

Gordon Children's Academy

This document maps the progression of substantive scientific knowledge through the school's eight agreed threads from EYFS to Year 6. Knowledge statements are synthesised from the current Science Long-Term Plan and Key Knowledge Documents; where there is no discrete unit, this is stated rather than introducing additional content.

Biology	Chemistry	Physics	Earth Science
Living things and their interactions with the environment.	Matter: the properties of materials and how they change.	Forces, energy and interactions in the physical world.	Earth processes, seasonal patterns and Earth's place in space.

Biology | Plants

How plants grow, reproduce and interact with their environment.

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plant seeds and observe growth and change. Notice seasonal changes in plants and flowers.	Identify common wild and garden plants, including deciduous and evergreen trees. Identify and describe basic plant structures. Recognise seasonal changes in plants.	Know that seeds and bulbs grow into mature plants. Plants need water and light to grow; requirements can vary. Know that germination is the start of growth.	Explain the functions of roots, stems/trunks, leaves and flowers. Know plants require air, light, water, nutrients and room to grow. Describe water transport, pollination, seed formation and seed dispersal.	No discrete Plants unit. Previous plant knowledge is applied when studying habitats and food chains.	Describe sexual and asexual reproduction in plants. Describe stages of reproduction in flowering plants: pollination, fertilisation, dispersal and germination. Recognise bulbs and tubers as examples of asexual reproduction.	No discrete Plants unit. Plant knowledge is applied when classifying living things and explaining adaptation and evolution.

End Point: Pupils understand how plants grow and reproduce, including the functions of their different parts, their requirements for growth, water transport, pollination, seed formation and seed dispersal, and recognise how plants interact with their environment.

Biology | Animals

How animals grow, survive and function.

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Observe minibeasts and other animals in the natural world. Explore hibernation and the butterfly life cycle.	Identify and name common fish, amphibians, reptiles, birds and mammals. Identify carnivores, herbivores and omnivores. Describe and compare the structure of common animals.	Know animals reproduce and have offspring that grow into adults. Compare offspring that do and do not resemble adults. Describe simple life cycles, including frog and butterfly. Know animals need water, food and air to survive.	Know animals cannot make their own food and need the right nutrition. Distinguish vertebrates and invertebrates through skeleton knowledge. Explain how skeletons and muscles support movement.	Use producer, consumer, predator and prey in food chains. Recognise that animals depend on other living things for energy and survival.	Compare life cycles of mammals, birds, amphibians, reptiles and insects. Describe reproduction and different patterns of growth, including complete and incomplete metamorphosis.	Explain that characteristics can be inherited and offspring vary. Explain how adaptations can support survival. Recognise that species change over long periods of time.

End Point: Pupils understand how animals grow, survive, reproduce and evolve, explaining how adaptations enable species to survive over time.

Biology | Human Body

How the human body grows, functions and stays healthy.

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Explore the senses and talk about what can be heard and tasted. Develop awareness of the body through everyday experiences.	Identify, name, draw and label basic parts of the human body. Link body parts to the five senses. Know that humans are mammals.	Know humans need water, food and air for survival. Recognise that exercise, a balanced diet and hygiene support health. Describe growth from young to adult.	Explain the roles of the skeleton, joints and muscles. Know animals, including humans, need the right nutrition. Identify main food groups and the idea of a balanced diet.	Describe the main parts and functions of the digestive system. Identify incisors, canines and molars and their functions. Explain how food is broken down and nutrients/water are absorbed.	Describe changes as humans develop from birth to old age. Recognise stages in the human life cycle.	Identify the heart, blood and blood vessels as parts of the circulatory system. Explain transport of oxygen, nutrients and waste. Explain how diet, exercise, drugs and lifestyle affect how the body functions.

End Point: Pupils understand how major human body systems function, including the skeletal, muscular, digestive and circulatory systems, and can explain how diet, exercise, drugs and lifestyle affect how the body functions.

Biology | Living Things & Environments

How living things are classified, interact and depend upon environments.

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Observe minibeasts and other living things in local environments. Notice similarities, differences and change in the natural world. Explore simple habitats such as minibeast hotels.	Use observable features to identify and group common animals and plants. Recognise simple differences between groups of living things.	Distinguish living, dead and never-alive things. Know a habitat provides what living things need to survive. Explore habitats and microhabitats and simple food chains.	No discrete Living Things & Environments unit. Knowledge of plants, animals, nutrition and reproduction supports later work on interdependence.	Classify organisms using similarities and simple classification keys. Group vertebrates, invertebrates, flowering and non-flowering plants. Explain that habitats can change and this can pose dangers. Construct and interpret food chains and food webs.	Compare life cycles and reproduction across plants and animal groups. Use similarities and differences to compare living things.	Classify living things into broad groups and subdivisions. Know microorganisms are living things too small to see unaided. Use characteristics to justify classification. Apply knowledge of adaptation and environmental survival.

