Maulden Lower School Science Curriculum Map
Knowledge, skills and understanding - progression across the school

1.Key Knowledge

	EYFS Key knowledge	Year 1 Key Knowledge	Year 2 Key Knowledge	Year 3 Key Knowledge	Year 4 Key Knowledge	Years 5 and 6 at Alameda Middle School Key Knowledge
Biology - Plants	The Natural World ELG Children at the expected level of development will: - Explore the natural world around them, making observations and drawing pictures of animals and plants	Pupils should be taught to: ▫ identify and name a variety of common wild and garden plants, including deciduous and evergreen trees ▫ identify and describe the basic structure of a variety of common flowering plants, including trees.	Pupils should be taught to: ▫ observe and describe how seeds and bulbs grow into mature plants ▫ find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	Pupils should be taught to: ▫ identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers ▫ 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 ▫ investigate the way in which water is transported within plants ▫ explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	No separate topic - plants are covered in living things and their habitats	No separate topic - plants are covered in living things and their habitats

	EYFS Key knowledge	Year 1 Key Knowledge	Year 2 Key Knowledge	Year 3 Key Knowledge	Year 4 Key Knowledge	Years 5 and 6 at Alameda Middle School Key Knowledge
Biology - Animals, including Humans	The Natural World ELG Children at the expected level of development will: - Explore the natural world around them, making observations and drawing pictures of animals and plants.	Pupils should be taught to: ▫ identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals ▫ identify and name a variety of common animals that are carnivores, herbivores and omnivores ▫ describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) ▫ identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Pupils should be taught to: ▫ notice that animals, including humans, have offspring which grow into adults ▫ find out about and describe the basic needs of animals, including humans, for survival (water, food and air) ▫ describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	Pupils should be taught to: ▫ 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 ▫ identify that humans and some other animals have skeletons and muscles for support, protection and movement.	Pupils should be taught to: ▫ describe the simple functions of the basic parts of the digestive system in humans ▫ identify the different types of teeth in humans and their simple functions ▫ construct and interpret a variety of food chains, identifying producers, predators and prey.	Y5 Pupils should be taught to: ▫ describe the changes as humans develop to old age. Y6 Pupils should be taught to: ▫ identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood ▫ recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function ▫ describe the ways in which nutrients and water are transported within animals, including humans.
Biology - Living Things and their Habitats	The Natural World ELG Children at the expected level of development will: - 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	No separate topic - linked to Plants and Animals including Humans	Pupils should be taught to: ▫ explore and compare the differences between things that are living, dead, and things that have never been alive ▫ 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 ▫ identify and name a variety of plants and animals in their habitats, including microhabitats ▫ 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.	No separate topic - linked to Plants and Animals including Humans	Pupils should be taught to: ▫ recognise that living things can be grouped in a variety of ways ▫ explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment ▫ recognise that environments can change and that this can sometimes pose dangers to living things.	Y5 Pupils should be taught to: ▫ describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird ▫ describe the life process of reproduction in some plants and animals. Y6 Pupils should be taught to: ▫ 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 ▫ give reasons for classifying plants and animals based on specific characteristics. Year 6 also continues into an Evolution and Inheritance topic

	EYFS Key knowledge	Year 1 Key Knowledge	Year 2 Key Knowledge	Year 3 Key Knowledge	Year 4 Key Knowledge	Years 5 and 6 at Alameda Middle School Key Knowledge
Chemistry - Materials	The Natural World ELG Children at the expected level of development will: - Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	EVERYDAY MATERIALS distinguish between an object and the material from which it is made ▫ identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock ▫ describe the simple physical properties of a variety of everyday materials ▫ compare and group together a variety of everyday materials on the basis of their simple physical properties.	USES OF EVERDAY MATERIALS ▫ identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses ▫ find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	ROCKS ▫ compare and group together different kinds of rocks on the basis of their appearance and simple physical properties ▫ describe in simple terms how fossils are formed when things that have lived are trapped within rock ▫ recognise that soils are made from rocks and organic matter.	STATES OF MATTER ▫ compare and group materials together, according to whether they are solids, liquids or gases ▫ 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) ▫ identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	PROPERTIES AND CHANGES OF MATERIALS ▫ 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 ▫ know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution ▫ use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating ▫ give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic ▫ demonstrate that dissolving, mixing and changes of state are reversible changes ▫ 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.

