Science in the Early Years Foundation Stage

The statutory Framework for the Early Years Foundation Stage (September 2021) separates learning and development into seven areas (three prime areas and four specific areas). The most relevant statements for science are taken from: *Communication and Language* (prime area); *Personal, Social and Emotional Development* (prime area) and *Understanding the World* (specific area of learning) and the targets that relate to the science curriculum, as set out by Development Matters guidance, are as follows:

Communication and Language

1. Learn new vocabulary.
2. Ask questions to find out more and to check what has been said to them.
3. Articulate their ideas and thoughts in well-formed sentences.
4. Describe events in some detail.
5. Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen.
6. Use new vocabulary in different contexts.
7. Make comments about what they have heard and ask questions to clarify their understanding (listening, attention and understanding ELG).

Personal, Social and Emotional Development

1. Be increasingly independent in meeting their own care needs, e.g. brushing teeth, using the toilet, washing and drying their hands thoroughly.
2. Make healthy choices about food, drink, activity and toothbrushing.
3. Know and talk about the different factors that support their overall health and wellbeing: regular physical activity, healthy eating, toothbrushing, sensible amounts of 'screen time', having a good sleep routine and being a safe pedestrian.
4. Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices (ELG - Managing Self).

Understanding the World

1. Use all their senses in hands-on exploration of natural materials.
2. Explore collections of materials with similar and /or different properties.
3. Talk about what they see using a wide vocabulary.
4. Plant seeds and care for growing plants.
5. Understand the key features of the life cycle of a plant and an animal.
6. Begin to understand the need to respect and care for the natural environment and all living things.
7. Explore and talk about different forces they feel.
8. Talk about differences between materials and changes they notice.
9. Explore the natural world around them.
10. Describe what they see, hear and feel while they are outside.
11. Recognise some environments that are different to the one in which they live.
12. Understand the effect of changing seasons on the natural world around them.
13. Explore the natural world around them, making observations and drawing pictures of animals and plants (ELG - The natural World).
14. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class (ELG - The Natural World).
15. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter (ELG - The Natural World).

Science in the Early Years at Danson Primary School

At Danson Primary School we teach science related skills and knowledge through a mixture of child-initiated and adult-led learning in our rich indoor and outdoor environments. We provide our children with a wide variety of learning opportunities to develop their understanding and ask questions to further their knowledge, skills and understanding of vocabulary. Please see the table below for the breakdown of how the targets from Personal, Social and Emotional Development (prime area) and Understanding the World (specific area of learning) feed into different science strands.

Danson Primary School Science Progression

Animals including Humans

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• I can understand the key features of the life cycle of a plant and an animal. • I begin to understand the need to respect and care for the natural environment and all living things. • I am increasingly independent in meeting my own care needs, e.g. brushing teeth, using the toilet, washing and drying my hands thoroughly. • I can make healthy choices about food, drink, activity and toothbrushing. • I can explore the natural world around me, making observations and drawing pictures of animals and plants (ELG - The Natural World). • I know and can talk about the different factors that support my overall health and wellbeing: regular physical activity, healthy eating, toothbrushing, sensible amounts of 'screen time', having a good sleep routine and being a safe pedestrian. • I can manage my own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices (ELG -Managing Self).	• I can identify and name a variety of common animals that are birds, fish, amphibians, reptiles and mammals • I can identify and name a variety of common animals that are carnivores, herbivores and omnivores. • I can describe and compare the structure of a variety of common animals (birds, fish, amphibians, reptiles and mammals, and including pets). • I can identify, name, draw and label the basic parts of the human body and say which parts of the body are associated with each sense.	• I can notice that animals, including humans, have offspring which grow into adults • I can find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	• I can identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • I can identify that humans and some animals have skeletons and muscles for support, protection and movement.	• I can describe the simple functions of the basic parts of the digestive system in humans • I can identify the different types of teeth in humans and their simple functions • I can construct and interpret a variety of food chains, identifying producers, predators and prey.	• I can describe the changes as humans develop from birth to old age.	• I can identify and name the main parts of the human circulatory system, and explain the functions of the heart, blood vessels and blood • I can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function • I can describe the ways in which nutrients and water are transported within animals, including humans.
Vocabulary						
alive, animal, exercise, food, life cycle, needs, smell, touch, hear, taste, see, senses, water	amphibians, birds, fish, mammals, reptiles, carnivore, herbivore, omnivore, sight, hearing, touch, taste, smell	adult, develop, life cycle, offspring, reproduce, nutrition, live young, dehydrate, diet, disease, energy, germs, heart rate	Energy, nutrition, contract, skeleton, muscle, healthy, fats, minerals, carbohydrates, protein, fat	Energy, waste, digest, saliva, organ, producer, consumer, mouth, tongue, teeth, oesophagus, stomach, small intestine, large intestine, herbivore, carnivore, canine, incisor, molar	Foetus, embryo, womb, gestation, baby, toddler, teenager, elderly, growth, development, puberty, adolescent, life expectancy, fertilisation, pituitary gland.	Circulatory, heart, blood vessels, veins, arteries, oxygenated, deoxygenated, valve, exercise, respiration

