

|  |  | | Red Hall Primary and Strive |
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| What is the intent of our science curriculum?  At Red Hall Primary School, we want all children to   * Become confident, capable and independent scientists. * Be curious about the world around them and to ask questions and explain their own ideas and findings. Children are encouraged to follow their own fascinations, wonders and questions. * Be excited about science and all of the weird and wonderful discoveries that come with this inspiring and fascinating * Become passionate practitioners deepening their curiosity and * Learn and remember more about science. | | What experiences will the children receive?  We make sure learning is hands-on, real life, using the teacher’s experiences, videos, photos, experiments and if possible involves a trip, an exciting hook or a memorable experience.  Nothing makes us happier than when a child comes to school with a story about their own science exploring, such as a family walk where they collected leaves, a new puppy, a library book about dinosaurs and fossils or an experiment they tried at home! | |
| By the end of their time at Red Hall, what will all of our children have?   * Made good progress from their starting point * Have a strong science vocabulary * Had the chance to try a wide range of scientific activities and experiences * Have developed the knowledge and skills they need to move into secondary school. * Be excited by science and will want to continue to develop their learning both in school and on their own. * Be proud of their work and their achievements * Just to be interested in their world, this can be plants, animals, planets, dinosaurs, anything! | | | |

How is Science taught at Red Hall?

| **EYFS** | **Year 1 – Year 6** |
| --- | --- |
| In Red Hall Early Years, we want to ensure all children have chances to experience as much real life science as possible with activities, experiments and hands-on opportunities that may not be offered at other schools.  During their time at Red Hall School we hope to offer your child some or all of the following experiences   * Open ended activities which allow the children to develop their independence * Play Invitations which encourage problem solving * Activities and discussions which follow the children’s own interests and experiences * Visits and trips which provide real life experiences * Invitations within the classroom to support the development of exploration, investigation and working scientifically skills * Encouraging children to persevere and be resilient learners when faced with challenges * Outdoor as well as indoor learning with real life experiences | At Red Hall we want to ensure all children have chances to experience as much real life science as possible with activities, experiments and hands-on opportunities that may not be offered at other schools.  During their time at Red Hall School we hope to offer your child some or all of the following experiences   * High quality teaching from teachers and TAs * Real life experiences, e.g. trips to the seaside, a woodland * Hooks into science e.g. letters from an ‘alien’ who wants to learn about earth animals * Whole school science events such as the planet design competition * Visits from science, technology and maths specialists * Science, Technology and Maths (STEM) week activities annually * Opportunities to have their work celebrated in assemblies or on social media * Lots of experiments and investigations * Access to high quality and varied science equipment and resources * Links to local Science, Technology and Maths companies such as Cummins or Cleveland Bridge |

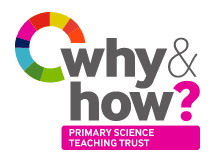
| Lesson Sequence | | | |
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| Reflection | Main Input | Task | Reflection |
| A reflection of prior learning: last year, last term and last week.  Include 2 vocabulary questions at KS2  Green Pen  Concept Map  Opportunity to pre-teach future learning. | Introduce new learning  Introduce new vocabulary | Independent learning | Recap learning  Use big thinking questions (Odd One Out, What would happen if …? or real life links (Real scientists, practical examples of how this aspect of science e.g. how archaeologists uses rocks/fossils, how environmentalists use food chains etc. |

| **EYFS** | | |
| --- | --- | --- |
| Lullaby Lane | Nursery | Reception |
| Take part in a nature walk during each season  Experience playing during different types of weather  Know a few common farm animals  Know a few common pets  Name a few body parts  Experience freezing and melting | Experience growing something  Experience picking flowers, plants, vegetables and fruits  Know a few common fruits & vegetables  Understand different clothes they will need for different types of weather  Name human body parts  Know a few common pets & a few common farm animals  Know a few common animals from other countries  Experience using wood, paper, card, fabric (wool, cotton, felt) in building and making  Name a few parts of animal bodies | Know a few common UK wild plants  Know a few common grown flowers  Have knowledge of sun safety  Know a few common UK wild animals  Know a few common UK wild birds  Know a few common sea animals  Know some habitat words  Sort objects into groups (wood, metal and plastic)  Know the 5 senses |
| Key Knowledge | Key Knowledge | Key Knowledge |
| Talk about snow, rain and sunny weather  Know pig, cow, sheep  Know dog, cat  Know hand, foot, head  Talk about hot and cold  Talk about wet and dry | Know the difference between flowers and trees  Talk about seeds and bulbs  Know apple, orange, banana, grapes  Know carrot, potato, broccoli, cauliflower  Know hat, scarf, gloves, umbrella, wellies  Name head, leg, arm, hand, foot, knee, elbow, back, shoulder, fingers, toes  Know cat, dog, fish, rabbit, guinea pig  Know pig, cow, sheep, duck, chicken, goat  Know lion, tiger, penguin, polar bear, camel, snake, spider, monkey  Name paper, wood, card and a type of fabric  Name paw, tail, ear, wing | Name dandelion, daisy and buttercup  Know rose, tulip, daffodil  Understand they need sunglasses, sun hat and sun block when in the sun  Name rabbit, squirrel, fox, badger, rat, snake (adder), frog  Name blackbird, owl, robin, seagull  Name shark, dolphin, whale, octopus, starfish  Know woodland, sea/ocean, beach/seashore, jungle  Sort wood, metal and plastic  Know their 5 senses- touch, taste, smell, sight and hearing |
| Key Vocabulary | | |
| Plant, Grow, Petal, Seed, Bulb, Flower, Stalk, Hot, Cold, Wet, Dry, Snow, Wind, Rain, Sun, Pet, Wild, Head, Shoulder, Knee, Hand, Feet, Leg, Arm, Finger, Thumb, Spring, Summer, Autumn, Winter  Common farm animals, common pets, common flowers (wild and garden), common fruits, common vegetables, common wild UK animals, common UK wild birds, common sea animals  Material words- paper, card, fabric, wool, wood, touch, taste, smell, see, hear, woods, river, beach, rock pool, field | | |

**Whole School Themes**

| **Autumn 1: Community**  **A Moment In Time** | **Autumn 2: Aspirational**  **Tell Me a Story** | **Spring 1: Respect**  **The Most Amazing Journey** | **Spring 2: Inclusive**  **We Are Family** | **Summer 1: Nurturing**  **Magic, Mystery and Mayhem** | **Summer 2: Growing together**  **Dream BIG** |
| --- | --- | --- | --- | --- | --- |
| Year 1 – Seasonal Change  Year 5- Earth and Space  Year 6- Evolution and Inheritance | Year 1- Animals  Year 2- Animals  Year 3- Animals | Year 1- Plants  Year 2- Plants  Year 3- Rocks | Year 2- Animals  Year 4- Living Things  Year 5- Animals  Year 5- Living Things | Year 4- States of Matter  Year 5- Properties and Changes of Materials | Year 1- Plants  Year 2- Plants  Year 3- Plants |

