

Science – Skills and Knowledge Grid – Class 1

Topic	Vocabulary	Knowledge
<p>Plants</p>	<p>Wild plant, garden plant, weed, deciduous, evergreen, roots, stem, leaves, petals, flowers, fruit, seed, bulb.</p>	<p>I know the names of a variety of common wild and garden plants, including deciduous and evergreen trees. I can name and label the parts of a variety of common flowering plants including trees including: leaves, flowers, petals, fruit, roots, bulbs, seed, trunk, branches and stem.</p> <p>Scientific Enquiry:</p> <p>I can observe changes in plants over time (trees in our school orchard, class hyacinth bulbs and class sunflowers). I can use a magnifying glass to observe closely (when looking at plants). I can record the growth of our class hyacinth bulbs over time and measure our class sunflower plants over time. I can label diagrams of the different parts of plants including trees.</p>
<p>Animals, including humans</p>	<p>Amphibians, birds, mammals, fish, reptiles, carnivores, herbivores, omnivores, sight, hearing, touch, taste, smell.</p>	<p>I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. I can label a diagram of the parts of the animal groups above plus pets using terms like beak, wing, feathers, fin, scales, tail, gills, scaly skin, teeth, smooth skin, webbed feet, I can compare animals in the 5 groups above for example feathers vs scales, eggs vs milk- feeding babies, breathe in air or breathe underwater</p> <p>I know we need to return animals safely to their homes after studying them eg frogs/ newts from our school pond</p> <p>I know humans are animals and are mammals.</p> <p>I know that carnivores eat meat, herbivores eat plants and omnivores eat both meat and plants. I can name some common animals which are carnivores (fox), herbivores (cows, sheep) and omnivores (pigs, hens).</p> <p>I can identify, name, draw and label the basic parts of the human body.</p> <p>I know several games, songs, actions and rhymes about the parts of the body.</p> <p>I know the 5 senses and I can tell you which part of the body is associated with each sense. (Ear – hear, eye – sight, skin – touch, nose – smell, tongue – taste)</p> <p>Working scientifically</p> <p>I can group pictures of animals into the 5 groups (classify) and compare and contrast them.</p> <p>I can group (classify) animals according to what they eat (meat, plants, both)</p> <p>I can use my senses to compare different textures, sounds and smells. (hearing, sight, taste, touch, smell).</p>

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Topic	Vocabulary	Knowledge
<p>Everyday materials</p>	<p>Object, material, hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy, waterproof, not waterproof, absorbent, not absorbent, transparent, opaque.</p>	<p>I know that the word 'material' can mean a piece of fabric but it can also mean what an object is made from. I can distinguish between an object and the material from which it is made. I can identify and name a variety of everyday materials including wood, plastic, glass, metal, water, rock. I know that an object can be made from more than one material (eg plastic handled scissors) I can describe the simple physical properties of a variety of everyday materials eg bendy/ not bendy, stretchy/ stiff, hard/ soft, rough, smooth, shiny/dull, waterproof/ not waterproof, absorbent/not absorbent, opaque/ transparent.</p> <p>Working Scientifically</p> <p>I can compare and group together a variety of everyday materials (eg fabric, foil, metal, plastic, glass, water, rock) on the basis of their simple physical properties (bendy/ not bendy, stretchy/ stiff, hard/ soft, rough, smooth, shiny/dull, waterproof/ not waterproof, absorbent/not absorbent, opaque/ transparent). I can design a simple test to explore questions eg What is the best material for an umbrella? For lining a dog basket? To keep fabric dry in water?</p>
<p>Seasonal Changes:</p>	<p>Seasons, Spring, Summer, Autumn, Winter, weather, daylight</p>	<p>I can tell you what the four seasons are in one year and in what order they come : Autumn, Winter, Spring, Summer I look closely at what happens to the trees in our school orchard and the school grounds during the passing of the four seasons. I observe the weather daily and we record it on our class weather recording sheet. I know what weather we are likely to experience in each season: rain & wind in Autumn, sometimes frost and snow in Winter, rain and sunshine in Spring, drier warmer weather in Summer. I know that global heating is changing the weather patterns in the seasons (wetter Autumns, warmer Summers). I know that day length gets longer in the summer and shorter in the winter</p> <p>Working Scientifically</p> <p>With support, I can read the class thermometer and tell you if it is cold, warm or hot With support, I can look at the class rainfall gauge and tell you if we have had a little or a lot of rain. I can suggest answers to questions using data.</p>

