

|  |  | 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!
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How is Science taught at Red Hall?

| **EYFS** | **Year 1 – Year 6** |
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| 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
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| 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 KS2Green Pen Concept MapOpportunity to pre-teach future learning. | Introduce new learningIntroduce new vocabulary | Independent learning | Recap learningUse 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** |
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| Lullaby Lane | Nursery | Reception |
| Take part in a nature walk during each seasonExperience playing during different types of weatherKnow a few common farm animalsKnow a few common petsName a few body partsExperience freezing and melting | Experience growing somethingExperience picking flowers, plants, vegetables and fruitsKnow a few common fruits & vegetablesUnderstand different clothes they will need for different types of weatherName human body partsKnow a few common pets & a few common farm animalsKnow a few common animals from other countriesExperience using wood, paper, card, fabric (wool, cotton, felt) in building and makingName a few parts of animal bodies | Know a few common UK wild plantsKnow a few common grown flowersHave knowledge of sun safetyKnow a few common UK wild animalsKnow a few common UK wild birdsKnow a few common sea animalsKnow some habitat wordsSort objects into groups (wood, metal and plastic)Know the 5 senses |
| Key Knowledge | Key Knowledge | Key Knowledge |
| Talk about snow, rain and sunny weatherKnow pig, cow, sheepKnow dog, catKnow hand, foot, headTalk about hot and coldTalk about wet and dry | Know the difference between flowers and treesTalk about seeds and bulbsKnow apple, orange, banana, grapesKnow carrot, potato, broccoli, cauliflowerKnow hat, scarf, gloves, umbrella, welliesName head, leg, arm, hand, foot, knee, elbow, back, shoulder, fingers, toesKnow cat, dog, fish, rabbit, guinea pigKnow pig, cow, sheep, duck, chicken, goatKnow lion, tiger, penguin, polar bear, camel, snake, spider, monkeyName paper, wood, card and a type of fabricName paw, tail, ear, wing | Name dandelion, daisy and buttercupKnow rose, tulip, daffodilUnderstand they need sunglasses, sun hat and sun block when in the sunName rabbit, squirrel, fox, badger, rat, snake (adder), frogName blackbird, owl, robin, seagullName shark, dolphin, whale, octopus, starfishKnow woodland, sea/ocean, beach/seashore, jungleSort wood, metal and plasticKnow 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, WinterCommon farm animals, common pets, common flowers (wild and garden), common fruits, common vegetables, common wild UK animals, common UK wild birds, common sea animalsMaterial 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** |
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| Year 1 – Seasonal ChangeYear 5- Earth and SpaceYear 6- Evolution and Inheritance | Year 1- AnimalsYear 2- AnimalsYear 3- Animals | Year 1- PlantsYear 2- PlantsYear 3- Rocks | Year 2- AnimalsYear 4- Living ThingsYear 5- AnimalsYear 5- Living Things | Year 4- States of MatterYear 5- Properties and Changes of Materials | Year 1- PlantsYear 2- PlantsYear 3- Plants |

**Resources TO SUPPORT SCIENCE CURRICULUM AND DELIVERY**



**Progression of Skills**

|  | **Year 1** | **Year 2** | **Years 3** | **Year 4** | **Year 5** | **Year 6** |
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| **Plants** | Identify and name a variety of common wild and garden plants including deciduous and evergreentreesIdentify and describe structure of a variety of common flowering plants, including trees | Observe and describe how seeds and bulbs grow into mature plantsFind 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 varyInvestigate how water is transported in plantsExplore 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 aliveIdentify 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 otherIdentify and name a variety of plants and animals in their habitats, including micro habitatsDescribe 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 waysExplore and use classification keys to help group, identify and name a variety of living things in their local and wider environmentRecognise 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 birdDescribe 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 animalsGive 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 omnivoresDescribe and compare the structure of a variety of common animalsIdentify, 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 adultsFind out and describe the basic needs of animals and humansDescribe 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 foodIdentify 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 humansIdentify the different types of teeth in humans and their simple functionsConstruct 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 bloodRecognise the impact of diet, exercise, drugs and lifestyle on the way their bodies functionDescribe 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 agoRecognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parentsIdentify 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 