Lawford Curriculum Overview - Science

Year Group	Autumn		Spring		Summer	
	Question/curriculum area Key Knowledge Key Skills	Concepts BV	Question/curriculum area Key Knowledge Key Skills	Concepts BV	Question/curriculum area Key Knowledge Key Skills	Concepts BV
Reception Biology Chemistry Physics Earth Science	Enquiry Based Approach Key Enquiry Question: **Where have I come from and where am I going?** **Key Science Knowledge and Key Enquiry Question:** Human Life Cycle What can humans do at different parts of their lives? We once were babies What can we do now that we couldn't do when we were babies? **What Season Are We in?** Key Science Knowledge and Key Enquiry Question: Autumn What are the signs that it is Autumn? **What Jobs keep our World Moving?** **Key Science Knowledge and Key Enquiry Question:** Doctors What do doctors do to help us? Hand Washing Why is it important to wash our hands? Midwives How are babies Made? Pharmacists How do we keep ourselves safe from harmful chemicals in our homes? Dentists How do dentists look after us? Which foods are good and bad for our teeth? Egg Experiment	Change Care Identity Change Care Identity	Enquiry Based Approach Key Enquiry Question: **Does Chocolate Grow on Trees?** **Key Science Knowledge and Key Enquiry Question:** What does growing mean? The journey of chocolate Our Planet Paper and Trees Growing Cress Experiment Which cress seeds will grow best? What does a plant need in order to grow healthily? What observations have you made? **What food do we get from a farm?** **Key Science Knowledge and Key Enquiry Question:** Types of farming What does Arable Farming mean? What does Pastoral farming mean? Life Cycle of a butterfly What changes from caterpillar to butterfly? What observations have you made? Seasonal Farming What fruits and vegetables grow in which season in the UK? Life Cycle of a chicken What changes from egg to chicken? What observations have you made? Healthy Eating What foods are healthy and unhealthy? Life Cycle of a Frog	Change Care Conflict Power Change Care Conflict	Enquiry Based Approach Key Enquiry Question: **What can we learn from a book?** **Key Science Knowledge an Key Enquiry Question:** Space What Can we learn about Space? What do we know about our Solar System? What do we know about Space travel? What do we know about the stars and the moon? Dinosaurs What do fossils tell us? Floating and Sinking Experiment What objects float and what objects sink? What observations have you made? **What Season Are We in?** Key Science Knowledge and Key Enquiry Question: Summer What are the signs that it is Summer?	Conflict Power

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	What liquid will make the egg shell decay? What observations have you made? Vets How do vets help our community? Our Pets What animals do you have within your family? **What Season Are We in?** Key Science Knowledge and Key Enquiry Question: Winter What are the signs that it is Winter?		What changes from frogspawn to frog? What observations have you made? Life Cycle of a Sunflower What changes from seed to adult flower? What observations have you made? **What Season Are We in?** Key Science Knowledge and Key Enquiry Question: Spring What are the signs that it is Spring?			
1	**Key skills (working scientifically)** • 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 1 - Seasonal changes (Earth Science)** **Key Knowledge:** Understand there are four seasons Understand the changes that take place in autumn Understand the changes that take place in winter Understand the changes that take place in spring Understand the changes that take place in summer Explain how the weather and seasons change **Key Questions** • What happens to the weather in different seasons? • How do trees and plants change through the year? • What clothes might we wear in winter and summer?	Change Care Identity	**Key skills (working scientifically)** • 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 1 - Animals, including humans 2 - All about animals (Biology)** **Key Knowledge:** Discover animal families Learn about the differences between mammals and birds Learn about the differences between amphibians, reptiles and fish Discover the types of food living things eat Explore the difference between wild animals and pets Explain the characteristics of an animal **Key Questions:** • How do animals look different from one another? • What do different animals eat? • Which animals live on land, in water or both?	Change Care Identity	**Key skills (working scientifically)** • 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 1 – Plants (Biology)** **Key Knowledge:** Understand that seeds grow into plants Identify the basic parts of a plant and tree Understand that different plants can grow in the same environment Know the difference between deciduous and evergreen trees Know that fruit trees and vegetables are varieties of plants Record the growth of a plant **Key Questions:** • What do plants need to grow well? • Can we name the parts of a plant? • How do flowers, trees and vegetables differ?	Change Power Care Identity

