



Glebe Academy Science Key Skills

Key Stage 1

Year 1:

Animals and Humans

- Identify and name a range of common animals from the local and wider environment.
- Classify and sort familiar animals according to whether they are invertebrates, fish, amphibians, reptiles, birds or mammals.
- Name animals living in a range of familiar environments, such as their homes, woodland or school grounds.
- Explain how to take care of an animal from the local habitat.
- Identify whether an animal is a carnivore, herbivore or omnivore and how we might know this from their physical appearance.
- Draw and label basic parts of the human body, including those related to the senses.
- Describe in simple terms the life cycle of a familiar animal such as a frog, butterfly or human.
- Compare animals that are kept as pets, knowing which group they belong to.

Electricity

- Identify and talk about products that use electricity.
- Recognise that electricity can be dangerous.

Plants

- Identify and name common flowers and trees found growing in the locality.
- Sort trees into groups to show those that are evergreen and those that are deciduous.
- Identify the basic structural parts of common flowering plants and trees, including root, stem, stalk, leaves, flowers, bulb, fruit, seeds and trunk.
- Identify their locality as a habitat for living things.
- Care for a growing seedling, observing and describing its growth.
- Identify the seeds, as a part of a plant, that makes a whole new plant.
- Describe how plants change over time, including seasonal change (leaves fall off, blossom, buds opening).
- Name, compare and contrast familiar plants according to their observable features.

Seasonal Changes

- Name a range of different types of weather from pictures or sounds.
- Describe some positive and negative effects of the weather for ourselves and our environment.
- Observe and record the daily weather on a chart or in a table.
- Broadly assign different weather types to seasons.
- Describe how day length changes over a year, from experience and know how it affects their lives.

Substances, matter and materials

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Working Scientifically

- Use everyday language/begin to use simple scientific words to ask or answer a scientific question.
- Follow instructions to complete a simple test individually or in a group.
- Observe objects, materials and living things and describe what they see.
- Use simple, non-standard measurements in a practical task.
- Sort and group objects, materials and living things, with help, according to simple observational features.
- Talk about their findings and explain what they have found out.
- Use everyday or simple scientific language to ask and/or answer a question on given data.
- Explain, with help, what they think they have found out.

Year 2:

Animals Including Humans

- Use everyday language/begin to use simple scientific words to ask or answer a scientific question.
- Follow instructions to complete a simple test individually or in a group.
- Observe objects, materials and living things and describe what they see.
- Use simple, non-standard measurements in a practical task.
- Sort and group objects, materials and living things, with help, according to simple observational features.
- Talk about their findings and explain what they have found out.
- Use everyday or simple scientific language to ask and/or answer a question on given data.
- Explain, with help, what they think they have found out.

Electricity

- Create working circuits in the context of D&T (e.g. to light a bulb or work a buzzer).

- Identify dangerous scenarios from pictures or video clips.

Plants

- Identify what eats plants as a food source and recognise simple food chains.
- Sort seeds and bulbs into groups according to physical features.
- 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).
- Explain how plants are suited to their habitats and give examples of plants growing in different habitats.
- Describe how plants grow, identifying what a plant needs for healthy growth and survival.
- Recognise that plants produce seeds in order to reproduce and generate new plants.
- Describe how bulbs help plants to grow in winter.
- Make comparisons between seeds or bulbs grown in different conditions (e.g. with and without light or water).

Seasonal Changes

- Identify less familiar weather conditions that are more common in other parts of the world.
- Explain how and why the weather influences our choice of clothing and affects what we can do.
- Identify patterns and similarities and differences within recorded weather over a given period of time.
- Explain how animals or plants are affected by the seasons, using a specific animal or plant as an example.
- Make comparisons to other parts of the world where day length changes to a greater or lesser degree, such as Arctic or equatorial regions.

Substances, matter and materials

- Identify the uses of everyday materials in a familiar location (e.g. school or home), recording their findings.
- Sort and grade a range of materials for a specific property (e.g. smoothness).
- Identify and describe the range of materials that can be used to make a single given object (e.g. cup, chair, table or shelter).
- Describe how the shape of some materials can be changed by twisting, bending, squashing or stretching.
- 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).
- 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.

Working Scientifically

- Suggest ideas, ask simple questions and know that they can be answered/investigated in different ways including simple secondary sources, such as books and video clips.
- Do things in the correct order when performing a simple test and begin to recognise when something is unfair.
- Observe something closely and describe changes over time.
- Use simple equipment, such as hand lenses or egg timers to take measurements, make observations and carry out simple tests.
- Decide, with help, how to group materials, living things and objects, noticing changes over time and beginning to see patterns.
- Gather data, record and talk about their findings, in a range of ways, using simple scientific vocabulary.
- Identify simple patterns and/or relationships using simple comparative language.
- Use simple scientific language to explain what they have found out.