fromIdentify and name a variety of everyday materialsDescribe simple physical properties of everyday materialsCompare 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 propertiesDescribe 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 gasesObserve 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 solutionUse 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 changesExplain 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 lightNotice that light is reflected from surfacesRecognise that light from the sun can be dangerous and that there are ways to protect their eyesRecognise that shadows are formed when the light from a light source is blocked by an opaque objectFind patterns in the way that the size of shadows change. | Identify how sounds are made, associating some of them with something vibratingRecognise that vibrations from sounds travel through a medium to the earFind patterns between the pitch of a sound and features of the object that produced itFind patterns between the volume of a sound and the strength of the vibrations that produced itRecognise that sounds get fainter as the distance from the sound source increases. |  | Recognise that light appears to travel in straight lineslight travels in straight lines to explain that objects are seen because they give out or reflect light into the eyeExplain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyesUse 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 seasonsObserve 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 systemDescribe the movement of the Moon relative to the EarthDescribe the Sun, Earth and Moon as approximately spherical bodiesUse 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 surfacesNotice that some forces need contact but magnetic forces can act at a distanceObserve how magnets attract or repel each other and materialsCompare and group materials based on attraction to magnets, Identify magnetic materialsDescribe magnets as having two polesPredict 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 objectIdentify the effects of air resistance, water resistance and friction, that act between moving surfacesRecognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect |  |
| **Electricity** |  |  |  | Identify common appliances that run on electricityConstruct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzersIdentify 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 batteryRecognise that a switch opens and closes a circuit, associate this with whether or not a lamp lights in a simple series circuitRecognise 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 circuitCompare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switchesUse recognised symbols when representing a simple circuit in a diagram. |
| **Working Scientifically** | Ask simple questions and recognise they can be answered different waysObserve closely, using simple equipmentPerform simple testsIdentify and classifyUse observations and ideas to suggest answersGather and record data to help answer questions | Ask simple questions and recognise they can be answered different waysObserve closely, using simple equipmentPerform simple testsIdentify and classifyUse observations and ideas to suggest answersGather and record data to help answer questions | Ask questions and use different types of scientific enquiries to answer themSet up simple practical enquiries, comparative and fair testsObserve taking measurements with standard units, using equipment, including thermometers and data loggersGather record classify and present data in a variety of ways to answer questionsRecord findings using scientific language, drawings, diagrams, keys, bar charts, and tablesReport on findings from enquiries, oral and written explanations, displays, presentations of results and conclusionsUse results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questionsIdentify differences, similarities, changes related to scientific ideas and processesUse scientific evidence to answer questions or to support their findings. | Ask questions and use different types of scientific enquiries to answer themSet up simple practical enquiries, comparative and fair testsObserve taking measurements with standard units, using equipment, including thermometers and data loggersGather record classify and present data in a variety of ways to answer questionsRecord findings using scientific language, drawings, diagrams, keys, bar charts, and tablesReport on findings from enquiries, oral and written explanations, displays, presentations of results and conclusionsUse results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questionsIdentify differences, similarities, changes related to scientific ideas and processesUse scientific evidence to answer questions or to support their findings. | Plan different types of scientific enquiries to answer questions, including recognising and controlling variablesTake measurements, using a range of scientific equipment, with accuracy and precision, taking repeat readings when appropriateRecord data and results of increasing complexity using diagrams, labels, classification keys, tables, scatter graphs, bar and line graphsUse test results to make predictions to set up further comparative and fair testsReport 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 presentationsIdentify scientific evidence that can support or refute ideas or arguments. | Plan different types of scientific enquiries to answer questions, including recognising and controlling variablesTake measurements, using a range of scientific equipment, with accuracy and precision, taking repeat readings when appropriateRecord data and results of increasing complexity using diagrams, labels, classification keys, tables, scatter graphs, bar and line graphsUse test results to make predictions to set up further comparative and fair testsReport 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 presentationsIdentify scientific evidence that can support or refute ideas or arguments. |

