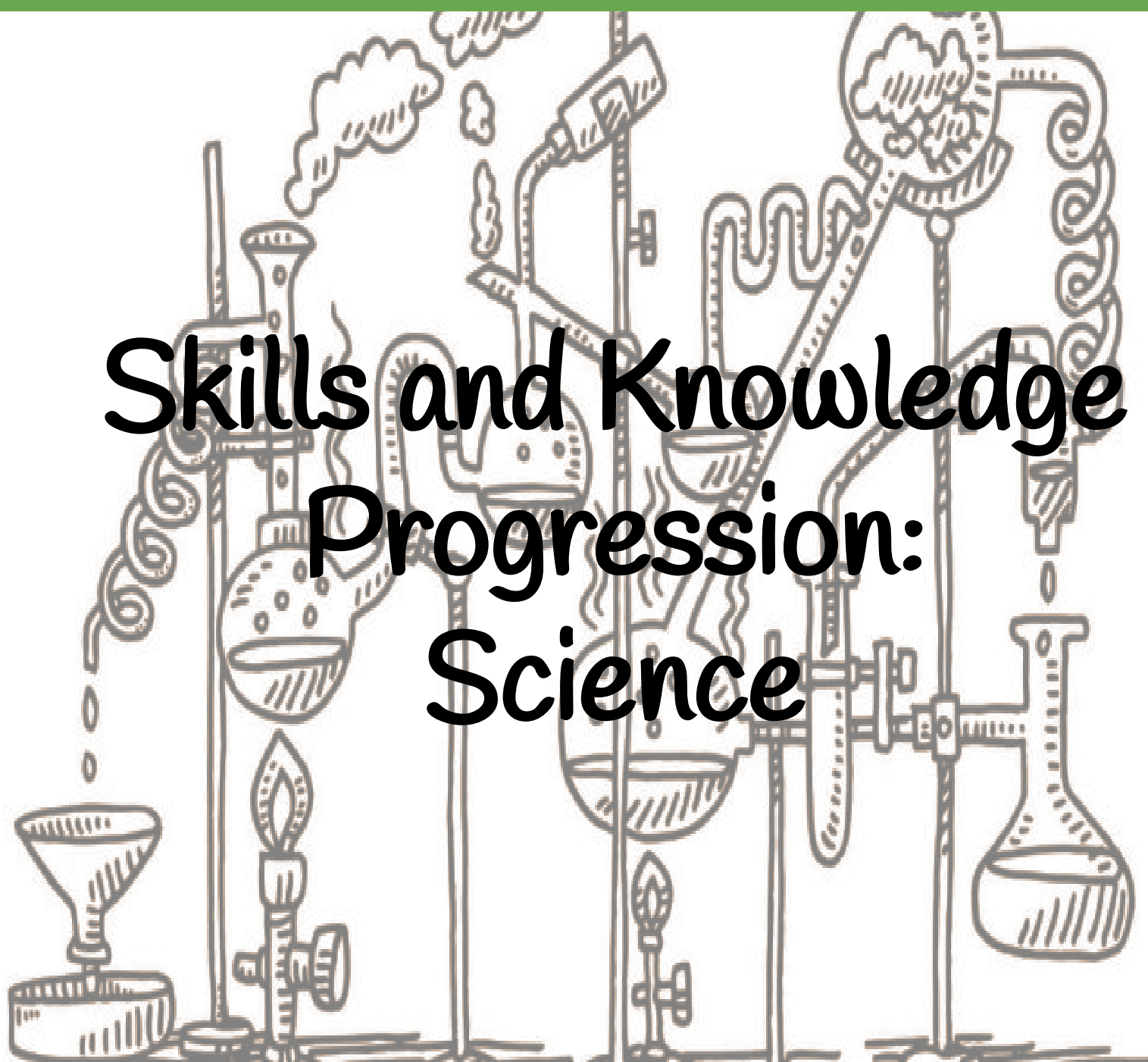
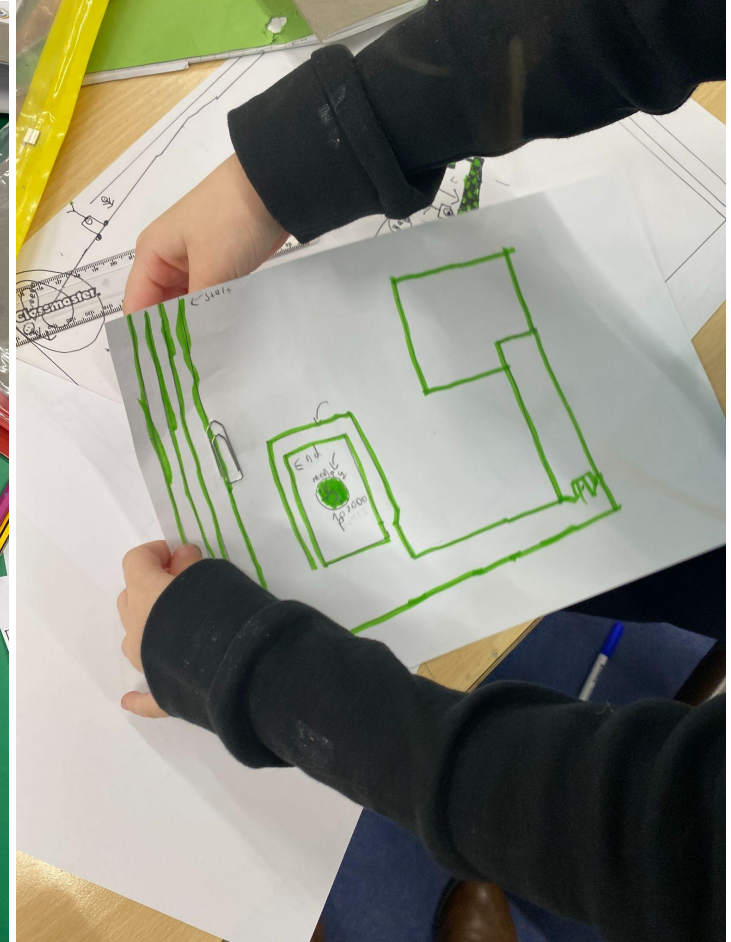


