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Year Group & Term	Driving Question	Disciplinary Knowledge	Substantive Knowledge	Language	SDG
Year 1					
Seasonal Change: (ongoing – one session per term)	How do the seasons change throughout the year?	• To observe changes across the four seasons. • To observe and describe weather associated with the seasons and how day length varies.	• To know the different seasons across the year. • To know some features of each season. • To know the day lengths changes linked to the seasons.	Seasonal changes – seasons, summer, spring, autumn, winter, day, night, light, dark, weather, sunny, rain, fog, snow, sleet, hail.	
Plants: (1 term)	What do I know about plants?	• To know the names of a variety of common wild and garden plants, including deciduous and evergreen trees. • To know that evergreen trees maintain their leaves throughout the year and that deciduous trees shed their leaves in autumn. • To identify a variety of common wild and garden plants, including deciduous and evergreen trees. • To identify and describe the basic structure of a variety of common flowering plants, including trees.	• To know and name different garden plants and deciduous and evergreen trees. • To be able to explain the difference between deciduous and evergreen trees. • To know and describe the basic structure of a variety of common flowering plants, including trees.	Deciduous, evergreen, trees, leaves, stem, flowers, blossom, petals, fruits.	15
Animals, including humans: (½ term)	What is special about me?	• To identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. • To understand how humans change over time. • To name the basic body parts of animals and humans. • To know the 5 human senses and their job.	• To know the names of human body parts. • To know the 5 senses and what they do.	ourselves, head, neck, arms, elbow, face, ears, eyes, hair, mouth, teeth, stomach, feet, foot, nose, fingers, skin, knees, textures, sound, smell, touch, see, tall, taller, tallest, similar to, different, difference.	10
Animals, including humans: (½ term)	What do I know about animals?	• To identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. • To identify and name a variety of common animals that are carnivores, herbivores and omnivores. • To know that herbivores eat plants; carnivores eat other animals and omnivores eat both animals and plants. • To describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).	• To know and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. • To know and name a variety of common animals that are carnivores, herbivores and omnivores. • To know that herbivores eat plants; carnivores eat other animals and omnivores eat both animals and plants. • To know, describe and compare different animal body parts.	Fish, amphibian, reptile bird, mammal, carnivores, herbivores and omnivores.	14, 15

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Everyday materials (1 term)	What are the properties of different materials?	• To distinguish between an object and the material from which it is made. • To know that an object is made from/of a material. • To know and name a wide variety of materials. • To know some materials that can or can't be recycled. • To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. • To know that materials have properties and name these. • To describe the simple physical properties of a variety of everyday materials. • To compare and group together a variety of everyday materials on the basis of their simple physical properties.	• To know and name different materials. • To know that objects are made from different materials (glass, metal, water and rock). • To know, name and describe properties of materials.	Property, hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy, rigid, waterproof, absorbent, opaque, transparent, wood, paper, metal, glass, fibre, plastic, foil, man-made, natural, matter.	12

Year Group & Term	Driving Question	Disciplinary Knowledge	Substantive Knowledge	Language	SDG
Year 2					
Biology: Animals including Humans: (1 term)	How can I keep myself healthy?	• To know that animals, including humans, have offspring which grow into adults. • To know, explore and understand the life cycle of a human and animal. • To know how animals reproduce. • Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). • To describe the importance for humans of exercise and eating the right amounts of different types of food. • To know the basic food groups. • To know the effects that fatty foods can have on our bodies. • To know the impact of exercise on the heart and body. • To describe the importance for humans of hygiene. • To know the reasons for keeping clean and staying healthy.	To know that animals have offspring. To know that offspring grow in to adults. To know that animals need water, food and air to survive. To know why it is important to exercise. To know the importance of a healthy diet. To know the importance of hygiene.	Survival, water, air, food, adult, baby, offspring, kitten, calf, puppy, pupa, spawn, tadpole, frog, exercise, hygiene, baby, toddler, child, teenager, adult, exercise.	1, 2
Everyday Materials: (½ term)	Why are different materials important?	• To compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • To identify the properties of materials that make them suitable or unsuitable for particular purposes. • To find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. • To know that applying forces to objects can change their shape, by squeezing, stretching, bending and twisting.	To know why certain materials are used for different objects. To know and compare different properties of materials. To know that a force can be added to a material to change its shape e.g. squashed, twisted, bended and stretched. To know how to reduce, reuse and recycle.	Reinforce words from Year 1 plus squashing, twisting, bending, stretching, conductor, suitability, flexible, rigid.	12