Science – Skills and Knowledge Grid – Class 2

Topic	Vocabulary	Knowledge
<p>Plants</p>	<p>Germination, sprout, shoot, seed dispersal, sunlight, water, temperature, nutrition.</p>	<p>I know that a seed or bulb grows into a plant. I know that seeds grow roots and then become a small plant which breaks through the soil and takes the nutrients from the soil through its stem to help it grow bigger. I know that seeds need water, light and a good temperature to grow and stay healthy.</p> <p>Working Scientifically</p> <p>I know how to complete a fair experiment to see how well seeds grow in different environments by ensuring all parts of the experiment use the same equipment (cup, soil, seeds) I know how to ask simple questions about what may happen to our seeds growing in different environments and I understand that these could be answered in different ways. E.g. Will the seeds grow in an environment without light? I know how to conduct an experiment using simple equipment and observing what happens, e.g. measuring the length the cress grows over different stages of the experiment using a ruler. I know how to record the results of our experiment by measuring how tall the seeds grow in the different environments. I know how to use the data I have found to explain what I have seen in our experiment to answer any questions we had at the start. E.g. Do the measurements taken show that the seeds kept in the dark grew? Or did having no light affect their growth? I know how to use my results to explain the best environment for my seeds to grow in.</p>
<p>Animals, including humans</p>	<p>Adult, develop, life cycle, offspring, reproduce, young, dehydrate, diet, disease, energy, exercise, germs, heart rate, hygiene, nutrition, pulse.</p>	<p>I know that animals and humans have offspring that grow into adults. I know some examples of offspring and the adults they become. E.g. a puppy grows into a dog. I know that animals and humans need water, air, food, shelter and sleep to survive. I know it is important to have a healthy diet by eating the right amounts of different types of food. E.g. protein, carbohydrates, fats etc. I know it is important to exercise to stay healthy to build a stronger heart and muscles. I know it is important to have good hygiene, e.g. washing, changing for PE, cleaning our teeth etc.</p> <p>Working Scientifically</p> <p>I can draw and label a diagram to show the needs of animals and humans to survive.</p>

Science – Skills and Knowledge Grid – Class 2

Topic	Vocabulary	Knowledge
<p>Use of everyday materials</p>	<p>Materials, suitability, properties, metal, wood, plastic, glass, paper, cardboard.</p>	<p>I know that different materials are used for different purposes, e.g. A window is made of glass so we can see through it and house is made of bricks, so it is strong. I can compare the suitability of a variety of everyday materials for particular uses with examples e.g. wood, metal, plastic, glass brick, rock, paper and cardboard. I know how to test whether some materials are stretchy, bendy, hard, transparent, absorbent, waterproof, shiny, smooth, rough etc. I know that you can change the shapes of some materials by squashing, bending, twisting and stretching them by testing different objects made of different materials. E.g. squashing a sponge, stretching some playdoh/bluetac, bending a straw etc.</p> <p>Working Scientifically</p> <p>I can identify and classify the uses of different materials and record the observations.</p>
<p>Living things and their habitats</p>	<p>Life process, living, dead, never living, food chain, food sources, habitat, microhabitat, depend, survive.</p>	<p>I know and can explore things can be classed as living, dead or never alive and I know the differences between them. For example, things that need water and food are living, leaves, twigs and feathers are dead because they used to be living and items made of plastic, metal and rocks have never been alive. I know that a habitat is a place where something lives and that most living things live in a habitat to which they are most suited. I know that different habitats like urban, coastal, woodland and a pond have different animals and plants that live there. For example, foxes and badgers live in a woodland habitat and dolphins and turtles live in an ocean habitat. I know that minibeasts are small insects like spiders, flies, worms, caterpillars, slugs, ants and beetles and they live in a microhabitat such as under a log, in the soil, under fallen leaves, under a rock/stone or in the grass. I know that animals get their food from plants and other animals. I know what a food chain is and can make a simple one using plants and animals.-for example, grass-caterpillar – bird</p> <p>Working Scientifically</p> <p>I know how to investigate and describe the conditions in different habitats and micro-habitats and I can draw simple diagrams to show those I have found. I can draw a diagram of a simple food chain.</p>