	EYFS Key knowledge	Year 1 Key Knowledge	Year 2 Key Knowledge	Year 3 Key Knowledge	Year 4 Key Knowledge	Years 5 and 6 at Alameda Middle School Key Knowledge
Physics	The Natural World ELG Children at the expected level of development will: - Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	SEASONAL CHANGES Pupils should be taught to: observe changes across the four seasons observe and describe weather associated with the seasons and how day length varies.	No separate Physics topics. Can be covered by finding out about famous Scientists and through work to cover the Working Scientifically curriculum objectives (see key skills section).	LIGHT Pupils should be taught to: recognise that they need light in order to see things and that dark is the absence of light notice that light is reflected from surfaces recognise that light from the sun can be dangerous and that there are ways to protect their eyes recognise that shadows are formed when the light from a light source is blocked by an opaque object find patterns in the way that the size of shadows change. FORCES AND MAGNETS Pupils should be taught to: compare how things move on different surfaces notice that some forces need contact between two objects, but magnetic forces can act at a distance observe how magnets attract or repel each other and attract some materials and not others 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 describe magnets as having two poles predict whether two magnets will attract or repel each other, depending on which poles are facing.	SOUND Pupils should be taught to: identify how sounds are made, associating some of them with something vibrating recognise that vibrations from sounds travel through a medium to the ear find patterns between the pitch of a sound and features of the object that produced it find patterns between the volume of a sound and the strength of the vibrations that produced it recognise that sounds get fainter as the distance from the sound source increases. ELECTRICITY Pupils should be taught to: identify common appliances that run on electricity construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers 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 recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit recognise some common conductors and insulators, and associate metals with being good conductors.	Y5 FORCES (gravity, friction, air resistance, levers, pulleys and gears) EARTH AND SPACE (other planets, movement of the moon relative to the earth, earth's rotation) Y6 LIGHT (travels in straight lines, how we see things) ELECTRICITY (what affects bulb brightness, buzzer volume, voltage, symbols)

	EYFS Key knowledge	Year 1 Key Knowledge	Year 2 Key Knowledge	Year 3 Key Knowledge	Year 4 Key Knowledge	Years 5 and 6 at Alameda Middle School Key Knowledge
Famous Scientists	Names of famous scientists will be referred to in teaching where relevant	Linda Brown Buck a biologist who discovered mammals have odorant receptors in their noses. George James Symons invented the rain gauge Ole Kirk Christiansen the inventor of Lego Carl Hagenbeck invented the first Zoo with animal enclosures.	Louis Pasteur & discovering germs, Elizabeth Garrett Anderson & the importance of doctors, Charles Macintosh & waterproof materials, Rachel Carson & ocean pollution, Horticulturalists & the Eden Project,	Michael Faraday – linked to Forces and Magnets topic Isaac Newton – Forces and Light	Alexander Graham Bell, Thomas Edison, Nikola Tesla – linked to Sound topic	

2. Key Skills

	EYFS Key Skills	Year 1 and 2 Key Skills	Year 3 and 4 Key Skills	Year 5 and 5 at Alameda Middle School Key Skills
Working Scientifically	Finding ways to solve problems Making predictions Testing their ideas Developing ideas of grouping, sequences, cause and effect Planning, making decisions about how to approach a task, solve a problem and reach a goal Checking how well their activities are going Changing strategy as needed Reviewing how well the approach worked	During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: ☒ asking simple questions and recognising that they can be answered in different ways ☒ observing closely, using simple equipment ☒ performing simple tests ☒ identifying and classifying ☒ using their observations and ideas to suggest answers to questions ☒ gathering and recording data to help in answering questions.	During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: ☒ asking relevant questions and using different types of scientific enquiries to answer them ☒ setting up simple practical enquiries, comparative and fair tests ☒ making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers ☒ gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ☒ recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables ☒ reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ☒ using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ☒ identifying differences, similarities or changes related to simple scientific ideas and processes ☒ using straightforward scientific evidence to answer questions or to support their findings.	During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: ☒ planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary ☒ taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate ☒ recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs ☒ using test results to make predictions to set up further comparative and fair tests ☒ reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations ☒ identifying scientific evidence that has been used to support or refute ideas or arguments.