Skills and Knowledge Progression: Science





Magnet Games - Yr 3/4

<p>National Curriculum aims & purpose:</p>	<p><i>School aims – skills, attitudes and knowledge that we would like all children to develop on their journey through the school</i></p>
<p>A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.</p> <p>Aims: develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them equip pupils with the knowledge required to understand the uses and implications of science, today and for the future.</p>	<p>Our science curriculum inspires and motivates our children by giving them opportunities to work like scientists. Children will build scientific knowledge and develop a sense of curiosity to investigate and deepen their understanding of how the physical world works. Our children are encouraged to ask questions, select appropriate ways to answer them, experiment, make observations, reflect and have the resilience to make and learn from their mistakes in a safe environment. This empowers our children to obtain and apply fundamental skills that will equip them for an ever changing world.</p> <p>During science lessons, we will ensure that children are given the opportunity to ask ambitious questions and then plan and conduct investigations with the aim of answering these questions. In KS1 their natural curiosity should be encouraged and they will be given the opportunity to talk about what they have found out. In Years 3 and 4, children will explore, talk about, test and develop ideas and begin to make some decisions about which types of scientific enquiry would be most effective. In Years 5 and 6, they will encounter more abstract ideas and begin to recognise that scientific ideas change and develop over time. Children will draw conclusions, use evidence to justify their ideas and use their understanding to explain their findings.</p> <p>It is key that knowledge content and practical skills are taught hand-in-hand, with children developing and building on their factual knowledge as they journey through the school, making links between topics applying skills and understanding from previous learning to new areas as they are met.</p>

<p>Links to learning in EYFS:</p>	<p>Links to other subjects / curriculum areas:</p>	<p>Experiences every child should have:</p>
<p>Communication and Language Make comments about what they have heard and ask questions to clarify their understanding.</p> <p>PSED Make comments about what they have heard and ask questions to clarify their understanding.</p> <p>Personal, Social and Emotional Development Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.</p>	<p>Use of ICT to collect data, analyse results and present findings History - the lives and impact of famous scientists from the past Geography - animal habitats from around the world, weather systems, rock formation Maths - Data handling English - posing and writing questions, presenting findings both verbally and through written observations and conclusions</p>	<p>Observing a range of plants and animals first-hand, in the local environment, parks,, zoos and other animal centres Growing their own fruits and vegetables all the way through from seed to the plate Creating electrical circuits and watching something they have constructed respond to their commands Be surprised by what happens and excited about what they discover when working practically Make discoveries through trial and error - and not being afraid to get things wrong Ask 'big questions' about life and the universe</p>

Understanding the World

- Explore the natural world around them, making observations and drawing pictures of animals and plants.
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

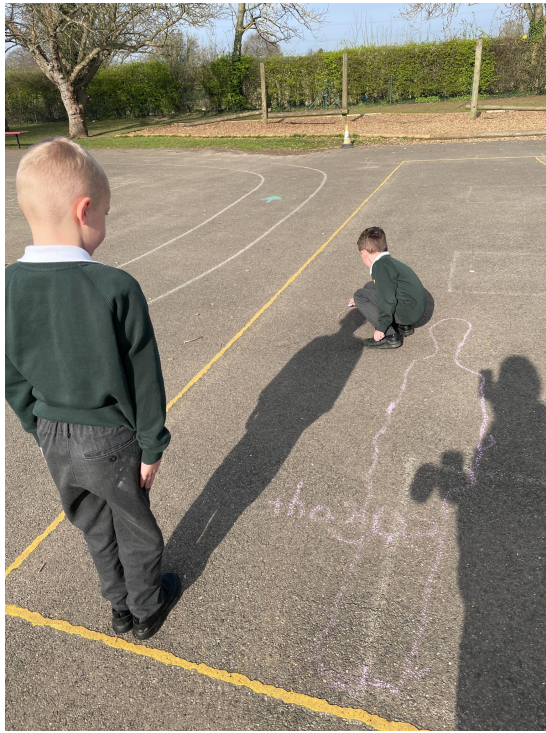
Art - using plants and animals in the local and wider environment as a starting point for art
DT building structures using a variety of materials, selected for their properties and effectiveness



Science Week - Yr 5/6

Science Knowledge Progression

	Yr 1/2	Yr 3/4	Yr 5/6
Cycle A	<p>My Body Growth and Survival Identifying Plants Growing Plants Seasonal Changes</p>	<p>States of Matter Rocks, Fossils and Soils Forces and Magnets Light and Shadow How Plants Grow Scientist Study</p>	<p>Seeing Light Changing circuits Properties and Changes of Materials Classifying Organisms Life Cycles</p>
Cycle B	<p>Everyday Materials Exploring Everyday Materials Identifying Animals Living in Habitats Super Scientists Living Things and their Habitats Animals including Humans</p>	<p>Health and Movement Eating and Digestion Changing Sound Circuits and Conductors Living in Environment</p>	<p>Forces Evolution and inheritance Earth and Space Changes and Reproduction Healthy Bodies</p>