**National Curriculum Coverage**

YEAR ONE

| Autumn  | Spring | Summer |
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| Seasonal ChangeObserve changes across the four seasonsObserve and describe weather associated with the seasons and how day length variesAnimals, including humansIdentify 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 omnivoresDescribe and compare the structure of a variety of common animalsIdentify, name, draw and label basic parts of human body and say which sense it is associated with | Seasonal ChangeObserve changes across the four seasonsObserve and describe weather associated with the seasons and how day length variesEveryday MaterialsDistinguish between an object and the material it is made fromIdentify and name a variety of everyday materials (including wood, plastic, glass, metal, water and rock)Describe simple physical properties of everyday materialsCompare and group materials based on their physical propertiesPlantsIdentify and name a variety of common wild and garden plants including deciduous and evergreentreesIdentify and describe structure of a variety of common flowering plants, including trees | Seasonal ChangeObserve changes across the four seasonsObserve and describe weather associated with the seasons and how day length variesPlantsIdentify and name a variety of common wild and garden plants including deciduous and evergreentreesIdentify 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 mammalsKnow which UK animals use our local habitats Name common animals kept as pets and classify themUnderstand that these animals are not in their natural habitatUnderstand that wild animals must be returned to their habitat after we have studied themName some fish, amphibians, reptiles, birds and mammals from different countriesDescribe 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 structureDescribe 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 shadowsMake 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/nightNames 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/nightObject, 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/transparentNames 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/nightNames 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 3112Zoo Lab 01324 667800Animal Club enquiries@animal-club.co.ukLife Science Centre (Newcastle)Dorman Museum (Middlesbrough) – skeletons/animal displaysGreat North Museum (Newcastle) – skeletons/animal displaysWetheriggs Animal Rescue Barnard CastleSaltholme Wildlife and Reserve and Discovery Park- MiddlesbroughNorth East Falconry 07592 932533School staff with pets- S Akers- tortoise, Strive- Guinea Pigs, B Sewell- rabbits, Office area- fish | CumminsCleveland BridgePreston Park (Stockton-on-Tees)Sunderland Museum and Winter Gardens (Sunderland)Visit to local garden centresVisit local allotmentsOutside In (South Park) 0191 584 3112Friends of South Park 01325 283225School Woodland and local areaHamsterley Forest – Bishop Auckland areaHardwick Park- Bishop Auckland areaBroken Scar- DarlingtonRockwell Nature Reserve Drinkfield MarshBrinkburn PondSouth Burdon Community WoodsBotanical Gardens DurhamSchool 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 centresVisit local allotmentsOutside In (South Park) 0191 584 3112Friends of South Park 01325 283225School Woodland and local areaHamsterley Forest - Bishop Auckland areaHardwick Park- Bishop Auckland areaBroken Scar- DarlingtonRockwell Nature Reserve Drinkfield MarshBrinkburn PondSouth Burdon Community WoodsSchool staff with plant knowledge/gardening knowledge – D Lowery, V Pidgeon |
| Working Scientifically |
| Ask simple questions and recognise they can be answered different waysObserve closely, using simple equipmentPerform simple testsIdentify and classifyUse observations and ideas to suggest answersGather 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 MaterialsIdentify 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 humansNotice that animals, including humans have offspring which grow into adultsFind out and describe the basic needs of animals and humans for survivalDescribe the importance for humans of exercise, eating right amounts of different food and hygiene | PlantsObserve and describe how seeds and bulbs grow into mature plantsFind out and describe how plants need water, light and a suitable temperature to grow and stay healthyAnimals, including humansNotice that animals, including humans have offspring which grow into adultsFind out and describe the basic needs of animals and humans for survivalDescribe the importance for humans of exercise, eating right amounts of different food and hygiene | PlantsObserve