| | <p>4. How can materials that are soluble or insoluble be compared?</p> <p>5. How can I investigate the solubility of different materials?</p> <p>6. How can filtering, sieving, evaporating and using magnets separate mixtures?</p> <p><u>Changes of materials</u></p> <p>1. How can evaporation be used to recover the solute from a solution?</p> <p>2. How can a change be reversed?</p> <p>3. How do we know when new materials are made from a chemical reaction?</p> <p>4. How is rusting a irreversible change and how could you prevent it?</p> <p>5. How fires burn and how can be extinguish them?</p> <p>6. How can we make a fizzy rocket?</p> | <p>5. How do gears work?</p> <p>6. How do gears work together?</p> <p><u>Earth and space</u></p> <p>1. What are the planets of the solar system?</p> <p>2. Why do we have day and night?</p> <p>3. How does a planet’s distance from the sun affect the length of its year?</p> <p>4. What are the different phases of the moon?</p> <p>5. Is the earth flat ?</p> | <p>4. What are the parts of an egg ?</p> <p>5. Why is David Attenborough and Jane Goodall’s research so important for animal con<u>h</u></p> <p><u>Animals incl The human life cycle</u></p> <p>1. What are the key stages of a mammal’s life cycle?</p> <p>2. What is a gestation period?</p> <p>3. What is foetal development?</p> <p>4. What are the changes experienced in puberty?</p> <p>5. How do humans change during old age?</p> |
| <p>Assessment checkpoints</p> | <p>Children who are secure will be able to:</p> <p><u>Properties of materials</u></p> <ul style="list-style-type: none"> As a Scientist, I can group materials according to their properties. | <p>Children who are secure will be able to:</p> <p><u>Forces As a scientist I will</u></p> <ul style="list-style-type: none"> Explore the life and work of Isaac Newton <p>Understand the influence gravity has on the universe</p> | <p>Children who are secure will be able to:</p> <p>Children will</p> <p><u>Animals incl humans –the human cycle- As a scientist I will</u></p> <p>To explain explain the different parts of the life cycle of a human and compare to another animals</p> |

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| | <ul style="list-style-type: none"> • As a Scientist, I can Identify materials that are thermal conductors • As a Scientist, I can investigate the hardness of materials. • As a scientist I understand what the term 'dissolve' means. • As a scientist I can ask questions that explore the solubility of a solute. • As a Scientist, I can • Identify the different separation processes • As a scientist I can carry out a fair test <p><u>Changes of materials</u> As a Scientist, I can</p> <ul style="list-style-type: none"> • Describe how evaporation can be used to get the salt back from salty water <p>As a Scientist, I can Identify materials that are thermal conductors As a Scientist,</p> <ul style="list-style-type: none"> • Name some irreversible changes <p>Use observations to describe how you can tell an irreversible change has taken place Explain why the change is irreversible and what new products have been made</p> | <ul style="list-style-type: none"> • Understand how air resistance acts on objects Design and test parachutes, using averages to get more accurate results Draw an accurate diagram of the forces acting on a parachute and explain their purpose • Understand how water resistance acts on objects • Describe the forces acting on an object floating in water <p>Identify the similarities and differences between air and water resistance</p> <ul style="list-style-type: none"> • Understand how friction acts on objects • Accurately use a Newton meter to measure a force • Name the forces acting on a range of objects <p>Describe the effect forces can have on an object Explain how gears work</p> <ul style="list-style-type: none"> • Explain how gears work and their purpose • Create a set of interacting gears <p>Notice patterns in the workings of gear</p> <ul style="list-style-type: none"> • <u>Earth and space</u> | <p>I know that animals have different lengths and variations of gestation periods</p> <p>I understand which methods suit different plants To compare the needs of an older child to a newborn child. Understand how humans age</p> <p><u>Studying iving Things –the human cycle</u> As a scientist I will know Sexual and asexual reproduction in plants</p> <p>Similarities and differences between mammals</p> <p>Explain the lifecycle of a mammal</p> <p>Explain the similarities between insect and amphibian life cycles</p> <p>Recall facts about the structure of an egg</p> |
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| | <p>Identify rusting as an irreversible change Plan an experiment to investigate rusting and include how to make it a fair test As a Scientist, I can</p> <ul style="list-style-type: none"> • Identify the 3 factors a fire needs to burn <p>Describe and explain different methods for extinguishing a fire As a Scientist, I can Predict the best substances used to make the fizzy rocket</p> <ul style="list-style-type: none"> • Use experiment results to test a prediction and write a conclusion to show the best substances to make a fizzy rocket <p>Use measuring equipment to suggest ways to improve the accuracy of the observations made in the experiment</p> | <ul style="list-style-type: none"> • Name key characteristics of a planet <p>Understand the order of the planets from the Sun</p> <ul style="list-style-type: none"> • Explain why we have day and night • Explore how the tilt of the earth creates seasons • Explore how the planet's distance affects the length of its year. • I can present my results in both a table and line graph <p>Why the moon has different phases</p> <ul style="list-style-type: none"> • The rotation of the moon <p>Describe the sun, earth and moon as approximately spherical bodies.</p> <p>Use my scientific knowledge and vocabulary to argue 'Is the earth flat?'</p> | <p>Understand the lifecycle of a bird and reptile</p> <p>Understand the importance of documenting living things and highlighting their decline in the world</p> <p>Suggest ideas for conservation</p> |
| <p>When do Assessment checkpoints happen?</p> | <p><i>End of unit assessments</i></p> | <p>End of unit assessments</p> | <p>End of unit assessments</p> |