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	Year 1- Animals, including humans 1 - All about me (Biology) **Key Knowledge:** Discover the basic parts of the human body Learn about eyes and sight Learn about ears and hearing Explore the tongue and taste Explore the sense of touch Discover how your nose smells **Key Questions:** • What parts of the body can we name? • How do we keep our bodies healthy? • Why is it important to eat well, exercise and rest?	Change Care Identity	**Year 1 - Everyday materials - Exploring everyday materials (Chemistry)** **Key Knowledge:** Identify and name a variety of everyday materials Distinguish between an object and the material it is made from Describe the properties of everyday materials Identify objects that are natural and those that are manmade Predict and identify if an object will float or sink Explore which materials are best for different objects **Key Questions:** • Which materials are hard, soft, waterproof or flexible? • Why are some materials suitable for a coat or an umbrella? • How can we compare different objects by the material they are made from?	Change Conflict Power		
2	**Key skills (working scientifically)** • 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 - Living things and their habitats (Biology)** **Key Knowledge:**	Conflict Care Identity	**Key skills (working scientifically)** • 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 - Animals, including humans 1 – Growth (Biology)** **Key Knowledge:** Describe the needs of animals for survival Describe the needs of humans, for survival	Change Care Identity	**Key skills (working scientifically)** • 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 - Animals, including humans 2 - Life cycles (Biology)** **Key Knowledge:** Order the stages of the human life cycle	Change Identity

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	Explore and compare the differences between things that are living, dead, and things that have never been alive Identify and name a variety of plants and animals in a microhabitat Design a suitable microhabitat where living things could survive Find out what animals eat to survive in their habitats Understand a food chain Understand the journey food makes from the farm to the supermarket **Key Questions:** 1. What is the difference between something that is living, dead, or has never been alive? 2. Can you name two habitats where animals might live? 3. Why might a cactus be suited to a desert habitat? 4. How can a habitat provide food, water, and shelter for living things? **Year 2 – Living Things and their habitats – Habitats from around the world (Biology)** **Key Knowledge:** Learn about habitats Appreciate that environments are constantly changing Explore the rainforest and its problems Describe life in the ocean Discover the Arctic and Antarctic habitat Create a model of a habitat **Key Questions:** 1. What is the difference between something that is living, dead, or has never been alive? 2. Can you name two habitats where animals might live? 3. Why might a cactus be suited to a desert habitat? 4. How can a habitat provide food, water, and shelter for living things?	Change Conflict Power Care Identity	Explore the importance of eating the right food Describe what a healthy, balanced diet looks like Investigate the impact of exercise on our bodies Investigate the importance of hygiene **Key Questions:** 1. What do humans need to stay healthy? 2. Why is it important to eat a balanced diet? 3. How can exercise help your body? 4. What are the five senses, and how do they help us? **Year 2 - Uses of everyday materials (Chemistry)** **Key Knowledge:** Identify different materials and their uses Understand how to select the right materials to build a bridge Explore and test the stretchiness of materials Understand that materials can change their shape by twisting, bending, squashing or stretching Find out about Charles Macintosh and explore how materials are suitable for different purposes Discover which materials change shape when making a road with John McAdam **Key Questions:** 1. What materials could be used to make a raincoat, and why? 2. Which material would be best for a window and why? 3. How can you describe the properties of a material, such as hard, soft, rough, or smooth? 4. Why are some materials better for certain jobs than others?	Conflict Power	Describe the stages of a human life cycle Identify the offspring and parent of an animal Explore the life cycle of a chicken Describe the life cycle of a butterfly Explore the life cycle of a frog **Key Questions:** What is a life cycle? Can you order the stages of a butterfly's life cycle? How does a tadpole change as it grows? **Year 2 – Plants (Biology)** **Key Knowledge:** Design an experiment to find out what plants need to grow Know the difference between seeds and bulbs Describe the life cycle of a plant Describe what plants need to grow and stay healthy Understand that different plants survive in different environments Observe and record the growth of plants over time **Key Questions:** 1. What do plants need to grow well? 2. Can you name the main parts of a plant? 3. What happens to a plant if it does not get enough water? 4. Why are seeds important to plants?	Change Care Identity
3	**Rocks and soils (chemistry)**		**Animals including humans (biology)**	Change	**Light (physics)**	Care

