

Blackminster Middle School
Curriculum Map years 6, 7 and 8

Topic	Core Knowledge Year 6
<p>Introduction to Science Science skills</p>	<p>I can highlight the dangers that exist in a Science lab.</p> <p>I can prevent injuries during science practical lessons.</p> <p>To can understand and describe the need for laboratory rules.</p> <p>I can recognise common laboratory apparatus.</p> <p>I can draw and label a scientific diagram accurately.</p> <p>I can label and use a Bunsen Burner to safely boil water.</p> <p>I can make observations accurately to measure and record temperature.</p> <p>I know and can apply variables to experiments</p> <p>I can design and carry out experiments looking at the 'Best' Biscuit</p> <p>I am starting to learn and apply key skills such as method writing, drawing results tables with the variables in the correct columns and drawing graphs correctly</p>
<p>Electricity and Magnets</p>	<p>I can recall some basic electrical circuit components and can learn the symbols for each of these</p> <p>I know the difference between conductors and insulators, and common materials for each</p> <p>I know how to build a series and parallel circuit</p>

	<p>I know the symbols and rules for drawing a series and parallel circuit</p> <p>I can compare the advantages and disadvantages for using a series and parallel circuit</p> <p>I can introduce the ammeter and how to measure current in Amps</p> <p>I can compare the current in a series and parallel circuit</p> <p>I can name some common magnetic material and realise not all metals are magnetic?</p> <p>I can recall how magnets repel or attract but can now map the magnetic field with iron filings</p> <p>I know how to stop the magnetic field</p> <p>I can recall that a pole is the strongest part of a magnet and that there are two poles on every magnet</p> <p>I can use the domain theory of magnetism to explain magnetisation and demagnetisation</p>
Cells, tissues and organs. Healthy eating	<p>I know how to label and use a microscope</p> <p>I can prepare and draw the cheek cell on the microscope slide</p> <p>I can label the main parts of an animal cell</p> <p>I can describe the function of the different parts of a cell</p> <p>I know that cells make up tissues and tissues make up organs</p> <p>I can label the organs and know their functions</p> <p>I can introduce healthy eating as a method of looking after our cells and keeping our organs healthy</p>

	<p>I can introduce the key skill of using a Bunsen Burner to be able to burn food to look at the release of energy from food</p> <p>I know what an unhealthy diet is to include obesity, drugs and smoking</p>
Light	<p>I can recall what makes a light source and how shadows form the same shape as the objects that cast them</p> <p>I can recall how light travels and will then understand what a light year is</p> <p>I will complete experiments to look at how the size of shadows is changed</p> <p>I know key terms used to describe materials such as translucent, transparent and opaque</p> <p>I will carry out practical experiments using ray boxes to show light travelling in a straight line and how it behaves including reflection and refraction</p> <p>I know what dispersion is and what colours make up the Rainbow</p>
Particles	<p>I can recall that changes of state are reversible and can understand how particles arranged in a solid, a liquid and a gas</p> <p>I can understand how particles behave</p> <p>I can question what happens when you heat and cool particles</p> <p>I can name all the changes of states e.g. evaporation, condensation</p> <p>I can recall that some materials dissolve in a liquid to form a solution, I will investigate this through an experiment.</p> <p>I will question which materials are soluble and insoluble.</p> <p>I will investigate what factors influence how soluble a material is</p>

	<p>I can recall how some materials can be separated and apply this to an experiment using filtration to separate a mixture</p> <p>I can use chromatography to separate a mixture</p>
<p>Atoms, elements, compound, mixtures and the Periodic Table</p>	<p>I will be introduced to the periodic table and what makes up an element</p> <p>I can question atoms and how do they make up all known substances</p> <p>I can question what makes up an atom including Protons, Neutrons and Electrons.</p> <p>I can understand what the Atomic Number and Mass Number represent</p> <p>I can question what the electronic configuration of an element is</p> <p>On the periodic table, I know where the metals and non-metals are found</p> <p>I can question why the chemical symbols look different to the name of an element</p>
<p>Environment, adaptation and evolution</p>	<p>I can recall a habitat provides the basic needs for different animals and plants and how they depend on each other</p> <p>I can question how organisms are adapted to their habitat</p> <p>I can understand photosynthesis and how is a leaf cell adapted for photosynthesis (chloroplasts).</p> <p>I can recall a food chain and introduce what the arrows in a food chain represent</p> <p>I can question how feeding relationships can be shown in food webs</p> <p>I can question how predators and prey are adapted</p>

