fortismere **Science KS3 Curriculum Map 2021-22**

| Yr7 (KS3) | Topic Area | Knowledge that is taught | Examples of key compulsory practicals for students | Knowledge/Skills revisited and to be revisited | What does good look like? | Resources/support at home |
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| 1 | **Big Idea 3 Energy 1**<br>3.1 Energy Costs (sub-topic 1)<br><br>3.2 Energy Transfer and Conservation of energy (sub-topic 2) | 3.1<br>Calculating the costs (economic costs and health costs) of using the stored energy in food, fuels and natural resources.<br><br>3.2<br>The amount of energy in the Universe is the same but can be transferred from one energy store to another store in useful and unuseful ways. | **Practical: Food as fuel**<br>Compare the energy content of different foods<br><br>**Practical: Comparing efficiency of lamps**<br>Measure the energy dissipated as heat of different household bulbs. | Expected prior knowledge:<br>KS2<br>Y7<br>2.1 Potential difference and resistance<br>4.1 Sound<br>4.2 Light<br><br>Y8<br>3.3 Work<br>3.4 Heating and cooling<br>8.4 Digestion and Unhealthy diets<br><br>Y9 P3 Energy Resources<br><br>Maths skills at KS3 & GCSE - Rearranging of formulae<br>Efficiency Equation - Y10 GCSE P1.5 | Please see the published checklists at the beginning of each Big Idea.<br>For students to be assessed to have 'mastered' the curriculum they should be competent in the Know and Apply criteria of the curriculum.<br><br>Links:<br>Checklist 3.1<br>Checklist 3.2 | Kerboodle suite (online textbook and activities assigned by teacher)<br><br>BBC Bitesize KS3: https://www.bbc.co.uk/bitesize/topics/zc3g87h |
| 2 | **Big Idea 8 Organisms 1**<br>8.1 Movement<br><br>8.2 Cells | 8.1<br>The levels of organisation in a human body and how our joints and muscles work | **Required enquiry skill AT2: Producing and recording a clearly focused image of an object**<br>Examining plant and animal | Expected prior knowledge: knowledge:<br><br>To be revisited in:<br>Y7 | Links:<br>Checklist 8.1<br>Checklist 8.2 | BBC Bitesize: https://www.bbc.co.uk/bitesize/topics/znyycdm |

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| | | 8.2<br>The function and structure of animal and plant cells.<br>Comparing and explaining, using examples sampled and observed under microscope, the differences between specialised cells | cells by mounting tissue on a slide and observing under a microscope<br><br>**Project: Model of Specialised Cell**<br>Create a 3D model of a specialised cell. This should be in the style of a Science Museum display model including detailed explanations of the features and functions of a specialised cell. | 10.1 Human reproduction<br><br>Y8<br>8.3 Breathing<br>8.4 Digestion<br><br>Year 9 B1 Cell Structure and Transport | | |
| 3 | **Big Idea 5 Matter 1**<br>5.1 The Particle Model<br><br>5.2 Separating Mixtures | 5.1 Understand why different substances can be categorised as solid, liquid or gas; explain the properties of each state of matter and what happens when substances change from one state to another using the ideas of particles and energy<br><br>5.2 How can substances be separated from their solutions; what affects the solubility of a substance | **Required enquiry skill AT 1: Heat a measured volume of water until almost boiling, having selected and used appropriate equipment**<br>Making a prediction about diffusion and testing this prediction<br><br>**Required enquiry skill AT 3: Find out at regular intervals the temperature of water being heated and tabulate observations to reveal the pattern**<br>Which is the best temperature for making a | Expected prior knowledge:<br>KS2<br>Some materials will dissolve in liquid to form a solution; describe how to recover a substance from a solution; use knowledge of solids, liquids and gases to decide how mixtures might be separated, including filtering, sieving and evaporating; dissolving, mixing and changes of state are reversible<br><br>Knowledge revisited in: | Links:<br>Checklist 5.1<br>Checklist 5.2 | BBC Bitesize:<br>https://www.bbc.co.uk/bitesize/topics/z9r4jxs<br><br>https://www.bbc.co.uk/bitesize/topics/zkr4jxs<br><br>https://www.bbc.co.uk/bitesize/topics/zych6g8 |