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	• What is a rock? • What different types of rocks are there? • How can rocks be grouped? • How are fossils formed and what can they tell us? • Who was Mary Anning and how did she contribute to the scientific community? • How is soil formed? • What is permeability? **Key knowledge** • To know that there are three types of rocks that are formed naturally (igneous, sedimentary &metamorphic) • To Know how a fossil is formed • Understand the properties of rock and their use • To know how soils is formed • To Know about Mary Anning and her work with fossils Igneous • To know that when molten magma cools, igneous rocks are formed • To know that this either cools and forms rocks under the earth's surface, or flows out of erupting volcanoes as lava and may mix with other minerals • To know that examples include granite and basalt Sedimentary • To know that sometimes little pieces of rocks that have been weathered can be found at the bottom of lakes, seas and rivers. This called sediment. • To know that over millions of years, layers of this sediment build up forming sedimentary rocks • To know that examples include limestone and chalk • To know that sedimentary rocks are porous and can easily be worn down Metamorphic • To know that when some igneous and sedimentary rocks are heated and squeezed (pressured) they form metamorphic rocks		• Why do humans need the 5 key food groups? • What is the role of the skeleton? • What is the role of muscles? **Key knowledge** • 5 food groups: Protein – muscle repair and growth Carbohydrates – slow release energy Fats and oils – energy storage Dairy – Calcium vitamin D and bone growth Fruit and vegetables – minerals and vitamins for function including the brain. • Humans need a healthy diet that includes eating all food groups in moderation. • Role of skeleton is to provide protection to vital organs and allow movement • 3 types of skeletons: • Endoskeleton – inside the body • Exoskeleton - outside their body • Hydrostatic skeleton- soft bodied with no skeleton. • The human skeleton is made up of 206 bones. • To know the function of key bones in the human skeleton. • Muscles attach to the skeleton and are responsible for movement • Muscle contract and relax • Two types of muscles: voluntary and involuntary. • The heart is a muscle.	Care	• What are light sources? • What is sunlight and how to stay safe? • What does it mean for a material to be reflective? • How are shadows formed? • How do shadows change during the day? • How change shadows change size? **Key knowledge** • Light travels in straight lines • Light sources produce their own light (sun, candle, torch, bioluminescence). • Some objects reflect light (the moon, mirror, surface of water, cats eyes (on the road) • Light travels in straight lines • Looking directly at the sun is dangerous. • Sunlight can damage the skin and eyes. • Sun cream, hat can be used to protect the body. • Opaque objects – allow no light through • Translucent – allow some light through • Transparent – allow all light through. • Shadows form when an opaque object block sunlight. • The size of a shadow changes when it is moved further from the light source. **Plants (biology)** • What do plants need to thrive? • What are the parts of a flower? • How is water transported within plants? • What is the life cycle of a flowering plant? • How do plants spread their seeds? **Key knowledge** • Plants need: Water, nutrients, oxygen and sunlight to grow.	Change