	<p>I know how animals and plants are classified</p> <p>I know what MRS GREN represents and how something is classified as living</p> <p>To understand what fossils represent</p> <p>To understand inheritance and how this leads to evolution</p> <p>To understand the process of evolution</p>
Forces and their effects	<p>I can recall the effects of air resistance, water resistance and friction that occur between moving surfaces and can question what other forces are present</p> <p>I know that forces happen in pairs</p> <p>I know how to measure a force using the correct units and a Newton meter</p> <p>I can label the forces on both balanced and unbalanced objects</p> <p>I can describe the forces acting on an object moving at a constant speed</p> <p>I can discuss whether friction is it useful or not and can describe what friction is</p> <p>I can investigate which material causes more friction and can apply the variables to my investigation</p> <p>I can describe what forces apply to objects in a fluid</p>

Topic	Core Knowledge Year 7
Forces 2	<p>I can question how to calculate the resultant force after recapping what we learnt from Forces.</p> <p>I know how to compare forces with gravity</p> <p>I know how to identify a contact and non-contact force</p> <p>I know how to predict a force and carry out an experiment to measure the forces</p> <p>I can question how can we tell how fast something is travelling and describe the motion of an object whose speed is changing</p> <p>I know how to sketch and explain a labelled distance-time graph.</p> <p>I know the difference between mass and weight</p> <p>I know how to calculate gravity on Earth and then compare the weight on different planets</p>
Electromagnets	<p>I know how to build a circuit after recapping it from Electricity and introducing the Voltmeter to measure potential difference</p>

	<p>I can recap on how to build a series and parallel circuit including current and introduce the symbol for a voltmeter</p> <p>I know that potential difference and a complete circuit are both necessary for a current to flow?</p> <p>I know the units for potential difference and resistance?</p> <p>I can compare the resistance of conductors and insulators after recapping those terms from Electricity</p> <p>I can predict how differing values of resistance will affect the amount of current that flow</p> <p>I can predict how changing the thickness and length of a wire will affect its resistance</p> <p>I am able to recap non-contact forces and be introduced to electrostatics</p> <p>I am able to state the 2 types of charge and am able to describe what happens when you bring similarly and differently charged objects together.</p>
Energy	<p>I know that energy is measured in Joules</p> <p>I can describe and compare the energy values for food and fuels</p> <p>I can compare the energy in food and fuel with the energy needed for different activities</p> <p>I can complete an experiment to look at how we can use temperature change to see which foods release most energy</p> <p>I can name renewable and non-renewable energy resources, stating advantages and disadvantages of fossil fuels</p> <p>I know that energy can neither be created nor destroyed</p>

	<p>I can calculate the quantities of energy transfer whilst explaining how to calculate and pay for the amount of energy transferred</p> <p>I can understand the potential energy and kinetic energy of falling objects</p> <p>I can describe and compare the elastic energy in different materials whilst explaining how elastic energy is transferred.</p>
Waves	<p>I can identify, describe and explain how loud/quiet sounds are made.</p> <p>I can describe sound using the key scientific language and can relate this to displayed waveforms.</p> <p>I can understand how we hear including how the ear detects sound expanding on how this cause defects in hearing.</p> <p>I can understand how sound travels through different states of matter and understand how the material's properties reflect and absorb sound</p> <p>I can recap on how light travels and explain how shadows are formed in eclipses.</p> <p>I can recap reflection from light and expand to explain the difference between specular and diffuse reflection, including the law of reflection</p> <p>I can recap refraction from Light and apply the ideas learnt to understanding lenses</p> <p>I can describe how the human eye works and apply this to how to correct vision.</p> <p>I can recap dispersion and expand this to include how light of different wavelengths can be split and <u>recombined</u></p>
Matter	<p>I can recap the differences between solids, liquids and gases from Particles in terms of the particle model and relate them to their properties and behaviour.</p>

	<p>I can now apply the particle model to explain diffusion and the observations</p> <p>I can recap changes of state to explain reversible reactions</p> <p>I can explain the changes of state using the particle model and ideas about energy transfer</p> <p>I can recap separating mixtures and then explain the difference between a pure substance and an impure substance</p> <p>I can use the terms solvent, solution, solute and soluble and analyse patterns of data to explain solubility</p> <p>I can question how we can use distillation to separate a mixture</p> <p>I can recap chromatography to separate colours and apply this to electrophoresis</p>
Reactions	<p>I can recap reversible physical changes and introduce the signs of a chemical reaction</p> <p>I can recap where the metals and non-metals are on the periodic table and their properties. I can describe the observations between metals and acids</p> <p>I can use general WORD equations for the reactions between acids and metals?</p> <p>I can carry out and describe the test for hydrogen gas</p> <p>I know how to name the chemical 'salts'</p> <p>I know what displacement reactions are and can explain displacement equations using equations and particle models</p>