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Living things and their habitats: (1 term)	How do animals and plants depend on each other?	• To explore and compare the differences between things that are living, dead, and things that have never been alive. • To know that living things move, grow, consume nutrients and reproduce. • To know the terms habitat and micro-habitat. • To know how a habitat provides for the basic needs of animals and plants. • To describe how animals obtain their food from plants and other animals. • To know how a simple food chain works. • To 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. • To know that all animals have certain characteristics that are essential for keeping them alive and healthy. • To identify and name a variety of plants and animals in their habitats, including microhabitats. • To 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. • To explain what carnivores, herbivores and omnivores are.	To know what a habitat and a microhabitat are and how they support survival. To know that most living things live in habitats to which they are suited and how they depend on each other. To know and name the differences between things living, dead and things that have never been alive. To know how animals obtain different food from a variety of sources and how a food chain works.	Habitat, micro-habitat (stones, leaf litter, path), shelter, warmth, ocean, rainforests, desert, polar region, woodland, seashore, living, not-living, alive, food chain, energy, predator, prey, life processes, carnivores, herbivores, omnivores.	14, 15
Plants: (1/2 term)	How do plants grow?	• To observe and describe how seeds and bulbs grow into mature plants. • To find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. • To know what seeds, need to germinate and grow. • To observe and record how a plant changes over time.	To know how seeds and bulbs grow in to plants. To know that plants need water, light and a suitable temperature to grow and stay healthy.	Seeds, bulbs, water, light, temperature, growth, healthy.	2, 15

Year Group & Term	Driving Question	Disciplinary Knowledge	Substantive Knowledge	Language	SDG
Year 3					
Light: (½ term)	How does light travel?	• To recognise that they need light in order to see things and that dark is the absence of light. • To know how light behaves. • To know that objects can be opaque, translucent or transparent. • To know that light is reflected from a surface. • To recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • To recognise that shadows are formed when light from the light source is blocked by an opaque object. • To know what might cause a shadow to change. • To know that the size of a shadow changes dependant on where the light source is. • To find patterns in the way that the size of shadows change.	• To know that light is reflected from a surface. • To know that light from the sun can be dangerous and that there are ways to protect their eyes. • To know that shadows are formed when light from the light source is blocked by an opaque object. • To know what might cause a shadow to change. To know that the size of a shadow changes dependant on where the light source is.	Light, dark, shadows, mirror, shiny, smooth, rough, surfaces, reflective, transparent, translucent, opaque.	

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Rocks: (½ term)	What are the physical properties of rocks, soil and fossils?	• To know that rocks have different properties depending on how they are formed. • To compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. • To know that there are three types of rocks: igneous, sedimentary and metamorphic. • To know the properties of igneous, metamorphic and sedimentary rocks. • To describe in simple terms how fossils are formed when things that have lived are trapped within rock. • To know that fossils can help us learn about things that lived long ago. • To know and recognize that soils are made from rocks and organic matter.	To name and identify properties of the three types of rocks: igneous, sedimentary and metamorphic. To know how and why rocks change over time and why this happens. • To know how fossils are formed. To know how soil is made and what it is made from. •	Physical properties igneous, sedimentary and metamorphic rock, granite, limestone, sandstone, marble, slate, fossils, soil, weathering, crust, mantle, outer core, inner core, chalk, fragment, erosion, natural, man-made, heat, pressure, sediment, resin, minerals, amber, mould, magma, geologist, petrologist, compost, recycle, reuse, micro-organisms, organic matter, particles, sand, silt, palaeontology.	5, 12, 15
Forces: (½ term)	How does friction effect movement?	• To compare how things move on different surfaces. • To know objects move differently on rough and smooth surfaces. • To know objects resist movement more on rough surfaces because there is higher friction as the object moves. • To know a force can be thought of as a push or a pull.	• To know how things move on different surfaces. • To know how friction impacts on movement. • To know a force can be thought of as a push or a pull.	Force, contact, friction, push, pull.	
Plants: (½ term)	What is the life cycle of a flowering plant?	• To observe and describe how seeds and bulbs grow into mature plants. • To find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. • To know what seeds, need to germinate and grow. • To observe and record how a plant changes over time.	• To know the name and function of plants: roots, stem/trunk, leaves and flowers. • To know what plants need for life and growth (air, light, water, nutrients from soil, and room to grow) and how this varies from plant to plant. • To know how and why water is transported within plants. • To know how flowers reproduce and disperse their seeds. To know the part the flower plays in the life cycle of the plant (including pollination, seed formation and seed dispersal).	Air, light, water, nutrients, soil, reproduction, transportation, dispersal, pollination, flower.	15
Magnets: (½ term)	How do magnets work?	• To describe magnets as having two poles (called north and south). • To observe how magnets attract or repel each other and attract some materials and not others. • To notice that some forces need contact between two objects, but magnetic forces can act at a distance. • To 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. • To predict whether two magnets will attract or repel each other, depending on which poles are facing.	• To know magnets as having two poles (called north and south). • To know why and how magnets attract or repel. • • To know that magnetic forces can act at a distance. • To know how to compare and group together a variety of everyday magnetic and non-magnetic materials. • To know how to predict whether two magnets will attract or repel each other, depending on which poles are facing.	Magnetic force, force, contact, attract, repel, friction, poles.	12