**Resources TO SUPPORT SCIENCE CURRICULUM AND DELIVERY**



**Progression of Skills**

|  | **Year 1** | **Year 2** | **Years 3** | **Year 4** | **Year 5** | **Year 6** |
| --- | --- | --- | --- | --- | --- | --- |
| **Plants** | Identify and name a variety of common wild and garden plants including deciduous and evergreentrees  Identify and describe structure of a variety of common flowering plants, including trees | 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 | Identify and describe functions of plants parts (roots, stem/trunk, leaves, flowers)  Explore requirements of plant life and growth and how they vary  Investigate how water is transported in plants  Explore the role of flowers in the life cycle of flowering plants (pollination, seed formation and seed dispersal) |  |  |  |
| **Living Things** |  | Explore and compare differences between living, dead and never been alive  Identify that living things live in habitats to which they are suited, describe how habitats provide the basic needs of animals and plants, how they depend on each other  Identify and name a variety of plants and animals in their habitats, including micro habitats  Describe how animals get food from plants and animals, use a food chain, identify and name sources of food |  | 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. | 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. | 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** | Identify and name a variety of common animals (Fish, amphibians, reptiles, birds, mammals)  Identify and name a variety of common animas that are carnivores, herbivores and omnivores  Describe and compare the structure of a variety of common animals  Identify, name, draw and label basic parts of human body and say which sense it is associated with | Notice animals, including humans have offspring which grow into adults  Find out and describe the basic needs of animals and humans  Describe the importance for humans of exercise, eating right amounts of different food and hygiene | Identify that animals, including humans, need the right types and amount of nutrition, that they cannot make their own food  Identify that humans and some other animals have skeletons and muscles for support, protection, movement | Describe the functions of the 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 | Describe the changes as humans develop to old age. | 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.  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. |
| **Materials** | Distinguish between an object and the material it is made from  Identify and name a variety of everyday materials  Describe simple physical properties of everyday materials  Compare and group materials on their physical properties | Identify and compare suitability of a variety of everyday materials (wood, metal, plastic, glass, brick, rock, paper and cardboard)  Find out how the shapes of solid objects made from some materials can be changed (squashing, bending, twisting, stretching) | Compare and group different kinds of rocks by appearance and simple physical properties  Describe how fossils are formed when things that have lived are trapped within rock | 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. | Compare and group everyday materials by properties, (Hardness, solubility, transparency, conduction (electrical and thermal), and magnets)  Know that some materials dissolve in liquid forming a solution, describe how to recover a substance from a solution  Use knowledge of solids, liquids, gases to separate mixtures (filters, sieves, evaporate)  Give reasons, based on evidence from tests, for the uses of materials, (metals, wood and plastic)  Show that dissolving, mixing and changes of state are reversible changes  Explain that some changes result in new materials, and that this change is not usually reversible, including burning and acid on bicarbonate of soda. |  |
| **Light and Sound** |  |  | 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. | Identify 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 it  Find patterns between the volume of a sound and the strength of the vibrations that produced it  Recognise that sounds get fainter as the distance from the sound source increases. |  | Recognise that light appears to travel in straight lines  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. |
| **Space** | Observe changes across four seasons  Observe and describe weather associated with the seasons and how day length varies |  |  |  | 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** |  |  | Compare how things move on different surfaces  Notice that some forces need contact but magnetic forces can act at a distance  Observe how magnets attract or repel each other and materials  Compare and group materials based on attraction to magnets, Identify magnetic materials  Describe magnets as having two poles  Predict if magnets will attract or repel depending on which poles are facing. |  | 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 and gears, allow a smaller force to have a greater effect |  |
| **Electricity** |  |  |  | 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, associate this with whether or not a lamp lights in a simple series circuit  Recognise common conductors and insulators, associate metals with being good conductors. |  | 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. |
| **Working Scientifically** | Ask simple questions and recognise they can be answered different ways  Observe closely, using simple equipment  Perform simple tests  Identify and classify  Use observations and ideas to suggest answers  Gather and record data to help answer questions | Ask simple questions and recognise they can be answered different ways  Observe closely, using simple equipment  Perform simple tests  Identify and classify  Use observations and ideas to suggest answers  Gather and record data to help answer questions | Ask questions and use different types of scientific enquiries to answer them  Set up simple practical enquiries, comparative and fair tests  Observe taking measurements with standard units, using equipment, including thermometers and data loggers  Gather record classify and present data in a variety of ways to answer questions  Record findings using scientific language, drawings, diagrams, keys, bar charts, and tables  Report on findings from enquiries, oral and written explanations, displays, presentations of results and conclusions  Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions  Identify differences, similarities, changes related to scientific ideas and processes  Use scientific evidence to answer questions or to support their findings. | Ask questions and use different types of scientific enquiries to answer them  Set up simple practical enquiries, comparative and fair tests  Observe taking measurements with standard units, using equipment, including thermometers and data loggers  Gather record classify and present data in a variety of ways to answer questions  Record findings using scientific language, drawings, diagrams, keys, bar charts, and tables  Report on findings from enquiries, oral and written explanations, displays, presentations of results and conclusions  Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions  Identify differences, similarities, changes related to scientific ideas and processes  Use scientific evidence to answer questions or to support their findings. | Plan different types of scientific enquiries to answer questions, including recognising and controlling variables  Take measurements, using a range of scientific equipment, with accuracy and precision, taking repeat readings when appropriate  Record data and results of increasing complexity using diagrams, labels, classification keys, tables, scatter graphs, bar and line graphs  Use test results to make predictions to set up further comparative and fair tests  Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral/written forms such as displays and presentations  Identify scientific evidence that can support or refute ideas or arguments. | Plan different types of scientific enquiries to answer questions, including recognising and controlling variables  Take measurements, using a range of scientific equipment, with accuracy and precision, taking repeat readings when appropriate  Record data and results of increasing complexity using diagrams, labels, classification keys, tables, scatter graphs, bar and line graphs  Use test results to make predictions to set up further comparative and fair tests  Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral/written forms such as displays and presentations  Identify scientific evidence that can support or refute ideas or arguments. |