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| | | | cup of tea?<br><br>**Required enquiry skill AT 4: Separate ingredients from mixtures using appropriate techniques such as evaporation, filtration, chromatography**<br>Separate sea water using appropriate separation techniques<br><br>**Practical**: **Distillation**<br>Separate ink and water by distillation<br>**Practical**: **Chromatography analysis of different colour inks**<br>Determine by chromatography which inks are solutes | Y7<br>6.1 Acids and Alkalis; making salts<br><br>Y8<br>3.4 Heating and Cooling<br>5.4 Periodic Table<br>8.2 Movement of substances<br>8.3 Gas exchange<br><br>Year 9 | | |
| 4 | **Forces 1**<br>1.1 Speed<br><br>1.2 Gravity | 1.1 Understand that the change in movement of an object requires force and that this force can be contact or non-contact; Calculate the resultant force on objects and predict the determine the motion of the object; explain how to tell the story of the motion of an object using the average speed equation and distance-time graphs | **Practical: Measuring force**<br>**Required enquiry skill AT 5: Measure the speed of a moving object using appropriate equipment**<br>Investigating the average speed of a trolley on a ramp | Expected prior knowledge: KS2 Forces and their effects.<br><br>Knowledge revisited in:<br>Y7<br>4.1 Waves: Speed of Sound and Light<br><br>7.2 Earth: Gravitational forces between planets | Links:<br>Checklist 1.1<br>Checklist 1.2 | BBC Bitesize: https://www.bbc.co.uk/bitesize/topics/z4brd2p |

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| | | 1.2 Understand that the gravitational force of weight acting on our bodies is the same force that acts on all the bodies in the Solar System and know how to calculate the weight of any object with mass | | Y8<br>Forces<br>1.3 Friction, Drag; Moments; Terminal Velocity<br><br>1.4 Pressure, force and area<br><br>24 Magnetism and magnetic fields<br><br>3.3 Energy: Work done by a force | | |
| 5 | **Big Idea 7 Earth 1**<br>7.1 Rocks<br><br>7.2 The Universe | 7.1<br>How we classify rocks<br>How materials are recycled in the rock cycle<br><br>7.2 Understanding the scale and size of our Solar System and galaxy; understanding how the movement of the Earth and Moon explains the seasons and the observations we make of the Sun and the night sky;<br>understanding why it is hotter in August than in December in Britain but the other way around in Australia;<br>Understanding that ideas about the Universe have | | Expected prior knowledge:<br>KS2: categorising materials based on their properties; the position and orbital movement of the Earth, Moon and Sun.<br><br>Rocks can be classified according to their properties<br>Properties of rocks depends on how they were formed<br>The Earth and other planets orbit the Sun<br>The Moon orbits the Earth, and other planets | Links:<br>Checklist 7.1<br>Checklist 7.2 | BBC Bitesize:<br>Rocks - https://www.bbc.co.uk/bitesize/topics/z3fv4wx<br><br>Space - https://www.bbc.co.uk/bitesize/topics/z8c9q6f |

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| | | changed based on new evidence. | | can have moons.<br>The Earth spins on its axis, which explains why we have day and night.<br>Light travels in straight lines and explains why shadows form.<br><br>Knowledge revisited in:<br>Y7<br>1.2 Gravity<br>4.2 Light (shadows Y6?)<br>Y8<br>7.4 Earth resources<br><br>GCSE<br>C14 EArth REsources<br>P16 Space (Separate Sciences) | | |
| 6 | **Big Idea 9 Ecosystems 1**<br>9.1 Interdependence<br>9.2 Plant Reproduction | 9.1 Understand competition for resources that occurs within the organisation of an ecosystem; understand how small changes, such as infection or human interference with the environment, can affect the populations of the ecosystem<br><br>9.2 Understand how wind and insect pollinated flowers reproduce by studying the steps of reproduction from | **Practical: Flower dissection**<br>Follow instructions to dissect a flower and examine the reproductive organs and features of a plant. | Expected prior knowledge:<br>Food chains show feeding relationships<br>Environments can change and may pose dangers to living things<br>Plants need light, space, water and minerals togrow<br>Many flowers reproduce by pollen transfer so seeds can be made. | Links:<br>Checklist 9.1<br>Checklist 9.2 | BBC Bitesize:<br>https://www.bbc.co.uk/bitesize/topics/zxhhvcw<br><br>https://www.bbc.co.uk/bitesize/topics/zhssgk7<br><br>Plants:<br>https://www.bbc.co.uk/bitesize/guides/zs7thyc/revision/1 |