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Biology: Animals, including humans: (½ term)	Are bones important?	• To identify that animal, 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. • To know that humans and some animals have skeletons and muscles for support, protection and movement. • To know that skeletons provide support for muscles and protect the body. • To know the function of the human skeleton. • To know that muscles work in pairs. • To know what vertebrate and invertebrate means. • To know that a nutritious diet can be achieved in a variety of ways	• To know why animals including humans need the right amount of nutrients. • To know we get nutrients from the food we eat. • To know that animals have a skeleton. • To know the job of the skeleton. • To know that muscles help animals move.	Movement, muscles, bones, skull, skeleton, nutrition, fat, sugar, carbohydrate, protein, vitamins, minerals, dairy produce, meat, fruit, vegetables, diet.	1
Year Group & Term	Driving Question	Disciplinary Knowledge	Substantive Knowledge	Language	SDG
Year 4					
States of matter: (½ term)	What are the properties of solids, liquids and gases?	• To compare and group materials together, according to whether they are solids, liquids or gases. • To 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). • To know that some changes are irreversible. • To identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. • To know that, as temperature increases, solids can change into liquids. • To know that, with a further increase of temperature, the liquid changes into gas. • To know when solids turn into liquids, this is called melting and that the reverse process is called freezing. • To know when liquids turn into gasses, this is called evaporation and that the reverse process is called condensation. • To know that the melting point of water is 0 degrees Celsius and that the boiling point is 100 degrees Celsius. • To know that water flows around our world in a continuous process called the water cycle.	• To know how to compare and group materials. • To know how some materials can change their state. • To know that some changes are irreversible. • To know and explain the water cycle.	Solid, liquid, gas, evaporation, condensation, bond, particles, temperature, freezing, heating, cooling, Celsius, water cycle, melting, reversible change, precipitation, transpiration, surface runoff, groundwater.	
Animals, including humans: (½ term)	How does the digestive system work?	• To know and be able to explain the digestive system. • To describe the simple functions of the basic parts of the digestive system in humans. • To construct and interpret a variety of food chains, identifying producers, predators and prey. • To know what a primary and secondary consumer are. • To identify the different types of teeth in humans and their simple function. • To know that a human has three types of teeth, incisors, canines and molars and that these each perform different functions.	• To know how the digestion system works. • To know why the digestive system is important. • To know the three types of human teeth and that each one has different functions. • To know how to construct and interpret a variety of food chains.	Mouth, tongue, teeth, incisors, canines, premolars, molars, oesophagus, stomach, small intestine, large intestine, digestive system, food chain, energy, producer, predator, prey, primary consumer, secondary consumer.	3