**National Curriculum Coverage**

YEAR ONE

| Autumn | Spring | Summer |
| --- | --- | --- |
| Seasonal Change  Observe changes across the four seasons  Observe and describe weather associated with the seasons and how day length varies  Animals, including humans  Identify and name a variety of common animals (Fish, amphibians, reptiles, birds, 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  Identify, name, draw and label basic parts of human body and say which sense it is associated with | Seasonal Change  Observe changes across the four seasons  Observe and describe weather associated with the seasons and how day length varies  Everyday Materials  Distinguish between an object and the material it is made from  Identify and name a variety of everyday materials (including wood, plastic, glass, metal, water and rock)  Describe simple physical properties of everyday materials  Compare and group materials based on their physical properties  Plants  Identify and name a variety of common wild and garden plants including deciduous and evergreentrees  Identify and describe structure of a variety of common flowering plants, including trees | Seasonal Change  Observe changes across the four seasons  Observe and describe weather associated with the seasons and how day length varies  Plants  Identify and name a variety of common wild and garden plants including deciduous and evergreentrees  Identify and describe structure of a variety of common flowering plants, including trees |
| Key Knowledge | Key Knowledge | Key Knowledge |
| **Seasonal Change**  Must name 4 seasons in order starting from any season.  Must know that in the UK the seasons are defined as **spring (March, April, May), summer (June, July, August), autumn (September, October, November) and winter (December, January, February)**.  Must say how the natural environment changes with each season (leaves on deciduous trees, behaviour of plants, animal behaviour (migration/hibernation for UK animals).  Must link typical weather with each season but understand that this is not the only weather for each season.  Must understand how the day is shorter in winter and longer in summer.  **Animals, including humans**  Name common UK fish, amphibians, reptiles, birds and mammals  Know which UK animals use our local habitats  Name common animals kept as pets and classify them  Understand that these animals are not in their natural habitat  Understand that wild animals must be returned to their habitat after we have studied them  Name some fish, amphibians, reptiles, birds and mammals from different countries  Describe the structure of a VARIETY of animals.  Compare the structure of a VARIETY of animals.  Identify the parts of the human body- point to your leg, point to their arm.  Name the parts of the human body- what is this?  Draw the parts of the human body.  Label the parts of the human body.  Name the human senses. Sight, touch, taste, smell, hearing.  Make links between body part and the senses. | **Seasonal Change**  Repeated skills  **Everyday Materials**  Understand the difference between an object and the material it is made from for example understand the difference between wood and a table, plastic and a cup etc.  Identify everyday materials- which one is made from glass, which one is made from wood etc.  Name everyday materials- what is this? What is this made from?  Understand that some objects are made from more than one material e.g. scissors may be made from metal and plastic.  Describe the physical properties of everyday materials e.g. hard, soft, rough, smooth etc.  Compare materials by their properties- these are both hard, this is waterproof but this is not.  Group materials by their properties- these are all absorbent; these are all dull.  **Plants**  Name common wild flowers and plants found on the school grounds and local area- daisy, dandelion, clover, ivy, buttercups, thistles, nettles, tansy (among others)  Name common garden flowers and plants found on the school and local area- (Visit to South Park) Pansies, Daisies, Forget-me-nots, Violas, Arabis, Tulips, Roses (among others)  Name common deciduous found on the school and local area- Silver Birch, Birch, Apple, Pear, Sycamore, Oak, Ash, Alder, Beech, Horse Chestnut (among others)  Name common evergreentrees found on the school and local area- Juniper, Scots Pine, Yew (caution-toxic), Holly (all native). Spruce, Red Wood, Cedar, Larch (Imported)  Name the parts of a flower’s structure AND a tree’s structure  Describe the structure of a flower and a tree- this is a petal and it attracts pollinators (bees/wasps etc.)  For the structure of a flower and tree- make sure different flowers and trees are considered | **Seasonal Change**  Repeated skills  **Plants**  Repeated skills |
| Working Scientifically | Working Scientifically | Working Scientifically |
| **Seasonal Change**  **Gather and record data to answer questions-** Use thermometer, rain gauge, ruler, timer/stop watch to answer questions about weather/seasons e.g. which season has the most rain, which season has the longest shadows, which month is the warmest? (Year long project)  **Observe closely, using simple equipment-** use a thermometer with support, use a rain gauge, measure the length of shadows  Make tables and charts (using pre-made templates) recording the weather across the year.  **Perform a simple test-** When does the ice cube melt the fastest? Using a timer/stop watch. When is a shadow the longest? Using ruler/measuring stick/tape measure.  **Animals, including humans**  **Identify and classify** – identify and classify animals into their basic animal groups, identify and classify animals into their food habitats/diet types  **Observe closely, using simple equipment-** Use magnifiers to look closely at parts of animals- gills, feathers, claws etc. | **Seasonal Change**  Repeated skills  **Everyday Materials**  **Perform a simple test-** Which material would be best for a roof? Which material is the strongest? Measure and record how much water is let through. Measure and record how many bricks a material can support before breaking.  **Identify and classify** – identify and classify objects by material. Identify and classify materials by properties.  **Plants**  **Observe closely, using simple equipment-** Use magnifiers to look closely at parts of different flowers, plants and trees. Detailed drawings  **Identify and classify-** name and sort leaves by type- evergreen or deciduous.  **Identify and classify-** parts of flowers. Classifying and grouping different petals, leaves, roots etc.  **Perform a simple test-** Can a flower/plant survive without its leaves/petals etc? | **Seasonal Change**  Repeated skills  **Plants**  Repeated skills |
| Key Vocabulary | Key Vocabulary | Key Vocabulary |
| Season, spring, summer, autumn, winter, weather, hot/warm, cool/cold, sun/sunny, cloud/cloudy, wind/windy, rain/rainy, snow/snowing, hail/hailing, sheet, frost, fog/mist, ice/icy, rainbow, thunder, lightning, storm, light/dark, day/night  Names of common animals (fish), names of common animals (amphibians), names of common animals (reptiles), names of common animals (birds), names of common animals (mammals), names of common animals (carnivores), names of common animals (herbivores), names of common animals (omnivores), wild animals, pets, body, neck, head, arms, elbows, legs, knees, face, eyes, ears, eyebrows, eyelashes, nose, hair, mouth, teeth, tongue, lips, feet, toes, fingers, nails, ankle, calf, thigh, hips, waist, chest, shoulder, back, hands, wrist, tail, wing, claw, fin, scales, feathers, fur, beak, sense, hear/hearing, smell/smelling, touch/touching, see/sight/seeing, taste/tasting, penis, vulva, nipples testicles, nipples (do not draw, do not associate with senses) | Season, spring, summer, autumn, winter, weather, hot/warm, cool/cold, sun/sunny, cloud/cloudy, wind/windy, rain/rainy, snow/snowing, hail/hailing, sheet, frost, fog/mist, ice/icy, rainbow, thunder, lightning, storm, light/dark, day/night  Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabrics, elastic, foil, card/cardboard, rubber, wool, clay, not see through, hard, soft, stretchy, stiff, bendy/floppy, waterproof, absorbent, breaks/tears, rough, smooth, see through, shiny, dull, opaque/transparent  Names of locally found wild plants, names of locally found garden plants, names of locally flowering plants, names of locally found trees, leaf/leaves, flower, blossom, petal, fruit, berry, root, bulb, seed, trunk, branch, stem, bark, stalk, vegetable, names of flowers grown, names of fruit and vegetables grown, deciduous, evergreen | Season, spring, summer, autumn, winter, weather, hot/warm, cool/cold, sun/sunny, cloud/cloudy, wind/windy, rain/rainy, snow/snowing, hail/hailing, sheet, frost, fog/mist, ice/icy, rainbow, thunder, lightning, storm, light/dark, day/night  Names of locally found wild plants, names of locally found garden plants, names of locally flowering plants, names of locally found trees, leaf/leaves, flower, blossom, petal, fruit, berry, root, bulb, seed, trunk, branch, stem, bark, stalk, vegetable, names of flowers grown, names of fruit and vegetables grown, deciduous, evergreen |
| Cultural Capital | Cultural Capital | Cultural Capital |
| Outside In (South Park) 0191 584 3112  Zoo Lab 01324 667800  Animal Club [enquiries@animal-club.co.uk](mailto:enquiries@animal-club.co.uk)  Life Science Centre (Newcastle)  Dorman Museum (Middlesbrough) – skeletons/animal displays  Great North Museum (Newcastle) – skeletons/animal displays  Wetheriggs Animal Rescue Barnard Castle  Saltholme Wildlife and Reserve and Discovery Park- Middlesbrough  North East Falconry 07592 932533  School staff with pets- S Akers- tortoise, Strive- Guinea Pigs, B Sewell- rabbits, Office area- fish | Cummins  Cleveland Bridge  Preston Park (Stockton-on-Tees)  Sunderland Museum and Winter Gardens (Sunderland)  Visit to local garden centres  Visit local allotments  Outside In (South Park) 0191 584 3112  Friends of South Park 01325 283225  School Woodland and local area  Hamsterley Forest – Bishop Auckland area  Hardwick Park- Bishop Auckland area  Broken Scar- Darlington  Rockwell Nature Reserve  Drinkfield Marsh  Brinkburn Pond  South Burdon Community Woods  Botanical Gardens Durham  School staff with plant knowledge/gardening knowledge – D Lowery, V Pidgeon | Preston Park (Stockton-on-Tees)  Sunderland Museum and Winter Gardens (Sunderland)  Visit to local garden centres  Visit local allotments  Outside In (South Park) 0191 584 3112  Friends of South Park 01325 283225  School Woodland and local area  Hamsterley Forest - Bishop Auckland area  Hardwick Park- Bishop Auckland area  Broken Scar- Darlington  Rockwell Nature Reserve  Drinkfield Marsh  Brinkburn Pond  South Burdon Community Woods  School staff with plant knowledge/gardening knowledge – D Lowery, V Pidgeon |
| Working Scientifically | | |
| Ask simple questions and recognise they can be answered different ways  Observe closely, using simple equipment  Perform simple tests  Identify and classify  Use observations and ideas to suggest answers  Gather and record data to help answer questions | | |
| Key Vocabulary | | |
| Question, equipment, gather, measure, record, data, sort, group, test, chart, table, observe, compare, describe, similar, similarities, differences, different, collect, results, ruler, tape measure, metre stick, beaker, pipette, syringe | | |