and describe how seeds and bulbs grow into mature plantsFind out and describe how plants need water, light and a suitable temperature to grow and stay healthyLiving things and their habitatsExplore and compare differences between living, dead and never been aliveIdentify 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 otherIdentify and name a variety of plants and animals in their habitats, including micro habitatsDescribe 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 plantsObserve bulbs growing into plantsDescribe the stages of a seed growing into a plantDescribe the stages of a bulb growing into a plantKnow the basic needs of a plant- water, light, suitable temperature.Begin to understand in simple terms that a plant can make its own foodSeeds 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 aliveMRS GREN- movement, respiration, sensitivity, growth, reproduction, excretion, nutritionRecap basic needs of living thingsUnderstand that a habitat is the natural home/environment for plants and animalsUnderstand 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 plantsExplain how a living thing is suited to its habitat or microhabitatExplain how a habitat meets the basic needs of a living thing, including plantsCreate 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/usefulObject, material, propertyWood, plastic, glass, metal, water, rock, brick, paper, fabrics, elastic, foil, card/cardboard, rubber, wool, clayHard, soft, stretchy, rigidOffspring, babies, young, grow, change, adults, older/younger, baby/toddler/child/teenagerBasic needs, water, food, air, breathing, survivalExercise, food types, fruit and vegetable, bread, rice, potato, pasta, milk and dairy foods, foods high in fat or sugar, meat, fish, egg, beansHygiene, clean, wash, healthy, medicine | Seeds, bulbs, fully grown, water, light, damp/wet/dry, dark/light, hot/warm/cool/colduse comparatives e.g. hottergrow/growth, healthy, shoot, seedling, wither/limp, die, dry/crispy, soil, earth, seeds, bulbsOffspring, babies, young, grow, change, adults, older/younger, baby/toddler/child/teenagerBasic needs, water, food, air, breathing, survivalExercise, food types, fruit and vegetable, bread, rice, potato, pasta, milk and dairy foods, foods high in fat or sugar, meat, fish, egg, beansHygiene, clean, wash, healthy, medicine | Seeds, bulbs, fully grown, water, light, damp/wet/dry, dark/light, hot/warm/cool/colduse comparatives e.g. hottergrow/growth, healthy, shoot, seedling, wither/limp, die, dry/crispy, soil, earth, seeds, bulbsLiving, dead, never been aliveMove, grow, feed, have offspring/young/babiesName 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. hotterSuited/suitable, basic needs, depend, shelterFood, food chain |
| Cultural Capital | Cultural Capital | Cultural Capital |
| National Glass Centre- SunderlandDiscovery Museum- Building Bridges exhibition, Ships and Ship Building exhibition, Inventors GallerySouth Shields Museum and Art Gallery- STEAM museum challenge £180Outside In (South Park) 0191 584 3112Zoo Lab 01324 667800Animal Club enquiries@animal-club.co.ukLife Science Centre (Newcastle)Dorman Museum MiddlesbroughGreat North Museum NewcastleWetheriggs Animal Rescue Barnard CastleThorp Perrow Bird of Prey and Mammal Centre School NurseSchool staff with pets- S Akers- tortoise, Strive- Guinea Pigs, B Sewell- rabbits | Preston Park Stockton-on-TeesSunderland Museum and Winter Gardens SunderlandVisit to local garden centresVisit local allotmentsOutside In (South Park) 0191 584 3112Friends of South Park 01325 283225School Woodland and local areaHamsterley Forest – Bishop Auckland areaBroken Scar- DarlingtonRockwell Nature Reserve Drinkfield MarshBrinkburn PondSouth Burdon Community WoodsBotanical Gardens DurhamSchool staff with plant knowledge/gardening knowledge – D Lowery, V Pidgeon | Preston Park Stockton-on-TeesSunderland Museum and Winter Gardens SunderlandVisit to local garden centresVisit local allotmentsOutside In (South Park) 0191 584 3112Friends of South Park 01325 283225School Woodland and local areaHamsterley Forest - Bishop Auckland areaBroken Scar- DarlingtonRockwell Nature Reserve Drinkfield MarshBrinkburn PondSouth Burdon Community WoodsBotanical Gardens DurhamSchool staff with plant knowledge/gardening knowledge – D Lowery, V PidgeonOutside In (South Park) 0191 584 3112Zoo Lab 01324 667800Animal Club enquiries@animal-club.co.ukLife Science Centre (Newcastle)Dorman Museum MiddlesbroughGreat North Museum NewcastleWetheriggs Animal Rescue Barnard CastleThorp Perrow Bird of Prey and Mammal Centre School NurseSchool grounds and local areaSchool staff with pets- S Akers- tortoise, Strive- Guinea Pigs, B Sewell- rabbits |
| Working Scientifically |
| Ask simple questions and recognise they can be answered different waysObserve closely, using simple equipmentPerform simple testsIdentify and classifyUse observations and ideas to suggest answersGather 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 |
| --- | --- | --- |
