



Science Essential Skills Grid—Animals (including Humans)



Aspect	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Identifying and naming	Identify and name a range of common animals from the local and wider environment.	Name and match animals to their offspring.	Identify some of the most important bones in animals such as skull, ribs and spine, describing their primary functions.	Identify producers, predators and prey in a given food chain and define the terms.	Identify, and present in an appropriate way, the key stages in human growth and development from birth to old age.	Identify the major parts of the human circulatory system and their functions.
Classification	Classify and sort familiar animals according to whether they are invertebrates, fish, amphibians, reptiles, birds or mammals.	Sort and classify things according to whether they are dead, alive or have never been alive.	Classify and group animals into vertebrates or invertebrates.	Develop own classification keys and assign living things to groups, using their keys.	Describe how we define a mammal and how this relates to classification.	Recognise the importance of the classification system and its inception, giving reasons for how the groups and subgroups are chosen.
Habitats, adaptation and interdependence	Name animals living in a range of familiar environments, such as their homes, woodland or school grounds.	Define the terms 'habitat' and 'micro-habitat', giving examples of animals that live in each place.	Know that animals, including humans, cannot make their own food, by investigating food chains and recognise that all food begins with a plant.	Construct a variety of food chains and explain what would happen if one of the parts of the chain became 'unavailable'.	Complete own research/watch documentaries, noting detail on animals and plants in their habitats. Include the work of naturalists such as Attenborough or Goodall.	Describe how animals must be adapted to their habitats for survival, using a range of animals and their adaptations as examples.
Growth, health and survival	Explain how to take care of an animal from the local habitat.	Identify the basic needs of animals and humans for survival, including good nutrition and regular exercise.	Describe how each of the main food groups specifically benefit the human body for growth and health.	Identify different foods that can affect the health of teeth and know the importance of good oral hygiene.	Describe the process of sexual reproduction in a familiar animal and why it is important for species survival.	Recognise and describe the damaging impact that some drugs and other substances can have on the human body.
Diet and teeth	Identify whether an animal is a carnivore, herbivore or omnivore and how we might know this from their physical appearance.	Construct a simple food chain that includes humans as the top consumer.	Identify the different food groups and design a healthy meal based on these food groups.	Identify the different types of teeth and their functions, including how these vary from animal to animal and animal to human.	Make informed choices to maintain their health and well-being, explaining reasons for these choices.	Explain how nutrients and water are transported within humans and animals.
The body	Draw and label basic parts of the human body, including those related to the senses.	Explain simply how humans and some familiar animals change as they grow.	Describe how the skeleton and muscles work together to support, protect and assist movement.	Identify body parts associated with the digestive system, such as mouth, tongue, teeth, oesophagus, stomach and intestine and describe their special functions.	Describe the key physical changes in the male and female human body during puberty.	Describe how lifestyle is important for the health of the human circulatory system, contributing towards a class policy on exercise and diet choices.
Life cycles	Describe in simple terms the life cycle of a familiar animal such as frog, butterfly or human.	Recognise the need for animals and humans to grow and reproduce. Describe the life cycles of some common animals and humans.			Draw the life cycle of an insect, an amphibian, a bird and a mammal, highlighting the key differences and similarities.	Describe how the life cycles of bacteria and viruses differ.
Comparing	Compare animals that are kept as pets, knowing which group they belong to.	Compare the living things in familiar habitats with the living things in a less familiar habitat.	Compare the diets of a herbivore and carnivore with (typically) omnivorous humans.	Compare and contrast the digestive system of a herbivore, with a carnivore, using their knowledge of the parts of the human digestive system, including end products.	Compare key facts about mammalian gestation and birth and suggest reasons for variation within a species (e.g. typical gestation in humans being between 37-42 weeks).	Compare scientifically the effect that different exercises have on heart rate, making predictions and measuring heart rate accurately.



Science Essential Skills Grid—Earth and Space



Aspect	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Identifying and naming					Name the eight planets of the solar system and describe their position and movement relative to the Sun and neighbouring planets.	
Moons					Describe what a moon is, how they maintain an orbit around a planet and which planets in our solar system have them.	
Spherical bodies					Describe the key force responsible for planets being spherical.	
Day and night					Explain day and night using the earth's rotation, correct terminology and a model if required.	Compare times in other parts of the world and relate this to the use of time-zones.
Day length and the seasons					Explain how the Earth's 'position' affects day length.	Explain how the day length changes to a greater or lesser degree in other parts of the world (e.g. Arctic or equatorial regions).