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	• To know that examples include slate and marble • To know that metamorphic rocks are strong • To know that bricks and concrete are not rocks because they are man-made Fossils • To know that fossils are the remains of prehistoric life • To know that they are usually formed when a living thing (plant or animal) dies, and the body is covered up or buried by sediment over tens of thousands of years • To know that some fossils are formed when the tough bones and teeth in animals and the woody part of plants are preserved • To know that other fossils are made from imprints in surrounding sedimentary rock such as footprints or imprints of shells • To know that fossils tell us about the Earth and about life that existed hundreds of thousands and millions of years ago Soil • To know that soils is made from pieces of rock, minerals, decaying plants and water • To know that when rock is broken down into small grains, soil is formed • To know that there are layers of soil • To know that above the soil is leaf litter and recently decaying plants • To know that as the soil becomes deeper, the rock grains become larger until bedrock is reached **Key skills (working scientifically)** • asking relevant questions and using different types of scientific enquiries to answer them (how are fossils formed) • 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		• To name the key muscles and their function. **Magnets and forces (physics)** • What are contact and non-contact forces? • How do things move on different surfaces? • What is magnetism? • Is everything magnetic? • How can magnetism be used? **Key knowledge** • Forces can be classified as push or pull • Forces can be classified as contact (friction) and non-contact (gravity, magnetism) • Friction causes objects to move more slowly across surfaces. • The rough a surface , the more friction that is created. • Magnets have 2 poles – North and south • North and North – repulsion • South and South – repulsion • North and South – attraction • Magnets have a magnetic field around them (invisible) which attracts magnetic materials • The Earth has a magnetic field • Some metals are magnetic (copper, steel, iron) some are not (gold, silver) Key skills (Working scientifically) • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables (food groups, magnets)		• Function: • Leaves – absorb sunlight to make food in a process called photosynthesis photosynthesis) • Roots – anchor plant in place, absorb water, absorb nutrients • Stem – transports water to the leaves • Flower – attracts pollinators for pollination, fertilisation, seed formation and dispersal • Parts of a flowering plant: • Anther – pollen produced • Stigma - stem of the anther • Petal – attracts pollinators • Stigma – pollen is deposited here for fertilisation • Ovary – unfertilised seeds are stored. • Plants can dispersal their seed via: water (coconuts), animals (poo)(squirrels), explosions, and wind (dandelions/sycamore) **Key skills (working scientifically)** • asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests (seed dispersal, plant growth, sun cream) • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers (plant growth, seed dispersal, flower dissection, light sources) • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions (seed dispersal, plant growth, sun cream, reflectors) • recording findings using simple scientific language, drawings, labelled diagrams, keys,	

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	• gathering, recording, classifying and presenting data in a variety of ways to help in answering questions (types of rocks) • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables (types of rocks, • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions (permeability of soil) • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions (permeability of soil) • identifying differences, similarities or changes related to simple scientific ideas and processes (types of rocks) • using straightforward scientific evidence to answer questions or to support their findings. (How are fossils formed?)		• reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions (role of muscles, function of skeleton, friction) • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions (friction) • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers (friction) • • using straightforward scientific evidence to answer questions or to support their findings. (healthy eating)		bar charts, and tables (seed dispersal, plant growth, light sources, sun cream) • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions (plant growth, reflectors, shadows). • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions (plant growth) • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings. (life cycle of flowering plants)	
4	**States of matter (chemistry)** • What are solids liquids and gases? • How do states of matter change? • Does everything have the same melting point? • Does everything have the same boiling and freezing point? • What is the water cycle? • Key knowledge • There are 3 states of matter: • Solid – definite shape, particles are tightly packed and vibrate.	Change	**Living things and their habitats (biology)** • How can living things be grouped? • Invertebrates or vertebrates – What's the difference? • How can plants be classified? **Key knowledge** • Living things share characteristics that allow them to be grouped • Scientists classify living things to understand similarities and differences • Animals can be classified as vertebrates or invertebrates	Care Change Power Democracy	**Sound (physics)** • How are sounds made? • How does sound travel? • Can sound be restricted? • What is pitch? • What is volume? **Key knowledge** • Sound is created by vibrations and travel in waves after from the object which created the waves. • Sound waves travel from the object towards our ears drums which vibrate, which in turn is interpreted by our brains	