YEAR TWO

| Autumn | Spring | Summer |
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| Use of Everyday Materials  Identify and compare suitability of a variety of everyday materials (wood, metal, plastic, glass, brick, rock, paper and cardboard)  Find out how the shapes of solid objects made from some materials can be changed (squashing, bending, twisting, stretching)  Animals, including humans  Notice that animals, including humans have offspring which grow into adults  Find out and describe the basic needs of animals and humans for survival  Describe the importance for humans of exercise, eating right amounts of different 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  Animals, including humans  Notice that animals, including humans have offspring which grow into adults  Find out and describe the basic needs of animals and humans for survival  Describe the importance for humans of exercise, eating right amounts of different 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  Living things and their habitats  Explore and compare differences between living, dead and never been alive  Identify that living things live in habitats to which they are suited, describe how habitats provide the basic needs of animals and plants, how they depend on each other  Identify and name a variety of plants and animals in their habitats, including micro habitats  Describe how animals get food from plants and animals, use a food chain, identify and name sources of food |
| Key Knowledge | Key Knowledge | Key Knowledge |
| **Use of Everyday Materials**  Identify everyday materials- which one is made from glass, which one is made from wood etc. and discuss why it is suitable for its use.  Compare everyday materials by suitability e.g. why is glass suitable for a window and metal not?  Understand that one object can be made from different materials but not all materials (spoons can be made from wood, plastic, metal but not usually glass) and explain why using suitability of materials.  Understand that one material can be used to make different objects (metal is used for coins, cars, cans etc.) and explain why using suitability of materials.  Explore how some solid objects made from some materials can be changed.  **Animals, including humans**  Recognise the offspring of different animals including humans and examples of each of the animal groups fish, amphibians, reptiles, birds and mammals, introduce insects.  Complete simple life cycles- chicken (or other specific bird), butterfly (or other specific insect), frog (or other specific amphibian), turtle (or other specific reptile), sheep (or other specific mammal). Must cover humans.  Know the basic needs of animals for survival- air, water, shelter and food.  Research how an animal from each group meets their basic needs.  Understand how humans stay healthy- exercise, diet and hygiene.  Understand different types of food- protein, fruit, vegetables, carbohydrates, fats, dairy, oils. | **Plants**  Observe seeds growing into plants  Observe bulbs growing into plants  Describe the stages of a seed growing into a plant  Describe the stages of a bulb growing into a plant  Know the basic needs of a plant- water, light, suitable temperature.  Begin to understand in simple terms that a plant can make its own food  Seeds and bulbs need water. Most seeds and bulbs do not need light. Seeds and bulbs have a store of energy (food) inside them.  Plants need water and light but can make their energy (food)  **Animals, including humans**  Repeated skills | **Plants**  Repeated skills  **Living things and their habitats**  Classify objects by living, dead and never been alive.  Compare living things, dead things and things that have never been alive  MRS GREN- movement, respiration, sensitivity, growth, reproduction, excretion, nutrition  Recap basic needs of living things  Understand that a habitat is the natural home/environment for plants and animals  Understand that a microhabitat is a very small habitat- under a stone, log or in a leaf pile etc.  Know a range of habitats-(UK) coastal, pond, urban, woodland. (World) Arctic, desert, ocean, tropical.  Know a range of micro-habitats- log, stone, leaf pile, grass, puddles.  Name living things in each habitat and microhabitat- animals AND plants  Explain how a living thing is suited to its habitat or microhabitat  Explain how a habitat meets the basic needs of a living thing, including plants  Create simple food chains for different living things. |
| Working Scientifically | Working Scientifically | Working Scientifically |
| **Use of Everyday Materials**  **Perform a simple test-** Use data logger to measure how much light passes through a material. Look at material suitability for an object using two properties- e.g. an umbrella needs to be light but waterproof, material for a den needs to insulate and be waterproof etc.  **Identify and classify** – identify and classify objects by material. Identify and classify materials by properties.  **Animals, including humans**  **Observe closely, using simple equipment-** Measure, tabulate & chart hand span, arm length, foot length across the school.  **Gather and record data-** Healthy diet- record what we eat in a day and track how healthy it is.  **Perform simple test-** Using glitter or bug gel to investigate which soap is best for cleaning hands.  **Ask simple questions and answer in different ways-** research how animals meet their basic needs | **Plants**  **Identify and classify-** sort seeds and bulbs into right groups  **Perform simple tests/Observe closely using simple equipment-** grow different seeds and measure height of shoots.  **Perform simple tests-** try to grow same seed/bulb under different conditions.  **Gather and record data-** Use results from different experiments- record simply.  **Animals, including humans**  Repeated skills | **Plants**  Repeated skills  **Living things and their habitats**  **Ask simple questions and answer in different ways-** Is a flame alive? Is a deciduous tree dead in winter? Is a bone living?  **Identify and classify-** sort objects by living, dead and never been alive.  **Observe closely, using simple equipment-** Use magnifiers to look closely at parts of animals- gills, feathers, claws and to look at insects in microhabitats.  **Gather and record data-** pictogram/block graph to record how many insects found in different habitats  **Perform simple tests-** Which material do woodlice/spiders/centipedes prefer for their shelter? |
| Key Vocabulary | Key Vocabulary | Key Vocabulary |
| Suitable/unsuitable, use/useful  Object, material, property  Wood, plastic, glass, metal, water, rock, brick, paper, fabrics, elastic, foil, card/cardboard, rubber, wool, clay  Hard, soft, stretchy, rigid  Offspring, babies, young, grow, change, adults, older/younger, baby/toddler/child/teenager  Basic needs, water, food, air, breathing, survival  Exercise, food types, fruit and vegetable, bread, rice, potato, pasta, milk and dairy foods, foods high in fat or sugar, meat, fish, egg, beans  Hygiene, clean, wash, healthy, medicine | Seeds, bulbs, fully grown, water, light, damp/wet/dry, dark/light, hot/warm/cool/cold  use comparatives e.g. hotter  grow/growth, healthy, shoot, seedling, wither/limp, die, dry/crispy, soil, earth, seeds, bulbs  Offspring, babies, young, grow, change, adults, older/younger, baby/toddler/child/teenager  Basic needs, water, food, air, breathing, survival  Exercise, food types, fruit and vegetable, bread, rice, potato, pasta, milk and dairy foods, foods high in fat or sugar, meat, fish, egg, beans  Hygiene, clean, wash, healthy, medicine | Seeds, bulbs, fully grown, water, light, damp/wet/dry, dark/light, hot/warm/cool/cold  use comparatives e.g. hotter  grow/growth, healthy, shoot, seedling, wither/limp, die, dry/crispy, soil, earth, seeds, bulbs  Living, dead, never been alive  Move, grow, feed, have offspring/young/babies  Name local habitats (e.g. a pond, woodland, meadow)  Name micro-habitats (under log, stony path, under bushes)  Damp/wet/dry, dark/light, hot/warm/cool/cold, use comparatives e.g. hotter  Suited/suitable, basic needs, depend, shelter  Food, food chain |
| Cultural Capital | Cultural Capital | Cultural Capital |
| National Glass Centre- Sunderland  Discovery Museum- Building Bridges exhibition, Ships and Ship Building exhibition, Inventors Gallery  South Shields Museum and Art Gallery- STEAM museum challenge £180  Outside In (South Park) 0191 584 3112  Zoo Lab 01324 667800  Animal Club [enquiries@animal-club.co.uk](mailto:enquiries@animal-club.co.uk)  Life Science Centre (Newcastle)  Dorman Museum Middlesbrough  Great North Museum Newcastle  Wetheriggs Animal Rescue Barnard Castle  Thorp Perrow Bird of Prey and Mammal Centre  School Nurse  School staff with pets- S Akers- tortoise, Strive- Guinea Pigs, B Sewell- rabbits | Preston Park Stockton-on-Tees  Sunderland Museum and Winter Gardens Sunderland  Visit to local garden centres  Visit local allotments  Outside In (South Park) 0191 584 3112  Friends of South Park 01325 283225  School Woodland and local area  Hamsterley Forest – Bishop Auckland area  Broken Scar- Darlington  Rockwell Nature Reserve  Drinkfield Marsh  Brinkburn Pond  South Burdon Community Woods  Botanical Gardens Durham  School staff with plant knowledge/gardening knowledge – D Lowery, V Pidgeon | Preston Park Stockton-on-Tees  Sunderland Museum and Winter Gardens Sunderland  Visit to local garden centres  Visit local allotments  Outside In (South Park) 0191 584 3112  Friends of South Park 01325 283225  School Woodland and local area  Hamsterley Forest - Bishop Auckland area  Broken Scar- Darlington  Rockwell Nature Reserve  Drinkfield Marsh  Brinkburn Pond  South Burdon Community Woods  Botanical Gardens Durham  School staff with plant knowledge/gardening knowledge – D Lowery, V Pidgeon  Outside In (South Park) 0191 584 3112  Zoo Lab 01324 667800  Animal Club [enquiries@animal-club.co.uk](mailto:enquiries@animal-club.co.uk)  Life Science Centre (Newcastle)  Dorman Museum Middlesbrough  Great North Museum Newcastle  Wetheriggs Animal Rescue Barnard Castle  Thorp Perrow Bird of Prey and Mammal Centre  School Nurse  School grounds and local area  School staff with pets- S Akers- tortoise, Strive- Guinea Pigs, B Sewell- rabbits |
| Working Scientifically | | |
| Ask simple questions and recognise they can be answered different ways  Observe closely, using simple equipment  Perform simple tests  Identify and classify  Use observations and ideas to suggest answers  Gather and record data to help answer questions | | |
| Key Vocabulary | | |
| Questions/answers, equipment, gather/measure/record, data/Pictogram, tally chart, block diagram, venn diagram, sort/order, group, test, chart, table, observe/explore, compare, describe, similar, similarities, differences, different, collect, results, ruler, tape measure, metre stick, beaker, pipette, syringe, observe changes over time, notice patterns, link, secondary sources, hand lenses, egg timer, stop watch | | |