Pupils will be given opportunities to try out the 5 different types of enquiry – 1) observing over time; 2) identifying and classifying; 3) pattern seeking; 4) research; 5) comparative testing (KS1) and fair testing (KS2)

3. Key Vocabulary

EYFS Key Vocabulary	Year 1 Key Vocabulary	Year 2 Key Vocabulary	Year 3 Key Vocabulary	Year 4 Key Vocabulary	Year 5 at Alameda Middle School Key Vocabulary
General: natural, wild, wildlife, native. Places: habitats: woodland, desert, ocean, jungle, Arctic, seaside Microhabitats: - log, stone, tree, dead leaves, soil. Objects: fruits and vegetables Bread/baking: - Mix, knead, prove, rise. ingredients, Materials: object, material, properties, suitable, pipette, recycling Properties: waterproof, strong/weak, hard/soft. Materials: bubble wrap, foil, plastic, fabric, paper, straw, sticks, bricks, metal, glass. Living things: plants, grow Lifecycle: roots, shoots, stem, leaves, buds, flower, water, light, warmth, temperature, soil, compost Living things: animals, body parts, backbone, skeleton, soft body, shell, hibernate, nocturnal, adult/parent, baby. Lifecycle: Egg, caterpillar, chrysalis, butterfly. Birds, insects/bugs/ mini beasts	Animals Including Humans: Ourselves, sense, eye, ear, nose, mouth, hand, foot, feet, senses, arm, leg, head, neck, knee, wing, beak, see, hear Smell, touch, feel, alive, living, not alive, human, animal, tall, tallest, taller, like, similar to, different, difference, same, body, bodies, change, short, shorter, shortest, grow Move, adult, young. Seasons, spring, summer, autumn, winter, seasonal, changes, weather Everyday Materials: materials, natural, man-made, manufactured, object, change, bake, bend, twist, stretch, squash, heat, cool, Freeze, melt, boil, new material, material Metal, plastic, wood, paper, glass, clay, rock, fabric, sand, hard, soft, rough, smooth, shiny, dull, bendy, waterproof, strong, weak, group, object, sort, stretchy, magnetic, not magnetic, lets light through, transparent Plants Plant, plants, branch, root, stem, trunk, flower, leaf, leaves Seeds, seedlings, weed, grow, growing, living, alive, not living not alive, dead, healthy, Animals including humans Grow, growth, move, have young, reproduce, feed, diet, variety, germ, healthy, unhealthy, medicines, safety Exercise, taste, sweet, salty, sour, food, adult, young, parent baby Living things including habitats Reproduce, produce young, produce new plants, animals, plants, shoot, within, under, next to, fruit, earth, soil, seeds		Animals Including Humans: Skeleton, bone, bones, ribs, spine, skull, vertebrate, contract, relax, contraction, joint, move, muscles, muscle, feed, feeding, growth, activity, food groups, vegetables, meat, fish, cereals, sugars, fats, fruits, starches, tooth, teeth, incisor, molar, canine, diet, healthy, unhealthy, root, decay, food, balanced diet, carnivore, herbivore, omnivore, producer, consumer, food chain. Plants: Plants, light, warmth, water, leaves, roots, stem Grow, growth, height Rocks and Soils: Rock, slate, granite, sandstone, chalk, soil, clay, sand Limestone, quartz, marble, stone, pebble, texture, Absorbent, characteristic, surface Light and Shadow Rock, slate, granite, sandstone, chalk, soil, clay, sand Limestone, quartz, marble, stone, pebble, texture Absorbent, characteristic, surface Forces and Magnets Magnet, spring, metal, iron, copper, aluminum, steel Brass, attract, repel, magnetic, non-magnetic, attraction Repulsion, force, elastic, pull towards, push away from Stretch, squash, compress, friction, air resistance, water resistance, force meter, newton, surface area, forces, resists Sound: Sounds, pitch, loudness, vibrate, vibration, muffle, tuning, quiet, soft, noise, sound, source, loud, high, low Vibrating, soundproof States of Matter, Solid, liquid, melt, freeze, solidify, dissolve, solution, filter, undissolved, dissolved, separate, sieve, mix, evaporation, condensation, water cycle, precipitation, evaporate, condense, change of state, state, gas, melt, Conditions, solidify, freezing, melting	