| Year 6 | Autumn 1 | | Spring 1 | | Summer 1 | |
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| Christian Values | Perseverance  | Compassion  | Respect  | Forgiveness  | Trust  | Courage  |
| Lead enquiry question. (Composite Outcome) | Animals inc humans – The heart and circulatory system Living things and habitats Linnean system,organisms and microorganisms | | Electricity Light | | Evolution and inherit Looking after our environment | |
| Golden Threads | Belonging and Aspiring | | Belonging and achieving | | Belonging | |
| | Animals incl humans – The heart and circulatory system Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood Understand the basic workings of the respiratory system Recognise the impact of diet, exercise, drugs and lifestyle on the way bodies function Describe the ways that nutrients/water are transported within humans Create branching databases (tree diagrams) and keys to enable others to name living things and objects | | Electricity Associate the brightness of a lamp or volume of a buzzer with the number and voltage of cells used in the circuit Compare/give reasons for variations in how components function, including brightness of bulbs, loudness of buzzers and on/off position of switches (open and closed circuits) Understand short circuits Understand electric current Use recognised symbols when representing a simple circuit in a diagram Identify specific clear questions that will help to sort without ambiguity • Choose suitable sources to use | | Evolution and Inheritance (NC) Recognise that living things have changed over time and that fossils provide info about living things that inhabited Earth millions of years ago Recognise that living things produce offspring of the same kind but they vary and aren't identical to parents Identify how animals and plants are adapted to suit their environment in different ways and that this leads to evolution Looking after our environment | |

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| | <ul style="list-style-type: none"> • Present what they learnt in a range of ways e.g. different graphic organisers, line graphs and scatter graphs Talk about the features that items share and do not share based on the information in the key etc Use data to show that items grouped together have more things in common than with things in other groups • Provide detailed oral or written explanations for their findings <p>Linnean system , organisms and microorganisms</p> <p>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</p> <p>Give reasons for classifying plants and animals based on specific characteristics</p> <p>Understand basic taxonomy</p> <p>Understand different classes of vertebrates and major characteristics (review of Y4)</p> <p>Understand basic cell structure</p> <p>Understand the differences between animal & plant cells</p> | <ul style="list-style-type: none"> • Recognise and independently control variables where necessary. • Decide how often to take a measurement. <p>Light</p> <p>Recognise that light appears to travel in straight lines (revision)</p> <p>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</p> <p>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then eyes</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. Understand workings of different mirrors: plane, concave, convex Understand use of mirrors in telescopes</p> <p>Identify specific clear questions that will help to sort without ambiguity</p> <ul style="list-style-type: none"> • Choose suitable sources to use • Recognise and independently control variables where necessary. • Decide how often to take a measurement. | <p>Ask a range of questions recognising that some can be answered through research and others may not</p> <ul style="list-style-type: none"> • Ask a range of questions and identify the type of enquiry that will help to answer the questions. <p>Ask further questions based on results.</p> <p>Plan an Enquiry .</p> <ul style="list-style-type: none"> • Choose a research source from a range provided <p>Answer questions using scientific evidence gained from a range of sources.</p> <p>Describe causal relationships, change over time and identify patterns</p> |
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| | <p>Create branching databases (tree diagrams) and keys to enable others to name living things and objects</p> | <p>Compare not only based on physical properties but also on knowledge gained through previous enquiry.</p> <ul style="list-style-type: none"> • Make a range of relevant observations linked to the question | |
| <p>Tier 3 Vocabulary</p> | <p><u>Animals inc humans – The heart and circulatory system</u></p> <ul style="list-style-type: none"> • circulatory system • atrium • ventricle • vessel • valves • artery • vein • capillary • Microscope • blood • plasma • platelet • white blood cell • red blood cell • absorb • diffusion • osmosis • concentration • nutrient • diet • exercise • heart rate • BPM - beats per minute • pulse | <p><u>Electricity</u></p> <ul style="list-style-type: none"> • circuit diagram • symbol • battery • circuit • wires • voltage • voltmeter • brightness • electricity • current • blown • variable resistor • dimmer switch • LED • resistor • variable • control test • fair test • output • systematically <p><u>Light</u></p> <ul style="list-style-type: none"> • symbol • eye • light | <p><u>Evolution and inherit</u></p> <ul style="list-style-type: none"> • offspring • characteristic • inherit • variation • environmental • adaptation • habitat • climate • nutrition • feature • nutrients • epiphytes • toxic • predator • pollinate • fossil • Mary Anning • palaeontologist • ichthyosaurus • Charles Darwin • evolve • theory • natural selection • extinct |