Science – Skills and Knowledge Grid – Class 3

Topic	Vocabulary	Knowledge
<p>Animals, including humans:</p>	<p>Healthy, nutrients, energy, saturated fats, unsaturated fats, carbohydrates, protein, fibre, vitamins, water, vertebrate, invertebrate, muscle, tendon, joint.</p>	<p>I know that animals including humans depend on different nutritionally balanced diets, which is why they don't all eat the same things. I know that animals including humans depend on the correct nutrition in order to: grow, be strong and be healthy. I know what food groups make a healthy human diet (e.g. the eat-well plate) I know that different foods have different types of nutrients that have different roles and what some of those roles are (e.g. that carbohydrates and fats provide energy) I know that humans and some animals have skeletons for support and protection (e.g. humans have endoskeletons that protect organs such as the heart and brain) I know that humans and some animals have muscles for movement (e.g. that our muscles move our skeleton's joints by working in pairs)</p> <p>Working Scientifically</p> <p>With support I can identify criteria for sorting and classifying (e.g. vertebrates and invertebrates / endo-skeletons, exo-skeletons and hydrostatic-skeletons)</p>
<p>Rocks</p>	<p>Rock, igneous rock, sedimentary rock, metamorphic rock, magma, lava, sediment, permeable, impermeable, fossilisation, erosion.</p>	<p>I know how to compare and group rocks on the basis of their appearance and simple physical properties e.g. igneous, sedimentary and metamorphic rocks I know that soil is formed from parts of rocks combined with other organic matter. I know that a fossil is physical evidence left behind by something dead for example animals, plants or animal footprints. I know that fossils are normally made when layers of sediment compress onto the dead animal, leaving an impression of their bones.</p> <p>Working Scientifically</p> <p>With support I can identify criteria for sorting and classifying rocks With prompting I can draw and label diagrams of rock formation I can use a variety of equipment as instructed, such as pipets and measuring jugs to carry out an investigation about porous / non-porous rocks I can indicate findings from an enquiry that could be reported when testing rocks With support I can use evidence to produce a simple conclusion when testing rocks</p>

Science – Skills and Knowledge Grid – Class 3

Topic	Vocabulary	Knowledge
Plants:	Roots, stem, nutrients, evaporation, leaves, flowers, pollinator, fertilisation, petal, stamen, carpel, sepal, pollination, germination, seed dispersal.	<p>I know and can describe the functions of different parts of a flowering plant: root, stem, trunk, leaves and flower</p> <p>I know that plants need air, water, nutrition and sunlight to help them live and grow.</p> <p>I know that some plants need different amounts of these things to live and grow well because I have considered why some plants are easier to care for than others (e.g. drought tolerant shrubs such as Lady's Mantle) and that some grow more naturally in different climates (e.g. tomatoes in Spain / in UK greenhouses)</p> <p>I know, and can explain using a picture, how water is transported through plants.</p> <p>I know the names of and have explored some of the parts of a flower that play a part in the life cycle, such as the petals, stamen and carpel.</p> <p>I know about pollination, seed formation and seed dispersal and can draw simple diagrams to show a plant's life cycle, which include this.</p> <p>Working Scientifically</p> <p>With support I can develop relevant, testable questions about what helps plants grow well</p> <p>I can plan an enquiry such as a comparative or fair test to answer my questions about what helps plants grow well</p> <p>With prompting and support I can write a conclusion based on evidence of which plants grew well</p> <p>With prompting, I can draw and label diagrams of water transportation within plants</p>

Science – Skills and Knowledge Grid – Class 3

Topic	Vocabulary	Knowledge
<p>Light:</p>	<p>Light, light source, dark, reflection, reflect, reflective, ray, pupil, retina shadow, opaque, translucent, transparent.</p>	<p>I know that we need light to be able to see. I know that complete darkness means that there is no light. I know that some surfaces reflect light, such as mirrors. I know that my eyes need to be protected from the sun so that my eyes and vision are not damaged and I can suggest ways to do this. I know that shadows are made when the light's path is blocked by an object. I know how to make shadows smaller and bigger by moving a light source closer to or further from and opaque object</p> <p>Working Scientifically</p> <p>I can suggest how an investigation can be extended by suggesting a line of enquiry having observed what happens to shadows created by the sun throughout the day. I can use standard measurement (cms) when taking measurements in my shadow size enquiry. With prompting I can use tables to record evidence for my shadow size enquiry. With prompting I can recognise patterns that relate to scientific ideas by looking carefully at the numbers recorded in my shadow size enquiry. With prompting I can gather and display evidence in various ways e.g. graphs or charts.</p>
<p>Forces and magnets:</p>	<p>Forces, friction, surface, push, pull magnet, magnetic, magnetic field, poles, repel, attract.</p>	<p>I know that smooth surfaces (that create less friction) help an object move more quickly, such as polished wood. I know that rough surfaces (that create more friction) slow a travelling object down or stop it, such as carpet. I know that pushes and pulls are forces. I know that magnetic forces do not need contact but that pushes and pulls do. I know, or can suggest, which surfaces may attract magnets or repel magnets and I can compare and group these based on testing. I know that magnets have two poles. I know that magnets will attract or repel, depending on their poles and I can form a prediction about this.</p> <p>Working Scientifically</p> <p>I can set up a comparative test to find out which surfaces create more or less friction. I can use a variety of equipment as instructed such as materials and rulers to set up my friction and magnets experiments. With prompting I can use tables to record evidence from my friction experiment.</p>