YEAR THREE

| Autumn | Spring | Summer |
| --- | --- | --- |
| Rocks  Compare and group different kinds of rocks by appearance and simple physical properties  Describe 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  Identify that animals, including humans, need the right types and amount of nutrition, that they cannot make their own food- they get nutrition from what they eat  Identify that humans and some other animals have skeletons and muscles for support, protection, movement  Forces and Magnets  Compare how things move on different surfaces  Notice that some forces need contact but magnetic forces can act at a distance  Observe how magnets attract or repel each other and materials  Compare and group materials based on attraction to magnets, Identify magnetic materials  Describe magnets as having two poles  Predict if two magnets will attract or repel, depending on which poles are facing. | Plants  Identify and describe functions of plants parts (roots, stem/trunk, leaves, flowers)  Explore the requirements of plant life and growth and how they vary from plant to plant  Investigate how water is transported in plants  Explore the role of flowers in the life cycle of flowering plants (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 sizes of shadows change. |
| Key Knowledge | Key Knowledge | Key Knowledge |
| **Rocks and soils**  Compare rocks by appearance  Group rocks by appearance  Compare rocks by properties  Group rocks by properties  Explain the process of fossilisation  Compare soils by appearance  Group soils by properties- rocks and organic matter  Understand how soils are formed and what it is made from (worn down rock, humus[dead and rotting material], air and water) | **Animals, including humans**  Understand the importance of a balanced diet. Healthy Plate. Healthy Diet. For humans and other animals  Compare the human diet to herbivore animal’s diet and carnivore animal’s diet  Understand the nutritional value of different foods  Understand different lifestyles require different diets- weight training, runner, sedentary life style.  Understand the impact of poor nutrition  Classify animals by vertebrate, invertebrate and exoskeleton.  Understand the role parts of a skeleton serve e.g. skull protects brain, femurs allow movement.  Name and find major bones  Name and find major muscles  Label major muscle and explain the process of how muscles allow movement  **Forces and Magnets**  Investigate on how a toy vehicle/drag toy moves on smooth/rough surfaces  Understand friction slows movement, creates grip and creates heat  Know contact forces- friction, air resistance, water resistance and up-thrust  Know magnetic forces  Understand that only metals are attracted to magnets but not all metals  Understand the magnetic poles  Understand how magnetic poles attract or repel each other. | **Plants**  Name the parts of plants (look at a range of plants, including trees)  Describe the function of each part of a plant  Name the parts of a flower  Understand requirements for plant life and growth (look at a range of plants, including trees)  Understand how water is transported in plants  Understand pollination, seed formation and seed dispersal- comparing  **Light**  Know natural and man-made sources of light  Understand the absence of light and the impact of this.  Understand how light energy is reflected from certain surfaces (link back to work on materials in previous years)  Describe the danger the sun can cause  Name and explain ways to protect your eyes.  Explain how shadows are formed  Investigate what causes the size of a shadow to change. |
| Working Scientifically | Working Scientifically | Working Scientifically |
| **Rocks and soils**  **Use scientific enquiry-** Use simple classification key  **Gather, record, classify and present data-** research and explain the fossilisation process  **Set up simple practical enquiries/make observations using equipment (cm)-** grow seeds in different soil types  **Set up simple practical enquiries/make observations using equipment (ml)-** investigate which soil has the highest/lowest water retention | **Animals, including humans**  **Gather, record, classify and present data-** Create plate of food and children work out calorie count/protein/carbohydrates for each plate. Which is the healthiest?  **Record findings-** Show information from plate of food in bar chart and table.  **Set up simple practical enquiries/make observations using equipment (scales)-** Weigh and dehydrate pieces of fruit then check to see how much water was lost (Water content)  **Use scientific evidence to answer questions or to support findings-** Check the teacher’s sorting of animals into different classes  **Gather, record, classify and present data-** name, label and explain parts of the human skeleton/muscle systems  **Forces and Magnets**  **Set up simple practical enquiries/make observations using equipment (cm)-** how far does a toy car travel after rolling down a ramp- change surface  **Set up simple practical enquiries/make observations using equipment (temperature)-** rub hands against different surfaces and record change in temperature.  **Gather, record, classify and present data/ Set up simple practical enquiries/make observations using equipment (time)-** parachute drop with different materials  **Gather, record, classify and present data-** magnetic materials investigation | **Plants**  **Identify differences, similarities related to scientific ideas-** compare parts of different plants and flowers.  **Set up simple practical enquiries/make observations using equipment (cm)-** Grow seeds in different conditions  **Set up simple practical enquiries/tests-** Grow seeds in different conditions/leave celery or white flowers in coloured water.  **Set up simple practical enquiries-** wearing an old sock over their shoe children work round different parts of the school ground then record who found the most seeds. Place each sock in a zip lock bag with moisture and see which sock grows any sprouts.  **Light**  **Set up simple practical enquiries/make observations using equipment (light energy)-** record with data logger much light is reflected  **Set up simple practical enquiries/make observations using equipment (light energy)-** best material for blocking light, best sunglasses for blocking light  **Ask relevant questions and use scientific enquiries to answer them-** Children investigate which material creates the darkest shadows  **Set up simple practical enquiries/make observations using equipment (cm)-** Length of shadow throughout the day. |
| Key Vocabulary | Key Vocabulary | Key Vocabulary |
| Rock, stone, pebble, boulder, soil  Fossils, grains, crystals, hard/soft, texture, absorb water, let water through  Marble, chalk, granite, sandstone, slate  Sandy soil, clay soil, chalky soil, peat | Nutrition, nutrients, food types, fruit and vegetable, bread, rice, potato, pasta, milk and dairy foods, foods high in fat or sugar, meat, fish, egg, beans, carbohydrates  Protein, vitamins and mineral, fat, dietary fibre, water, balanced diet  Skeleton, muscles, support, protection, movement, skull, ribs, spine/vertebra, joints, sockets, bones, tendons  Vertebrate, invertebrate, endoskeleton, exoskeleton, hydrostatic skeleton  Force, push/pushing, pull/pulling, friction, resistance, newtons  Contact force, non-contact force, magnetic force  Magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet  Attract, repel  Magnetic material, metal, iron, steel  Non-magnetic material  Poles, north pole, south pole  Gravity | Part, role, function, photosynthesis  Leaf/leaves, flower, blossom, petal, root, bulb, seed, trunk/branch/stem, bark, stalk  Fruit, berry  Seed formation, seed dispersal, pollination  Water, light, air  life cycle  Nutrients, soil, fertiliser  Damp/wet/dry, dark/light, hot/warm/cool/cold  use comparatives e.g. hotter  Grow/growth, healthy transported  Light, light source, names of light sources e.g. torch, dark/darkness  Reflect, reflective, mirror  Shadow, block, direct/ direction  Transparent, opaque, translucent |
| **Cultural Capital** | **Cultural Capital** | **Cultural Capital** |
| Great North Museum- fossils  Seaham, Saltburn, Redcar (<https://ukfossils.co.uk/>)  Quarrington Quarry (Durham)  Coxhoe Drystone (Durham)  Whitby Museum- fossils  Killhope Lead Mining Museum- Bishop Auckland Area  Cleveland Ironstone Mining Museum- Saltburn  Howe Stean Gorge- North Yorkshire  Stump Cross Caverns- North Yorkshire  Life Science Museum (Newcastle) | School Kitchen  Morrisons visit  Asda visit  Toby Carvery  Dorman Museum (Middlesbrough) – skeletons/animal displays  Great North Museum (Newcastle) – skeletons/animal displays  Life Science Museum (Newcastle)  Billingham Ice Skating | Preston Park Stockton-on-Tees  Sunderland Museum and Winter Gardens Sunderland  Visit to local garden centres  Visit local allotments  Outside In (South Park) 0191 584 3112  Friends of South Park 01325 283225  School Woodland and local area  Hamsterley Forest - Bishop Auckland area  Broken Scar- Darlington  Rockwell Nature Reserve  Drinkfield Marsh  Brinkburn Pond  South Burdon Community Woods  Maiden Head Nature Reserve  Botanical Gardens Durham  Shadow puppet show for school- link to local issues or wider world issues  Design bird scarers for school garden area or local allotments  Specsavers |
| Working Scientifically | | |
| Ask relevant questions and use different types of scientific enquiries to answer them  Set up simple practical enquiries, comparative and fair tests  Observe taking measurements with standard units, using equipment, including thermometers and data loggers  Gather, record, classify and present data in a variety of ways to answer questions  Record findings using scientific language, drawings, labelled diagrams, keys, bar charts, and tables  Report on findings from enquiries, oral and written explanations, displays, presentations of results and conclusions  Use results to draw simple conclusions, make predications for new values, suggest improvements and raise further questions  Identify differences, similarities or changes related to scientific ideas and processes  Use straightforward scientific evidence to answer questions or to support findings | | |
| Key Vocabulary | | |
| Questions/answers, types of scientific enquiry, changes, similarities/differences, identify, classify/sort/group, order, observe changes over time, notice patterns  Present, link, secondary sources, comparative tests, fair tests, careful/accurate, observations, questions/answers  Equipment, thermometers, data loggers, microscope, magnifying glass  Gather/measure/record, data/evidence/results, keys, bar charts, table, results, conclusions, prediction, support/not support | | |