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Sound: (1 term)	How does sound travel?	• To identify how sounds are made, associating some of them with something vibrating. • To know that sound is generated when an object vibrates. • To explore and identify the way musical instruments use vibration to make sound. • To recognise that vibrations from sounds travel through a medium to the ear. • To find patterns between the pitch of a sound and features of the object that produced it. • To know how sounds can be changed in a variety of ways for example, through pitch and volume. • To find patterns between the volume of a sound and the strength of the vibrations that produced it. • To know which materials provide the best insulation against sound. • To recognise that sounds get fainter as the distance from the sound source increases. • To know that the volume of a sound is quieter if the listener is further away from the object.	• To know that sound is generated and travels. • To know how sounds can be changed. • To know which materials provide the best insulations against sound.	Vibration, volume, pitch, medium, insulation.	10
Electricity: (½ term)	What is electricity?	• To identify common appliances that run on electricity. • To identify how to work safely with electricity. • To know cells, batteries and the mains are all sources of electrical energy. • To construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. • To know how to draw simple circuit diagrams. • To know that electrical current can flow if there is a complete circuit. • To know that when electrical current is needed to make a circuit work. • To know that wires allow electrical current to flow around a circuit. • To 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. • To know that a switch functions by completing or breaking a complete circuit. • To recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. • To recognise some common conductors and insulators, and associate metals with being good conductors. • To draw and explain a circuit with symbols.	• To know and name appliances that run on electricity. • To know sources of electrical energy. • To know how to draw simple circuit diagrams. • To know how a circuit works. • To know and name some common conductors and insulators.	Cells, wires, bulbs, switches, battery, buzzers, circuit, series, conductors, insulators, components, brighter, dimmer.	
Living things and their habitats: (1/2 term)	How can we use grouping to categorise animals?	• To recognise that living things can be grouped in a variety of ways. • To know that animals can be grouped based on their physical characteristics. • To explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. • To know that a classification key uses questions to sort and identify different living things. • To recognise that environments can change and that this can sometimes pose dangers to living things. • To know that changes to the environment can make it more difficult for living things to survive and reproduce. • To know the impact of humans on environments.	• To know how to group living things in a variety of ways. • To know how to use a classification key. • To know that changes to the environment can affect living things. • To know the impact of humans on environments.	Fish, amphibians, reptiles, birds, mammals, herbivore, carnivore, omnivore, invertebrates, slug, snail, worms, spiders, insects, vertebrates, group, classify, environment, habitats.	15

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Year Group & Term	Driving Question	Disciplinary Knowledge	Substantive Knowledge	Language	SDG
Year 5					
Physics **Earth and space:**	How have our ideas about space changed over time?	• I can use reasoning to explain times in different countries. (Applying scientific reasoning to explain time differences based on Earth's rotation) • I can explain the use of shadows to measure time. (Investigating how shadows change with the movement of the sun to understand timekeeping methods)	• I can explain the term spherical. • I can explain day and night. • I can name the 8 planets around our Star: The sun. • I can explain the difference between geocentric and heliocentric. • I can explain how ideas about the solar system have changed over time. • I can explain the position of the Earth, Sun and Moon. • I can explain the apparent movement of the sun. • I can explain the movement of the Moon.	Earth, sun, moon, axis, rotation, day, night, phases of the moon, star, sphere, planet, dwarf planet, Mercury, Venus, Mars, Jupiter, Saturn, Uranus and Neptune.	5
Physics **Forces:**	Why are forces important?	• I can ask questions and make predictions about the effects of forces. (Asking relevant questions and predicting outcomes based on prior knowledge) • I can explore how different objects fall, e.g. cones, parachutes, and seeds. (Making systematic observations to identify patterns) • I can set up and carry out fair tests to investigate air resistance and water resistance. (Planning and conducting controlled investigations) • I can design and test parachutes or boats to investigate resistance. (Applying scientific knowledge to practical designs and evaluating effectiveness) • I can observe and record the effects of friction, e.g. on bicycle brakes. (Collecting and recording data through careful observation) • I can design and test products that use levers, pulleys, gears, or springs to explore their effects. (Using practical enquiry to test mechanisms and evaluate outcomes)	• I can explain that unsupported objects fall towards the Earth because of gravity. • I can describe how air resistance affects moving objects. • I can describe how water resistance affects moving objects. • I can explain how friction slows down or stops moving objects. • I can recognise that mechanisms such as levers, pulleys and gears allow a smaller force to have a greater effect. • I can give examples of how scientists, such as Galileo and Newton, developed ideas about gravity.	Gravity, force, pull, Newton, weight, mass, friction, air resistance, turbine, streamlined, water resistance, adaptation, gears, machines, low gear, high gear, levers, mangonel, pivot.	7,8, 14
Chemistry **Properties of changing materials:**	What are the properties of different materials and how can they change?	• I can ask questions to sort materials. (Asking relevant questions to identify patterns and groupings) • I can classify materials into groups. (Using comparative and sorting skills to organise data) • I can use fair testing to investigate. (Planning and conducting controlled investigations)	• I can explain reversible changes. • I can explain the formation of new materials. • I can explain melting & dissolving. • I can explain burning. • I can explain how to recover dissolved materials. • I can describe a number of separating techniques. • I can give examples of new materials made by Scientists.	Hardness, solubility, solution, transparency, conductivity, filter, evaporation, sieve, melting, dissolving, mixing, burning, irreversible.	6, 12,14
Biology Living things and their habitats:	Are all life cycles the same?	• I can compare the changes between human and animal life cycles. (Using comparative analysis to identify similarities and differences)	• I can recall the names of the parts of a flowering plant. • I can explain reproduction in plants. • I can show the stages in the lifecycle of a flowering plant. • I can show the lifecycle changes in an animal. (e.g. Birds, butterflies, frogs) • I can understand the stages in human life • I can describe reproduction in humans. (simple version)	Classification, vertebrates, invertebrates, micro-organisms, amphibians, reptiles, mammals, insects.	