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| | | pollination to fertilisation | | Y7<br>10.1 Variation<br><br>Y8<br>10.3 Evolution and natural selection<br><br>GCSE: | | |
| 7 | **Big Idea 4 Waves 1**<br>4.1 Sound<br><br>4.2 Light | 4.1 How do instruments create sounds? How do we hear those sounds? Understand how the frequency and wavelength are linked mathematically and apply the knowledge of skills of describing sound waves to explain how our ears distinguish between sounds by their pitch and volume.<br><br>4.2 Why does the lightning arrive before the thunder? Understand how we see luminous and non-luminous objects of different colours and how shadows cause eclipses; Understand that the wave model explains the behaviour of light when it is reflected by surfaces and refracted through transparent materials; understand how | 4.2.2; 4.2.3 Drawing Wave diagrams (reflection/refraction)<br><br>**Practical:** Investigating Reflection<br><br>**Practical:** Investigating Refraction<br><br>**Practical:** Modelling the Eye and the Camera | Expected prior knowledge:<br><br>How shadows form<br>Different thickness objects make different sounds<br><br>Work revisited in:<br>1.1 Speed<br><br>2.1 P.D. and resistance (microphones)<br><br>Y8<br>4.3 Wave effects and energy transfer<br>4.4 Wave properties and more detailed use of the wave(front) model<br><br>GCSE:<br>P12 Waves | Links:<br>Checklist 4.1<br>Checklist 4.2 | BBC Bitesize:<br>https://www.bbc.co.uk/bitesize/topics/zw982hv |

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| | | lenses can correct imperfect vision | | P13 Electromagnetic Specturm | | |
| 8 | **Big Idea 6 Reactions 1**<br>6.1 Acids and Alkalis<br><br>6.2 Metals and Non-metals | 6.1 Understand the difference between physical (change of state) and chemical changes (reactions); understand how to test and compare acids and alkalis (bases) and name some typical household examples; explain how salts can be formed during useful neutralisation reactions<br><br>6.2 Understand how bases and salts can be formed during the reactions of metals and non-metals; use established observed trends and the relative position in the reactivity series to predict whether reactions will take place and the likely products | **Required enquiry skill AT 6: Measure changes in the pH of solutions using indicators**<br>6.1.3 Measuring pH changes<br><br>**Required enquiry skill AT 7: Observe and investigate a range of chemical reactions using equipment appropriately**<br>6.2.6 Interpreting chemical reactions | Expected prior knowledge:<br><br>KS2<br>Some changes result in the formation of new materials, and that this kind of change is not usually reversible, eg. burning and the action of acid on bicarbonate of soda<br><br>Y8<br>6.3 and 6.4 Reactions | Links:<br>Checklist 6.1<br>Checklist 6.2 | BBC Bitesize:<br>https://www.bbc.co.uk/bitesize/topics/zn6hvcw<br><br>https://www.bbc.co.uk/bitesize/topics/zypsgk7 |