YEAR FOUR

| Autumn | Spring | Summer |
| --- | --- | --- |
| **States of matter**  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.  **Animals, including humans**  Describe the functions of the 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 | **Living things and their habitats**  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. | **Sound**  Identify 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 it  Find patterns between the volume of a sound and the strength of the vibrations that produced it  Recognise that sounds get fainter as the distance from the sound source increases.  **Electricity**  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, associate this with whether or not a lamp lights in a simple series circuit  Recognise common conductors and insulators, associate metals with being good conductors. |
| Key Knowledge | Key Knowledge | Key Knowledge |
| **States of matter**  Explore everyday materials  Develop simple descriptions of states of matter  Know solids hold shape, can be cut or shaped, you can keep hold of them  Know liquids make a pool not a pile, flow downwards, take the shape of the container, the surface stays level  Know gasses escape from unsealed container, most are invisible, gases spread out into any empty space  Know particles of a solid are packed tightly and vibrate in place  Know particles of a liquid are not so tightly packed and can move a little  Know particles of a gas have lots of room and move all over, all the time  Observe water as a liquid, solid and gas  Know changes that happen to water as it is heated or cooled  Know water freezes at 0 degrees centigrade and boils at 100 degrees centigrade  Understand the stages of the water cycle and that it is repeated  **Animals, including humans**  Name and identify the main body parts associated with the digestive system  Understand the function of the parts of the digestive system  Name and identify human teeth  Understand the function of different human teeth  Understand how to keep teeth healthy  Create food chains for a variety of animals  Interpret food chains for different animals answering questions. | **Living things and their habitats**  Classify a variety of living things (including plants) in different ways  Use classification keys to sort animals into groups  Use classification keys to sort plants into groups  Explore how local habitats change across the year  Understand how local environments can change both positively (planting of woodlands, wildflower gardens etc.) and negatively (over urbanisation, deforestation etc.)  Understand dangers to living things including plants when changes occur | **Sound**  Understand how sound is made- vibrations  Understand effect on sound energy as it travels through different mediums- effect on strength of vibrations  Recognise link between pitch and materials (linking back to work on materials on previous years)  Recognise link between strength of vibrations and volume of sound  Understand how distance effects sound  **Electricity**  Know common appliances that run on electricity at home, school and wider community  Construct simple circuits  Identify parts of a simple circuit and name them.  Recognise when circuits are incomplete  Understand use of switches and the impact on a circuit  Identify common conductors  Identify common insulators  Recognise that most metals are good conductors |
| **Working Scientifically** | **Working Scientifically** | **Working Scientifically** |
| **States of matter**  **Ask relevant questions and use scientific enquiries to answer them-** Investigate everyday materials and sort into states of matter  **Report on findings from enquiries-** Share findings from investigation with explanations or presentation  **Set up simple practical enquiries/make observations using equipment (temperature/time)/record in chart and table-** Record temperature of water as it boils and freezes  **Set up simple practical enquiries/make observations using equipment (ml)-** Record volume of water as it evaporates and how temperature affects this  **Ask relevant questions and use scientific enquiries to answer them-** report on water cycle  **Animals, including humans**  **Use straightforward scientific evidence to answer questions-** How is poo made? How do we get energy? Where does my dinner go?  **Report on findings from enquiries-** complete labelled diagrams of the digestion system, include key.  **Use straightforward scientific evidence to answer questions-** Whose teeth are best?  **Ask relevant questions and use scientific enquiries to answer them-** Which drink it best for our teeth? Egg in different liquids experiment  **Use straightforward scientific evidence to answer questions-** impact of removing part of a food chain | **Living things and their habitats**  **Report on findings from enquiries-** classify living things, including plants using a classification key and report findings.  **Report on findings from enquiries-** investigate habitats and show findings with bar charts and tables  **Report on findings from enquiries-** create wildlife area and record changes of number of insects, birds etc. | **Sound**  **Ask relevant questions and use scientific enquiries to answer them-** Investigate how sound is made  **Set up simple practical enquiries/make observations using equipment (hertz/decibles)-** which material produced the loudest sound.  **Set up simple practical enquiries/make observations using equipment (hertz/decibles)-** how is the volume of sound affected by distance of source  **Electricity**  **Identify differences and similarities related to scientific ideas and processes-** Classify appliances by which ones use electricity  **Using results to draw simple conclusions, make predictions for new value and raise further questions-** investigate conductivity and insulating properties of materials and make predictions about unknown materials  **Set up simple practical enquiries/make observations using equipment –** Test conductivity of materials |
| Key Vocabulary | Key Vocabulary | Key Vocabulary |
| States of matter, solid, liquid, gas  Air, oxygen  Powder, grain/granular, crystals  Change state  Ice/water/steam, water vapour, heated/heating, cooled/cooling, melt, freeze, solidify, melting point, molten, boil  Temperature, degrees Celsius evaporation, condensation particles  Digestive system, nutrition, nutrients  Mouth, teeth, canines, incisor, molar, pre-molar, saliva, tongue, rip, tear, chew, grind, cut, oesophagus (gullet), stomach, small intestine, large intestine, rectum, anus  Carnivore, herbivore, omnivore, producer, consumer, predator, prey, food chain | Classification keys  Environment  Fish, amphibians, reptiles, birds, mammals  Vertebrates, invertebrates  Name some vertebrates/invertebrates  Human impact  Name positive/ negative human impact | Sound, sound source, noise, vibrate/vibration, travel  Solid/liquid/gas  Pitch, tune, high/low, volume, loud/quiet, fainter, muffle, strength of vibrations, insulation  Instrument, percussion, strings, brass, woodwind, tuned instrument  Electricity, appliances/device, mains, plug  Electrical circuit, complete circuit, circuit diagram, circuit symbol, components, cell, battery, wire, crocodile clip, bulb, switch, plug, buzzer, motor  Bright/dim, fast(er)/slow(er)  Positive/negative, connect/connection, loose connection, short circuit  Conductor, insulator, metal/non metal |
| Cultural Capital | Cultural Capital | Cultural Capital |
| Gritting Services  Billingham Ice Skating  Outside In (South Park) 0191 584 3112  Zoo Lab 01324 667800  Animal Club [enquiries@animal-club.co.uk](mailto:enquiries@animal-club.co.uk)  Life Science Centre (Newcastle)  Dorman Museum Middlesbrough- animal skeletons  Great North Museum Newcastle- animal skeletons  Wetheriggs Animal Rescue Barnard Castle  Thorp Perrow Bird of Prey and Mammal Centre  School Nurse  School staff with pets- S Akers- tortoise, Strive- Guinea Pigs, B Sewell- rabbits | Preston Park Stockton-on-Tees  Sunderland Museum and Winter Gardens Sunderland  Visit to local garden centres  Visit local allotments  Outside In (South Park) 0191 584 3112  Friends of South Park 01325 283225  School Woodland and local area  Hamsterley Forest - Bishop Auckland area  Broken Scar- Darlington  Rockwell Nature Reserve  Drinkfield Marsh  Brinkburn Pond  South Burdon Community Woods  Maiden Head Nature Reserve  Botanical Gardens Durham  Tynemouth Aquarium  School staff with pets- S Akers- tortoise, Strive- Guinea Pigs, B Sewell- rabbits | The Forum  Hippodrome Darlington  Any local building work |
| Working Scientifically | | |
| Ask relevant questions and use different types of scientific enquiries to answer them  Set up simple practical enquiries, comparative and fair tests  Observe taking measurements with standard units, using equipment, including thermometers and data loggers  Gather, record, classify and present data in a variety of ways to answer questions  Record findings using scientific language, drawings, labelled diagrams, keys, bar charts, and tables  Report on findings from enquiries, oral and written explanations, displays, presentations of results and conclusions  Use results to draw simple conclusions, make predications for new values, suggest improvements and raise further questions  Identify differences, similarities or changes related to scientific ideas and processes  Use straightforward scientific evidence to answer questions or to support findings | | |
| Key Vocabulary | | |
| Questions/answers, types of scientific enquiry, changes, similarities/differences, identify, classify/sort/group, order, observe changes over time, changes  Present, increase/decrease  Secondary sources, comparative tests, fair tests, careful/accurate, observations, appearance, gather/measure/record, data/evidence/results, keys, bar charts, table, results, conclusions, prediction  Equipment, thermometers, data loggers, magnifying glasses, microscope | | |