Key Stage 2

Year 3:

Animals including humans

- Suggest ideas, ask simple questions and know that they can be answered/investigated in different ways including simple secondary sources, such as books and video clips.
- Do things in the correct order when performing a simple test and begin to recognise when something is unfair.
- Observe something closely and describe changes over time.
- Use simple equipment, such as hand lenses or egg timers to take measurements, make observations and carry out simple tests.
- Decide, with help, how to group materials, living things and objects, noticing changes over time and beginning to see patterns.
- Gather data, record and talk about their findings, in a range of ways, using simple scientific vocabulary.
- Identify simple patterns and/or relationships using simple comparative language.
- Use simple scientific language to explain what they have found out.

Electricity

- Create rules that show an understanding of electrical safety requirements in the home.

Evolution and inheritance

- Identify a range of fossilised animals and plants from pictures.
- Define what a fossil is and how they are formed.
- Suggest what the fossils of the future may be.

Forces

- Name a range of familiar daily activities which rely upon or are caused by forces and magnets.
- 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).
- Explain the terms 'magnetic attraction' and 'repulsion' and 'magnetic poles', using a model for assistance.
- Make predictions, explaining thinking then test a range of magnets for their strength and polarity.
- Compare how an object moves over surfaces made from different materials, making predictions and measuring the distance travelled.
- Sort and group materials into those that are magnetic and those that are not and identify patterns within the groups.

Light and Sound

- Identify that light is reflected from surfaces, using equipment such as mirrors to demonstrate.
- Recognise that dark is the absence of light and describe how light behaves.
- Explain that when a light source is blocked a shadow is formed.
- Classify a range of objects as either light sources or light reflectors.
- Compare how the size, shape and sharpness of shadows can change, using equipment or models.
- Recognise that light from the Sun is damaging for vision and the skin, and how we can protect ourselves.

Plants

- 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).

- Sort and classify a range of seeds into broad dispersal methods, such as wind (dandelion), water (coconut) or animal (yew).
- Draw a simple diagram to show how water is transported through a plant.
- 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.
- Recognise that plants make their own food necessary for growth and survival, storing it in their leaves.
- Order pictures showing the stages in the life cycle of a plant.
- Allocate different stages of a plant's life cycle to different seasons, suggesting reasons why the stages occur when they do.
- Compare and explain the effect of different factors on plant growth, including light and nutrition.

Substances, matter and materials

- Identify and name a range of rocks and soils, describing how fossils are formed (link to evolution).
- 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.
- Suggest reasons why certain rocks or stones are used for a specific purpose.
- Explain the terms 'weathering' and 'erosion' and describe the effect they have on different types of rocks and soils.
- Investigate the physical properties of one or a number of rock types and relate their properties to their appearance.
- Compare in detail a range of rock or soil samples from the locality, using simple tables and diagrams to present their findings.

Working Scientifically

- Use ideas to pose questions, independently, about the world around them.
- Discuss enquiry methods and describe a fair test.
- Make decisions about what to observe during an investigation.
- Take accurate measurements using standard units.
- Talk about criteria for grouping, sorting and categorising, beginning to see patterns and relationships.
- Record their findings using scientific language and present in note form, writing frames, diagrams, tables and charts.
- Gather, record and use data in a variety of ways to answer a simple question.
- Draw, with help, a simple conclusion based on evidence from an enquiry or observation.

Year 4:

Animals including humans

- Use ideas to pose questions, independently, about the world around them.
- Discuss enquiry methods and describe a fair test.
- Make decisions about what to observe during an investigation.
- Take accurate measurements using standard units.
- Talk about criteria for grouping, sorting and categorising, beginning to see patterns and relationships.
- Record their findings using scientific language and present in note form, writing frames, diagrams, tables and charts.
- Gather, record and use data in a variety of ways to answer a simple question.
- Draw, with help, a simple conclusion based on evidence from an enquiry or observation.

Electricity

- Identify and name a range of familiar devices and equipment that require electricity for power.
- Construct operational simple series circuits, using a range of components and switches for control, and use these to make simple devices.
- 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.
- 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.
- Sort and classify materials into those that are conductors and those that are insulators, identifying similarities within the groups.
- Recognise the dangers of working with electricity and explain how to work safely.

Forces

- Identify how the magnetic north and south pole is different to the geographical north and south pole.
- Demonstrate using models or actions, the key forces in action during a given activity.
- Develop research skills, using secondary sources (e.g. finding out why aurora form at the north and south magnetic poles).
- Test whether any materials block magnetic attraction.
- 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.