	<p>I can give some examples of oxidation and describe it using word equations and particle diagrams including combustion</p> <p>I can describe what an acid and alkali is and identify hazards associated with them</p> <p>I know how to identify acids and alkalis using various indicators and can describe the pH</p> <p>I can describe neutralisation and apply it to WORD equations linking into naming the chemical 'salts'</p> <p>I can investigate and compare the effectiveness of indigestion remedies</p>
Earth	<p>I can name and describe the characteristics of the different layers of the Earth and explain how volcanoes change the Earth.</p> <p>I can describe and explain the properties of the sedimentary, metamorphic and sedimentary rocks</p> <p>I can describe and explain the rock cycle</p> <p>I can describe the characteristics of a star and relate our sun to other stars</p> <p>I can explain the concept of galaxies</p> <p>I can explain the effects of the Earth's motion</p> <p>I can recall a light year and explain what causes the appearance of the moon to change</p> <p>I can use models to explain ideas in science</p>
Organisms	<p>I can describe and name the bones of the internal skeleton</p>

	<p>I can describe the roles of the tendons, ligaments, joints and muscles</p> <p>I can question how our bones & joints allow movement</p> <p>I can describe and give examples of antagonistic muscles and plan an investigation into comparing muscle strengths</p> <p>I can recall some medical problems with the skeletal system and explore possibilities of how to improve the human movement.</p> <p>I can recap some of the effects of drugs on the body and include the effect of organ damage on other body systems</p> <p>I can recap the cells, tissues and organs covered in KS2 and expand my knowledge to include specialised cells and expanding the knowledge of the organelles to include the mitochondria and ribosomes</p> <p>I can explain the structure and function of the specialised cells.</p> <p>I can compare and contrast features of different unicellular organisms and explain how they are adapted to carry out functions</p>
Ecosystems	<p>I can recap the food webs and introduce the scientific language used to describe food webs. I can make predictions about factors affecting the plant and animal populations including toxins</p> <p>I can understand the importance of insects in their roles on pollinators, how we use artificial pollination and evaluate the risks of monoculture</p> <p>To link in with pollination, I know the different parts of a flower and their functions. I can evaluate the differences between the wind-pollinated and insect-pollinated plants.</p>

	<p>I can describe the process of fertilisation, describing the role of pollen tubes and explain how seeds are formed and dispersed</p> <p>I know ways in which organisms affect their environment, including the predator prey cycle</p>
Genes	<p>I know what is continuous and discontinuous variation and how do I represent it graphically</p> <p>I understand that variation can be caused by inheritance or by the environment and the importance of variation on enabling a species to survive</p> <p>I can describe the main organs of the reproductive system including their functions in males and females leading onto causes of low fertility</p> <p>I know the changes that take place in boys and girls during puberty</p> <p>I know the stages of the menstrual cycle</p> <p>I know what fertilisation is and how the foetus develops</p> <p>I can understand the factors affecting a developing foetus and analyse advice given to pregnant women including concerns about smoking</p>

<p>Forces 3</p>	<p>Recap force diagrams and resultant forces to explain the motion of forces in equilibrium</p> <p>Question which factors affect drag and frictional forces whilst evaluating how well sports/vehicle technology reduces these forces</p> <p>To understand stretch and compression through investigating the forces involved in changing the shape of an object</p> <p>To know the effects of forces on springs</p> <p>I can explain pressure, how to calculate it and its effects on a solid surface</p> <p>I can describe how pressure in liquids increases with depth and how gas pressure varies with height</p> <p>I can explain how pressure changes in relation to particles and gravity</p> <p>I can explain why some objects sink and float and relate it to density, displacement and upthrust</p>
<p>Electromagnets 2</p>	<p>Recall the properties of magnets including the magnetic field</p> <p>Introduce the key features of the Earth's magnetic field and how fields can vary in strength</p> <p>I can describe what an electromagnet is, investigate the factors affecting the strength and describe its applications</p>
<p>Energy 2</p>	<p>I understand work done and can apply the equation to different situations including how to make work easier</p> <p>I can describe how temperature differences lead to energy transfer</p> <p>I can explain with examples of how energy can travel by conduction, convection and radiation</p> <p>I can recap the meaning of insulators and conductors and can explain how insulation works</p>