| RocksCompare and group different kinds of rocks by appearance and simple physical propertiesDescribe how fossils are formed when things that have lived are trapped within rockRecognise that soils are made from rocks and organic matter. | Animals, including humansIdentify 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 eatIdentify that humans and some other animals have skeletons and muscles for support, protection, movement Forces and MagnetsCompare how things move on different surfacesNotice that some forces need contact but magnetic forces can act at a distanceObserve how magnets attract or repel each other and materials Compare and group materials based on attraction to magnets, Identify magnetic materialsDescribe magnets as having two polesPredict if two magnets will attract or repel, depending on which poles are facing. | PlantsIdentify 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 plantInvestigate how water is transported in plantsExplore the role of flowers in the life cycle of flowering plants (pollination, seed formation and seed dispersal)LightRecognise that they need light in order to see things and that dark is the absence of lightNotice that light is reflected from surfacesRecognise that light from the sun can be dangerous and that there are ways to protect their eyesRecognise that shadows are formed when the light from a light source is blocked by an opaque objectFind patterns in the way that the sizes of shadows change. |
| Key Knowledge | Key Knowledge | Key Knowledge |
| **Rocks and soils**Compare rocks by appearanceGroup rocks by appearanceCompare rocks by propertiesGroup rocks by propertiesExplain the process of fossilisationCompare soils by appearanceGroup soils by properties- rocks and organic matterUnderstand 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 animalsCompare the human diet to herbivore animal’s diet and carnivore animal’s dietUnderstand the nutritional value of different foodsUnderstand different lifestyles require different diets- weight training, runner, sedentary life style.Understand the impact of poor nutritionClassify 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 bonesName and find major musclesLabel 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 surfacesUnderstand friction slows movement, creates grip and creates heatKnow contact forces- friction, air resistance, water resistance and up-thrustKnow magnetic forcesUnderstand that only metals are attracted to magnets but not all metalsUnderstand the magnetic polesUnderstand 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 plantName the parts of a flowerUnderstand requirements for plant life and growth (look at a range of plants, including trees)Understand how water is transported in plantsUnderstand pollination, seed formation and seed dispersal- comparing**Light**Know natural and man-made sources of lightUnderstand 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 causeName and explain ways to protect your eyes.Explain how shadows are formedInvestigate 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, soilFossils, grains, crystals, hard/soft, texture, absorb water, let water throughMarble, chalk, granite, sandstone, slateSandy 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, carbohydratesProtein, vitamins and mineral, fat, dietary fibre, water, balanced dietSkeleton, 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, newtonsContact force, non-contact force, magnetic forceMagnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnetAttract, repelMagnetic material, metal, iron, steelNon-magnetic materialPoles, north pole, south poleGravity | Part, role, function, photosynthesisLeaf/leaves, flower, blossom, petal, root, bulb, seed, trunk/branch/stem, bark, stalkFruit, berrySeed formation, seed dispersal, pollinationWater, light, airlife cycleNutrients, soil, fertiliserDamp/wet/dry, dark/light, hot/warm/cool/colduse comparatives e.g. hotterGrow/growth, healthy transportedLight, light source, names of light sources e.g. torch, dark/darknessReflect, reflective, mirrorShadow, block, direct/ directionTransparent, opaque, translucent |
| **Cultural Capital** | **Cultural Capital** | **Cultural Capital** |
| Great North Museum- fossilsSeaham, Saltburn, Redcar (<https://ukfossils.co.uk/>)Quarrington Quarry (Durham)Coxhoe Drystone (Durham)Whitby Museum- fossilsKillhope Lead Mining Museum- Bishop Auckland AreaCleveland Ironstone Mining Museum- SaltburnHowe Stean Gorge- North YorkshireStump Cross Caverns- North YorkshireLife Science Museum (Newcastle) | School KitchenMorrisons visitAsda visitToby CarveryDorman Museum (Middlesbrough) – skeletons/animal displaysGreat North Museum (Newcastle) – skeletons/animal displaysLife Science Museum (Newcastle)Billingham Ice Skating | Preston Park Stockton-on-TeesSunderland Museum and Winter Gardens SunderlandVisit to local garden centresVisit local allotmentsOutside In (South Park) 0191 584 3112Friends of South Park 01325 283225School Woodland and local areaHamsterley Forest - Bishop Auckland areaBroken Scar- DarlingtonRockwell Nature Reserve Drinkfield MarshBrinkburn PondSouth Burdon Community WoodsMaiden Head Nature ReserveBotanical Gardens DurhamShadow puppet show for school- link to local issues or wider world issuesDesign bird scarers for school garden area or local allotmentsSpecsavers |
| Working Scientifically |