Light and Sound

- Listen to and be able to identify a variety of familiar sounds and what is vibrating in each case.
- Describe how sound travels through a medium to the outer ear and how sound is transferred to the inner ear.
- Describe and demonstrate how the volume or pitch of a sound can be altered, using a range of equipment such as musical instruments.
- Investigate and classify materials for their ability to insulate against sound.
- Measure and compare the volume of a sound at different distances from its source, using appropriate equipment.
- Recognise that certain sounds can be damaging for hearing and identify ways in which the ear can be protected.

Plants

- Identify and name a variety of plants in the local and a contrasting environment from their physical appearance.
- Use classification keys to classify plants into groups, such as flowering or non-flowering plants, or compound, palmate or single blade leaves.
- Identify uncommon, specialised plant parts such as tendrils and suckers and explain their functions.
- Describe how a plant's habitat may naturally change throughout the year and how plants adapt to these changes.
- Explain how humans can impact on a plant's environment in both positive and negative ways, giving examples from their locality.
- Draw a labelled diagram to show the life cycle of a familiar plant, including germination, flower production, pollination, seed formation and seed dispersal.
- Describe in detail the changes that occur in a familiar tree or plant over the seasons.
- 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.

Substance, matter and materials

- Identify how water changes state, using the correct terminology and relate these key processes to the water cycle.
- Classify everyday materials as a solid, liquid or gas at room temperature.
- Describe a material whose use changes as its state changes.
- Explain the effect of heating and cooling on a range of substances, including water.
- Describe the properties of solids, liquids and gases, giving examples of each (e.g. solids retain their shape).
- 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.

Working Scientifically

- 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.
- Make decisions about different enquiries, including recognising when a fair test is necessary and begin to identify variables.
- Make systematic and careful observations.
- Take accurate measurements using standard units and a range of equipment, including thermometers and data loggers.
- Identify similarities/differences/changes when talking about scientific processes.
- Use and begin to create simple keys.
- Choose appropriate ways to record and present information, findings and conclusions for different audiences (e.g. displays, oral or written explanations).
- Identify, with help, changes, patterns, similarities and differences in data to help form conclusions.
- Use scientific evidence to support their findings.
- Use recorded data to make predictions, pose new questions and suggest improvements for further enquiries.

Year 5:

Animals including humans

- Identify, and present in an appropriate way, the key stages in human growth and development from birth to old age.
- Describe how we define a mammal and how this relates to classification.
- 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 the process of sexual reproduction in a familiar animal and why it is important for species survival.
- Make informed choices to maintain their health and well-being, explaining reasons for these choices.
- Describe the key physical changes in the male and female human body during puberty.
- Draw the life cycle of an insect, an amphibian, a bird and a mammal, highlighting the key differences and similarities.
- 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).

Earth and Space

- Name the eight planets of the solar system and describe their position and movement relative to the Sun and neighbouring planets.
- Describe what a moon is, how they maintain an orbit around a planet and which planets in our solar system have them.
- Describe the key force responsible for planets being spherical.
- Explain day and night using the Earth's rotation, correct terminology and a model if required.
- Explain how the Earth's 'position' affects day length.

Forces

- Identify and define the opposing forces that act upon objects moving through air, water or along a surface.
- 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.
- Demonstrate, using a model, how simple levers, gears and pulleys assist the movement of objects using less force.
- Make predictions, supported by scientific reasoning to test the effects of friction on movement and distance travelled.
- Compare the speed with which objects of different shapes and surface area fall through the air or water, and explain the reason for any differences in terms of the forces

acting on the objects.

- Classify and group forces based on their actions or whether they act directly, or at distance.

Light and Sound

- Identify by investigation if and how light and sound travel through space, using specific examples to validate their thinking.
- Investigate shadows in relation to times of day and explain why the Sun appears to move across the sky.
- Describe the Earth's rotation to explain day and night.
- Compare day lengths during different seasons and provide an explanation for why they differ.
- Recognise that it isn't safe to look directly at the Sun, even when wearing dark glasses.

Plants

- Identify the key structures involved in plant sexual reproduction.
- Classify plant types according to how they reproduce.
- Explain why plants have flowers and why it is important for them to attract insects and other pollinators.
- Describe features of flowers, such as scent, colour, shape and size, and how they have evolved to ensure successful pollination.
- Describe the different ways in which new plants can be grown from the parent plant, including seeds, bulbs, tubers, cuttings and grafting.
- Describe the process of plant reproduction using the correct scientific language. Observe/comment on/record plant life cycles.
- Grow a range of plants/vegetables from seeds, cuttings, tubers and bulbs across the different seasons and note the conditions needed for successful growth.
- Make comparisons between asexual and sexual reproduction in plants, suggesting reasons why plants may reproduce in different ways.