	<p>I can describe the relationship between energy transfer and energy change</p>
<p>Waves 2</p>	<p>I can understand how sound waves vary in frequency and apply these ideas to ultrasound</p> <p>I understand the function of microphones and loudspeakers</p> <p>I know that light can vary in frequency and describe the uses UV light</p> <p>I can understand and compare transverse and longitudinal waves</p> <p>I can understand how to use water waves to understand wave behaviour</p>
<p>Matter 2</p>	<p>I can recap the periodic table from KS2 and elements whilst introducing the how the periodic table is arranged with patterns and in relation to the scientists who designed it including John Dalton and Dmitro Mendeleev</p> <p>I can explore the Group 1 metals in the periodic table including their physical properties and reactivity</p> <p>I can explore the physical properties of the Group 7 Non-metals in the periodic table including their physical properties and reactivity</p> <p>I can recap what an element is and introduce a compound and mixture?</p> <p>I can understand a molecule</p> <p>I understand how to recognise how compounds are formed and named</p> <p>Interpret the ratio of atoms and formula of compounds</p>

	<p>I can compare the properties of the elements and properties of the compounds they form</p> <p>I will know what a polymer is and explain how their properties relate to their functions</p> <p>I can describe what is meant by ceramics and composites explaining how their properties relate to their functions</p>
Reactions 2	<p>I understand exothermic reactions and can explain the energy changes taking place</p> <p>I understand endothermic reactions and can explain the energy changes taking place whilst carrying out investigations</p> <p>I can describe and explain what a catalyst is</p> <p>I can recap combustion as an oxidation reaction and can summarise it using a SYMBOL equation</p> <p>I can compare complete and incomplete combustion</p> <p>I can explore the use of fuels including comparing the energy contents of different fuels</p> <p>I can recognise thermal decomposition and explain, using SYMBOL equations, some uses for it.</p> <p>I can explain conservation of mass using particle diagrams to explain chemical reactions</p>
Earth 2	<p>I can describe the composition of the atmosphere</p> <p>I can identify the greenhouse gases and explain how carbon dioxide is released from the burning of fossil fuels</p> <p>I can describe the carbon cycle</p> <p>I can understand that human activities affect the carbon cycle and explain how this relates to carbon stores and carbon dioxide producers</p>

	<p>I can describe the effects of global warming, explaining the consequences of global warming and evaluate the arguments for human activities impacting global warming</p> <p>I can describe the resources that the Earth provides and how human activity can affect these resources</p> <p>I understand the importance of recycling whilst explaining the benefits and limitations of the recycling schemes</p> <p>I can understand how to extract metals based on their reactivity</p>
Organisms 2	<p>I can describe and explain how we breathe</p> <p>I understand how to measure breathing including identifying the variables in a lung-volume investigation</p> <p>I can explain gas exchange in humans and can distinguish the difference between breathing and respiration</p> <p>I understand and can explain the physical effects of disease and lifestyle on the breathing system including smoking</p> <p>I can describe the components of a healthy diet and their importance</p> <p>I can calculate and compare the energy requirements of different diets</p> <p>I can understand the effects of an unbalanced diet including eating too much or little leading to deficiencies</p> <p>I can identify the organs of the digestive system, describe and explain how each organ is adapted to its function in the process of digestion</p> <p>I can explain the importance of enzymes and gut bacteria in digestion</p>

Ecosystem 2	<p>I can understand and explain the importance of respiration and can show the process in a WORD equation</p> <p>I can describe what is meant by anaerobic respiration in humans and make links to explain oxygen debt</p> <p>I can describe and investigate fermentation whilst recalling the word equation for anaerobic respiration in plants and microbes</p> <p>I can compare the similarities and differences in anaerobic and aerobic respiration.</p> <p>I can investigate a method to chlorophyll is essential for photosynthesis</p> <p>I know the structure of leaves and how this relates to its function</p> <p>I can understand how water and minerals move through a plant whilst investigating the importance of these minerals to a plant</p> <p>I can recall what photosynthesis is and can identify/investigate the factors that can affect photosynthesis</p>
Genes 2	<p>I can describe and understand the importance of biodiversity</p> <p>I can identify what changes can cause a species to become extinct and the use of gene banks to try and preserve hereditary material</p> <p>I can review and evaluate theories of what caused the extinction of the dinosaurs</p> <p>I can describe where chromosomes are found and describe their links to genes and DNA</p>