Science Week - Yr 1/2

Skills Progression : Scientific Enquiry

	KS1	Lower KS2	Upper KS2
Ideas and Questions	<ul style="list-style-type: none"> ask simple questions and recognising that they can be answered in different ways recognise scientific and technical developments that help us 	<ul style="list-style-type: none"> ask relevant questions and using different types of scientific enquiries to answer them explain the purposes of a variety of scientific and technological developments 	<ul style="list-style-type: none"> use their scientific experiences to explore ideas and raise different types of questions talk about how scientific ideas have developed over time recognise the applications of specific scientific ideas
Planning	<ul style="list-style-type: none"> perform simple tests or follows teachers' instructions with guidance, suggest what they will do with guidance, identify things to measure or observe that are relevant to the question use resources provided or chosen from a limited range use simple measurements and equipment to gather data suggest why a test is unfair 	<ul style="list-style-type: none"> set up simple practical enquiries, comparative and fair tests begin to make decisions about what observations to make and how long to make them for begin to choose the type of simple equipment that might be used from a reasonable range use appropriate equipment and measurements with reasonable accuracy recognises when a simple fair test is needed with help, decide how to set up a fair test and control variables 	<ul style="list-style-type: none"> select and plan different types of scientific enquiries to answer questions make decisions about what observations to make, what measurements to use, how long to make them for and whether to repeat them choose the most appropriate equipment to make measurements explain how to use the equipment accurately recognise when and how to set up comparative and fair tests recognise and control variables where necessary (eg. explains which variables need to be controlled and why)
Observing and Presenting	<ul style="list-style-type: none"> observe closely (including changes over time), using simple equipment make measurements using non-standard units use simple secondary sources to find answers gather simple data to help answer questions record findings in a range of ways, e.g. simple tables, diagrams, pictograms, sorting circles, bar charts and templates talk about their findings using everyday terms, text scaffolds or simple scientific language 	<ul style="list-style-type: none"> make systematic and careful observations make accurate measurements using standard units, using a range of equipment recognise when and how secondary sources might help answer questions that cannot be answered through practical investigations gather and record data in a variety of ways make decisions about how to record and analyse the data and prepare own formats for recording record and presents findings using drawings, labelled diagrams, keys, tally charts, Carroll diagrams, Venn diagrams, bar charts and tables report on findings from enquiries, in simple scientific language 	<ul style="list-style-type: none"> take measurements, in standard units, using a range of scientific equipment, with increasing accuracy and precision take repeat readings when appropriate recognise which secondary sources will be most useful to research their ideas begin to separate opinion from fact record data and results of increasing complexity, making own decisions about how to record calculate mean value where appropriate record and present findings using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs report on findings from enquiries, using relevant scientific language, in oral and written explanations such as displays and other presentations

Looking for Patterns	<ul style="list-style-type: none"> • use simple observable features to compare objects, materials and living things • identify and classify (decides how to sort and group objects) • with guidance, begin to notice changes (ie. cause and effect), patterns and relationships 	<ul style="list-style-type: none"> • use observable and other criteria to group, sort and classify in different ways (including simple keys and branching databases) • identify differences, similarities or changes related to simple scientific ideas and processes • with help, look for changes, patterns, and relationships in their data 	<ul style="list-style-type: none"> • use and develops keys and other information records to identify, classify and describe living things and materials • identify conclusions, causal relationships and patterns
Explaining Results	<ul style="list-style-type: none"> • talk about what they have found out and how they found it out • use their observations and ideas to suggest answers to questions • use comparative language to describe changes, patterns and relationships 	<ul style="list-style-type: none"> • with help, use results to draw simple conclusions and answers questions using appropriate level of knowledge • use straightforward scientific evidence to answer questions or to support their findings • use relevant scientific language to discuss their ideas and communicate their findings 	<ul style="list-style-type: none"> • draw valid conclusions, explains and interprets the results (including the degree of trust) using scientific knowledge and understanding • identify scientific evidence that has been used to support or refute ideas or arguments • use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas
Evaluating	<ul style="list-style-type: none"> • with support, suggest whether or not what happened was what they expected • with support, suggest different ways they could have done things 	<ul style="list-style-type: none"> • with support, use results to suggest improvements to what they have done • with support, raise further questions (eg. arising from the data) • with support, make predictions for new values within or beyond the data collected 	<ul style="list-style-type: none"> • make practical suggestions about how their working method could be improved (eg. the effect of sample size on reliability) • use results to identify when further tests and observations might be needed • use test results to make predictions and to set up further comparative and fair tests
Vocabulary	<p>observe, changes, patterns, grouping, sorting, compare, same, different, identify (name), measure, data, record results, drawing, picture, table, tally chart, present, pictogram, block chart, Venn diagram, ask questions, test, investigate, explore, equipment, resources, magnifying glass, hand lens, ruler, tape measure, metre stick, pipette, syringe, spoon, teaspoon, answer questions, interpret results, scientific enquiry, pattern seeking, comparative testing, observing over time, classifying, researching using secondary sources</p>	<p>practical work, fair testing, relationships, accurate, thermometer, data logger, stopwatch, timer, estimate, data, diagram, identification key, chart, bar chart, prediction, similarity, difference, evidence, information, findings, criteria, values, properties, characteristics, conclusion, explanation, reason, evaluate, improve</p>	<p>variables, independent variable, dependent variable, control variable, evidence, justify, argument (science), causal relationship, accuracy, precision, scatter graphs, bar graphs, line graphs, force meter</p>