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	• Liquid – take the shape of their container, particles are less tightly packed and move more freely • Gas: particles are completely free. • Temperature can cause materials to change states of matter: • Solid to liquid – melting • Liquid to gas – Evaporation • Gas to liquid- Condensation • Liquid to solid – freezing (solidifying) • Water freezes at 0 ° c and boils at 100 ° c Process of the water cycle: 1) Ocean – sun heats ocean surface causing water to evaporate 2) Water vapour rises and then cools down (condensing) leading to clouds forming 3) Clouds can no longer absorb water so the water falls to the ground during precipitation (raining/snowing/hailing) 4) Water lands into bodies of water, absorbed into the ground or into rivers and streams. 5) Rivers and streams lead to the ocean **Electricity (physics)** • How to stay safe when using electricity • What components make up a series circuit? • What are conductors and insulators? • How do switches work? **Key knowledge** • Electricity can come from mains power or cells. • Mains electricity is dangerous and should not be touched or interfered with.		• Vertebrates are grouped into mammals, birds, fish, reptiles and amphibians • Plants can be grouped into flowering and non-flowering plants • Classification keys use yes/no questions based on observable features • Habitats can change naturally or because of human activity • Environmental change can affect living things positively or negatively **Working scientifically** • asking relevant questions and using different types of scientific enquiries to answer them • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers (Grouping animals, classifying plants) • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables (classifying animals) • identifying differences, similarities or changes related to simple scientific ideas and processes (classifying animals and plants) • using straightforward scientific evidence to answer questions or to support their findings. (classifying animals		• Sound can travel through solid, liquids and gases (mediums) • When sound travels through mediums, it cause the medium particles to vibrate creating a disturbance that continues the wave. • Insulators reflect sound waves which dampens the sound. • The volume of sound is measured in decibels • The volume of sound is dependent on the amount of energy/power the original sound has. • Pitch is caused by the speed of the sound wave vibrations: • High speed = High pitch • Slow speed = Low pitch • The further a sound wave travels the fainter it gets. **Animals including humans (biology)** • How does the digestive system work? • Why are there different types of teeth? • What are food chains? • What are food webs? **Key knowledge** Digestive system: 1) Mouth – teeth tear and grind food, salvia 2) Down the oesophagus 3) In the stomach, muscles mix the food further. 4) Small intestine – nutrients are absorbed 5) Large intestines- left over food travels through	

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	• Cells store electricity and push charge around a circuit. • A simple circuit needs all components connected in a complete loop. • A circuit must include: a power source, wires, and an output device like a bulb or buzzer. • Adding more cells can make a bulb brighter (up to safety limits). • Adding more bulbs can make each bulb dimmer. • Switches open (break) and close (complete) circuits. • Metals conduct electricity; most other materials do not. • Circuits will not work if there are gaps, loose connections, wrong cell orientation, or broken components. **Key skills (working scientifically)** • asking relevant questions and using different types of scientific enquiries to answer them (boiling and melting investigation,) • setting up simple practical enquiries, comparative and fair tests (boiling and melting point investigations) • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers (electrical circuits investigation) • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions (states of matter investigation) (conductors and insulators investigation) • recording findings using simple scientific language, drawings, labelled diagrams, keys,				6) Rectum – food is pushed out in the form of faeces (poo) (excretion) • Teeth: • Premolars- tear and grind • Canines – Tear • Incisors – cutting and shearing • Molars – Grinding • Herbivores – Mainly incisors and molars • Carnivores – Mainly canines and incisors • Omnivores – use all three • Food chains and webs show the transfer of energy from one organism to another. • The organism at the top of a food chain or web is called the Apex predator. **Key skills (working scientifically)** • asking relevant questions and using different types of scientific enquiries to answer them (volume investigation) • setting up simple practical enquiries, comparative and fair tests (material investigation) • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers (volume investigation) • 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 (Distance investigation) • reporting on findings from enquiries, including oral and written explanations,	

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	bar charts, and tables (states of matter investigation, circuit diagram) • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions (boiling and melting point investigation) • identifying differences, similarities or changes related to simple scientific ideas and processes (states of matter, conductors and insulators investigation) • using straightforward scientific evidence to answer questions or to support their findings (melting and boiling point investigation)				displays or presentations of results and conclusions (distance investiagtion • 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 (volume investigation • using straightforward scientific evidence to answer questions or to support their findings.	
5	**Living things and their habitats (biology)** • **Understand the life cycle of mammals** • **Understand the life processes of a plant.** • **Compare the life cycle of insects and amphibians** • **Describe the life cycle of a birds and reptiles** • **To describe asexual and sexual reproduction** **Key Knowledge** • Mammals can be classified into 3 groups: • Placental mammals (Give birth to live offspring) • Marsupial (carry offspring in a pouch) • Monotreme (offspring hatched from eggs) • Life cycle of a mammal: Embryo, Juvenile, adult	Change Identity Care Individual liberty Tolerance	**Forces (physics)** To understand the different forces that act on an object What is gravity? What is air resistance? How does surface area affect air resistance? How do levers, pulleys and gears affect forces? **Key Knowledge** Forces come in pairs that are opposite to each other (Newton's third law) Forces that can act on an object are: Friction, air resistance, gravity, buoyancy, magnetism Mass = the amount of matter an object contains (measured in g/kg etc) Weight = the force of gravity acting on a object (measured in N, using a newton metre)	Change Conflict Democracy	**Properties of materials (chemistry)** • What are properties of materials? • What are thermal conductors and insulators • What is hardness? • What materials are soluble? • How can we separate materials? Key knowledge • "Heat" refers to temperature (Not necessarily how hot something is) • Conductors allow electric/heat through them easily whereas there is more resistance in insulators. • Transparent let's all light through, Translucent lets some light through, opaque lets no light through • When a solute dissolve in a liquid this mixture is bonded and is known as a solution • Temperature can affect the solubility of a substance	