Science Essential Skills Grid—Electricity



Aspect	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Identifying and naming	Identify and talk about products that use electricity.			Identify and name a range of familiar devices and equipment that require electricity for power.		Identify and name components of a circuit and define terms, such as voltage and current in relation to series circuits.
Series circuits		Create working circuits in the context of D&T (e.g. to light a bulb or work a buzzer).		Construct operational simple series circuits, using a range of components and switches for control, and use these to make simple devices.		Work scientifically to construct a series circuit for a specific device or outcome and explain how it works.
Circuit symbols				Predict if a circuit will work based on whether it is a complete loop and draw simple circuits, using their own or conventional circuit symbols.		Draw a series circuit, using the conventional circuit symbols.
Current and voltage				Recognise that a cell (battery) is a power source, generating and pushing current (electricity) through a circuit, and by adding cells the power source increases.		Describe the relationship between the number or voltage of a cell or cells and the effect it has on a bulb or buzzer for example.
Conductors and insulators				Sort and classify materials into those that are conductors and those that are insulators, identifying similarities within the groups.		Predict materials that could be good conductors a fair test to show this.
Safety	Recognise that electricity can be dangerous.	Identify dangerous scenarios from pictures or video clips.	Create rules that show an understanding of electrical safety requirements in the home.	Recognise the dangers of working with electricity and explain how to work safely.		Demonstrate how to work safely with electrical circuits.



Science Essential Skills Grid—Evolution and Inheritance



Aspect	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Identifying and naming			Identify a range of fossilised animals and plants from pictures.			Identify features which are inherited from parents, such as eye colour and those that are not, such as tattoos and dyed hair colour.
Inheritance						Match offspring to their parents, linked to observable features and characteristics.
Evolution						Describe how variation in living things leads to the evolution of a species, using specific examples. Research the work of Darwin or Wallace to explain how the theory of evolution developed.
Adaptation						Identify how specific plants or animals have adapted to their environment.
Fossils			Define what a fossil is and how they are formed.			Explain how fossils are formed and how fossil discoveries have helped the theory of evolution.
The future						Suggest ways in which future changes in the world's climate may impact on ourselves and other living species, and suggest ideas of how we may adapt to these changes.



Science Essential Skills Grid—Forces



Aspect	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Identifying and naming			Name a range of familiar daily activities which rely upon or are caused by forces and magnets.	Identify how the magnetic north and south pole is different to the geographical north and south pole.	Identify and define the opposing forces that act upon objects moving through air, water or along a surface.	
Physical processes			Describe forces in action (pulling and pushing) and whether the force requires direct contact between objects or whether the force can act at distance (magnetic force).	Demonstrate using models or actions, the key forces in action during a given activity.	Describe the force of gravity, what causes it and how the force of gravity changes (e.g. if we were standing on a different planet). Use study skills to research the work of scientists such as Galileo and Newton.	
Phenomena			Explain the terms 'magnetic attraction' and 'repulsion' and 'magnetic poles', using a model for assistance.	Develop research skills, using secondary sources (e.g. finding out why aurora form at the north and south magnetic poles).	Demonstrate, using a model, how simple levers, gears and pulleys assist the movement of objects using less force.	
Testing			Make predictions, explaining thinking then test a range of magnets for their strength and polarity.	Test whether any materials block magnetic attraction.	Make predictions, supported by scientific reasoning to test the effects of friction on movement and distance travelled.	
Comparing			Compare how an object moves over surfaces made from different materials, making predictions and measuring the distance travelled.	Compare the speed in which objects fall to the ground through the same distance of air or water, using their knowledge of forces to explain the outcomes.	Compare the speed with which objects of different shapes and surface area fall through air or water, and explain the reason for any difference in terms of the forces acting on the objects.	
Classification			Sort and group materials into those that are magnetic and those that are not and identify patterns within the groups.		Classify and group forces based on their actions or whether they act directly, or at distance.	