| Ask relevant questions and use different types of scientific enquiries to answer themSet up simple practical enquiries, comparative and fair testsObserve taking measurements with standard units, using equipment, including thermometers and data loggersGather, record, classify and present data in a variety of ways to answer questionsRecord findings using scientific language, drawings, labelled diagrams, keys, bar charts, and tablesReport on findings from enquiries, oral and written explanations, displays, presentations of results and conclusionsUse results to draw simple conclusions, make predications for new values, suggest improvements and raise further questionsIdentify differences, similarities or changes related to scientific ideas and processesUse 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 patternsPresent, link, secondary sources, comparative tests, fair tests, careful/accurate, observations, questions/answersEquipment, thermometers, data loggers, microscope, magnifying glassGather/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 gasesObserve 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 humansIdentify the different types of teeth in humans and their simple functionsConstruct 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 waysExplore and use classification keys to help group, identify and name a variety of living things in their local and wider environmentRecognise 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 vibratingRecognise that vibrations from sounds travel through a medium to the earFind patterns between the pitch of a sound and features of the object that produced itFind patterns between the volume of a sound and the strength of the vibrations that produced itRecognise that sounds get fainter as the distance from the sound source increases.**Electricity**Identify common appliances that run on electricityConstruct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzersIdentify 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 batteryRecognise that a switch opens and closes a circuit, associate this with whether or not a lamp lights in a simple series circuitRecognise common conductors and insulators, associate metals with being good conductors. |
| Key Knowledge | Key Knowledge | Key Knowledge |
| **States of matter**Explore everyday materialsDevelop simple descriptions of states of matterKnow solids hold shape, can be cut or shaped, you can keep hold of themKnow liquids make a pool not a pile, flow downwards, take the shape of the container, the surface stays levelKnow gasses escape from unsealed container, most are invisible, gases spread out into any empty spaceKnow particles of a solid are packed tightly and vibrate in placeKnow particles of a liquid are not so tightly packed and can move a littleKnow particles of a gas have lots of room and move all over, all the timeObserve water as a liquid, solid and gasKnow changes that happen to water as it is heated or cooledKnow water freezes at 0 degrees centigrade and boils at 100 degrees centigradeUnderstand 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 systemUnderstand the function of the parts of the digestive systemName and identify human teethUnderstand the function of different human teethUnderstand how to keep teeth healthyCreate food chains for a variety of animalsInterpret food chains for different animals answering questions. | **Living things and their habitats**Classify a variety of living things (including plants) in different waysUse classification keys to sort animals into groupsUse classification keys to sort plants into groupsExplore how local habitats change across the yearUnderstand 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- vibrationsUnderstand effect on sound energy as it travels through different mediums- effect on strength of vibrationsRecognise link between pitch and materials (linking back to work on materials on previous years)Recognise link between strength of vibrations and volume of soundUnderstand how distance effects sound **Electricity**Know common appliances that run on electricity at home, school and wider communityConstruct simple circuitsIdentify parts of a simple circuit and name them. Recognise when circuits are incompleteUnderstand use of switches and the impact on a circuitIdentify common conductorsIdentify common insulatorsRecognise 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, gasAir, oxygenPowder, grain/granular, crystalsChange stateIce/water/steam, water vapour, heated/heating, cooled/cooling, melt, freeze, solidify, melting point, molten, boilTemperature, degrees Celsius evaporation, condensation particlesDigestive system, nutrition, nutrientsMouth, teeth, canines, incisor, molar, pre-molar, saliva, tongue, rip, tear, chew, grind, cut, oesophagus (gullet), stomach, small intestine, large intestine, rectum, anusCarnivore, herbivore, omnivore, producer, consumer, predator, prey, food chain | Classification keysEnvironmentFish, amphibians, reptiles, birds, mammalsVertebrates, invertebratesName some vertebrates/invertebratesHuman impactName positive/ negative human impact | Sound, sound source, noise, vibrate/vibration, travelSolid/liquid/gasPitch, tune, high/low, volume, loud/quiet, fainter, muffle, strength of vibrations, insulationInstrument, percussion, strings, brass, woodwind, tuned instrumentElectricity, appliances/device, mains, plugElectrical circuit, complete circuit, circuit diagram, circuit symbol, components, cell, battery, wire, crocodile clip, bulb, switch, plug, buzzer, motorBright/dim, fast(er)/slow(er)Positive/negative, connect/connection, loose connection, short circuitConductor, insulator, metal/non metal |