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	• Metamorphosis is the process of transforming from an immature organism to a mature organism. • Life cycle of Caterpillar: Egg, Larva, Pupa (chrysalis), Adult. • Life cycle of bird and reptile: egg, hatchling, juvenile, adult • Asexual reproduction requires on adult and the offspring are genetically identical (clones) to the parent. • Sexual reproduction: requires a male and a female of the same species, offspring are genetically similar to both parents. • In sexual production take 50% of their genetic information from paternal parent and 50% from maternal parent. **Animals including humans (biology)** • Know the seven life processes • Identify key stages of a mammal life cycle (humans) • Explore the gestation period of mammals • Learn about the changes experienced during puberty • Describe the changes humans may experience during adulthood and old age **Key Knowledge** Seven life process – movement, respiration, sensitivity, growth, reproduction, excretion, nutrition Life cycle of a human – Foetus, infancy, childhood, adolescence; Early, middle and late adulthood. • Changes in females: at puberty: larynx grows, skin becomes oilier, grow hair		Mass remains the same while weight can vary (dependent on gravity). Air resistance is the force in which a moving object is contacting. Air resistance increase with speed and surface area. Pulleys, levers and gears are mechanisms that reduce the amount of 'work' needed to achieve the same force. **Earth & Space (physics)** The Earth, Moon and Sun and how they move relative to each other. Is the Earth flat? Why do we get night and day? Why does the sun appear to move across the sky? Why do we get seasons? How is our solar system structured? **Key Knowledge** day – how long it takes a planet to make one full rotation on its axis (24 hours for Earth) Year – How long it takes a planet to make one full orbit of a star (Earth- 364 ¼ days) The sun is a star (all the stars in the sky are typically much bigger than Sol (our sun) The Moon (Lunar) orbits the Earth The Earth Orbits the sun (Sol) in a elliptical shape		**Changes in materials (Chemistry)** • How can we recover materials from a solution? • What changes are reversible? What changes are irreversible? • How do we know new materials have been made? • How does rusting occur? • How are fires started? **Key knowledge** • There are 3 states of matter: Solid, liquid and gas • Dissolving, mixing and changes of states are reservable changes • When a new material is formed, the change is usually irreversible (eg cooking) • Evaporation is where a material changes from a liquid to a gas. • Rusting occurs when a metal reacts with oxygen (corrosion) • Oxygen and water can cause metal to rust. • The fire triangle: heat, fuel oxygen. • Fires can be extinguished by removing one part of the triangle. **Key skills (working scientifically)** • Reading, spelling and pronouncing scientific vocabulary correctly • Planning different types of scientific enquires and recognising and controlling variables (properties of materials investigation, thermal conductors' investigation, solubility investigation) • Identifying scientific evidence that has been used to support or refute ideas or arguments (hardness research, Fire triangle) • Taking measurements with a range of scientific equipment, with increasingly accuracy and precision, taking repeat readings where necessary.	