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| 9 | **Big Idea 2 Electromagnets**<br>2.1Potential Difference and Resistance<br>2.2 Current | 2.1 Understand that potential difference tells you about the force on the charges in a circuit and about how energy is transferred; state that current flows when there is a potential difference across a conductor; measure the potential difference and calculate the resistance of components in a variety of circuits, identifying patterns<br><br>2.2 Understand that current is a rate of flow of charged objects and happens because of a potential difference; be able to determine the current in a circuit using the resistance equation and measurement; understand how insulators become charged and how the discharge current can be hazardous | **Required enquiry skill AT 8: Build electrical circuits using various components and measure current and voltage using an ammeter and voltmeter**<br>Investigating the resistance of<br>conducting dough<br><br>**Required enquiry skill AT 9: Represent and interpret a range of simple circuit diagrams using appropriate symbols**<br>Should be a component of every electrical circuits practical in Years 7&8.<br><br>**Practical**: charging and discharging insulators and using a model to explain the observations. | Expected prior knowledge:<br><br>1.1 and 1.2 Non-contact forces<br><br>3.1 how electricity is generated and how we pay for it<br><br>Work revisited in:<br>Y8<br>2.3 Electromagnets and how to make them<br>2.4 Magnetism and fields<br><br>GCSE:<br>P4 Electric Circuits<br>P5 Electricity in the home | Links:<br>Checklist 2.1<br>Checklist 2.2 | BBC Bitesize:<br>https://www.bbc.co.uk/bitesize/topics/zgy39j6 |
| 10 | **Big Idea 10 Genes 1**<br>1.1 Variation<br>1.2 Human reproduction | 1.1 Observe categorise and analyse variation in populations and suggest how variations can be considered adaptations to the environment in an ecosystem | Collecting variation data (Tabulating, Recording, graph drawing) | Expected prior knowledge:<br><br>KS2<br>Describe: differences in the life cycles of mammal, amphibian, insect and bird; the life | Links:<br>Checklist 10.1<br>Checklist 10 .2 | BBC Bitesize:<br>https://www.bbc.co.uk/bitesize/topics/zybbkqt |

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| | | | | process of reproduction in some plants and animals<br>9.1 Ecosystems<br>Y8<br>10.3 Evolution and natural selection | | |

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| Yr8 (KS3) | Topic Area | Knowledge/Skills that are taught | Examples of key compulsory practicals for students (SE details) | Knowledge/Skills revisited and to be revisited | What does good look like? | Resources/support at home |
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| 1 | **Big Idea 3 Energy 2**<br>3.3 Work<br>3.4 Heating and Cooling | 3.1 Use work done = force x distance to compare the work done by different machines; explain using the application of W=fd and the conservation of energy how levers and pulleys can make a physical job easier.<br>3.2 Describe the ways that energy can be transferred using particle and wave models; explain how each energy transfer can be insulated and the importance of tis in our home. | **Class practical:** Students measure the time for their body heat to raise the temperature of a thermometer using choice of 3 different conduction materials (aluminium; cotton; polyester; wool)<br><br>**Class practical:** IR radiation absorption and boiling tubes painted silver/black | Expected prior knowledge:<br>Y7<br>4.2 light waves<br>5.1 the particle model and changing state<br><br>GCSE:<br>P1 Conservation of energy<br>P2 Heat transfer | Please see the published checklists at the beginning of each Big Idea.<br>For students to be assessed to have 'mastered' the curriculum they should be competent in the Know and Apply criteria of the curriculum.<br><br>Links:<br>Checklist 3.3<br>Checklist 3.4 | BBC Bitesize: https://www.bbc.co.uk/bitesize/topics/zc3g87h |
| 2 | **Big Idea 5 Matter 2**<br>5.3 Elements<br>5.4 Periodic Table | 5.3 Understand how substances are made of atoms and describe the difference between elements and compounds; describe the structure of polymers and their uses; know the relationship between the chemical formula of a substance and composition/ratio of atoms of the substance | **Teacher Demo:** Group 1 reactions (alkali metals)<br><br>**Class practical:** Identify trends and make predictions based on the some Group 7 (halogens) reactions. | Expected prior knowledge:<br>Y7<br>6.2 Metals and non-metals – reactions with acid/oxygen/water and displacement reactions<br><br>Knowledge revisited in:<br>Y8 7.3 Climate and impact | Links:<br>Checklist 5.3<br>Checklist 5.4 | BBC Bitesize: https://www.bbc.co.uk/bitesize/topics/zstp34j |