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Biology **Animals including humans:**	How do humans develop to old age?	• I can use a timeline to show the different stages of human life. (Representing data in sequence to identify patterns and changes over time) • I can research gestation periods and make conclusions. (Gathering and interpreting secondary data to draw evidence-based conclusions)	• I can understand the changes as we move through old age. • I can detail the changes during puberty. • I can name the different stages of human life. • I can explain the term naturalists and animal behaviourists. • I can understand the need to care for older people. • I am able to offer help and advice to others.	Egg, sperm, fetus, baby, toddler, child, teenager, adult, old age, development, growth, human, infancy, childhood,	
Year Group & Term	Driving Question	Disciplinary Knowledge	Substantive Knowledge	Language	SDG
Year 6					
Animals including humans: (1 term)	How does the heart drive the circulatory system?	• I can give examples of substances transported in blood. (Recognising and explaining scientific concepts through investigation and reasoning) • I can explain the effects of diet & exercise on the body. (Applying knowledge to health science and evaluating scientific evidence) • I can identify how a number of drugs, including alcohol, affect the body. (Investigating the impact of external substances on biological systems, linking to scientific enquiry and evidence-based conclusions)	• I can identify and name the main bones in the body. • I can explain how muscles move my body. • I can name and label the main organs of the body. • I can name and label the main parts of the human circulatory system. • I can explain how the heart works & explain different blood vessels in my body.	Circulatory system, heart, blood, arteries, veins, vessels, oxygenated, deoxygenated, valve, carbon dioxide, nutrients, muscles, exercise, respiration, nutrients, diet, drugs, harmful, beneficial, respiration.	3
Light: (½ term)	How are light and sight linked?	• I can investigate what affects the size of a shadow. (Planning and conducting an enquiry to explore variables that impact shadow size) • I can describe/explain how simple optical devices such as periscopes, telescopes, binoculars, and mirrors work. (Applying scientific knowledge to understand how optical devices manipulate light)	• I can explain how we see objects (luminous/non-luminous). • I can explain how light travels in straight lines. • I can explain how shadows are formed and why they are the same shape as the object. • I can explain why we can see objects using the idea of reflection.	Refraction, reflection, light, spectrum, rainbow, colour, shadow.	7
Electricity: (½ term)	What are the different parts of a circuit?	• I can identify and give reasons for why some circuits work and others do not. (Applying scientific reasoning and troubleshooting to investigate circuits) • I can draw circuit diagrams using the correct symbols. (Using scientific conventions to represent electrical circuits accurately) • I can use science equipment to take accurate measurements. (Developing practical skills in measuring electrical quantities such as voltage or current)	• I understand the concept of a full circuit. • I can describe/explain how the number of cells and voltage relate to brightness/loudness of a bulb/buzzer. • I can identify electrical dangers.	Cells, wires, bulbs, switches, buzzers, series, conductors, insulators, amps, volts, cell, symbols, current, voltage.	9, 13