Knowledge Progression: Biology

Year Group	Unit of Work	Plants	Vocabulary
1	Identifying Plants	<ul style="list-style-type: none"> • I know that a plant is a living thing that grows. • I know that plants need sunlight, air and water. • I know that plants have seeds that grow into new plants. • I can recognise where the seeds are in a variety of plants. • I can plant a seed and describe what I expect it to look like in a few weeks time. • I can identify and describe a variety of garden plants. • I can identify the difference between a flower and a tree. • I can identify a variety of wild plants. • I can identify and describe a variety of trees. • I know the difference between an evergreen and a deciduous tree. • I can identify the roots, stem, leaves, flower and petals of a flower. • I know what roots are and why they are important. • I can describe the changes a seed goes through as it becomes a plant. 	<p>leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, names of trees in the local area, names of garden and wild flowering plants in the local area</p>
2	Growing Plants	<ul style="list-style-type: none"> • I know that different seeds grow into different plants. • I can use information on a seed packet to tell me when a seed should be planted, how to plant it and how to care for the seed as it grows into a plant. • I can follow the instructions on a seed packet to plant a seed. • I know that seeds can be eaten by humans and animals. • I know that some plants grow from bulbs. • I can explain the life cycle of a plant grown from a bulb, such as a tulip. • I know that the bulb provides a store of food for the plant while it is in the ground during the winter months. • I know that the fruit of the plant is the part that carries the seeds. • I can explain why most plants grow lots of seeds instead of just one. • I can explain some of the ways in which seeds are dispersed. • I know that not all seeds will grow into a new plant and can explain reasons for this. • I know that the term 'germination' refers to the process when a seed starts to grow and produce shoots. 	<p>light, shade, Sun, warm, cool, water, space, grow, healthy, bulb, germinate, shoot, seedling</p>
3	How Plants Grow	<ul style="list-style-type: none"> • I can identify and describe the functions of the roots, stem, leaf and flower of flowering plants. • I know that the root is the first part of the plant to grow from the seed and that the young root absorbs water and minerals from the soil to help the seed sprout. • I can describe each step in the growth of roots. • I can describe the process of water transportation in plants. • I can explain what the process of photosynthesis is. • I know that the plant uses minerals from the soil to make chlorophyll in its leaves. • I can explain what the process of pollination is. • I can explain some of the ways pollen grains get from the male stamen to the female part of the plant. • I can order the stages in the life cycle of flowering plants. • I can identify the ways in which a variety of different plants disperse their seeds. • I know that seeds have an outer coat to protect them that starts to absorb water and soften when it lands in soil. • I know that seeds can have one, two or three seed leaves that store food. 	<p>photosynthesis, pollen, insect/wind pollination, male, female, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal), air, nutrients, minerals, soil, absorb, transport</p>

• I know that seeds are an important source of food for animals.

Animals Including Humans

1	Identifying Animals	<ul style="list-style-type: none"> • I can identify and name a variety of common UK pets. • I can identify a variety of UK mammals, birds, reptiles, fish and amphibians. • I know that mammals have backbones, feed their young with milk and have fur. • I can find a similarity or difference between pairs of mammals. • I know that birds have feathers, wings and a beak. • I know that lizards are cold-blooded vertebrates that lay eggs. • I can identify differences in the features of birds and lizards. • I know that fish and amphibians lay eggs. • I know the steps in the life cycles of amphibians and fish, and spot similarities and differences. • I know what a herbivore, carnivore and omnivore are. • I can identify common animals that are herbivores, carnivores and omnivores. • I can explain some of the ways in which people need to look after pets. 	head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, names of animals experienced first-hand from each vertebrate group
1	My Body	<ul style="list-style-type: none"> • I can name the different parts of my body, such as arms, legs, head, wrist, fingernails, etc. • I can describe which parts of my body I use for different activities. • I can name the five senses. • I can describe why each of the five senses is important, and how we use each one. • I know that the senses of smell and taste are very closely linked. 	parts of the human body including those within the school's RSE policy, senses, touch, see, smell, taste, hear, fingers, skin, eyes, nose, ears, tongue
2	Growth and Survival	<ul style="list-style-type: none"> • I know that all species of animals have babies, including humans, and that if they didn't the species would become extinct. • I can match a variety of baby animals to their parents. • I know that some baby animals look very similar to their parents and some look very different. • I know that mammals give birth to live young and birds, reptiles and fish lay eggs. • I know that different animals are pregnant for different lengths of time, and that this is often dependent on the size of the animal. • I know that the eggs animals lay are vulnerable to predators and other dangers, which is why the parent animal often builds a nest to keep them safe and lays several eggs at once. • I know that some eggs have hard shells and some eggs have soft shells. • I can identify a variety of animals that give birth to live young and those that lay eggs. • I can explain the stages a human goes through to grow from a baby to an adult. • I know that all animals need food, water and air to stay alive. • I know that animals need to live in different environments to get the food, water and oxygen they need. • I know that it is important to eat a healthy balance of foods because different foods are useful to our bodies for different things. • I can use the food pyramid and balanced plate model to find out how much carbohydrate, fruits and vegetables, protein, dairy, fats and sugars I should eat. • I can plan a healthy, balanced meal. • I know that exercise is important to keep our heart and lungs healthy, and that it keeps our muscles strong and flexible. • I know that exercise is important to keep us from getting overweight. • I can design an exercise to work my whole body using different apparatus. 	offspring, reproduction, growth, baby, toddler, child, teenager, adult, old person, names of animals and their babies (e.g. chick/chicken, kitten/cat, caterpillar/butterfly), survive, survival, water, food, air, exercise, heartbeat, breathing, hygiene, germs, disease, food types (e.g. meat, fish, vegetables, bread, rice, pasta, dairy)