EYFS Key Vocabulary	Year 1 Key Vocabulary	Year 2 Key Vocabulary	Year 3 Key Vocabulary	Year 4 Key Vocabulary	Year 5 at Alameda Middle School Key Vocabulary
			Living Things and Their Habitats, Habitat, nutrition, environment, keys, condition, consumer, producer, organism, predator, prey, food , chain, similar, different Electricity Electricity, electrical, circuit, battery, bulb, crocodile clip, buzzer, motor, conduct, conductor, insulate, insulator, switch, break, power, bright, brightness, dim batteries		

4. Yearly Overview

[1] biology, chemistry, physics

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Working Scientifically
EYFS	Following children's interests and learning may include…						
	Ourselves Similarities & differences Our bodies Our senses Parts of our body		**Light and Dark** Torches Shadow and light Nocturnal animals	**Space** Moon, stars and planets	**Animals and Plants** Life cycles and habitats Learning what is needed for growth Observing changes over time Investigating patterns		Similarities and differences in relation to places, objects, materials and living things. Discuss different environments. Observations of animals and plants and explain why some things occur, talk about changes.
Year 1	**Animals including humans** Identify and name parts of the human body Identify and name – carnivores, omnivores, herbivores **Seasonal Changes** Change across the seasons		**Everyday Materials** Objects and materials Properties Compare and group	**Seasonal Changes** Change across the seasons Weather and day length change	**Animals** Identify and name – amphibian, reptile, vertebrate, invertebrate Describe and compare structure	**Plants** Identify and name – including deciduous and evergreen. Describe and identify basic structure.	**Working Scientifically KS1** • Asking simple questions and recognising that they can be answered in different ways • Observing closely using simple equipment • Performing simple tests • Identifying and classifying • Using their observations and ideas to suggest answers to questions • Gathering and recording data to help in answering questions
Year 2	**The Environment** Climate change Reducing, reusing & recycling Ways to save energy and conserve water Wind power	**Scientists & Inventors** Louis Pasteur, Elizabeth Garrett Anderson, Charles Macintosh, Rachel Carson	**Animals inc. Humans** Animal young, Growing & changing Basic needs Healthy eating Exercise and keeping clean	**Living Things & Their Habitats** Living, dead or have never been alive, Local and worldwide habitats Food chains	**Plants** Observing plants, Seeds & bulbs, Life cycles of plants, Plants' basic needs, Edible plants, Comparing the growth of different plants.	**Everyday Materials** Identifying uses of different materials, Comparing suitability of materials, Materials that can and can't change shape, Recycling materials	

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Working Scientifically
Year 3	**Rocks and Soils** Compare and group rocks based on simple properties How and why fossils are formed Soils are made from rock and organic matter	**Light and Shadows** Need light to see things Darkness as absence of light Light is reflected Shadows and how they change Light from the sun can be dangerous	**Forces and Magnets** Compare how things move on different surfaces Repulsions and attraction Magnets and magnetic/non-magnetic materials Magnets have two poles Predict whether magnets will attract or repel	**Animals including humans** Animal and human nutrition Skeletons and muscles	**Plants** Identify and describe functions of parts Water transportation within plants Requirements for life and growth Life cycle of flowering plants		• ask relevant questions and use different types of enquiry to answer them • setting up simple enquiries, comparisons and fair tests • making systematic and careful observations, taking accurate measurements using standard units with a range of equipment including thermometers and dataloggers • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording findings using simple scientific language, drawings, labelled diagrams, bar charts and tables • reporting on findings from enquiries, oral and written explanations, displays or presentations of results and conclusions • using results to draw conclusions, make predictions, suggest improvement and raise further questions • identify differences, similarities or changes • use evidence to answer questions
Year 4	**Sound** How sounds are made – vibration Sound travels through air to the ear Patterns in pitch and volume Sounds get fainter as distance from source increases Pattern between volume of sound and strength of vibration	**States of Matter** Compare and group solids, liquids and gases Changing state on heating and cooling Temperature Evaporation and condensation in water cycle	**Animals including humans** focus on the digestive system in humans and animals and the functions of teeth. Children will learn more about herbivores, carnivores and omnivores in the context of teeth, digestion and the food chain. In addition, they will extend their understanding of food chains to more complex chains and food webs.		**Living Things + their Habitats** identify, sort, group and classify living things. 'vertebrates' and 'invertebrates' use and create classification keys to group, identify and name living things from the local habitat and beyond. environments are subject to human-made and natural changes, and that these changes can have a significant impact on living things.	**Electricity** Common appliances Simple series circuit and complete circuit to light a bulb Switches, conductors and insulators	