Living Things and Their Habitats

EYFS	Year 2	Year 4	Year 5	Year 6
• I can talk about what I see using a wide vocabulary. • I can explore the natural world around me. • I understand the key features of the life cycle of an animal. • I can describe what I can see, hear, and feel whilst outside. • I know some similarities and differences between the natural world around me and contrasting environments, drawing on my experiences and what has been read in class (ELG - The Natural World).	• I can explore and compare the differences between things that are living, dead, and things that have never been alive. • I can identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. • I can identify and name a variety of plants and animals in their habitats, including micro-habitats. • I can describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.	• I can recognise that living things can be grouped in a variety of ways. • I can explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. • I can recognise that environments can change and that this can sometimes pose dangers to living things.	• I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. • I can describe the life process of reproduction in some plants and animals.	• I can describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. • I can give reasons for classifying plants and animals based on specific characteristics.
Vocabulary				
Garden, forest, sand, seaside, water, wood	life processes, living, dead, never living, food chain, food sources, habitat, microhabitat, depend, survive	Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, snails, slugs, worms, spiders, insects, environment, habitats	Asexual reproduction, sexual reproduction, life cycle, metamorphosis	Classification, micro-organisms, kingdoms, species, arachnid, crustacean

Materials

EYFS	Year 1	Year 2	Year 5
• I can use all my senses in hands-on exploration of natural materials. • I can explore collections of materials with similar or different properties. • I can talk about the differences between materials and changes I notice.	**Everyday Materials** • 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, water and rock. • I can describe the simple physical properties of a variety of everyday materials. • I can compare and group together a variety of everyday materials on the basis of their physical properties.	**Uses of Everyday Materials** • I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	**Properties and Changes of Materials** • I can compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. • I can understand that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. • I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. • I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. • I can demonstrate that dissolving, mixing and changes of state are reversible changes. • I can explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.
Vocabulary			
Touch, shiny, soft, hard, rough	object, materials, hard, soft, stretchy, shiny, dull, rough, smooth, bendy, waterproof, absorbent, transparent	materials, suitability, properties, not stretchy, not bendy, opaque	Hardness, solubility, transparency, conductivity, magnetic, filter, evaporation, dissolving, mixing, reversible, irreversible, conductor, insulate, thermal, solution

Plants

EYFS	Year 1	Year 2	Year 3
• I can plant seeds and care for growing plants. • I understand the key features of a life cycle of a plant. . • I begin to understand the need to respect and care for the natural environment and all living things • I can explore the natural world around me, making observations and drawing pictures of animals and plants (ELG - The Natural World).	• I can identify and name a variety of common plants, including garden plants, wild plants and trees, and those classified as deciduous and evergreen. • I can identify and describe the basic structure of a variety of common plants including roots, stem/trunk, leaves and flowers.	• I can observe and describe how seeds and bulbs grow into mature plants. • I can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	• I can identify and describe the functions of different parts of plants; roots, stem, leaves and flowers. • I can explore the requirements of plants for life and growth (air, light, water, nutrients from soil and room to grow) and how they vary from plant to plant. • I can investigate the ways in which water is transported within plants. • I can explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
Vocabulary			
Change, flower, grow, leaf, plant, seed, sunlight, water, life cycle, needs	wild plants, garden plants, weed, deciduous, evergreen, roots, stems, leaves, flowers, petals, fruit	germination, seed dispersal, sprout, shoot, sunlight, water, temperature, nutrition	Function, seed dispersal, nutrients, pollination, fertilisation, flowering

Forces

EYFS	Year 3	Year 5
• I can explore and talk about different forces I can feel.	**Forces & Magnets** • I can compare how things move on different surfaces. • I can notice that some forces need contact between two objects, but magnetic forces can act at a distance. • I can observe how magnets attract or repel each other and attract some materials and not others. • I can compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. • I can describe magnets as having two poles • I can predict whether two magnets will attract or repel each other, depending on which poles are facing.	**Forces** • I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. • I can identify the effects of air resistance, water resistance and friction, that act between moving surfaces. • I can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Vocabulary

Push, up, down	Force, push, pull, surface, attract, friction, repel, north pole, south pole, magnetism	Air resistance, water resistance, friction, gravity, newtons, gears, pulleys