I can describe the structure of DNA

I can assess the work of Watson, Crick, Wilson and Franklin on DNA structure

I can explain the number of chromosomes in gametes and how genetic disorders may arise

I can understand and explain variation by inheritance and can describe how identical twins occur

I can use a model to represent inheritance and predict the likelihood of inheriting specific traits

Spiral learning - how the topics build on one another

Electricity and Magnets	<p>I can recall some basic electrical circuit components from KS2 and can learn the symbols for each of these</p> <p>I know the difference between conductors and insulators, and common materials for each</p> <p>I know how to build a series and parallel circuit</p> <p>I know the symbols and rules for drawing a series and parallel circuit</p> <p>I can compare the advantages and disadvantages for using a series and parallel circuit</p> <p>I can introduce the ammeter and how to measure current in Amps</p> <p>I can compare the current in a series and parallel circuit</p> <p>I can name some common magnetic material and realise not all metals are magnetic?</p> <p>I can recall how magnets repel or attract but can now map the magnetic field with iron filings</p> <p>I know how to stop the magnetic field</p> <p>I can recall that a pole is the strongest part of a magnet and that there are two poles on every magnet</p> <p>I can use the domain theory of magnetism to explain magnetisation and demagnetisation</p>
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Electromagnets	<p>I know how to build a circuit after recapping it from Electricity and introducing the Voltmeter to measure potential difference</p> <p>I can recap on how to build a series and parallel circuit including current and introduce the symbol for a voltmeter</p> <p>I know that potential difference and a complete circuit are both necessary for a current to flow?</p> <p>I know the units for potential difference and resistance?</p> <p>I can compare the resistance of conductors and insulators after recapping those terms from Electricity</p> <p>I can predict how differing values of resistance will affect the amount of current that flows? (qualitative)</p> <p>I am able to predict how changing the thickness and length of a wire will affect its resistance (qualitative)?</p> <p>I am able to recap non-contact forces and be introduced to electrostatics</p> <p>I am able to state the 2 types of charge and am able to describe what happens when you bring similarly and differently charged objects together.</p>
Electromagnets 2	<p>Recall the properties of magnets including the magnetic field</p> <p>Introduce the key features of the Earth's magnetic field and how fields can vary in strength</p> <p>I can describe what an electromagnet is, investigate the factors affecting the strength and describe its applications</p>

Cells, tissues and organs. Healthy eating	<p>I know how to label and use a microscope</p> <p>I can prepare and draw the cheek cell on the microscope slide</p> <p>I can label the main parts of an animal cell</p> <p>I can describe the function of the different parts of a cell</p> <p>I know that cells make up tissues and tissues make up organs</p> <p>I can label the organs and know their functions</p> <p>I can introduce healthy eating as a method of looking after our cells and keeping our organs healthy</p> <p>I can introduce the key skill of using a Bunsen Burner to be able to burn food to look at the release of energy from food</p> <p>I know what an unhealthy diet is to include obesity, drugs and smoking</p>
Organisms	<p>I can describe and name the bones of the internal skeleton</p> <p>I can describe the roles of the tendons, ligaments, joints and muscles</p> <p>I can question how our bones & joints allow movement</p> <p>I can describe and give examples of antagonistic muscles and plan an investigation into comparing muscle strengths</p>

	<p>I can recall some medical problems with the skeletal system and explore possibilities of how to improve the human movement.</p> <p>I can recap some of the effects of drugs on the body and include the effect of organ damage on other body systems</p> <p>I can recap the cells, tissues and organs covered in KS2 and expand my knowledge to include specialised cells and expanding the knowledge of the organelles to include the mitochondria and ribosomes</p> <p>I can explain the structure and function of the specialised cells.</p> <p>I can compare and contrast features of different unicellular organisms and explain how they are adapted to carry out functions</p>
Organisms 2	<p>I can describe and explain how we breathe</p> <p>I understand how to measure breathing including identifying the variables in a lung-volume investigation</p> <p>I can explain gas exchange in humans and can distinguish the difference between breathing and respiration</p> <p>I understand and can explain the physical effects of disease and lifestyle on the breathing system including smoking</p> <p>I can describe the components of a healthy diet and their importance</p> <p>I can calculate and compare the energy requirements of different diets</p>