YEAR FIVE

| Autumn | Spring | Summer |
| --- | --- | --- |
| **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 the Earth and the falling object  Identify the effects of air resistance, water resistance and friction  Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect | **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.  **Animals, including humans**  Describe the changes as humans develop to old age | **Properties and changes of materials**  Compare and group everyday materials by properties including their hardness, solubility, transparency, conductivity (electrical and thermal) and their response to magnets  Give reasons, based on evidence from tests, for the uses of materials, (metals, wood and plastic)  Know that some materials dissolve in liquid forming a solution.  Describe how to recover a substance from a solution  Use knowledge of solids, liquids and gases to separate mixtures (filters, sieves, evaporation)  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 change is not usually reversible, including burning and the action of acid on bicarbonate of soda. |
| Key Knowledge | Key Knowledge | Key Knowledge |
| **Earth and Space**  Understand that the stars and planets are approximately spherical bodies  Know the geocentric and heliocentric models  Know how our Sun is a star and that it is at the centre of our solar system  Know order of planets making up our solar system in relation to distance from our Sun  Explain how the planets orbit the sun  Know the time it takes for Earth to orbit the sun linking to leap years and the direction of its orbit  Know the time it takes for our Moon to orbit Earth and the direction of its orbit  Understand how the Moon’s orbit creates the phases of the moon  Understand how Earth spins on its axis and how this creates day and night. (Link to work on shadows in previous year)  Understand how the Earth’s orbit around the Sun creates seasons.  Know that other planets in our Solar System have different orbits and rotations  Know that other planets in our Solar System have different moons  **Forces**  Understand contact and non-contact forces  Understand what water resistance is  Understand what air resistance is  Understand what friction is  Understand what gravity is  Understand and explain how these forces affect movement  Understand up thrust and its effect on objects  Understand balanced and unbalanced forces  Explore the effect of levers, pulleys and simple machines on movement | **Living things and their habitats**  Classify animals into main groups (Learning from previous year)  Classify plants into main groups (Learning from previous year)  Explore the life cycle of a mammal, amphibian, insect, bird and plant  Discuss the differences between these life cycles  Understand sexual reproduction in animals, including humans  Understand sexual and asexual reproduction in plants (recapping learning from previous year)  **Animals, including humans**  Create and use timeline to show stages in growth and development for humans.  Learn about changes caused by puberty | **Properties and changes of materials**  Recap learning from Year 4  Test and classify everyday materials by all listed properties- hardness, solubility, transparency, thermal conductivity, electrical conductivity and response to magnets  Justify use of materials for objects using above tests  Understand dissolving as a reversible change  Understand mixing as a reversible change  Understand changes of state as a reversible change  Explore reversible changes  Separate mixtures of solids, liquids and gases  Understand chemical changes and irreversible changes |
| Working Scientifically | Working Scientifically | Working Scientifically |
| **Earth and Space**  **Record data using scientific diagrams and labels-** labelled drawings of our solar system  **Identify scientific arguments-** Understand how knowledge of the solar system and planets has changed over time linked to models  **Plan scientific enquiry to explore how the Earth moves-** Using shadow length/length of day/seasons  **Use test results to make predications and set up further tests-** Plan further enquiry using information gathered about shadows/length of day/seasons  **Identify scientific arguments-** Order of planets/Pluto’s status  **Forces**  **Plan scientific enquiry to investigate-** Use force metre to recap pushes and pulls  **Take measurements with scientific equipment (Newton metre)-** force needed to drag shoe on different surfaces, force needed to move toy car on different surfaces  **Record data with increasing complexity-** dropping balls from different height/onto different surfaces/different materials and recording height reached after bounce  **Identify scientific arguments-** Understand theories (explained simply) linked to gravity and forces | **Living things and their habitats**  **Report and present findings-** Set up & maintain living examples of key animal groups.  **Record data using scientific diagrams and labels-** labelled drawings of plant reproduction  **Plan scientific enquiry to explore seed dispersal/take measurement using scientific equipment (cm)/ Record data using graphs-** collect sycamore seeds and investigate if length of propeller affects dispersal  **Animals, including humans**  **Record data using scientific diagrams and labels-** labelled diagram of human life cycle  **Record data using scientific diagrams and labels-** labelled diagram of changes caused by puberty | **Properties and changes of materials**  **Plan scientific enquiry to explore materials-** test materials for hardness, solubility, transparency, thermal conductivity, electrical conductivity and response to magnets  **Taking measurements (ml/light energy) with increasing accuracy and precision- taking repeat readings-** test materials for waterproofing and transparency  **Plan scientific enquiry to explore materials/use test results to make predictions-** test solubility and reversible changes and make predictions about other materials |
| Key Vocabulary | Key Vocabulary | Key Vocabulary |
| Earth, planets, sun, solar system, moon, celestial body, sphere/spherical, rotate/rotation, spin, night and day  Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, 'dwarf' planet  Orbit, revolve  Geocentric model, heliocentric model  Shadow clocks, sundials, astronomical clocks  Fall, gravity, force, friction, Earth  Air resistance, water resistance, Transfer  Moving surfaces  Mechanisms, levers, pulleys, gears  Forces and magnets, magnetic force, magnet, attract, repel | Life cycle, reproduction, sexual, asexual, germination, pollination, seed formation, seed dispersal, pollen, stamen, stigma, plantlets  e.g. spider plant, runners e.g. strawberry plant  Timeline, stages, growth, development, puberty, gestation, baby, offspring, child, adolescence, teenager, toddler, adult, grandparent, parent, birth, reproduction, egg, sperm, feutus | Hard, soft, stretchy, rigid, flexible, waterproof, absorbent, strong/weak, rough, smooth, hard, soft, stretchy, rigid, flexible  waterproof reflective, non-reflective  Transparent, opaque, translucent  Dissolve, solution, soluble, insoluble, solute, solvent, particle, mix/mixture, filtering, sieving, evaporating, residue, condensing,  reversible changes, new material,  not usually reversible, burning, gas given off, rusting |
| Cultural Capital | Cultural Capital | Cultural Capital |
| Life Science Museum (Newcastle)  Wynyard Planetarium & Observatory Stockton  Billingham Ice Skating  North East Land Sea and Air Museum- Sunderland | Preston Park Stockton-on-Tees  Sunderland Museum and Winter Gardens Sunderland  Visit to local garden centres  Visit local allotments  Outside In (South Park) 0191 584 3112  Friends of South Park 01325 283225  School Woodland and local area  Hamsterley Forest – Bishop Auckland area  Broken Scar- Darlington  Rockwell Nature Reserve  Drinkfield Marsh  Brinkburn Pond  South Burdon Community Woods  Botanical Gardens Durham | Angel of the North  Darlington Brick Train  Stephenson Steam Railway Museum – North Shields Engineering workshop 1hr £60 |
| Working Scientifically | | |
| Plan different types of scientific enquiries to answer questions, including recognising and controlling variables  Take measurements, using a range of scientific equipment, with accuracy and precision, taking repeat readings when appropriate  Record data and results using diagrams, labels, classification keys, tables, scatter graphs, bar and line graphs  Use test results to make predictions to set up further comparative and fair tests  Report and present findings from enquiries, including conclusions, casual relationships and explanations of and degree of trust in results, in oral/written forms such as displays and presentations  Identify scientific evidence that can support or refute ideas or arguments. | | |
| Key Vocabulary | | |
| Questions/answers, types of scientific enquiry, changes/ present, similarities/differences, observations/appearance, classify/sort/group/identify, opinion/fact,  observe changes over time, careful/accurate/accuracy, precision, increase/decrease  Secondary sources, comparative tests/fair tests, independent variable, dependent variable, controlled variable, degree of trust, causal relationships, conclusions, prediction, support/refute  Equipment, microscope, thermometers, data loggers, magnifying glasses  Gather/measure/record, data/evidence/results, keys/classification keys, bar charts/scatter graphs, table/results/line graph | | |