| Cultural Capital | Cultural Capital | Cultural Capital |
| Gritting ServicesBillingham Ice SkatingOutside In (South Park) 0191 584 3112Zoo Lab 01324 667800Animal Club enquiries@animal-club.co.ukLife Science Centre (Newcastle)Dorman Museum Middlesbrough- animal skeletonsGreat North Museum Newcastle- animal skeletonsWetheriggs Animal Rescue Barnard CastleThorp Perrow Bird of Prey and Mammal Centre School NurseSchool staff with pets- S Akers- tortoise, Strive- Guinea Pigs, B Sewell- rabbits | Preston Park Stockton-on-TeesSunderland Museum and Winter Gardens SunderlandVisit to local garden centresVisit local allotmentsOutside In (South Park) 0191 584 3112Friends of South Park 01325 283225School Woodland and local areaHamsterley Forest - Bishop Auckland areaBroken Scar- DarlingtonRockwell Nature Reserve Drinkfield MarshBrinkburn PondSouth Burdon Community WoodsMaiden Head Nature ReserveBotanical Gardens DurhamTynemouth AquariumSchool staff with pets- S Akers- tortoise, Strive- Guinea Pigs, B Sewell- rabbits | The ForumHippodrome DarlingtonAny local building work |
| Working Scientifically |
| Ask relevant questions and use different types of scientific enquiries to answer themSet up simple practical enquiries, comparative and fair testsObserve taking measurements with standard units, using equipment, including thermometers and data loggersGather, record, classify and present data in a variety of ways to answer questionsRecord findings using scientific language, drawings, labelled diagrams, keys, bar charts, and tablesReport on findings from enquiries, oral and written explanations, displays, presentations of results and conclusionsUse results to draw simple conclusions, make predications for new values, suggest improvements and raise further questionsIdentify differences, similarities or changes related to scientific ideas and processesUse 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, changesPresent, increase/decreaseSecondary sources, comparative tests, fair tests, careful/accurate, observations, appearance, gather/measure/record, data/evidence/results, keys, bar charts, table, results, conclusions, predictionEquipment, 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 systemDescribe the movement of the Moon relative to the EarthDescribe the Sun, Earth and Moon as approximately spherical bodiesUse 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 objectIdentify the effects of air resistance, water resistance and frictionRecognise 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 birdDescribe 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 magnetsGive 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 solutionUse knowledge of solids, liquids and gases to separate mixtures (filters, sieves, evaporation)Demonstrate that dissolving, mixing and changes of state are reversible changesExplain 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 bodiesKnow the geocentric and heliocentric modelsKnow how our Sun is a star and that it is at the centre of our solar systemKnow order of planets making up our solar system in relation to distance from our SunExplain how the planets orbit the sunKnow the time it takes for Earth to orbit the sun linking to leap years and the direction of its orbitKnow the time it takes for our Moon to orbit Earth and the direction of its orbitUnderstand how the Moon’s orbit creates the phases of the moonUnderstand 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 rotationsKnow that other planets in our Solar System have different moons**Forces**Understand contact and non-contact forcesUnderstand what water resistance isUnderstand what air resistance isUnderstand what friction isUnderstand what gravity isUnderstand and explain how these forces affect movementUnderstand up thrust and its effect on objectsUnderstand balanced and unbalanced forcesExplore 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 plantDiscuss the differences between these life cyclesUnderstand sexual reproduction in animals, including humansUnderstand 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 4Test and classify everyday materials by all listed properties- hardness, solubility, transparency, thermal conductivity, electrical conductivity and response to magnetsJustify use of materials for objects using above testsUnderstand dissolving as a reversible changeUnderstand mixing as a reversible changeUnderstand changes of state as a reversible changeExplore reversible changesSeparate mixtures of solids, liquids and gasesUnderstand 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 dayMercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, 'dwarf' planetOrbit, revolveGeocentric model, heliocentric modelShadow clocks, sundials, astronomical clocksFall, gravity, force, friction, EarthAir resistance, water resistance, TransferMoving surfacesMechanisms, levers, pulleys, gearsForces 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 plantTimeline, 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, flexiblewaterproof reflective, non-reflective Transparent, opaque, translucentDissolve, 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 StocktonBillingham Ice SkatingNorth East Land Sea and Air Museum- Sunderland | Preston Park Stockton-on-TeesSunderland Museum and Winter Gardens SunderlandVisit to local garden centresVisit