Science – Skills and Knowledge Grid – Class 4

Topic	Vocabulary	Knowledge
<p>Living things and their habitats:</p>	<p>Organisms, life processes, reproduction, respiration, excretion, nutrition, habitat, environment, endangered species, extinct, classification, vertebrates, invertebrates, specimen, characteristics.</p>	<p>I know that living things can be grouped in a variety of ways that help us study and identify them. I know that animals may be grouped based on body parts, number of legs, whether the animals have wings, hair or feathers or what type of food it eats. I know plants may be grouped according to the appearance of leaves, flowers and seeds. I know that the scientific term for grouping is classification. I know that classification keys can be used to help group, identify and name living things. I can classify animals into vertebrates e.g. mammals, birds, fish reptiles and amphibians, or invertebrates e.g. spiders and insects. I can classify plants into non seed producing e.g. ferns, algae, moss or seed producing e.g. flowering plants and trees. I know that animals may be suited in different environments at different stages of their lifecycle, like tadpoles and frogs. I know that environments can change, often because of human activity, and that this can affect the survival of living things e.g. how litter affects the environment. See investigation.</p> <p>Working Scientifically</p> <p>I can classify animals and plants according to their characteristics e.g. vertebrate or invertebrates. Seedling and non-seedling plants. I can use classification keys to group, identify names a variety of living things e.g. vertebrates- mammals, birds, fish, reptiles and amphibians. I can ask relevant questions and use a scientific investigation to write conclusions based on evidence. I can present my findings from the litter investigation verbally and written. I can use tables to record evidence.</p>

Science – Skills and Knowledge Grid – Class 4

Topic	Vocabulary	Knowledge
<p>Animals, including humans:</p>	<p>Animals, humans, digestive system, teeth, simple functions, food chains, producers, predators, prey, digest, oesophagus, small intestine, stomach, large intestine, rectum.</p>	<p>I know that the digestive system is designed to extract the goodness from food and get rid of the leftovers.</p> <p>I know that the main parts are the mouth, oesophagus, stomach, liver and pancreas, small and large intestine and the rectum, the anus.</p> <p>I know that our teeth are there to chew up food, which is softened by the saliva in our mouth which adds chemicals to the food. The tongue helps to push the food to the back of the mouth where it is swallowed into a tube called the oesophagus.</p> <p>I know that the oesophagus has a band of tight muscles at the bottom to stop the food coming back up from the stomach and that the stomach is like a blender.</p> <p>I know that the useful products from digestion are absorbed through the wall of the intestine into the blood to be transported around the body and to be used for energy and growth.</p> <p>I know that from the small intestine, the remnants of our food move into the large intestine where excess water and salts are removed leaving brown lumps of faeces.</p> <p>I know that the faeces are stored in the rectum and when it is full, we get the urge to poo and the faeces leaves the body through the opening at the end of the digestive system called the anus.</p> <p>Liver and pancreas function.</p> <p>I know that humans have incisors at the front which have a straight, sharp edge which helps cut up food.</p> <p>I know that humans have canines, which come next and are taller and more pointed. They are used to hold and tear food.</p> <p>I know that humans have premolars, which are behind the canines and are lower and bumpy to help grind food.</p> <p>I know that humans have molars at the back of the mouth, which are big and flat and help to grind and chew.</p> <p>Can we simplify simple functions</p> <p>I know that the plant is the 'producer' and the animals are 'consumers'.</p> <p>I know how to construct and interpret a variety of food chains.</p> <p>I know that another way to describe the organism in a food chain is by using the terms 'predator' and 'prey'. A predator is an animal that eats other animals and the prey is the animal that is eaten by the predator.</p> <p>Working Scientifically</p> <p>I can develop relevant questions that can be tested.</p> <p>I can plan an investigation on the effect of different liquids on egg shell and compare this to teeth.</p> <p>I can set up the investigation as a fair test and use a variety of equipment to do so.</p> <p>I can record my finding in a table.</p> <p>I can write a conclusion based on evidence and findings from the investigation.</p> <p>I can label diagrams accurately to identify teeth.</p>