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Evolution and inheritance: (½ term)	What is evolution?	• I can describe/explain how variations could affect an animal's survival. (Applying scientific knowledge to explain adaptation and survival) • I can research and understand the impact of Charles Darwin. (Engaging with historical scientific research and its impact on our understanding of biology)	• I understand inherited characteristics. • Understand that offspring show variation. • I can recognise that living things change over time (Evolution). • I can explain how fossils are formed. • I understand what fossils can tell us. • I can explain what is meant by extinction.	Fossils, adaptation evolution, characteristics, reproduction, genetics, environment, palaeontologist, advantage, disadvantage, species.	15
Living things and their habitats:	Why is classification important?	• I can sort animals and plants into groups based on characteristics. (Classifying living organisms based on observable features) • I can use keys to identify living things. (Using classification keys as a scientific tool to identify organisms) • I know about the research of Carl Linnaeus and why his work was important. (Understanding how scientific classification has developed over time and its impact on biology)	• I understand the needs of a living organism (MRS GREN). • I can define and explain habitats, including the living things in them. • I can explain how an animal is adapted to its environment. • I can name and give examples of the main kingdoms of life. • I can state the characteristics of mammals.	Classification, vertebrates, invertebrates, micro-organisms, amphibians, reptiles, mammals, insects.	
Year Group & Term	Driving Question	Disciplinary Knowledge	Substantive Knowledge	Language	SDG
Year 7					
Biology Structure and function of living organisms	What is a cell?	• I can prepare a slide and use a microscope to observe and record cell structure. (Make and record observations using scientific instruments and techniques.) • I can compare and contrast plant and animal cells. (Apply knowledge to analyse and interpret differences and similarities between biological structures.) • I can identify and explain adaptations of specialised cells. (Evaluate patterns and relationships in biological systems.)	• I can describe the role of diffusion in moving substances in and out of cells. • I can recall parts of a plant cell. • I can explain the function of plant cell parts. • I can recall parts of an animal cell. • I can explain the function of animal cell parts. • I can list the hierarchical organisation of multicellular organisms in the correct order.		
Biology Structure and function of living organisms	How does reproduction work?	• I can use data to compare the effects of different lifestyles on health and development. (Interpreting secondary data to identify patterns and draw conclusions) • I can ask questions and make predictions about inherited and environmental variation. (Generating scientific questions and predicting outcomes) • I can present and analyse data about growth and development. (Representing data to identify patterns and relationships)	• I can recall the parts of male and female reproductive organs. • I can explain the process of fertilisation in humans. • I can describe the stages of the menstrual cycle. • I can explain how lifestyle (smoking, drinking, drugs and illness) can affect a developing foetus. • I can explain the changes that happen during puberty. • I can explain the function of the parts of male and female reproductive organs. • I can recall and describe the role of the parts of a developing foetus and baby. • I can describe the process of birth. • I can identify and give examples of inherited and environmental variation.		
Chemistry The particulate nature of matter	How can something we can't see – particles – explain	• I can explain a number of separation techniques (filtration, evaporation and chromatography). (Planning and carrying out practical methods to separate mixtures and applying knowledge of particle behaviour)	• I can describe the properties (including density differences) of solids, liquids and gases. • I can describe soluble and insoluble substances (temperature). • I can explain dissolving using the terms solute, solvent and solution. • I can use the particle model to explain changes in state.		

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	everything we can see, touch, and use in our daily lives?		• I can explain the process of expansion and contraction (in terms of particles). • I can describe/explain pressure in gases (in terms of particles). • I can classify materials as solid, liquid or gas. • I can draw the particle arrangement for solids, liquids and gases and link them to the properties. • I can describe/explain diffusion (in terms of particles).		
Chemistry Chemical Reactions	What really happens when things burn, fizz, or change — and how do we know if it's a new substance?	• I can carry out gas tests – Oxygen, Hydrogen and Carbon Dioxide. (Using practical enquiry and test reactions to identify gases safely and accurately)	• I can show I understand Fire Safety / Fire Triangle. • I can identify chemical and physical changes in reactions. • I can describe and observe indicators of a chemical reaction. • I can explain the process of combustion and write an equation. • I can explain the meaning of oxidation and give examples with equations (burning metals). • I can recall gases in the air.		
Chemistry Acids and Alkalis	How can we tell if a substance is dangerous or useful — and how do acids and alkalis affect the world around us?	• I can identify hazards and risks associated with chemicals. (Recognising and assessing risks to plan safe investigations) • I can use indicators to tell me if a chemical is acid or alkali, and determine its strength. (Using appropriate equipment and observations to classify substances and measure pH)	• I can explain the properties of acids and alkalis. • I can show reaction equations for metals and water/acids, and acids and carbonates. • I can explain the neutralisation process. • I can write a word equation for a neutralisation reaction.		
Physics Energy Changes and Transfers	Where does energy come from, and why can't we ever really 'use it up'?	• I can calculate energy transfers and represent them in Sankey diagrams. (Using models and diagrams to represent data and show efficiency) • I can evaluate and compare different methods of generating electricity. (Using evidence to evaluate and justify scientific choices) • I can compare the energy content of different foods. (Using secondary data to compare values and draw conclusions)	• I can identify the different types of energy stores. • I understand the law of conservation and can identify energy transfers. • I can calculate energy transfers and show this information in Sankey diagrams. • I can identify and compare the energy in different fuels. • I can define and describe the source of fossil fuels. • I can evaluate and compare different methods of generating electricity. • I can say why and where the body gets its energy from. • I can compare the energy content of different foods. • I can define and compare the power ratings of a number of appliances.		