Science Essential Skills Grid—Light and Sound



Aspect	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Identifying and naming			Identify that light is reflected from surfaces, using equipment such as mirrors to demonstrate .	Listen to and be able to identify a variety of familiar sounds and what is vibrating in each case.	Identify by investigation if and how light and sound travel through space, using specific examples to validate their thinking.	Identify parts of the eye and draw a diagram showing how light enters our eyes in order to see, using the correct scientific vocabulary.
Phenomena			Recognise that dark is the absence of light and describe how light behaves.	Describe how sound travels through a medium to the outer ear and how sound is transferred to the inner ear.	Investigate shadows in relation to times of day and explain why the Sun appears to move across the sky.	Describe how white light can be split using prisms and droplets of water and what colours white light is made from.
Physical processes			Explain that when a light source is blocked a shadow is formed.	Describe and demonstrate how the volume or pitch of a sound can be altered, using a range of equipment such as musical instruments.	Describe the Earth's rotation to explain day and night.	Explain how light behaves and travels in straight lines. Demonstrate, using a model or diagram, how this explains why we can see objects and how shadows are formed.
Classifying			Classify a range of objects as either light sources or light reflectors.	Investigate and classify materials for their ability to insulate against sound.		Classify a range of objects or surfaces for their reflective qualities using scientific testing.
Comparing			Compare how the size, shape and sharpness of shadows can change, using equipment or models.	Measure and compare the volume of a sound at different distances from its source, using appropriate equipment.	Compare day lengths during different season and provide an explanation for why they differ.	Compare how a beam of ight changes direction (refraction) when passing through different mediums, such as water and air.
Safety			Recognise that light from the Sun is damaging for vision and the skin, and how we can protect ourselves.	Recognise that certain sounds can be damaging for hearing and identify ways in which the ear can be protected.	Recognise that it isn't safe to look directly at the Sun, even when wearing dark glasses.	Recognise the dangers of using lasers and how they can be used safely.



Science Essential Skills Grid—Plants



Aspect	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Identifying and naming	Identify and name common flowers and trees found growing in the locality.	Identify what eats plants as a food source and recognise simple food chains.	Identify and describe the functions of common plant parts. Explain how their structure is suited to their function (e.g. roots are long and branched to provide good anchorage).	Identify and name a variety of plants in the local and a contrasting environment from their physical appearance.	Identify the key structures involved in plant sexual reproduction.	Identify plants which have survived on Earth for millions of years and how we know this.
Classification	Sort trees into groups to show those that are evergreen and those that are deciduous.	Sort seeds and bulbs into groups according to physical features.	Sort and classify a range of seeds into broad dispersal methods, such as wind (dandelion), water (coconut) or animal (yew).	Use classification keys to classify plants into groups, such as flowering or non-flowering plants, or compound, palmate or single blade leaves.	Classify plant types according to how they reproduce.	Devise classification keys to identify plants in the immediate environment. Give reasons for classification and understand the significance of scientists' work, from study.
Plant parts and their functions	Identify the basic structural parts of common flowering plants and trees, including root, stem, stalk, leaves, flowers, bulb, fruit, seeds and trunk.	Describe the different plant parts and give examples of different foods that we eat which are derived from these plant parts, for example rhubarb (stem), carrot (root).	Draw a simple diagram to show how water is transported through a plant.	Identify uncommon, specialised plant parts such as tendrils and suckers and explain their functions.	Explain why plants have flowers and why it is important for them to attract insects and other pollinators.	Research and describe similarities and differences between petals, leaves, stamen and stigma on a variety of plants found in the locality and elsewhere.
Habitats and adaptation	Identify their locality as a habitat for living things.	Explain how plants are suited to their habitats and give examples of plants growing in different habitats.	Compare and describe how requirements for growth vary from plant to plant and how this relates to a plant's environment, such as with climbing and alpine plants.	Describe how a plant's habitat may naturally change throughout the year and how plants adapt to these changes.	Describe features of flowers, such as scent, colour, shape and size, and how they have evolved to ensure successful pollination.	Describe how plants have adapted and ultimately evolved to suit their environments using specific examples.
Growth and survival	Care for a growing seedling, observing and describing its growth.	Describe how plants grow, identifying what a plant needs for healthy growth and survival.	Recognise that plants make their own food necessary for growth and survival, storing it in their leaves.	Explain how humans can impact on a plant's environment in both positive and negative ways, giving examples from their locality.	Describe the different ways in which new plants can be grown from the parent plant, including seeds, bulbs, tubers, cuttings and grafting.	Suggest why some plants have survived over time and some have not.
Life cycles	Identify the seeds, as a part of a plant, that makes a whole new plant.	Recognise that plants produce seeds in order to reproduce and generate new plants.	Order pictures showing the stages in the life cycle of a plant.	Draw a labelled diagram to show the life cycle of a familiar plant, including germination, flower production, pollination, seed formation and seed dispersal.	Describe the process of plant reproduction using the correct scientific language. Observe/ comment on/ record plant life cycles.	Define the plant terms 'annual', 'biennial' and 'perennial', describing differences in life cycles and identifying plants of each type.
Seasonal changes	Describe how plants change over time, including seasonal change (leaves fall off, blossom, buds opening).	Describe how bulbs help plants to grow in winter.	Allocate different stages of a plant's life cycle to different seasons, suggesting reasons why the stages occur when they do.	Describe in detail the changes that occur in a familiar tree or plant over the seasons.	Grow a range of plants/ vegetables from seeds, cuttings, tubers and bulbs across the different seasons and note the conditions needed for successful growth.	Identify relationships between the seasons and a typical plant life cycle using observations from the school environment.
Comparisons	Name, compare and contrast familiar plants according to their observable features.	Make comparisons between seeds or bulbs grown in different conditions (e.g. with and without light or water).	Compare and explain the effect of different factors on plant growth, including light and nutrition.	Compare plants growing in a local habitat to those in a contrasting one, such as a cacti in the desert, and notice how they are adapted.	Make comparisons between asexual and sexual reproduction in plants, suggesting reasons why plants may reproduce in different ways.	Compare native plants with non-native plants and determine whether non-native plants can be classified in the same way as native plants.