Science – Skills and Knowledge Grid – Class 4

Topic	Vocabulary	Knowledge
<p>States of matter:</p>	<p>Compare, group, solid, liquids, gases, water vapour, observe, materials, change state, heated, cooled, degrees Celsius (°C), temperature, evaporation, condensation, water cycle, melt, freeze.</p>	<p>I know that solids are fairly rigid and tend to keep their shape unless a force is applied. I know that liquids will pour and flow into any shape. I know that gases spread out to fill a space and will escape from an unsealed container. I know how to compare and group according to solid, liquid, gas I know that materials change state when they are heated or cooled and that different materials will respond differently depending on the temperature. I know that melting, evaporating, condensing and freezing are changes of state. I know that melting is when a solid turns into a liquid. A solid melts at a certain temperature and this is called melting point e.g. between 30–32 degrees C, lower than body temperature. I know that evaporation is when a liquid changes to a gas and that evaporation can happen at almost any temperature. I know that evaporation requires heat energy and is faster at higher temperatures. I know that condensation is a process by which water vapour in the air cools down and changes to drops of liquid. I know that water vapour in the cold air condenses into drops, which return to water to the Earth as rain or snow. I know that freezing is when a liquid solidifies. It is usually accompanied by shrinking because solids are generally denser than liquids and their molecules are more densely packed. Liquids freeze at their freezing point, which for water is normally 0°C. I know that change of state is crucial to our water cycle as; the sun's heat evaporates water from land and sea, turning into invisible water vapour. Water rises into cold air and condenses into tiny drops of water that form a cloud. Inside the cloud, the droplets join together to form bigger drops that eventually fall as rain or snow. Rainwater collects in lakes or rivers, which return water to the sea where the cycle begins all over again.</p> <p>Working Scientifically</p> <p>I can use a variety of equipment as instructed with care. E.g. heating to melt ice. Other examples needed. I can use words and diagrams to record findings e.g. investigation on the rate of evaporation. I can record my findings in a variety of ways using tables and graphs. I can use standard units of measure accurately when measuring the rate of evaporation. I can use the evidence from an evaporation investigation to ask questions and suggest further investigations.</p>

Science – Skills and Knowledge Grid – Class 4

Topic	Vocabulary	Knowledge
<p>Sound:</p>	<p>Sounds, vibrations, travel, medium ear, ear drum, pitch, features, volume, strength, fainter, distance, source, increases, instruments, pitch, amplitude, sound wave, soundproof, absorb sound.</p>	<p>I know that sound is made when an object vibrates. I know that vibrations travel through air (or if we're under water, through water) to the ear and that we hear these as sounds. I know that a sound which bounces back from a hard surface is an echo. I know that our ears allow us to hear sound, as they respond to the vibrations in the air and send nerve signals to the brain and we hear them as sound. I know that when we talk about volume we mean from quiet to loud and pitch means from low to high. I know the volume of a sound varies with the size of vibrations (amplitude), the pitch with the number of vibrations per second (frequency). I know that these characteristics depend upon the properties of the object making the sound, such as the material it is made from and its shape e.g. metal objects make a different sound to a wooden one when you hit them. I know that a tight drum skin gives a higher pitched sound than a loose drum skin. I know that sounds get fainter as the distance from the sound source increases. I know that earmuffs block sound by absorbing the vibrations and stopping them from reaching the ear drum.</p>
<p>Electricity:</p>	<p>Electricity, generate, appliances, renewable, non-renewable, electrical circuit, components, cells, wires, bulbs, switches and buzzers, lamp, battery, simple series circuit, open/closed switch, conductors, insulators.</p>	<p>I know that common appliances run on electricity, such as electric heaters, radios and computers. I know that electricity can flow through components of electrical circuit and will only flow if the circuit is closed i.e has no gaps. I know that the components of a circuit will usually include an cells, wires, bulbs, switches and buzzers and can construct a simple circuit I know that all components must be connected into and made part of a circuit. I know that electricity can flow more easily through some materials than others. I know that materials that electric can pass through easily are called conductors and that most metals are good conductors. I know that materials that electricity passes poorly through or not at all are called insulators and that many plastics are insulators. I know how to design and create a simple switch</p> <p>Working Scientifically</p> <p>Predict how the operation of a switch will affect a bulb lighting I can record my findings and predictions on a table I can sort materials into conductors and insulators I can set up comparative fair tests.</p>