	<p>I can understand the effects of an unbalanced diet including eating too much or little leading to deficiencies</p> <p>I can identify the organs of the digestive system, describe and explain how each organ is adapted to its function in the process of digestion</p> <p>I can explain the importance of enzymes and gut bacteria in digestion</p>
Light	<p>I can recall what makes a light source and how shadows form the same shape as the objects that cast them</p> <p>I can recall how light travels and will then understand what a light year is</p> <p>I will complete experiments to look at how the size of shadows is changed</p> <p>I know key terms used to describe materials such as translucent, transparent and opaque</p> <p>I will carry out practical experiments using ray boxes to show light travelling in a straight line and how it behaves including reflection and refraction</p> <p>I know what dispersion is and what colours make up the Rainbow</p>
Waves	<p>I can identify, describe and explain how loud/quiet sounds are made.</p> <p>I can describe sound using the key scientific language and can relate this to displayed waveforms.</p> <p>I can understand how we hear including how the ear detects sound expanding on how this cause defects in hearing.</p> <p>I can understand how sound travels through different states of matter and understand how the material's properties reflect and absorb sound</p> <p>I can recap on light from KS2 and explain how shadows are formed in eclipses.</p>

	<p>I can recap reflection from light and expand to explain the difference between specular and diffuse reflection, including the law of reflection</p> <p>I can recap refraction from Light and apply the ideas learnt to understanding lenses</p> <p>I can describe how the human eye works and apply this to how to correct vision.</p> <p>I can recap dispersion and expand this to include how light of different wavelengths can be split and <u>recombined</u></p>
Waves 2	<p>I can understand how sound waves vary in frequency and apply these ideas to ultrasound</p> <p>I understand the function of microphones and loudspeakers</p> <p>I know that light can vary in frequency and describe the uses UV light</p> <p>I can understand and compare transverse and longitudinal waves</p> <p>I can understand how to use water waves to understand wave behaviour</p>
Particles	<p>I can recall that changes of state are reversible and can understand how particles arranged in a solid, a liquid and a gas</p> <p>I can understand how particles behave</p> <p>I can question what happens when you heat and cool particles</p> <p>I can name all the changes of states e.g. evaporation, condensation</p>

	<p>I can recall that some materials dissolve in a liquid to form a solution, I will investigate this through an experiment.</p> <p>I will question which materials are soluble and insoluble.</p> <p>I will investigate what factors influence how soluble a material is</p> <p>I can recall how some materials can be separated and apply this to an experiment using filtration to separate a mixture</p> <p>I can use chromatography to separate a mixture</p>
Matter	<p>I can recap the differences between solids, liquids and gases from Particles in terms of the particle model and relate them to their properties and behaviour.</p> <p>I can now apply the particle model to explain diffusion and the observations</p> <p>I can recap changes of state to explain reversible reactions</p> <p>I can explain the changes of state using the particle model and ideas about energy transfer</p> <p>I can recap separating mixtures and then explain the difference between a pure substance and an impure substance</p> <p>I can use the terms solvent, solution, solute and soluble and analyse patterns of data to explain solubility</p> <p>I can question how we can use distillation to separate a mixture</p> <p>I can recap chromatography to separate colours and apply this to electrophoresis</p>

<p>Matter 2</p>	<p>I can recap the periodic table from KS2 and elements whilst introducing the how the periodic table is arranged with patterns and in relation to the scientists who designed it including John Dalton and Dmitro Mendeleev</p> <p>I can explore the Group 1 metals in the periodic table including their physical properties and reactivity</p> <p>I can explore the physical properties of the Group 7 Non-metals in the periodic table including their physical properties and reactivity</p> <p>I can recap what an element is and introduce a compound and mixture?</p> <p>I can understand a molecule</p> <p>I understand how to recognise how compounds are formed and named</p> <p>Interpret the ratio of atoms and formula of compounds</p> <p>I can compare the properties of the elements and properties of the compounds they form</p> <p>I will know what a polymer is and explain how their properties relate to their functions</p> <p>I can describe what is meant by ceramics and composites explaining how their properties relate to their functions</p>
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<p>Atoms, elements, compound, mixtures and the Periodic Table</p>	<p>I will be introduced to the periodic table and what makes up an element</p> <p>I can question atoms and how do they make up all known substances</p>
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	<p>I can question what makes up an atom including Protons, Neutrons and Electrons.</p> <p>I can understand what the Atomic Number and Mass Number represent</p> <p>I can question what the electronic configuration of an element is</p> <p>On the periodic table, I know where the metals and non-metals are found</p> <p>I can question why the chemical symbols look different to the name of an element</p>
Reactions	<p>I can recap reversible physical changes and introduce the signs of a chemical reaction</p> <p>I can recap where the metals and non-metals are on the periodic table and their properties. I can describe the observations between metals and acids</p> <p>I can use general WORD equations for the reactions between acids and metals?</p> <p>I can carry out and describe the test for hydrogen gas</p> <p>I know how to name the chemical 'salts'</p> <p>I know what displacement reactions are and can explain displacement equations using equations and particle models</p> <p>I can give some examples of oxidation and describe it using word equations and particle diagrams including combustion</p> <p>I can describe what an acid and alkali is and identify hazards associated with them</p> <p>I know how to identify acids and alkalis using various indicators and can describe the pH</p>