2	Super Scientists	<ul style="list-style-type: none"> • I can explain the contributions Florence Nightingale, Joseph Lister and Alexander Fleming made to knowing what makes us ill and how to stop the prevention of germs and diseases. 	
3	Health and Movement	<ul style="list-style-type: none"> • I know that animals, including humans, get the nutrition they need from what they eat. • I know that the two main reasons humans need food is for growth and energy. • I know that we need proteins for growth and to help repair our bodies when we are ill or injured. • I know that starches, fats and sugars are good foods for energy. • I can explain how to eat a healthy, balanced diet. • I can design healthy, balanced meals for people who have dietary restrictions, e.g. vegetarians or people with wheat/dairy allergies. • I know that we have skeletons to support our bodies, protect our internal organs and to help us move. • I can name and locate some of the major bones in the human body. • I can describe similarities and differences between human and animal skeletons. • I know that all vertebrates have a backbone. • I can explain how invertebrates without an internal skeleton protect themselves. • I know that we need muscles to help us move. • I can explain the difference between smooth muscles, cardiac muscles and skeletal muscles. • I can explain the role of flexors and extensors in making our bones move. 	<p>nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine</p>
4	Eating and Digestion	<ul style="list-style-type: none"> • I can suggest similarities and differences in the diets of a variety of different animals. • I can identify herbivores, carnivores and omnivores in a variety of different habitats. • I can interpret and construct a variety of food chains with both producers and consumers. • I can suggest what might happen if one or more organisms was taken out of a food chain. • I can identify where canines, incisors and molars are in the human mouth. • I can explain the function of canines, incisors and molars. • I know that teeth have roots that hold the teeth in place in the gums. • I can suggest why different animals have different types of teeth. • I know that young children have 20 milk teeth that start growing through when they are around six months old. • I know that milk teeth fall out and are replaced by 32 adult teeth, which are permanent. • I know that tooth decay can cause teeth to rot and fall out. • I can suggest some ways of making sure my teeth stay healthy. • I can name the organs associated with the digestive system. • I can describe the functions of the basic parts of the digestive system. 	<p>digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, large intestine, rectum, anus, incisor, canine, molar, premolar, herbivore, carnivore, omnivore, producer, predator, prey</p>
5	Changes and Reproduction	<ul style="list-style-type: none"> • I can describe some of the ways our bodies change as we grow. • I know that our rate of growth is dependent on many different factors. • I can name the different stages in the human life cycle and put them in order. • I can describe the stages in the gestation period of humans and compare this to other animals. • I can describe the growth and development of children from age 0 to 11. • I understand the role of hormones in puberty. • I can describe the changes that occur to both boys and girls during puberty. • I can describe some of the ways teenagers can keep fit and healthy during all the changes that take place during puberty. • I know that a human is fully grown by the time they reach the age of around 20. • I know that the human body starts to deteriorate as it enters old age. • I can describe some of the ways in which humans can make sure they stay fit and healthy as they get older. 	<p>puberty, the vocabulary to describe sexual characteristics in line with the school's RSE policy</p>

6	Healthy Bodies	<ul style="list-style-type: none"> • I know that people have not always known that disease and illnesses were often related to diet, such as scurvy. • I know that James Lind is credited as being the scientist who conducted the world's first clinical trial to explore the effects of diet on scurvy. • I know that there are two groups of carbohydrates: sugars and starches. • I can describe the importance of the different food groups and why each one is important for keeping our bodies healthy. • I can name some different minerals and why they are important for our bodies. • I can use food labels to match foods to their nutritional values. • I can use food labels to assess how healthy a food is, explaining reasons for my choices. • I know that it is our circulatory system that transports nutrients around our bodies, and that the two organs associated with the circulatory system are the heart and lungs. • I can describe the functions of the heart and lungs. • I can describe how the circulatory system works. • I know that it is important to keep our hearts healthy and that exercise is a crucial part of this. • I know that it is the muscles in our bodies that allow us to move. • I can explain the difference between smooth muscles, cardiac muscles and skeletal muscles. • I can name some of the different muscle groups in the human body. • I can explain which muscles we use for a variety of different physical activities. • I can explain what happens to our muscles and the rest of our body when we exercise. • I can define what a drug is. • I know that some drugs are very beneficial and others are very harmful, and that some drugs are legal and some are illegal. • I can describe the short-term and long-term effects of drugs such as tobacco and alcohol. • I can make suggestions about the ways in which given characters can change their lifestyles to make them healthier. 	heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, cycle, circulatory system, diet, drugs, lifestyle
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Living Things and their Habitats