Science – Skills and Knowledge Grid – Class 5

Topic	Vocabulary	Knowledge
<p>Properties and changes of materials:</p>	<p>Solids, liquids, gases, melting, freezing, evaporating, condensing, conductor, insulator, transparency, dissolve, soluble, insoluble, reversible change, irreversible change, filter-ing, sieving.</p>	<p>I know that different materials are better suited to particular jobs based upon their properties. For example a suitable materials to insulate a cup is</p> <p>I know the properties of materials are hardness, transparency, flammable, insulator, conductivity, magnetism and flexibility.</p> <p>I know to turn a solid to a liquid it melts, for example ice to water.</p> <p>I know to turn a liquid to a solid it freezes, for example water to ice.</p> <p>I know that materials can be separated by sieving by separating larger particles from smaller particles such as flour and raisins.</p> <p>I know that materials can be separated by filtration where solids get left on the filter paper and liquid goes through such as sand and water</p> <p>I know that materials can be separated by evaporation where the liquid turns into a gas leaving the solid particles behind such as salt and water.</p> <p>I know a solution is made when solid particles mix with liquid particles.</p> <p>I know that materials that dissolve are called soluble, such as sugar and materials that do not dissolve are insoluble, such as sand.</p> <p>I know that an insulator doesn't let heat or electricity travel through it such as foam.</p> <p>I know that a reversible change is when the material can be changed back to what it was before the change, such as melting boiled sweets to make biscuits</p> <p>I know that an irreversible change is when something cannot be changed back to its original form and usually a new material is formed, such as taking a raw egg and cooking it-you cannot recover the raw egg.</p> <p>Working Scientifically</p> <p>Manage variables through solubility experiment-what variables affect rate of solubility.</p> <p>Following discussion of alternatives, select appropriate equipment when planning the solubility experiment and insulator experiment. Also select and use equipment to separate materials.</p> <p>Take measurements which are precise as well as accurate using a thermometer when conducting insulator experiment and recordings during solubility experiment</p> <p>With prompting, use various ways to record complex evidence including presenting data from insulator experiment</p> <p>Use a line graph to record basic data from insulator experiment</p> <p>With prompting, write a conclusion using evidence and causal links based on rates of solubility experiment</p> <p>Classify and describe when sorting materials based upon properties</p> <p>Show how evidence supports a conclusion when writing conclusion for solubility experiment</p> <p>With support, display and present key findings from enquiries orally and in writing for insulator and solubility experiment</p>

Science – Skills and Knowledge Grid – Class 5

Topic	Vocabulary	Knowledge
Earth and Space:	Planet, sun, star, moon, spherical body, sphere, axis, rotate, orbit, geocentric, heliocentric, astronomer	<p>I know that there are 8 planets and they all orbit the Sun, which is a star, and they all have moons. I know the sun, Earth and moon are spherical bodies I know the Earth rotates on its axis anti-clockwise and makes a complete rotation over 24 hours (a day). I know the Earth's rotation causes day and night and when it faces the sun it is day and when it faces away from the sun it is night. I know different parts of the Earth experience daylight at different times – this means that it is morning, afternoon and night in different places. This is also the reason why we have time zones. I know that the tilt of the Earth causes seasons. I know the Earth takes 365 and a quarter days to orbit the Sun. I know because of the extra quarter day it takes to orbit the Sun, every four years on Earth is a leap year. I know the Moon orbits the Earth anticlockwise and takes approximately 28 days. I know the Moon spins once on its axis every time it orbits Earth. This means that we only see one side of the Moon. I know the Moon has different phases depending on where it is in its orbit, these include crescent, full moon, half moon, new moon.</p> <p>Working Scientifically</p> <p>Begin to identify how an idea is supported or refuted by evidence when looking at scientific theory on the spherical earth and the geocentric and heliocentric theories of the solar system. With support, answer questions using evidence gathered from different types of scientific enquiry relating to spherical earth theories, geocentric and heliocentric solar system and day and night</p>
Forces	Forces, gravity, gravitational pull, weight, mass, newtons, friction, air resistance, water resistance, streamlined, buoyancy, mechanism	<p>I know that gravity is the force that pulls objects down towards the centre of the Earth. I know that gravity stops things floating away into space. I know when things such as a football go up into the air gravity pulls them down. I know that friction happens when two surfaces touch each other I know that friction works in the direction opposite to the direction in which the object is moving. I know that more friction is produced by rougher surfaces such as carpet and sandpaper and less friction is produced on smoother surfaces such as rubber and wood. I know that water and air resistance are forms of friction. I know that air resistance slows objects down because air slows you down when you move through it. I know that air resistance can be helpful, for example to stop a skydiver plummeting to Earth. I know that water resistance slows objects down because water slows you down as you move through it. I know to travel faster through air and water things need to be streamlined. I know that pulleys can be used to make a small force lift a lighter load. I know that the more wheels in a pulley the less force is needed to lift a weight. I know gears can be used to change the speed, force or direction of a motion. I know a lever can be used to make a small force lift a heavier load.</p> <p>Working Scientifically</p> <p>I know how to process repeat readings when timing fall on parachute investigation With support, indicate why some results may not be entirely trustworthy during parachute investigation eg stop-watch error and use of video for more accurate measurement</p>