	<p>I can describe neutralisation and apply it to WORD equations linking into naming the chemical 'salts'</p> <p>I can investigate and compare the effectiveness of indigestion remedies</p>
<p>Reactions 2</p>	<p>I understand exothermic reactions and can explain the energy changes taking place</p> <p>I understand endothermic reactions and can explain the energy changes taking place whilst carrying out investigations</p> <p>I can describe and explain what a catalyst is</p> <p>I can recap combustion as an oxidation reaction and can summarise it using a SYMBOL equation</p> <p>I can compare complete and incomplete combustion</p> <p>I can explore the use of fuels including comparing the energy contents of different fuels</p> <p>I can recognise thermal decomposition and explain, using SYMBOL equations, some uses for it.</p> <p>I can explain conservation of mass using particle diagrams to explain chemical reactions</p>
<p>Environment, adaptation and evolution</p>	<p>I can recall a habitat provides the basic needs for different animals and plants and how they depend on each other</p> <p>I can question how organisms are adapted to their habitat</p>

	<p>I can understand photosynthesis and how is a leaf cell adapted for photosynthesis (chloroplasts).</p> <p>I can recall a food chain and introduce what the arrows in a food chain represent</p> <p>I can question how feeding relationships can be shown in food webs</p> <p>I can question how predators and prey are adapted</p> <p>I know how animals and plants are classified</p> <p>I know what MRS GREN represents and how something is classified as living</p> <p>To understand what fossils represent</p> <p>To understand inheritance and how this leads to evolution</p> <p>To understand the process of evolution</p> <p>I can question behaviour and how is can affect the survival of a species</p>
Ecosystems	<p>I can recap the food webs and introduce the scientific language used to describe food webs. I can make predictions about factors affecting the plant and animal populations including toxins</p> <p>I can understand the importance of insects in their roles on pollinators, how we use artificial pollination and evaluate the risks of monoculture</p> <p>To link in with pollination, I know the different parts of a flower and their functions. I can evaluate the differences between the wind-pollinated and insect-pollinated plants.</p> <p>I can describe the process of fertilisation, describing the role of pollen tubes and explain how seeds are formed and dispersed</p> <p>I know ways in which organisms affect their environment, including the predator prey cycle</p>

Ecosystem 2	<p>I can understand and explain the importance of respiration and can show the process in a WORD equation</p> <p>I can describe what is meant by anaerobic respiration in humans and make links to explain oxygen debt</p> <p>I can describe and investigate fermentation whilst recalling the word equation for anaerobic respiration in plants and microbes</p> <p>I can compare the similarities and differences in anaerobic and aerobic respiration.</p> <p>I can investigate a method to chlorophyll is essential for photosynthesis</p> <p>I know the structure of leaves and how this relates to its function</p> <p>I can understand how water and minerals move through a plant whilst investigating the importance of these minerals to a plant</p> <p>I can recall what photosynthesis is and can identify/investigate the factors that can affect photosynthesis</p>

<p>Forces and their effects</p>	<p>I can recall the effects of air resistance, water resistance and friction that occur between moving surfaces and can question what other forces are present</p> <p>I know that forces happen in pairs</p> <p>I know how to measure a force using the correct units and a Newton meter</p> <p>I can label the forces on both balanced and unbalanced objects</p> <p>I can describe the forces acting on an object moving at a constant speed</p> <p>I can discuss whether friction is it useful or not and can describe what friction is</p> <p>I can investigate which material causes more friction and can apply the variables to my investigation</p> <p>I can describe what forces apply to objects in a fluid</p>
<p>Forces 2</p>	<p>I can question how to calculate the resultant force after recapping what we learnt from Forces.</p> <p>I know how to compare forces with gravity</p> <p>I know how to identify a contact and non-contact force</p> <p>I know how to predict a force and carry out an experiment to measure the forces</p> <p>I can question how we can tell how fast something is travelling and describe the motion of an object whose speed is changing</p> <p>I know how to sketch and explain a labelled distance-time graph.</p> <p>I know the difference between mass and weight</p> <p>I know how to calculate gravity on Earth and then compare the weight on different planets</p>