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| | | 5.4 Understand how the periodic table was created and the relationship between the position of the element and its properties; describe and explain the patterns of reactivity in key Groups (1, 7 and 0) and predict the products of reactions of those elements. | | on environment<br><br>GCSE:<br>C1 Atomic Structure<br>C2 The Periodic Table | | |
| 3 | **Big Idea 8 Organisms 2**<br>8.3 Breathing<br>8.4 Digestion | ***Recovery Curriculum*** *- Review and consolidation of Year 7 work on organ systems and specialised cells form respiratory system*<br>8.3 Understand the mechanisms for breathing and gas exchange; understand the effects of recreational drugs, alcohol and smoking on the human body<br>8.4 Test common foods to identify the main food types and discuss what constitutes a healthy or unhealthy diet; understand the physical and chemical processes that take place in the digestive system of the human body that provide reactants for reactions such as respiration | **Required enquiry skill AT 10: Carry out practical procedures using instructions without guidance and in a calm fashion with due regard to the safety of others:** Testing foods for nutrients | Expected prior knowledge:<br>Y7<br>8.1 Skeletal structure and function<br>1.4 Pressure<br><br>Knowledge revisited in:<br>Y8<br>9.3 Respiration | Links:<br>Checklist 8.3<br>Checklist 8.4 | BBC Bitesize: https://www.bbc.co.uk/bitesize/topics/zvrrd2p |
| 4 | **Big Idea 7 Earth 2**<br>7.3 Climate<br>7.4 Earth resources | ***Recovery Curriculum*** *- Review and consolidate Year 7 work on structure of the Earth and properties of rocks*<br>7.3 Understand what global | **Class practical:** Thermal decomposition of carbonates<br><br>**Class practical:** | Expected prior knowledge:<br>Y7<br>5.4 Periodic Table | Links:<br>Checklist 7.3<br>Checklist 7.4 | BBC Bitesize: https://www.bbc.co.uk/bitesize/topics/z3fv4wx |

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| | | warming is and how the changing levels of greenhouse gases alongside humanity's disruption of the Carbon Cycle, affects the temperature of the Earth's atmosphere within a year and over the last 200 years; know the evidence and arguments used to link climate change to global warming and human behaviour<br>7.4 Understand the methods that extract useful, sometimes rare, elements are from ores and be able to explain the importance of recycling methods. | exothermic and endothermic reactions | Knowledge revisited in:<br>6.2 Metals and non-metals<br><br>GCSE:<br>C13 Our atmosphere<br>C14 The Earth's Resources | | https://www.bbc.co.uk/bitesize/topics/zgvbkqt |
| 5 | **Big Idea 1**<br>**Forces 2**<br>1.3 Contact and non-contact forces<br>1.4 Pressure | ***Recovery Curriculum*** *- Review and consolidation of Year 7 work on resultant forces*<br>1.3 Understand how friction and drag affect s resultant forces and motion, and how to reduce it when it is not useful; understand reaction forces and describe how forces can deform objects and determine based on experimental results whether objects obey Hooke's Law; use the principle of moments to explain why objects fall over and calculate the moment of forces on a lever or children's see-saw.<br><br>1.4 Be able to describe the cause | **Required enquiry skill AT 10: Carry out practical procedures using instructions without guidance and in a calm fashion with due regard to the safety of others:**<br>1.3.1 Investigating non-contact forces | Expected prior knowledge:<br>Y7<br>1.1 Resultant forces and balanced/unbalanced forces<br><br>Knowledge revisited in:<br>GCSE<br>P1 Work done against friction; calculating elastic potential energy<br>P10 Hooke's law and extension of objects<br>P14 Pressure in fluids | Links:<br>Checklist 1.3<br>Checklist 1.4 | BBC Bitesize:<br>https://www.bbc.co.uk/bitesize/topics/z4brd2p |

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| | | of pressure in fluids and how atmospheric pressure varies with altitude; understand how liquids can transmit pressure in a useful way; understand that pressure increase with depth and that this causes upthrust; explain what is meant by stress and how footwear or vehicles are adapted to minimise stress on surfaces<br><br>Both: Using pressure equations to fluid pressure on surfaces and stress pressure on solid surfaces | | | | |
| 6 | **Big Idea 9 Ecosystems 2**<br>9.3 Interdependence<br>9.4 Photosynthesis | 9.3 Describe the processes aerobic and anaerobic respiration transfer energy from food to be used for growth, movement and repair; understand how different exercises/activities will involve aerobic and anaerobic respiration; describe how the fermentation processes of making bread, beer and wine<br><br>9.4 Describe how plants produce food by photosynthesis and how the structure of a leaf is adapted for photosynthesis; investigate the limiting factors of photosynthesis and how farmers can maximise plant growth | | Expected prior knowledge:<br>Y7<br>8.2 Specialised plant cells (palisade)<br>6.1 Word equations<br><br>Knowledge revisited in:<br>GCSE<br>Photosynthesis and limiting factors; transpiration<br>Aerobic and anaerobic respiration processes | <u>Links:</u><br>Checklist 9.3<br>Checklist 9.4 | BBC Bitesize: |