Science – Skills and Knowledge Grid – Class 5

Topic	Vocabulary	Knowledge
Animals, including humans	Prenatal, fertilisation, reproduction, sexual reproduction, asexual reproduction, gestation, life cycle, adolescence, puberty, menstruation, life expectancy, adulthood	<p> I know that fertilisation is when male and female sex cells fuse together I know that prenatal is the stage where cells grow into a foetus in the nine months prior to being born. I know that during infancy there is rapid development. We learn to sit up, walk, talk, eat. I know that during childhood we continue to grow physically and we develop new skills such as learning to read, swim and ride a bike. I know that during adolescents our bodies undergo changes both physically and emotionally. I know these physical changes are to enable reproduction during adulthood. I know during early adulthood the body is at peak fitness and strength I know that during later adulthood the ability to reproduce decreases I know that during old age our hair may go grey and we may lose some of our physical abilities/fitness I know that gestation is the period in which a mammal carries her offspring in her body before giving birth I know that asexual reproduction is the process where one parent produces new life where offspring are an exact copy of their parents I know that offspring from asexual reproduction are clones I know that sexual reproduction is a process where two parents, one male and one female, are needed to produce new life </p>
Living things and their habitats	Reproduction, Asexual reproduction, sexual reproduction, life cycle, metamorphosis, fertilise, pollination, reproduction, gestation.	<p> I know that some living things, such as plants contain male sex cells (pollen) and female sex cells (ovules) In other living things, such as humans they contain either the male or female sex cell I know that wind and insects help to transfer pollen to a different plant I know that the pollen from the stamen of one plant is transferred to the stigma of another and the pollen travels down a tube through the style and fuses with an ovule I know that some plants such as geraniums and spider plants use asexual reproduction to create a new plant and these are identical to the parent plant I know that mammals use sexual reproduction to produce their offspring, by the male sex cell (called sperm) fertilising the female sex cell I know that amphibians such as frogs are laid in eggs and once hatched go through many changes until they become an adult I know that metamorphosis is an obvious change in the structure of the body and some animals such as butterflies go through metamorphosis to become an adult I can describe the lifecycles of a mammal, an amphibian, an insect and a bird. </p> <p> Working Scientifically Start to use labelled diagrams to show more complex outcomes when dissecting parts of flower With support, answer questions using evidence gathered from different types of scientific enquiry when comparing lifecycles </p>