YEAR SIX

| Autumn | Spring | Summer |
| --- | --- | --- |
| **Light**  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.  **Electricity**  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. | **Living things and their habitats**  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.  **Evolution and Inheritance**  Know 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 are not identical to their parents  Identify how animals and plants are adapted to suit their environment and that adaptation may lead to evolution. | **Animals, including humans**  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. |
| Key Knowledge | Key Knowledge | Key Knowledge |
| **Light**  Recap work from Year 3  Understand key properties of light- travel in straight lines, opaque objects create shadows as the light is blocked, light travels fast (300,000,000 m per second)  Know that light reflects off an object and travels to our eye in order for us to see  Understand how reflection works.  **Electricity**  Recap work from Year 4  Understand how the number and voltage of cells affects a lamp or buzzer  Explain how different components in a circuit work  Use scientific symbols for parts of a circuit, drawn accurately | **Living things and their habitats**  Recap learning from previous years  Know about classification systems  Group living things by similarities and differences  Justify their groupings using classification keys.  Explore different microbes- looking at microscopic images  **Evolution and Inheritance**  Recap work on fossils  Be familiar with the theory of evolution and know examples of/evidence for this in real life  Look at the evolution timeline for plants, animals and humans  Understand adaptation to their habitat include plants  Understand how offspring and parents can differ including looking at cross breeding of dogs. | **Animals, including humans**  Recap learning from previous years- main body parts, skeletal system, muscular system and digestive system.  Know and understand the function of capillaries, arteries and veins  Know and understand the role of the heart and how it functions  Know and understand the role of the lungs, windpipe, ribs and diaphragm muscle.  Explain impact of lifestyle and exercise on the body  Understand how the circulatory system transport nutrients and how this links to the digestive system |
| **Working Scientifically** | **Working Scientifically** | **Working Scientifically** |
| **Light**  **Plan scientific enquiries/take measurements (light energy)/record and present data-** investigate how light travels and how light travels in a straight line  **Plan scientific enquiries/take measurements (light energy)/record and present data-** record using data logger how materials effect light energy and create shadows  **Plan scientific enquiries/take measurements (light energy)/record and present data-** record using data logger how reflection affects light energy  **Electricity**  **Use test results to make predictions and set up further tests-** Explore impact of number of cells/voltage affect light intensity/sound intensity using data logger  **Report and present findings including conclusions, casual relationships and explanations-** present findings from research/investigation in detail | **Living things and their habitats**  **Report and present findings including conclusions, casual relationships and explanations-**collect and classify insects from local habitats, observe and classify animals from local habitats, collect and classify local plants, present findings-identifying patterns  **Record and present data-** use classification keys  **Evolution and Inheritance**  **Identify scientific arguments-** be familiar with theories of evolution  **Report and present findings including conclusions, casual relationships and explanations-**collect and classify insects from local habitats, observe and classify animals from local habitats, collect and classify local plants, present findings-identifying how these have adapted to local area | **Animals, including humans**  **Record and present data-** detailed scientific diagrams  **Plan scientific enquiries/take measurements (pulse rate) record and present data-** investigate impact of different exercise on the body  **Identify scientific arguments-** understand current thinking around staying healthy and impact of lifestyle on health |
| Key Vocabulary | Key Vocabulary | Key Vocabulary |
| Light, light source, names of light sources e.g. torch, dark/darkness  Reflect, reflective, mirror  Shadow, block, absorb, direct/ direction  Transparent, opaque, translucent  Travels, straight lines  Periscope, rainbow, filters, spectrum, colours  Eyes, vision  Appliances/device, electrical circuit, complete circuit, circuit diagram, circuit symbol, positive/negative, terminal, connect/connection, loose connection, short circuit  Wire, crocodile clip, bulb, switch, buzzer, motor, components, cell, battery,  Bright/dim, volume, fast(er)/slow(er)  Conductor, insulator, metal/non metal  Voltage, current, resistance | Organism, micro-organisms, microbes  Fungus, mushrooms  classification keys  Environment  Fish, amphibians, reptiles, birds, mammals  Vertebrates, invertebrates, exoskeleton, endoskeleton, hydrostatic skeleton  Evolution, suited/suitable, environment, adapted/adaptation  Offspring, characteristics, vary/variation, inherit/inheritance, fossils | Circulatory system, heart, blood, blood vessels, pumps, oxygen, carbon dioxide, lungs  Nutrients, water, diet, exercise, drugs, lifestyle |
| Cultural Capital | Cultural Capital | Cultural Capital |
| Life Science Museum (Newcastle) | Outside In (South Park) 0191 584 3112  Zoo Lab 01324 667800  Animal Club [enquiries@animal-club.co.uk](mailto:enquiries@animal-club.co.uk)  Life Science Centre (Newcastle)  Dorman Museum Middlesbrough- fossils and skeletons  Great North Museum Newcastle- fossils and skeletons  Wetheriggs Animal Rescue Barnard Castle  Saltholme Wildlife and Reserve and Discovery Park- Middlesbrough  North East Falconry 07592 932533  School staff with pets- S Akers- tortoise, Strive- Guinea Pigs, B Sewell- rabbits | Life Science Centre (Newcastle) (Gross and Glorious Me) |
| Working Scientifically | | |
| Plan different types of scientific enquiries to answer questions, including recognising and controlling variables  Take measurements, using a range of scientific equipment, with accuracy and precision, taking repeat readings when appropriate  Record data and results using diagrams, labels, classification keys, tables, scatter graphs, bar and line graphs  Use test results to make predictions to set up further comparative and fair tests  Report and present findings from enquiries, including conclusions, casual relationships and explanations of and degree of trust in results, in oral/written forms such as displays and presentations  Identify scientific evidence that can support or refute ideas or arguments. | | |
| Key Vocabulary | | |
| Questions/answers, types of scientific enquiry, changes/ present, similarities/differences, observations/appearance, classify/sort/group/identify, opinion/fact,  observe changes over time, careful/accurate/accuracy, precision, increase/decrease  Secondary sources, comparative tests/fair tests, independent variable, dependent variable, controlled variable, degree of trust, causal relationships, conclusions, prediction, support/refute  Equipment, microscope, thermometers, data loggers, magnifying glasses  Gather/measure/record, data/evidence/results, keys/classification keys, bar charts/scatter graphs, table/results/line graph | | |