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| 7 | **Big Idea 4 Waves 2**<br>4.3 Wave effects<br>4.4 Wave properties | ***Recovery Curriculum*** *- Review and consolidate Year 7 work on light and sound waves, particularly volume/amplitude and pitch/frequency of sound.*<br><br>4.3 describe how waves can transfer energy and how microphones detect sound waves; state what ultrasound is and how it is used in medicine and industries; describe the electromagnetic spectrum and relate uses and dangers to the energy of the wave<br><br>4.4 Use the wave model to: compare transverse and longitudinal waves; describe what happens when waves reach a surface or boundary and when superimpose. | | Expected prior knowledge:<br>4.1 Sound - wavelength and frequency<br>4.2 Light - reflection and refraction<br>1.1 Calculating speed<br><br>Revisited in:<br>GCSE<br>P12 Wave properties<br>P13 Electromagnetic spectrum<br>P14 Light | Links:<br>Checklist 4.3<br>Checklist 4.4 | BBC Bitesize:<br>https://www.bbc.co.uk/bitesize/topics/zw982hv |
| 8 | **Big Idea 10 Genes 2**<br>10.3 Variation<br>10.4 Human reproduction | ***Recovery Curriculum*** *- Review and consolidate Year 7 work on adaptations to habitat environment.*<br><br>10.3 With reference to examples such as the peppered moth and Darwin's finches, describe the theory of natural selection and evaluate the evidence for natural selection the process of | | Expected prior knowledge:<br>Y7:<br>9.1 Ecosystems – competition<br>10.1 Variation and adapting to change<br>10.2 Fertilisation<br><br>Knowledge revisited in:<br>GCSE | Links:<br>Checklist 10.3<br>Checklist 10.4 | BBC Bitesize:<br>https://www.bbc.co.uk/bitesize/topics/z6pp34j/resources/1 |

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| | | evolution; explain how extinction can occur and describe humanity's interference in ecosystems has endangered some species and how we can preserve biodiversity in other endangered species.<br><br>10.4 Describe the relationship between genes, chromosomes and DNA and how DNA structure was discovered; explain how characteristics are inherited and predict the probability of specific characteristics, such as eye colour, being inherited by offspring; describe, ising examples of plants and/or animals, how a product is genetically modified and the potential advantages. | | DNAand the cause of variation<br>Genetic modification<br>Environmental changes and the impact humans have on biodiversity | | |
| 9 | **Big Idea 6 Reactions 2**<br>6.3 Types of reaction<br>6.4 Chemical energy | 6.3 Describing chemical reactions in terms of atomic models and predicting the products of reactions such as combustion and thermal decomposition; use the law of conservation of mass to explain observations and calculate the mass of reactants and products; write balanced symbol equations for chemical reactions | Practical: Displacement reaction patterns nd trends | Expected prior knowledge:<br>Y7<br>6.2 Metals and non-metals<br>Y8<br>Climate – burning reactions impact on environment<br><br>Knowledge revisited in:<br>GCSE | Links:<br>Checklist 6.3<br>Checklist 6.4 | BBC Bitesize:<br>https://www.bbc.co.uk/bitesize/topics/zypsgk7 |