Science – Skills and Knowledge Grid – Class 6

Topic	Vocabulary	Knowledge
<p>Evolution and Inheritance:</p>	<p>Offspring, variation, inheritance, characteristics, adaptation, habitat, environment, evolution, natural selection, fossil, adaptive traits, inherited traits.</p>	<p>I know that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago I know that Mary Anning is famous for her knowledge of fossils, that she influenced the thinking of eminent scientists at the time and that her most famous finds were an Ichthyosaur and a Plesiosaur I know that I have genes from both my father and my mother and yet I am not identical to my brother/sister because of 'natural variation' I know that Charles Darwin was a famous scientist who introduced the idea of 'natural selection' and 'survival of the fittest' Through discussion of the tortoises on the Galapagos Islands, I can identify what 'natural selection' and 'survival of the fittest' mean and what this means for adaptation and evolution over time I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. Eg. the peppered moth, cactus</p> <p>Working Scientifically</p> <p>I can identify how an idea is supported or refuted by evidence I can use various ways, as appropriate, to record complex evidence</p>
<p>Electricity</p>	<p>Circuit, symbol, cell, battery, current, amp, voltage, resistance, electrons.</p>	<p>I know that the number and voltage of cells affects the brightness of the lamp or volume of buzzer and can compare this in different circuits. eg. By varying the number/voltage of cells and the number of bulbs/buzzers and comparing the brightness of the lamp(s) or the volume of the buzzer(s). I can give reasons for variations in how components function in a simple circuit eg. by assessing the brightness of lamps/ I know how to construct a circuit with a switch for different purposes (eg. for a burglar alarm, for a lawn-mower, for a light). I can use the recognised symbols for representing a simple circuit in a diagram (eg. wire, cell, bulb, motor, buzzer, switch) I know that an LED has both positive and negative terminals and how to incorporate this into a simple circuit to make a light-up Christmas card (see D&T knowledge map).</p> <p>Working Scientifically:</p> <p>Identify and manage variables Use labelled diagrams to show complex outcomes Use various ways, as appropriate, to record complex evidence Write a conclusion, using evidence and identifying causal links</p>

Science – Skills and Knowledge Grid – Class 6

Topic	Vocabulary	Knowledge
Light:	Light, light source, reflection, incident ray, reflected ray, prism, shadow, transparent, trans-lucent, opaque, refraction.	<p>I know that light appears to travel in straight lines and can explain how I know this with reference to shadows</p> <p>I know that objects are seen because they give out or reflect light sources to objects and then to our eye</p> <p>I can explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes</p> <p>I know that white objects reflect more light than dark objects</p> <p>I know some of the parts of the eye: lens, cornea, pupil, iris, retina, optic nerve</p> <p>Working Scientifically:</p> <p>Answer questions using evidence gathered from different types of scientific enquiry</p> <p>Identify and manage variables</p> <p>Use appropriate equipment to take measurements</p> <p>Consider how by modifying instrument or technique, measurements can be improved</p> <p>Use labelled diagrams to show complex outcomes</p> <p>Use various ways, as appropriate, to record complex evidence</p> <p>Use evidence to suggest further comparative or fair tests that would develop the investigation</p>
<i>Living things and their habitats</i>	Characteristics, classify, key, bacteria, microorganism, microscope, species.	<p>I know that Linnaeus created a universal system for classifying organisms</p> <p>I know how to use a classification key in order to identify an organism</p> <p>I know the characteristics of a pond habitat and can name some of the creatures found in it: pond skater, water snail, newt, water flea, water boatman, dragonfly larva etc.</p> <p>I can give reasons for classifying plants and animals based on specific characteristics eg. those which are vertebrates, or those which flower, or those with leaves of a specific shape.</p> <p>I can use similarities and differences in observable features to decide how living things can be grouped eg. by making my own key to classify birds</p>

Science – Skills and Knowledge Grid – Class 6

Topic	Vocabulary	Knowledge
<p>Animals, including humans:</p>	<p>Circulatory system, heart blood vessels, oxygenated blood, deoxygenated blood, plasma, white blood cells, red blood cells, veins, arteries, lungs, oxygen, carbon dioxide.</p>	<p>I know that the heart, lungs and blood vessels make up the human circulatory system I know that the human heart has a figure of 8 pattern in pumping blood to and from the lungs and other organs/parts of the body I know that blood is made up of plasma, red blood cells, white blood cells and platelets and what role each constituent part plays I know that arteries carry oxygenated blood, and that veins carry de-oxygenated blood I know that the blood carries carbon dioxide back to the lungs as a waste product and exchanges it for oxygen I know how the digestive system breaks down nutrients from food, and how they are transported, along with water within the human body I know that my heart beats faster when I am exercising, and that it returns to a rest-ing pulse rate more quickly if I am fit and healthy I recognise the impact of lifestyle (including diet and exercise) on overall health and the impact that unnecessary drugs can have on this. (See PSHE curriculum).</p> <p>Working Scientifically:</p> <p>Identify and manage variables Use appropriate equipment to take measurements (eg. pulse meter, oximeter, stopwatch) Consider how by modifying instrument or technique, measurements can be improved Identify situations in which taking repeat readings will improve the quality of evidence Use line graphs to display complex data (eg. heart rate over time) Write a conclusion, using evidence and identifying causal links Display and present key findings from enquiries orally and in writing In conclusion, indicate how trustworthy they are Use evidence to suggest further comparative or fair tests that would develop the investigation</p>