2	Living in Habitats	<ul style="list-style-type: none"> • I know the difference between things that are living, things that are dead and things that have never been alive. • I can name the seven life processes that all living things need to be able to do to stay alive. • I know that all living things will eventually die. • I know what a habitat is. • I know that all living things need to live in a habitat that can provide them with the things they need to stay alive. • I can suggest what type of animals might live in a variety of different habitats. • I can match animals to their correct habitat. • I can identify and name some of the plants and animals that live in a seaside habitat. • I know that the plants and animals in a habitat are all dependent on each other for survival. • I can describe some habitats and their features in other parts of the world, such as rainforest, desert and Arctic habitats. • I can describe why some animals are well suited to their rainforest, desert or Arctic habitats. • I can describe what a microhabitat is. • I can identify some of the minibeasts that live in microhabitats. • I know that plants and animals in a habitat are linked to each other through food chains. 	living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, water, air, survive, survival, names of local habitats (e.g. pond, woodland etc.), names of micro-habitats (e.g. under logs, in bushes etc.), conditions, light, dark, shady, sunny, wet, damp, dry, hot, cold, names of living things in the habitats and micro-habitats studied
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		<ul style="list-style-type: none"> • I know that plants get their energy from the sun. • I can construct some simple food chains for a variety of habitats. 	
4	Living in Environments	<ul style="list-style-type: none"> • I can give a definition for the term 'habitat'. • I can suggest in which habitat you would find a variety of animals. • I can explain why it is important to be able to classify organisms. • I can identify animals that are vertebrates, invertebrates, mammals, birds, insects, fish, reptiles, amphibians, insects, annelids, crustaceans, arachnids, echinoderms and molluscs. • I can identify and classify a variety of British plants. • I know that changing just one thing in a habitat can have a big impact on all the organisms living there. • I can describe what deforestation is and why it is causing a big problem around the world. • I can describe some of the ways in which humans can both help sustain environments and ways in which they harm environments. • I can explain the negative impact draining a pond would have on the local environment, stating my case through a letter. 	classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate
5	Life Cycles	<ul style="list-style-type: none"> • I can describe the process of sexual reproduction in flowering plants, using each of these terms: petal, anther, carpel, filament, ovary, stamen, stigma, sepal and style. • I can describe the process of asexual reproduction in plants, giving some examples of plants that reproduce asexually. • I can describe how and why humans clone plants. • I can describe the process of sexual reproduction in animals. • I know that some animals reproduce externally and others reproduce internally, giving examples for each. • I can describe how the environment in which an animal lives affects the way it reproduces. • I know that hermaphrodites are animals that have both male and female reproductive organs, such as snails. • I can identify animals that live in a British woodland environment. • I can compare different habitats around the world with a British woodland environment and suggest ways in which the living conditions may be more or less challenging for the organisms living there. • I can suggest ways in which the life cycles of different animals might vary in different environments around the world. • I can describe and compare the life cycles of a variety of mammals, reptiles, fish and other animals. • I can describe what a naturalist does. • I can explain the contribution of some famous naturalists to our understanding of nature and the importance of humans looking after the environment. 	life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, cuttings
6	Classifying Organisms	<ul style="list-style-type: none"> • I can match organisms to their correct group (plant, mammal, amphibian, reptile, bird, fish, insect, crustacean, arachnid or mollusc, as well as echinoderm, myriapod and annelid) using what I know about the features of each group. • I can explain why it is important to be able to classify organisms. • I know the difference between vascular and non-vascular plants. • I can describe the difference between flowering and non-flowering plants. • I know that Carl Linnaeus is known as the Father of Taxonomy because of the system he developed to help classify organisms. • I know that the Linnaeus system uses Latin names for organisms so that there was a globally recognised naming system. • I can describe what each of the seven levels on the classification system are: kingdom, phylum, class, order, family, genus and species. 	vertebrates, fish, amphibians, reptiles, birds, mammals, warm-blooded, cold-blooded, invertebrates, insects, spiders, snails, worms, flowering, non-flowering, mosses, ferns, conifers

		<ul style="list-style-type: none"> • I can describe what a micro-organism is. • I know that micro-organisms can be classified into the kingdoms of protists, bacteria and fungi. • I can describe some examples of micro-organisms, such as in food production and illnesses. 	
6	Evolution and Inheritance	<ul style="list-style-type: none"> • I know that living things produce offspring of the same kind, but that normally offspring vary and are not identical to their parents. • I can suggest some common inherited characteristics, e.g. hair colour, eye colour, height, etc. • I know that 'variation' occurs from generation to generation in a species. • I can identify examples of variation in animals that are cross-bred. • I can identify the features of the environment an animal lives in and can explain some of the ways in which the animal has adapted to suit its environment. • I know that some inherited features are advantageous and some are not. • I know that, over many generations, advantageous features may be spread across a whole species, making them better adapted to their environment. • I understand how the adaptation of plants and animals to suit their environment may lead to evolution. • I can explain Darwin's theory of evolution and the process of natural selection. • I know that Darwin explained each step in the Linnaeus classification system to show where part of a population developed a new variation and eventually formed a new species. • I know that some variations are caused by mutations, and that some of these are harmless, some are advantageous and some are disadvantageous. • I know that changes to an environment can affect the evolutionary process. • I know that palaeontologists study fossils to explore how species have evolved over time. • I understand how humans have evolved over time, and how human behaviour can affect changes in other species over time. 	offspring, sexual reproduction, vary, characteristics, adapted, inherited, species, evolve, evolution

Knowledge Progression: Physics

Year Group	Unit of Work	Materials and States of Matter	Vocabulary
1	Everyday Materials	<ul style="list-style-type: none"> • I know what a material is. • I know the difference between a material and an object. • I can name a variety of materials. • I can describe a material's properties using adjectives. • I can explain why some materials are better suited for different purposes than others. 	object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through