Science Essential Skills Grid—Seasonal changes



Aspect	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Identifying and naming	Name a range of different types of weather from pictures or sounds.	Identify less familiar weather conditions that are more common in other parts of the world.				
Effects of weather	Describe some positive and negative effects of the weather for ourselves and our environment.	Explain how and why the weather influences our choices of clothing and affects what we can do.				
Recording the weather	Observe and record the daily weather on a chart or in a table.	Identify patterns and similarities and differences within recorded weather over a given period of time.				
The seasons	Broadly assign different weather types to seasons.	Explain how animals or plants are affected by the seasons, using a specific animal or plant as an example.				
Day length	Describe how day length changes over a year, from experience and know how it affects their lives.	Make comparisons to other parts of the world where day length changes to a greater or lesser degree, such as Arctic or equatorial regions.				



Science Essential Skills Grid—Substances, Matter and Materials



Aspect	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Identifying and naming	Name a range of everyday materials, including wood, plastic, metal, rock and glass.	Identify the uses of everyday materials in a familiar location (e.g. school or home), recording their findings.	Identify and name a range of rocks and soils, describing how fossils are formed (linked to evolution).	Identify how water changes state, using the correct terminology and relate these key processes to the water cycle.	Identify a wide range of reversible and irreversible changes that are in use in everyday life.	
Classification	Group and sort materials according to their simple physical properties.	Sort and grade a range of materials for a specific property (e.g. smoothness).	Classify and group rocks according to their appearance or physical properties, using a hand lens or digital microscope and identifying whether they are granular, crystalline or fossilised.	Classify everyday materials as a solid, liquid or gas at room temperature.	Classify and group mixtures for how they can be separated, including sieving, filtering and evaporating.	
Uses	Identify the material an object is made from, suggesting why it is made from that material.	Identify and describe the range of materials that can be used to make a single given object (e.g. cup, chair, table or shelter).	Suggest reasons why certain rocks or stones are used for a specific purpose.	Describe a material whose use of changes as its state changes.	Provide evidence and reasons why a material has been chosen for a specific use. Scientifically and systematically compare the functionality of a range of materials to perform a specific function.	
Physical processes	Identify some materials that help physical processes (e.g. woollen fabric keeps us warm).	Describe how the shape of some materials can be changed by twisting, bending, squashing or stretching.	Explain the terms 'weathering' and 'erosion' and describe the effect they have on different types of rocks and soils.	Explain the effect of heating and cooling on a range of substances, including water.	Describe what happens when a solute dissolves in a solvent to form a solution and how this process can be reversed.	
Physical properties	Describe properties of a material using everyday language or simple scientific vocabulary (e.g. hard/soft or bendy/not bendy).	Relate a material's physical properties to its uses (e.g. describe or demonstrate how a material can be unsuitable for a given task due to its ability to be changed by squashing and bending).	Investigate the physical properties of one or a number of rock types and relate their properties to their appearance.	Describe the properties of solids, liquids and gases, giving examples of each (e.g. solids retain their shape).	Describe comprehensively some familiar and unfamiliar material's physical properties, including transparency, conductivity, solubility and magnetism.	
Comparisons	Compare two or more different materials for their performance at a particular task (e.g. mopping up a spill).	Compare significant individuals who have developed useful materials (e.g. Charles Macintosh or John Dunlop) and decide which individual's material is of most use to them.	Compare in detail a range of rock or soil samples from the locality, using simple tables and diagrams to present their findings.	Measure or research the temperature, in degrees Celsius ($^{\circ}\text{C}$), at which materials change state and compare to the temperatures at which water changes state.	Compare reversible with irreversible change, using flow diagrams/equations to show which materials are added, what is made and indicating if the reaction can be reversed.	