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Physics Forces and Motion	How do forces control the way things move, from tiny springs to speeding cars?	• I can investigate the effect of changing a force on compression and stretching (Hooke's Law). (Planning and carrying out an investigation into variables affecting elasticity) • I can define, measure and calculate speed. (Collecting and analysing measurements to calculate speed, using simple data presentation)	• I can identify a number of different forces and state if they are push or pull forces. • I can describe/explain how changing a force can change the speed or direction of an object. • I can draw force arrows to show the direction and scale of a force. • I can explain balanced, reaction and resultant forces. • I can explain the difference between mass and weight (also in Space unit). • I can explain the causes of friction and how it affects the movement of objects. • I can explain why air resistance is a type of friction and how it affects moving objects. • I can describe/explain floating and sinking in liquids.		
Physics Current Electricty	How does electricity flow through circuits to power our world — and what happens if something goes wrong?	• I can set up electrical equipment into simple circuits from circuit diagrams (including fault finding). (Using practical enquiry skills to construct, test, and troubleshoot circuits) • I can present data scientifically (circuit diagrams). (Using standard representations to record and communicate data clearly)	• I can identify series and parallel circuits. • I can define and measure current (series and parallel). • I can explain electricity using a model. • I can define and measure voltage (series and parallel). • I can explain potential difference and resistance of components. • I can explain (recap) magnetic forces.		
Physics Static Electricity	Why do we sometimes get a shock from a door handle — and how can invisible charges affect the world around us?	• I can investigate and describe some of the effects of electrostatic forces. (Carrying out practical observations and drawing conclusions from evidence)	• I can investigate and describe some of the effects of electrostatic forces.		
Year Group & Term	Driving Question	Disciplinary Knowledge	Substantive Knowledge	Language	SDG
Year 8					
Biology Nutrition and Digestion	How does the food we eat keep us alive — and what really happens to it inside our bodies?	• I can explain the model gut experiment. (Using practical modelling to represent digestive processes) • I can show how to test for some food groups. (Carrying out practical investigations with reagents to identify nutrients)	• I can explain the effects of balanced and unbalanced diets. • I can recall and explain the function of the organs within the digestive system. • I can explain why different people have different nutritional requirements (calories). • I can explain why food needs to be digested and how it passes around the body. • I can explain the need for food (energy source).		

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			• I can name the useful substances in food (food groups) and how your body uses them. • I can explain the effect of enzymes and how they can be affected.		
Biology Cellular respiration	How do our cells turn food and oxygen into the energy that powers everything we do?	• I can show the difference between burning and respiration. (Using models and comparisons to explain chemical and biological reactions.) • I can describe a number of organ systems. (Using classification and representation skills to organise knowledge of biological systems)	• I can explain aerobic and anaerobic respiration (including equations). • I can show the difference between burning and respiration. • I can show how cells are adapted to their function for respiration.		
Biology Gas Exchange Systems	Why do we need to breathe, and how do our lungs and blood work together to keep us alive?	• I can explain how exercise affects pulse rate and breathing. (Collecting and interpreting primary data to show the effect of activity on the body) • I can identify (through testing) the gases in inhaled and exhaled air. (Carrying out practical investigations to compare gas content in respiration)	• I can describe a number of organ systems. • I can explain how exercise affects pulse rate and breathing. • I can describe the function of the heart and lungs. • I can recall the different blood vessels in the body. • I can explain how we breathe. • I can detail the effect of smoking on cells in the body.		
Biology Inheritance Chromosomes, DNA and Genes	Why do we look different from our parents — and how does this link to evolution and extinction?	• I can research and present evidence for natural selection and adaptation. (Using secondary sources to gather and interpret scientific evidence)	• I can explain variation in species. • I can identify and give examples of inherited and environmental variation. • I can explain how variation affects competition and natural selection. • I can explain how environmental changes can lead to extinction.		
Biology Relationships in an Ecosystem	How are living things connected in an ecosystem, and what happens if just one part changes?	• I can construct and interpret food chains and food webs. (Representing feeding relationships and energy flow to explain ecosystem interactions)	• I can construct a simple food chain and food web identifying producers and consumers. • I can describe adaptations of plants and animals and how this is related to habitats. • I can identify the structure and role of leaf stomata in gas exchange. • I can identify the structure of a flower. • I can describe pollination, seed and fruit formation. • I can identify what is needed for photosynthesis and write a word/symbol equation.		