End Point: Pupils understand that living things depend on their habitats and one another, and can classify plants, animals and microorganisms according to observable and specific characteristics, giving reasons for their classifications.

Chemistry | Materials

The properties, uses and changes of materials.

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Explore materials through practical experiences. Investigate durability and notice that materials look and feel different. Observe change over time, including decaying vegetables.	Know a material is what an object is made from. Describe simple physical properties such as shiny, stretchy, rough and smooth. Recognise that properties make materials suitable for different uses. Know waterproof means keeping out water.	Know one material can have many uses and different materials can serve the same purpose. Explain suitability using properties. Know shapes of some solid objects can be changed by squashing, bending, twisting and stretching.	Compare and group rocks using appearance and physical properties. Recognise igneous, metamorphic and sedimentary rocks as different rock types.	Group materials as solids, liquids or gases. Describe changes of state caused by heating and cooling. Explain evaporation and condensation within the water cycle.	Group materials by properties such as conductivity, hardness, solubility, transparency and magnetism. Explain dissolving and separation by filtering, sieving and evaporation. Distinguish reversible and irreversible changes and recognise formation of new materials.	No discrete Materials unit. Earlier materials knowledge is applied in Electricity when considering conductors and insulators.

End Point: Pupils understand that materials have different properties which determine their uses and can explain how materials change, including reversible and irreversible changes.

Physics | Energy

How light, sound and electricity behave and interact.

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Explore light and sound through sensory experiences and magnifying glasses. Notice effects in the immediate environment.	No discrete Energy unit.	No discrete Energy unit.	Know light is needed to see and darkness is the absence of light. Identify light sources and explain reflection. Classify objects as opaque, transparent or translucent. Explain that opaque objects block light to form shadows and recognise sunlight can damage eyes.	Sound: explain vibration, sound travelling through a medium, pitch, volume and sound becoming fainter with distance. Electricity: identify appliances, construct simple series circuits and explain complete loops, switches, conductors and insulators.	No discrete Energy unit.	Light: explain that light travels in straight lines, how light enters the eye, reflection and shadow shape. Electricity: explain how number/voltage of cells affects lamps and buzzers, compare component function and use recognised circuit symbols.

End Point: Pupils understand how light, sound and electricity behave and can apply their scientific knowledge to explain observations and simple electrical circuits.

Physics | Forces & Motion

How forces affect objects and movement.

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Explore pushing, pulling, rolling, floating and sinking. Investigate magnets and notice that some materials are attracted to them.	No discrete Forces & Motion unit. Floating and sinking may be revisited through simple testing in Materials.	No discrete Forces & Motion unit.	Know a force is a push or pull. Explain friction and compare movement on different surfaces. Distinguish contact forces from magnetic forces acting at a distance. Know magnets have north/south poles; opposite poles attract and like poles repel. Recognise not all metals are magnetic.	No discrete Forces & Motion unit.	Explain that unsupported objects fall because of gravity. Know air resistance and water resistance are forms of friction. Explain how mechanisms such as levers, pulleys and linkages/gears create movement or allow a smaller force to have a greater effect.	No discrete Forces & Motion unit.

End Point: Pupils understand that forces can change the movement of objects and can explain how different forces and mechanisms operate in familiar situations.

Earth materials and processes, seasonal patterns and Earth's place in the Solar System.

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Observe seasonal change from autumn to winter and across the year. Notice weather and changes in the natural world.	Name the four seasons and describe associated weather. Know summer has the longest days/highest temperatures and winter the shortest days/lowest temperatures. Observe seasonal changes in plants and the environment.	No discrete Earth Systems & Space unit.	Know fossils form when living things are trapped within rocks. Know soils are made from rocks and organic material. Describe how igneous, metamorphic and sedimentary rocks form.	Describe evaporation and condensation in the water cycle and relate evaporation rate to temperature.	Know the Sun is a star and planets orbit it; name the eight planets. Know the Sun, Earth, Moon and planets are approximately spherical. Describe the Moon's movement relative to Earth. Explain day/night through Earth's rotation and know Earth orbits the Sun in about one year.	No discrete Earth Systems & Space unit. Previous Earth and space knowledge remains part of the retained curriculum.

End Point: Pupils understand patterns of seasonal change and key features of Earth's materials, and can explain the movement of the Earth and other planets relative to the Sun, the movement of the Moon relative to the Earth, and how Earth's rotation causes day and night.