Substances, matter and material

- Identify a wide range of reversible and irreversible changes that are in use in everyday life.
- Classify and group mixtures for how they can be separated, including sieving, filtering and evaporating.
- 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.
- Describe what happens when a solute dissolves in a solvent to form a solution and how this process can be reversed.
- Describe comprehensively some familiar and unfamiliar material's physical properties, including transparency, conductivity, solubility and magnetism.
- 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.

Working Scientifically

- Raise different types of scientific questions, and hypotheses.
- Plan a range of science enquiries, including comparative and fair tests.
- Plan and carry out comparative and fair tests, making systematic and careful observations.
- Take measurements using a range of scientific equipment with increasing accuracy and precision.
- Use and develop keys to identify, classify and describe living things and materials.
- Record data and results of increasing complexity using scientific diagrams, labels, classification keys, tables, bar and line graphs and models.
- Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.
- Use a simple mode of communication to justify their conclusions on a hypothesis.

- Begin to recognise how scientific ideas change over time.

Year 6:

Animals including humans

- Identify the major parts of the human circulatory system and their functions.
- Recognise the importance of the classification system and its inception, giving reasons for how the groups and subgroups are chosen.
- Describe how animals must be adapted to their habitats for survival, using a range of animals and their adaptations as examples.
- Recognise and describe the damaging impact that some drugs and other substances can have on the human body.
- Explain how nutrients and water are transported within humans and animals.
- Describe how lifestyle is important for the health of the human circulatory system, contributing towards a class policy on exercise and diet choices.
- Describe how the life cycles of bacteria and viruses differ.
- Compare scientifically the effect that different exercises have on heart rate, making predictions and measuring heart rate accurately.

Earth and Space

- Compare times in other parts of the world and relate this to the use of time zones.
- Explain how the day length changes to a greater or lesser degree in other parts of the world (e.g. Arctic or equatorial regions).

Electricity

- Identify and name components of a circuit and define terms, such as voltage and current in relation to series circuits.
- Work scientifically to construct a series circuit for a specific device or outcome and explain how it works.
- Draw a series circuit, using the conventional circuit symbols.
- 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.
- Predict materials that could be good conductors of electricity and conduct a fair test to show this.
- Demonstrate how to work safely with electrical circuits.

Evolution and inheritance

- Identify features which are inherited from parents, such as eye colour and those that are not, such as tattoos and dyed hair colour.
- Match offspring to their parents, linked to observable features and characteristics.
- 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.
- Identify how specific plants or animals have adapted to their environment.
- Explain how fossils are formed and how fossil discoveries have helped develop the theory of evolution.
- Suggest ways in which future changes in the world's climate may impact on ourselves and other living species, and suggest ideas for how we may adapt to these changes.

Light and Sound

- Identify parts of the eye and draw a diagram showing how light enters our eyes in order to see, using the correct scientific vocabulary.
- Describe how white light can be split using prisms and droplets of water and what colours white light is made from.
- 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.
- Classify a range of objects or surfaces for their reflective qualities using scientific testing.

- Compare how a beam of light changes direction (refraction) when passing through different mediums, such as water and air.
- Recognise the dangers of using lasers and how they can be used safely.

Plants

- Identify plants which have survived on Earth for millions of years and how we know this.
- Devise classification keys to identify plants in the immediate environment.
- Give reasons for classification and understand the significance of scientists' work, from study.
- Research and describe similarities and differences between petals, leaves, stamen and stigma on a variety of plants found in the locality and elsewhere.
- Describe how plants have adapted and ultimately evolved to suit their environments using specific examples.
- Suggest why some plants have survived over time and some have not.
- Define the plant terms 'annual', 'biennial' and 'perennial', describing differences in life cycles and identifying plants of each type.
- Identify relationships between the seasons and a typical plant life cycle using observations from the school environment.
- Compare native plants with non-native plants and determine whether non-native plants can be classified in the same way as native plants.

Working Scientifically

- Pose/select the most appropriate line of enquiry to investigate scientific questions.
- 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.
- Make their own decisions about which observations to make, using test results and observations to make predictions or set up further comparative or fair tests.
- 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.
- Identify and explain patterns seen in the natural environment.
- Choose the most effective approach to record and report results, linking to mathematical knowledge.
- Identify and explain causal relationships in data and identify evidence that supports or refutes their findings, selecting fact from opinion.
- Identify validity of conclusion and required improvement to methodology.
- Discuss how scientific ideas develop over time.