Light

Year 3	Year 6
• I can recognise that they need light in order to see things and that dark is the absence of light. • I can notice that light is reflected from surfaces. • I can recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • I can recognise that shadows are formed when the light from a light source is blocked by a solid object. • I can find patterns in the way that the sizes of shadows change.	• I can recognise that light appears to travel in straight lines. • I can use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. • 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. • I can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Vocabulary

Transparent, translucent, opaque, reflection, shadow, light source, UV light,	Light source, reflection, refraction, spectrum, shadow, light, rainbow, colour

Electricity

Year 4	Year 6
• I can identify common appliances that run on electricity. • I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. • I can identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. • I can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. • I can recognise some common conductors and insulators, and associate metals with being good conductors.	• I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. • I can compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. • I can use recognised symbols when representing a simple circuit in a diagram.
Vocabulary	
Circuit, cell, wire, bulb, appliance, batteries, current voltage, switches, buzzers, circuit, series, conductors, insulators	Circuit, cell, wire, bulb, appliance, batteries, current voltage, switches, buzzers, circuit, series, conductors, insulators, amps, volts, cell

Seasonal Changes

EYFS	Year 1
• I can describe what they see, hear and feel whilst outside. • I can understand the effect of changing seasons on the natural world around them. • I can understand some important processes and changes in the natural world around me, including the seasons and changing states of matter (ELG - The Natural World).	• I can observe changes across the four seasons. • I can observe and describe weather associated with the seasons and how day length varies.
Vocabulary	
Weather, seasons	seasons, autumn, winter, weather, daylight, spring, summer

Science units taught in isolation in one-year group

Year 3	Year 4	Year 5	Year 6
Rocks ● I can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. ● I can describe in simple terms how fossils are formed when things that have lived are trapped within rock ● I can recognise that soils are made from rocks and organic matter.	**States of Matter** ● I can compare and group materials together, according to whether they are solids, liquids or gases. ● I can observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) ● I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. **Sound** ● I can identify how sounds are made, associating some of them with something vibrating. ● I can recognise that vibrations from a sound travel through a medium to the ear. ● I can find patterns between the pitch of a sound and features of the object that produced it. ● I can find patterns between the volume of a sound and the strength of the vibrations that produced it. ● I can recognise that sounds get fainter as the distance from the sound source increases.	**Earth & Space** ● I can describe the movement of the Earth, and other planets, relative to the Sun in the solar system ● I can describe the movement of the Moon relative to the Earth. ● I can describe the Sun, Earth and Moon as approximately spherical bodies. ● I can use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.	**Evolution & Inheritance** ● I can recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. ● I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. ● I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
Vocabulary			
Crystals, rough, smooth, permeable, fossils, soil, appearance, texture, impermeable	**States of Matter** Solid, liquid, gas, evaporation, condensation, particles, temperature, freezing, heating, melting **Sound** Volume, vibration, wave pitch, tone, speaker, material, sound, distance	Earth, sun, moon axis, rotation, day, night, phases of the moon, star, constellation, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, full moon, half moon, gibbous moon, waxing, waning, crescent, new moon, revolve, sphere, lunar	Fossils, adaptation, evolution, inheritance, characteristics, reproduction, genetics, breeding, environment, offspring, variation

Danson Primary School Science Progression
Working Scientifically

EYFS	KS1	LKS2	UKS2
Working Scientifically: ● I can ask questions to find out more ● I can talk about what I see using a wide vocabulary ● I can look closely, using equipment ● I can use my observations and ideas to suggest answers to questions	**Working Scientifically:** ● I can ask questions and know they can be answered in different ways ● I can look closely, using equipment ● I can perform simple tests. ● I can name and group ● I can use my observations and ideas to suggest answers to questions ● I can collect and record data to help answer questions	**Working Scientifically:** • I can ask relevant questions and use different types of scientific enquiries to answer them. • I can set up simple practical enquiries, comparative and fair tests. • I can make systematic and careful observations and where appropriate take accurate measurements, using a range of equipment. • I can record my findings, using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. • I can report on my findings, including oral explanations, display or presentations of results and conclusions. • I can use my results to draw simple conclusions, make predictions, suggest improvements and raise further questions. • I can identify differences, similarities or changes related to simple scientific ideas and processes. • I can use scientific evidence to answer questions or to support my findings. • I can gather, record, classify and present data in a variety of ways to help in answering questions	**Working Scientifically:** • I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • I can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • I can use test results to make predictions to set up further comparative and fair tests. • I can report and present findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results • I can identify scientific evidence that has been used to support or refute ideas or arguments.