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	under armpits, grow breasts, start to menstruate, gain hair on arms and legs, growth of pubic hair, grow taller, sweat glands produce more sweat, all parts of the body grow. • Changes in males: skin becomes oilier, larynx grows (Adam's apple), grows hair on chest, grow facial hair, grow hair under armpits, gain hair on arms and legs, grow pubic hair, scrotum, testes and penis develop, become more muscular, grow taller, sweat glands produce more sweat, all parts of the body grow. **<u>Key Skills (working scientifically)</u>** • Reading, spelling and pronouncing scientific vocabulary correctly • Planning different types of scientific enquires and recognising and controlling variables (How do bones change with age?) • Identifying scientific evidence that has been used to support or refute ideas or arguments (gestation periods research) • Taking measurements with a range of scientific equipment, with increasingly accuracy and precision, taking repeat readings where necessary (eye sight investigation) • Recording data and results of increasing complexity using scientific diagrams and labels, classification key, tables and bar and line graphs (Life cycle diagrams) • Reporting and presenting findings from enquires, including conclusions, casual relationships and explanations of and degrees of trust in results, in oral and written forms such as displays and other presentations. (Life cycles and gestation periods of mammals (		The sun appears to move across the sky due to the Earth's rotation. To know we have the seasons due to the angle (thus intensity) at which sunlight hits the Earth To know the Earth is not flat but approximately spherical To know the moon is visible in the nights sky due to reflecting the sun's light To know the order of the planets in our solar system **<u>Key skills (working scientifically)</u>** • Reading, spelling and pronouncing scientific vocabulary correctly • Planning different types of scientific enquires and recognising and controlling variables (Levers investigation, umbrella air resistance investigation, parachute investigation) • Identifying scientific evidence that has been used to support or refute ideas or arguments (Is the Earth flat investigation) • Recording data and results of increasing complexity using scientific diagrams and labels, classification key, tables and bar and line graphs (How the earth moves relative to the sun) • Using test results to make predictions (Levers investigation, umbrella air resistance investigation, parachute investigation) • Reporting and presenting findings (Levers investigation, umbrella air resistance investigation, parachute investigation)		• Using test results to make predictions to set up further comparative and fair tests • Recording data and results of increasing complexity using scientific diagrams and labels, classification key, tables and bar and line graphs (solubility investigation, thermal conductors investigation, separating mixtures investigation) • Reporting and presenting findings from enquires, including conclusions, casual relationships and explanations of and degrees of trust in results, in oral and written forms such as displays and other presentations. (properties of material investigation, Snowman explanations) (reservable and irreversible reactions investigation	

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6	**Living things (Biology)** • How can animals be grouped? • How did Carl Linnaeus contribute to the scientific community? • What are micro-organisms? **Key knowledge** • Vertebrates – have a back bone and internal skeleton • Invertebrates – No back bone (some may have an exoskeleton) • Carl Linnaeus was a 18th century scientist who created a new classification system for living things that is still used today • Linnaeus Classification system (taxonomy) • Kingdom, Classes, Orders, Families, Genus, Species • 3 types of Microorganism: Bacteria, Virus & Fungi **Electricity (physics)** • What is electricity and why is it important? • What are the symbols on an electrical circuit diagram? • How does volts affect a circuit? • How does variation effect a circuit? **Key knowledge** • To know the symbol for a buzzer, motor, cell, battery, bulb. • To know how to draw a electrical circuit • Voltage is the force which pushes an electrical current round the circuit (V)	Change Identity Care	**Evolution and inheritance (biology)** • Why are offspring different? • How have animals adapted to suit their environment? • How have plants adapted to suit their environment? • What can we learn from fossils? • What is natural selection? • How have humans evolved? **Key knowledge** • Characteristics of offspring are inherited by the parents (50% from paternal, 50% from maternal) • Environmental factors can also affect characteristics. • Adaptations occur over multiple generations. • Animals will have specific characteristics that are beneficial for the environment they live in (eg, Camels store fat in their humps which can be converted to water, arctic hares have white fur to camouflage). • Plants have specialised characteristics that benefit them in their environment (eg , cacti have spines to reduce water loss, Joshua tree has deep and wide roots for collecting water). • Fossils are the preserved remains, impressions of living things from long ago. • Fossils allow scientist to determine how organisms have changed and evolved over time.	Identity Change Tolerance Care	**Light (physics)** • How does light travel? • How do reflections form? • Why do we see colour? • Why do shadows form? **Key knowledge** • Light travels in straight lines (rays) • Light travels from a light source and contacts an object, some of the light is absorbed by the object, the rest of the light is reflected. The reflected light travels to our eyes. The colour of light that is reflect is the colour we perceive the object to be. White light (sunlight) is made up from 7 colours: Red, orange, yellow, green, blue, indigo, violet. • A rainbow is caused by a light refraction off a surface (usually rain drops) causing the light to split. • Black is the absence of light. • Shadows are formed because opaque objects block light from travelling through it and thus a shadow is formed where there is an absence of light. **Animals including humans (biology)** How does the heart and circulatory system work? What is blood and how does it move around the body? How does the body transport water and nutrients around the body?	Care Identity