local allotmentsOutside In (South Park) 0191 584 3112Friends of South Park 01325 283225School Woodland and local areaHamsterley Forest – Bishop Auckland areaBroken Scar- DarlingtonRockwell Nature Reserve Drinkfield MarshBrinkburn PondSouth Burdon Community WoodsBotanical Gardens Durham | Angel of the NorthDarlington Brick TrainStephenson 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 appropriateRecord data and results using diagrams, labels, classification keys, tables, scatter graphs, bar and line graphsUse test results to make predictions to set up further comparative and fair testsReport 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 presentationsIdentify 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/decreaseSecondary sources, comparative tests/fair tests, independent variable, dependent variable, controlled variable, degree of trust, causal relationships, conclusions, prediction, support/refuteEquipment, microscope, thermometers, data loggers, magnifying glassesGather/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 linesUse the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eyeExplain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyesUse 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 circuitCompare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switchesUse 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 animalsGive 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 agoRecognise that living things produce offspring of the same kind, but normally offspring are not identical to their parentsIdentify 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 bloodRecognise the impact of diet, exercise, drugs and lifestyle on the way their bodies functionDescribe the ways in which nutrients and water are transported within animals, including humans. |
| Key Knowledge | Key Knowledge | Key Knowledge |
| **Light**Recap work from Year 3Understand 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 seeUnderstand how reflection works.**Electricity**Recap work from Year 4Understand how the number and voltage of cells affects a lamp or buzzerExplain how different components in a circuit workUse scientific symbols for parts of a circuit, drawn accurately | **Living things and their habitats**Recap learning from previous yearsKnow about classification systemsGroup living things by similarities and differencesJustify their groupings using classification keys.Explore different microbes- looking at microscopic images**Evolution and Inheritance**Recap work on fossilsBe familiar with the theory of evolution and know examples of/evidence for this in real lifeLook at the evolution timeline for plants, animals and humansUnderstand 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 functionsKnow and understand the role of the lungs, windpipe, ribs and diaphragm muscle.Explain impact of lifestyle and exercise on the bodyUnderstand 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/darknessReflect, reflective, mirrorShadow, block, absorb, direct/ directionTransparent, opaque, translucentTravels, straight linesPeriscope, rainbow, filters, spectrum, coloursEyes, visionAppliances/device, electrical circuit, complete circuit, circuit diagram, circuit symbol, positive/negative, terminal, connect/connection, loose connection, short circuitWire, crocodile clip, bulb, switch, buzzer, motor, components, cell, battery,Bright/dim, volume, fast(er)/slow(er)Conductor, insulator, metal/non metalVoltage, current, resistance | Organism, micro-organisms, microbesFungus, mushroomsclassification keysEnvironmentFish, amphibians, reptiles, birds, mammalsVertebrates, invertebrates, exoskeleton, endoskeleton, hydrostatic skeletonEvolution, suited/suitable, environment, adapted/adaptationOffspring, characteristics, vary/variation, inherit/inheritance, fossils | Circulatory system, heart, blood, blood vessels, pumps, oxygen, carbon dioxide, lungsNutrients, water, diet, exercise, drugs, lifestyle |
| Cultural Capital | Cultural Capital | Cultural Capital |
| Life Science Museum (Newcastle) | Outside In (South Park) 0191 584 3112Zoo Lab 01324 667800Animal Club enquiries@animal-club.co.ukLife Science Centre (Newcastle)Dorman Museum Middlesbrough- fossils and skeletonsGreat North Museum Newcastle- fossils and skeletonsWetheriggs Animal Rescue Barnard CastleSaltholme Wildlife and Reserve and Discovery Park- MiddlesbroughNorth East Falconry 07592 932533School 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 appropriateRecord data and results using diagrams, labels, classification keys, tables, scatter graphs, bar and line graphsUse test results to make predictions to set up further comparative and fair testsReport 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 presentationsIdentify scientific evidence that can support or refute ideas or arguments. |
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| 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/decreaseSecondary sources, comparative tests/fair tests, independent variable, dependent variable, controlled variable, degree of trust, causal relationships, conclusions, prediction, support/refuteEquipment, microscope, thermometers, data loggers, magnifying glassesGather/measure/record, data/evidence/results, keys/classification keys, bar charts/scatter graphs, table/results/line graph |