Science Progression Grid—Working Scientifically



Aspect	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Asking and answering questions	Use everyday language/ begin to use simple scientific words to ask or answer a scientific question.	Suggest ideas, ask simple questions and know what they can be answered/investigated in different ways including simple secondary sources, such as books and video clips.	Use ideas to pose questions, independently, about the world around them.	Suggest relevant questions and know that they could be answered in a variety of ways, including using secondary sources such as ICT> answer questions using straight forward scientific evidence.	Raise different types of scientific questions, and hypotheses.	Pose/select the most appropriate line of enquiry to investigate scientific questions.
Investigating	Follow instructions to complete a simple test individually or in a group.	Do things in the correct order when performing a simple test and begin to recognise when something is unfair.	Discuss enquiry methods and describe a fair test.	Make decisions about different enquiries, including recognising when a fair test is necessary and begin to identify variables.	Plan a range of science enquiries, including comparative and fair tests.	Select and plan the most suitable line of enquiry, explaining which variables need to be controlled and why, in a variety of comparative and fair tests.
Observing	Observe objects, materials and living things and describe what they see.	Observe something closely and describe changes over time.	Make decisions about what to observe during an investigation.	Make systematic and careful observations.	Plan and carry out comparative and fair tests, making systematic and careful observations.	Choose the most appropriate equipment in order to take measurements, explaining how to use it accurately. Decide how long to take measurements for, checking results with additional readings.
Equipment and measuring	Use simple, non-standard measurements in a practical task.	Use simple equipment, such as hand lenses or egg times to take measurements, make observations and carry out simple tests.	Take accurate measurements using standard units.	Take accurate measurements using standard units and a range of equipment, including thermometers and data loggers.	Take measurements using a range of scientific equipment with increasing accuracy and precision.	Identify and explain patterns seen in the natural environment.
Identifying and classifying	Sort and group objects, materials and living things, with help, according to simple observational features.	Decide, with help, how to group materials, living things and objects, noticing changes over time and beginning to see patterns.	Talk about criteria for grouping, sorting and categorising, beginning to see patterns and relationships.	Identify similarities/ differences/changes when talking about scientific processes. Use and begin to create simple keys.	Use and develop keys to identify, classify and describe living things and materials.	Choose the most effective approach to record and report results, linking to mathematical knowledge.
Recording and reporting on findings	Talk about their findings and explain what they have found out.	Gather data, record and talk about their findings, in a range of ways, using simple scientific vocabulary.	Record their findings using scientific language and present in note form, writing frames, diagrams and tables and charts.	Choose appropriate ways to record and present information, findings and conclusions for difference audiences (e.g. displays, oral or written explanations).	Record data and results of increasing complexity using scientific diagrams, labels, classification keys, tables, bar and line graphs and models.	Choose the most effective approach to record and report results. Linking to mathematical knowledge.
Analysing data	Use everyday or simple scientific language to ask and/or answer a question on given data.	Identify simple patterns and/ or relationships using simple comparative language.	Gather, record and use data in a variety of ways to answer a simple question.	Identify, with help, changes, patterns, similarities and differences in data to help form conclusions. Use scientific evidence to support their findings.	Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	Identify and explain causal relationships in data and identify evidence that supports or refutes their findings, selecting fact from opinion.
Drawing conclusions	Explain, with help, what they think they have found out.	Use simple scientific language to explain what they have found out.	Draw, with help, a simple conclusion based on evidence from an enquiry or observation.	Use recorded data to make predictions, pose new questions and suggest improvements for further enquiries.	Use a simple mode of communication to justify their conclusions on a hypothesis. Begin to recognise how scientific ideas change over	Identify validity of conclusion and required improvement to methodology. Discuss how scientific ideas develop over time.