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	• To know how to identify and fix a broke circuit. **<u>Key skills (working scientifically)</u>** • Reading, spelling and pronouncing scientific vocabulary correctly • Planning different types of scientific enquires and recognising and controlling variables (micro-organism experiment, Voltage investigation) • Identifying scientific evidence that has been used to support or refute ideas or arguments (Linnaeus research) • Taking measurements with a range of scientific equipment, with increasingly accuracy and precision, taking repeat readings where necessary (microorganism investigation) • Recording data and results of increasing complexity using scientific diagrams and labels, classification key, tables and bar and line graphs (circuit diagrams, circuit investigation) • Reporting and presenting findings from enquires, including conclusions, casual relationships and explanations of and degrees of trust in results, in oral and written forms such as displays and other presentations. (microorganism investigation)		• Evolution is the change of characteristic in a population of living things over several generations. • Charles Darwin was a scientist during the 19th century who investigated evolution and the theory of natural selection. • Natural selection – offspring with the more favourable characteristics survive, their offspring inherit these characteristics. This cycle is constantly eventually leading to the whole population have these favourable characteristics • Modern day humans – Homo sapiens • Humans descended from primates. • First humans- 300,000 years ago. • Australopithecus (first bipedal human) • Homo hablis (larger brains, stood more upright) • Homo Erectus (discovered and utilised fire) • Neanderthals (using tools) • Homo sapiens caused Neanderthals to go extinct **<u>Key skills (working scientifically)</u>** • Reading, spelling and pronouncing scientific vocabulary correctly • Identifying scientific evidence that has been used to support or refute ideas or arguments (Fossils) • Recording data and results of increasing complexity using scientific diagrams and labels, classification key, tables and bar and line graphs (natural selection investigation • • Reporting and presenting findings from enquires, including conclusions, casual relationships and explanations of and degrees of trust in results, in oral and written forms such as displays		How can we change our affect heart rates? How do drugs and alcohol affect the body? **<u>Key knowledge</u>** • The heart is a muscle • The heart has four chambers and the aorta(left & Right ventricle, left & right atrium) – Blood travels to and from the heart. • 3 types of blood vessels: • Arteries (thick, oxygenated blood around the body) Veins (thin, deoxygenated blood to the heart) • Capillaries (microscopic, link veins and arteries) • 4 components make up the blood: • Red blood cells (carry oxygen) • Whiteblood cells (fight infection) • Platelets (help to clot blood and form scab) • Plasma (fluid part of blood). • During exercise heartrate increases to pump oxygenated blood around the body quicker. • Drugs are a substance that alters the way the body/mind functions. • Drugs can be classified into 4 groups: stimulants, depressants, painkillers and hallucinogens • Some drugs can cause: liver damage, poor sleep,high blood pressure and types of cancer. **<u>Key skills (working scientifically)</u>**	

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			and other presentations. (Natural selection investigation •		• Reading, spelling and pronouncing scientific vocabulary correctly • Identifying scientific evidence that has been used to support or refute ideas or arguments • Taking measurements with a range of scientific equipment, with increasingly accuracy and precision, taking repeat readings where necessary (heart rate experiment) • Recording data and results of increasing complexity using scientific diagrams and labels, classification key, tables and bar and line graphs (Colour investigation, shadow investigation, Lazer investigation) • Reporting and presenting findings from enquires, including conclusions, casual relationships and explanations of and degrees of trust in results, in oral and written forms such as displays and other presentations. (colour investigation)	