Forces 3	<p>Recap force diagrams and resultant forces to explain the motion of forces in equilibrium</p> <p>Question which factors affect drag and frictional forces whilst evaluating how well sports/vehicle technology reduces these forces</p> <p>To understand stretch and compression through investigating the forces involved in changing the shape of an object</p> <p>To know the effects of forces on springs</p> <p>I can explain pressure, how to calculate it and its effects on a solid surface</p> <p>I can describe how pressure in liquids increases with depth and how gas pressure varies with height</p> <p>I can explain how pressure changes in relation to particles and gravity</p> <p>I can explain why some objects sink and float and relate it to density, displacement and upthrust</p>
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Energy	<p>I know that energy is measured in Joules</p> <p>I can describe and compare the energy values for food and fuels</p> <p>I can compare the energy in food and fuel with the energy needed for different activities</p>
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	<p>I can complete an experiment to look at how we can use temperature change to see which foods release most energy</p> <p>I can name renewable and non-renewable energy resources, stating advantages and disadvantages of fossil fuels</p> <p>I know that energy can neither be created nor destroyed</p> <p>I can calculate the quantities of energy transfer whilst explaining how to calculate and pay for the amount of energy transferred</p> <p>I can understand the potential energy and kinetic energy of falling objects</p> <p>I can describe and compare the elastic energy in different materials whilst explaining how elastic energy is transferred.</p>
Energy 2	<p>I understand work done and can apply the equation to different situations including how to make work easier</p> <p>I can describe how temperature differences lead to energy transfer</p> <p>I can explain with examples of how energy can travel by conduction, convection and radiation</p> <p>I can recap the meaning of insulators and conductors and can explain how insulation works</p> <p>I can describe the relationship between energy transfer and energy change</p>

Earth	<p>I can name and describe the characteristics of the different layers of the Earth and explain how volcanoes change the Earth.</p> <p>I can describe and explain the properties of the sedimentary, metamorphic and sedimentary rocks</p> <p>I can describe and explain the rock cycle</p> <p>I can describe the characteristics of a star and relate our sun to other stars</p> <p>I can explain the concept of galaxies</p> <p>I can explain the effects of the Earth's motion</p> <p>I can recall a light year and explain what causes the appearance of the moon to change</p> <p>I can use models to explain ideas in science</p>
Earth 2	<p>I can describe the composition of the atmosphere</p> <p>I can identify the greenhouse gases and explain how carbon dioxide is released from the burning of fossil fuels</p> <p>I can describe the carbon cycle</p> <p>I can understand that human activities affect the carbon cycle and explain how this relates to carbon stores and carbon dioxide producers</p> <p>I can describe the effects of global warming, explaining the consequences of global warming and evaluate the arguments for human activities impacting global warming</p> <p>I can describe the resources that the Earth provides and how human activity can affect these resources</p>

	<p>I understand the importance of recycling whilst explaining the benefits and limitations of the recycling schemes</p> <p>I can understand how to extract metals based on their reactivity</p>
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Genes	<p>I know what continuous and discontinuous variation is and how I represent it graphically</p> <p>I understand that variation can be caused by inheritance or by the environment and the importance of variation on enabling a species to survive</p> <p>I can describe the main organs of the reproductive system including their functions in males and females leading onto causes of low fertility</p> <p>I know the changes that take place in boys and girls during puberty</p> <p>I know the stages of the menstrual cycle</p> <p>I know what fertilisation is and how the foetus develops</p> <p>I can understand the factors affecting a developing foetus and analyse advice given to pregnant women including concerns about smoking</p>
Genes 2	<p>I can describe and understand the importance of biodiversity</p>

I can identify what changes can cause a species to become extinct and the use of gene banks to try and preserve hereditary material

I can review and evaluate theories of what caused the extinction of the dinosaurs

I can describe where chromosomes are found and describe their links to genes and DNA

I can describe the structure of DNA

I can assess the work of Watson, Crick, Wilson and Franklin on DNA structure

I can explain the number of chromosomes in gametes and how genetic disorders may arise

I can understand and explain variation by inheritance and can describe how identical twins occur

I can use a model to represent inheritance and predict the likelihood of inheriting specific traits