2	Exploring Everyday Materials	<ul style="list-style-type: none"> • I can use a range of appropriate vocabulary to describe the properties of different materials. • I know the difference between a natural and a man-made material. • I know that the same product, e.g. a table, can be made from a variety of different materials, and can suggest suitable materials for each object. • I can explain how glass, pottery and paper are made. • I know that some materials can change shape permanently, some can change shape and go back to their original shape, and some can't change shape. • I can name a variety of materials that can change shape, can change shape temporarily and cannot change shape. • I know that there are lots of different types of plastic that can be used for different purposes. • I can explore the suitability of plastic and metal and explain why each material has been chosen for each different purpose. • I know that paper and cardboard are made from wood and can describe their uses for different purposes. • I can name some objects that can all be made from wood, plastic and metal, e.g. chairs. • I can suggest appropriate materials for an object to be made from. 	opaque, transparent, translucent, reflective, non-reflective, flexible, rigid, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching
3	Rocks, Fossils and Soils	<ul style="list-style-type: none"> • I know that most of our planet is made up of rock and that rocks are made up of a mixture of minerals that are pressed tightly together. • I can distinguish between rocks that are naturally occurring and those that are not. • I know that erosion is the process when something is worn away by water, wind or other natural materials over time. • I know that a pedologist is a scientist that studies soil. • I can explain why soil is so important to our planet. • I know that there are different layers of soil and that each layer is known as a horizon. • I can describe the features of each different soil horizon. • I know that the three main types of soil are clay, sand and silt. • I know that scientists split rocks into three main groups: igneous rock, sedimentary rock and metamorphic rock. • I know that igneous, sedimentary and metamorphic rock can change over millions of years in a process known as the rock cycle. • I know that a fossil is the petrified remains of plants and animals from more than 10,000 years ago. • I can explain how fossils are formed. • I know that a palaeontologist is a scientist who studies fossils. • I know that some fossils are common and some fossils are very rare. • I can identify some organisms from their fossils. 	rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorbs water, fossil, bone, flesh, minerals, marble, chalk, granite, sandstone, slate, types of soil (e.g. peaty, sandy, chalky, clay)
4	States of Matter	<ul style="list-style-type: none"> • I know the difference between a liquid and a solid. • I know how to tell if a material is a liquid or a solid. • I know that gases have mass. • I can describe the properties of a solid, liquid and gas. • I can explain what would happen if a solid, liquid and gas were poured into a container. • I know that solids, liquids and gases behave differently because the particles of each behave differently. • I know that water turns from a liquid to a solid at 0°C and from a liquid to a gas at 100°C. • I know that metals all have different melting points and that these are usually very high temperatures. • I know that the process of a liquid turning into a gas is called evaporation. • I know that the process of a gas cooling and turning into a liquid is called condensation. • I can explain how evaporation and condensation are part of the water cycle. 	solid, liquid, gas, heating, cooling, state change, melting, freezing, melting point, boiling, boiling point, evaporation, condensation, temperature, water cycle

5	Properties and Changes of Materials	<ul style="list-style-type: none"> • I know that some materials will dissolve in water to form a solution. • I know that not all materials react the same way when mixed with water; some will float, sink, dissolve or react. • I know that dissolving is a reversible change. • I know that soluble materials, such as sugar, are able to be separated from water through evaporation. • I know that filtering is a good way to separate water from insoluble materials, such as sand. • I can identify a range of mixing processes, dissolving processes or changes of state that are reversible. • I know that an irreversible change occurs when two materials react with each other to form a new substance. • I can explain what would happen to a variety of materials when they were heated and cooled, and explain whether these are reversible or irreversible changes. • I know that some materials change state when they are heated or cooled. • I know that when a material is burned, it produces a new product (e.g. gas or ash), which makes burning an irreversible change. • I can identify the properties of a variety of everyday materials, such as whether it is magnetic, conductive, soluble, flexible, etc. 	thermal insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material
Forces			
2	Super Scientists	<ul style="list-style-type: none"> • I know that Isaac Newton was the first person to identify gravity as a force. • I know that gravity is a force that makes things fall to the ground and stops things from floating around in the air. 	
3	Forces and Magnets	<ul style="list-style-type: none"> • I know that a force is a push or a pull on an object, and that a force needs two objects where one pushes or pulls the other to make it move. • I can describe whether a push or a pull is being used to move an object, and describe which direction the forces are acting in. • I know what a forcemeter is and can use one to measure forces in newtons. • I know that some forces, like gravity and magnetism, do not need contact between two objects to make things move. • I know that magnets have a north pole and a south pole. • I can describe lots of different uses for magnets. 	force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole
5	Forces in Action	<ul style="list-style-type: none"> • I know that the Earth's gravitational force causes objects to have weight, and that gravity pulls objects towards the centre of the Earth. • I know that friction is the force that acts as resistance between two objects when moving over one another. • I can explain examples of friction using photographs. • I know that air resistance is the force that occurs when air pushes against a moving object, making it slow down. • I can explain examples of how air resistance is used. • I know that water resistance is the force that pushes against objects as they pass through the water. • I know that the shape of an object dictates how much water resistance it will meet as it moves through the water. • I know that pulleys and levers make heavy objects easier to lift and can explain why. • I know that gears allow a smaller force to have a greater effect. • I know that two or more gears working together are called a transmission. • I can explain which direction a follower gear will turn based on the movement of the driver gear when two or more gears are used in a transmission. • I know that the force transmitted by gears in a transmission is called torque. 	force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears

		<ul style="list-style-type: none"> I can give some examples of how gears and transmissions are used in everyday life. I can recognise some different types of gears. 	
Light and Sound			
2	Super Scientists	<ul style="list-style-type: none"> I know that Isaac Newton worked out that the light from the sun is made up of lots of different colours mixed together, and that we see this as white light. I know that you can reverse the process of splitting light with a prism by passing the light through a lens to turn it back into white light. I can use what I know about light to explain why we have rainbows. 	
3	Light and Shadow	<ul style="list-style-type: none"> I know that we need light in order to see. I can name a variety of natural and man-made light sources. I know that the Sun is the most powerful light source. I know that we have night and day because the Earth rotates on its axis once every 24 hours. I can describe the difference between dawn and dusk. I know that shadows are formed when light is blocked by an object. I know that we have more shadows on a sunny day than on a cloudy day and can explain why. I know the difference between transparent, translucent and opaque objects. I know that opaque objects will cast a shadow, translucent objects will cast a faint shadow, and transparent objects will not cast a shadow. I know that we can see objects because light is reflected I know that some objects reflect more light than others. 	
4	Changing Sound	<ul style="list-style-type: none"> I know that sound travels through the air in waves and that sound waves are caused by vibrations in the air. I know that sound waves pass through some materials more easily than others. I know that sometimes sound needs to be muffled for safety or convenience. I can name a variety of musical instruments, describe what they sound like and explain how the sound is made. I know what the terms 'pitch' and 'volume' mean. I can identify when the pitch and volume of a sound changes, and explain what has happened. I can explain how the length, thickness and tightness of a string affects its pitch. I can explain how the length of the air column in wind instruments changes the pitch. 	<p>sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, quiet, loud, insulation</p>
6	Seeing Light	<ul style="list-style-type: none"> I can name the different parts of the eye and describe their function. I know that light can only travel in a straight line. I can explain how mirrors can be used to reflect light. I can explain how objects such as periscopes and rear-view mirrors work and why they are useful. I know that the angle the light lands on the mirror will affect which angle the light changes direction to, and I know that this is called the angle of reflection. I know that some surfaces reflect more light than others. I can explain the difference between a shadow and a reflection. I can explain how a mirror could make a shadow and a reflection at the same time. 	
Electricity			
2	Super Scientists	<ul style="list-style-type: none"> I know that Edison invented the first light bulb that could last for more than 12 hours. I know that a circuit needs a bulb, battery and wire to work. I know that a circuit needs to be complete for it to work. I know the symbols for wire, bulb and battery. 	

		<ul style="list-style-type: none"> I can create a simple working circuit. 	
4	Circuits and Conductors	<ul style="list-style-type: none"> I know that atoms generate electricity when they are rubbed together. I can explain the difference between static electricity and current electricity. I know that current electricity needs a complete circuit in order to work properly. I can use diagrams to explain which circuits will and won't work. I can explain the difference between mains and battery- powered electricity. I can describe some of the ways in which people can stay safe when using mains electricity. I can distinguish between objects that use mains electricity and those that use battery-powered electricity. I can write a definition for the words 'conductor' and 'insulator'. I can explain why some appliances are made with conductors on the inside and insulators on the outside. I can explain how switches work to complete a circuit. 	electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol
6	Changing Circuits	<ul style="list-style-type: none"> I can define each of these terms: circuit, current, conductor, insulator, volt, component, battery, motor. I know the difference between a series circuit and a parallel circuit. I know that if there are too many volts running through a circuit, it will blow the component. I can recognise and use conventional symbols used in circuit diagrams. 	circuit diagram, circuit symbol, voltage
Earth and Space			
1	Seasonal Changes	<ul style="list-style-type: none"> I know that the weather is always changing and that we have many different types of weather. I know that there are four seasons in the UK. I can name the months each season occurs in. I can identify the main features of each of the different seasons. I can describe different clothing that is appropriate to wear during each season. I can identify differences between each of the four seasons. I can describe how animals are affected by each of the four seasons, and how their behaviour changes during each one. I can describe some of the ways humans adapt to the different seasons, e.g. by what we wear, eat and do. I know that some foods are seasonal. I know that the number of hours of daylight changes throughout each of the four seasons. I know that there are more hours of sunlight during the summer than during the winter. 	weather, sunny, rainy, raining, shower, windy, snowy, cloudy, hot, warm, cold, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, rainbow, seasons, winter, summer, spring, autumn, Sun, sunrise, sunset, day length
5	Earth and Space	<ul style="list-style-type: none"> I know that the Sun, Earth and Moon are roughly spherical in shape. I can describe what the Sun, Earth and Moon are using appropriate vocabulary. I know that Earth orbits the Sun and the Moon orbits the Earth. I can describe how the rotation of the Earth creates night and day. I know that as well as orbiting the Sun, the Earth rotates on its axis, and that it takes one full day (24 hours) for a complete rotation. I understand why there are different time zones in the world. I can describe why the length of daylight changes throughout the year. I know that the tilt of the Earth's axis is what causes the four seasons of the year. I know that the Northern and Southern Hemispheres experience seasons at different times of year and can explain the reason for this. I can describe why the Moon appears to change shape throughout a lunar month. I can describe the different phases of the Moon using appropriate vocabulary. I can describe what a solar eclipse is and why it occurs. I can describe how theories about our solar system have changed over time, explaining the difference between geocentric and heliocentric models. 	Sun, Moon, Earth, planets (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, Solar System, rotate, star, orbit

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| | | <ul style="list-style-type: none">• I know that we are in a galaxy called the Milky Way.• I know that there are three main types of planets in our solar system and can describe the difference between terrestrial, gas giant and ice giant planets.• I can name the planets in our solar system and order them by their distance from the Sun.• I know that the length of a year is different on each planet because of the time it takes each one to orbit the Sun. | |
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