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| | <ul style="list-style-type: none">• stimulant• depressant• hallucinogen• painkiller• drug <p><u>Living things and habitats</u></p> <p>classify spore micro-organism seed similarities multicellular unicellular kingdom cell MRS GREN</p> <p>Genus Species plant microscopic fungi mycelium Ecosystem habitat</p> | <ul style="list-style-type: none">• light source• scientific diagram• reflected• mirror• bounce• Direction• angle• periscope• mirror• line of sight• Utilise• shadow• block• opaque• transparent• translucent• | <ul style="list-style-type: none">• ancestor• tool• primate• homo sapiens• Neanderthal <p><u>Looking after our environment</u></p> <ul style="list-style-type: none">• prevent• global warming• climate• climate change• Weather• adaptation• habitat• climate• nutrition• feature• net zero• renewable• non-renewable• greenhouse gases• emissions• combustion• fossil fuel• fuel• coal• industrial revolution• sustainability• subsidy• pledge |
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| | | | <ul style="list-style-type: none"> • conference • species • natural disaster • sensitive • habitat • vulnerable • |
| <p>Learning Objectives (Components)</p> | <p><u>Animals inc humans – The heart and circulatory system</u></p> <ol style="list-style-type: none"> 1. What is the role of the heart in the circulatory system? 2. What is the function of blood vessels? 3. What is the purpose of blood? 4. How does the body transport water and nutrients? 5. What affects the heart rate? 6. What is the impact of drugs and alcohol on the body? <p><u>Living things and habitats</u></p> <ol style="list-style-type: none"> 1. Why is it useful to classify something in science? 2. How are the kingdoms of life identified? | <p><u>Electricity</u></p> <ol style="list-style-type: none"> 1. What are the parts of an electrical circuit? 2. How is the brightness of a bulb affected by the voltage? 3. What problems may occur in a circuit? 4. What affects the output of a circuit? 5. How do you create a switch? 6. How do you wire a loop game ? <p><u>Light</u></p> <ol style="list-style-type: none"> 1. How does light travel? 2. How is light reflected off surfaces? | <p><u>Evolution and inherit</u></p> <ol style="list-style-type: none"> 1. Are offspring different? 2. How does an animal adapt to its environment? 3. How does a plant adapt to its environment? 4. What can we learn from fossils? 5. What is evolution and natural selection? 6. What is human evolution? <p><u>Looking after the environment</u></p> <ol style="list-style-type: none"> 1. What is climate change ? 2. How can I help to reduce landfill? 3. How can we reduce energy consumption? |

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| | <p>3. How are living things classified into groups? 4. What is a micro-organism and what are the different types? 5. What is asexual reproduction in living things? 6. How do you describe and classify a living organism ?</p> | <p>3. Can light be reflected off more than one surface? 4. What causes a shadow to change? 5. What creates a shadow? 6. How is a rainbow made?</p> | <p>4. What happens when fossil fuels are burnt? 5. What was the outcome of COP26? 6. What weather is an indicator of climate change?</p> |
| <p>Assessment checkpoints</p> | <p>Children who are secure will be able to: <u>Animals inc humans – The heart and circulatory system</u> As a scientist I can describe the structure and function of the heart, identify oxygenated and deoxygenated blood and describe how the blood moves around the heart identify and compare blood vessels describe the composition of blood and create pie chart to represent the data explain how water and nutrients are transported and understand the meaning of osmosis. create an experiment to accurately measure the pulse and describe how life choices affect health define use of different drugs and alcohol on health <u>Living things and habitats</u> As a scientist I can</p> | <p>Children who are secure will be able to: <u>Electricity</u> As a scientist I can create an electrical circuit and know the components and symbols create more complex electrical circuits and describe how a bulb’s brightness is affected by the voltage identify problems in a circuit and explain and fix issues identify variables for an investigation that explains the output of a circuit create and design a set of traffic lights identify electrical conductors and insulators. <u>Light</u> As a scientist I can</p> | <p>Children who are secure will be able to: <u>Evolution and inherit</u> As a scientist I can understand how offspring vary and are not identical to their parents describe how an animal adapts and to its environment to survive describe how a plan adapts to its environment to survive that fossils provide information to compare extinct and living adaptations. describe how natural selection causes living things to change over time describe how humans have evolved. <u>Looking after our environment</u> As a scientist I can understand climate change</p> |

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| | <p>explain why different species are classified and how they are classified understand and describe the six different kingdoms of life identify living things belonging to each group by their characteristics Identify the characteristics of different types of microorganisms investigate asexual reproduction through spore dispersal classify and describe a living organism</p> | <p>Explain that light travels in straight lines carry out a fair test to find out how light is reflected. create a periscope that can reflect an image. know that shadows change length.</p> <ul style="list-style-type: none"> shadows are created by position in relation to sun. <p>I know how light is refracted.</p> | <p>Describe the difference between climate and weather describe what recycling is and understand the term landfill Understand where the energy that the UK uses comes from Understand the difference between renewable and non-renewable energy how burning fossil fuels can add to climate change. describe the patterns of weather in climate change</p> |
| <p>When do Assessment checkpoints happen?</p> | <p><i>End of unit assessments</i></p> | <p>End of unit assessments</p> | <p>End of unit assessments</p> |