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Biology **Material Cycles and Energy**	How does energy flow through nature — and why is the cycle of life never-ending?	• I can identify what is needed for photosynthesis and write a word/symbol equation. (Using models and representations to explain photosynthesis.) • I can interpret data to explain how energy flows through ecosystems. (Analysing secondary data to explain cycles and predict impacts)	• I can explain the role of photosynthesis in producing energy for ecosystems. • I can explain how variation and competition affect survival. • I can explain how changes in the environment can affect populations and ecosystems.		
Chemistry The Periodic Table	How can a table of elements help us explain and even predict the way substances behave?	• I can use the periodic table to predict patterns of reactivity. (Using secondary data and models to predict outcomes from patterns)	• I have a good understanding of the periodic table. • I can define an element and give examples (5). • I can relate an element's atom to its position in the periodic table. • I can use the periodic table to predict patterns of reactions (alkali metals). • I can use and understand electronic configuration.		
Atoms, Elements and Compounds	What are substances really made of, and how do tiny particles combine to make everything around us?	• I can describe and observe indicators of a chemical reaction (e.g. iron sulphide). (Making and recording observations to identify chemical changes)	• I can explain the terms element, mixture and compound in terms of particles (giving simple examples). • I can explain the particles within an atom. • I can write word equations for elements reacting to form compounds. • I can write symbol equations for formation of compounds. • I can use simple formula to work out names of compounds, including numbers of atoms.		
Pure and Impure Substances	How can we separate mixtures into their pure parts — and why does it matter in everyday life?	• I can carry out separation techniques for mixtures. (Planning and performing practical procedures to separate substances and evaluate effectiveness)	• I can define and give examples of mixtures. • I can state the boiling point and freezing point of pure water. • I can describe ways to separate mixtures (including distillation).		
Chemical Reactions (Metals and Acids)	Why do some metals fizz, flame, or even explode when they react — and what does this reveal about their reactivity?	• I can carry out metal reactions and write equations. (Using practical enquiry and symbolic representation to record and interpret chemical reactions) • I can calculate oxygen content from oxidation reactions. (Using quantitative methods to analyse experimental data)	• I can identify and compare the properties of metals and non-metals. • I can use the properties of metals and non-metals to carry out classification. • I can carry out and explain with equations a variety of reactions of metals and water, metals and acids. • I can carry out metal oxidation reactions to calculate oxygen content. • I can identify the products of a metal carbonate + acid reaction.		

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			• I can explain and use the reactivity series. • I can explain and predict the outcome of displacement reactions. • I can use reactivity to explain the removal of metals from ores.		
Materials	How do the properties of materials decide how we use them, from building bridges to making smartphones?	• I can classify materials based on their properties. (Comparative analysis to group substances systematically)	• I can use scientific terminology to describe the properties of materials. • I can suggest uses of materials related to their properties.		
Earth and Atmosphere	How has the Earth's surface and atmosphere changed over time — and what does this mean for our future	• I understand the resources on Earth are limited and can present/evaluate the benefits and drawbacks of recycling. (Evaluating scientific evidence to present arguments and weigh up environmental issues)	• I can identify the 3 main parts of the Earth. • I can label a diagram and identify the structure of the Earth. • I can list/describe the stages of the rock cycle. • I can identify and compare the formation and properties of igneous, sedimentary and metamorphic rocks. • I can list/describe/explain the stages of the carbon cycle. • I can identify the main components of the Earth's atmosphere. • I can describe/explain how/why the composition of the Earth's atmosphere has changed over time.		
Physics Sound	How can invisible vibrations create the sounds we hear every day?	• I can investigate how sound behaves in different media. (Planning and carrying out an enquiry to measure how sound travels through solids, liquids, and gases) • I can use models and diagrams to represent sound waves. (Applying visual models to explain abstract concepts)	• I can describe/explain how/why the speed of sound changes depending on the medium it is in. • I can describe and explain how sound is generated and sound waves move. • I can show an understanding of soundwaves (wavelength, frequency, amplitude including units). • I can explain how the ear works.		
Physics Light	How does light allow us to see the world — and why does it sometimes trick us?	• I can carry out ray-tracing experiments for reflection and refraction. (Planning and conducting practicals to test laws of light behaviour) • I can use filters and coloured lights to investigate colour perception. (Testing hypotheses about colour mixing and analysing results)	• I can explain how light travels. • I can describe/explain how/why the speed of light changes depending on the medium it travels through. • I can draw accurately and explain the law of reflection. • I can draw, describe and explain refraction. • I can describe/explain how we see colours. • I can describe/explain/illustrate how filters and coloured lights can affect the colours we see. • I can explain the concept of white light.		