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| | | 6.4 Explain exothermic and endothermic reactions with reference to bond energies and represent the reactions using energy level diagrams | | Broad range of chemistry topics | | |
| 10 | **Big Idea 2 Electromagnets 2**<br>2.3 Magnetism<br>2.4 Electromagnetism | 2.3 Describe how magnets interact and use magnetic field models to explain strength of fields and observations about the Earth's magnetic field<br><br>2.4 Constructing and investigating the strength of electromagnets; describing how electromagnetic devices such as bells an loudspeakers work. | **Required enquiry skill AT 10: Carry out practical procedures using instructions without guidance and in a calm fashion with due regard to the safety of others:**<br>All practicals in topic<br><br>**Full investigation:**<br>What affects the strength of an electromagnet? | Expected prior knowledge:<br><br>KS2<br>Magnets attract and repel; some materials are magnetic<br>1.3 Non-contact forces<br>2.2 Current behaviour<br><br>Knowledge revisited in:<br>GCSE<br>P15 Electromagnetism<br>How DC motors work; electromagnetic induction in generators and transformers | Links:<br>Checklist 2.3<br>Checklist 2.4 | BBC Bitesize:<br>https://www.bbc.co.uk/bitesize/topics/zrvbkqt |
| | Disease and Immunity | TBC | TBC | TBC | | |

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| Yr9 | Topic Area | Key knowledge/skills (what has to be learnt) | Examples of required practicals for students | Knowledge/Skills revisited and to be revisited | What does good look like? | Resources/support at home |
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| B1 | Cell structure and transport | What can be seen under a light and an electron microscope and how to calculate magnification.<br><br>The similarities and differences between prokaryotic and eukaryotic cells and orders of magnitude.<br><br>How cells differentiate to form specialised cells.<br><br>How the structure of different types of animal and plant cells relates to their function.<br><br>The roles of osmosis and active transport in the movement of materials in and between cells.<br><br>How the surface area to volume ratio varies according the size of an organism. How to calculate surface area to volume ratio.<br><br>Why large multicellular organisms need special systems for exchanging materials with the environment. | Required practical: Looking at cells<br><br>Required practical: Investigating osmosis in plant cells | KS3 Revisited content: 8.2 Cells: observing cells, plant and animal cells, movement of cells. | Please see the published checklists on the website.<br>For students to be assessed as having 'mastered' the curriculum they should be competent in the Aiming for 6 criteria. Students who have progressed beyond mastery are competent in many aspects of the Aiming for 8 criteria. | Kerboodle suite (online textbook and activities assigned by teacher)<br><br>BBC Bitesize KS3: https://www.bbc.co.uk/bitesize/topics/zc3g87h |

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| B2 | Cell division | The role of chromosomes in cells and the importance of the cell cycle.<br><br>The type of cell division that forms the gametes and the way normal body cells grow and divide.<br><br>How cell differentiation varies in animals and plants.<br><br>The production and use of plant clones.<br><br>What stem cells are and how treatment with them may be used to treat people with different medical conditions. Potential benefits, risks, social and ethical issues in the use of stem cells in medical research and treatments. | | KS3 Revisited content: 8.2.3 Specialised cells | | Kerboodle<br>Google classroom<br>BBC Bitesize<br>My GCSE Science |
| B3 | Organisation and the digestive system | How specialised cells are organised into tissues and how several tissues work together to form an organ.<br><br>The importance of the digestive system and the position of the main organs.<br><br>The basic structure of carbohydrates, proteins and lipids.<br><br>How enzymes work as biological catalysts. The way the structure of | Required practical: Food tests<br><br>Required practical: The effect of pH on the rate of reaction of amylase | KS3 Revisited content: 8.4 Nutrients, food tests, digestive system, bacteria and enzymes in digestion. | | Kerboodle<br>Google classroom<br>BBC Bitesize<br>My GCSE Science |

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| | | enzymes is related to their function. The factors that affect enzyme action. The roles played by different digestive enzymes in the body. How digestion is made more efficient. | | | | |
| B4 | Organising animals and plants | The structure and function of the human circulatory system. The role and components of blood. The structure and function of the different blood vessels and the heart. The way of solving problems with heart and blood supply to the heart.<br><br>The structure and function of the human gas exchange system. The adaptations of the alveoli of the lungs for effective gas exchange. The mechanisms of breathing. The importance of ventilating the lungs to maintain steep concentration gradients.<br><br>The tissues and organs in plants. The role of the leaf stomata in gas exchange in a plant. How evaporation and transpiration are controlled in plants. | | KS3 Revisited content: 8.3 Breathing and gas exchange.<br>9.4 Leaves | | Kerboodle<br>Google classroom<br>BBC Bitesize<br>My GCSE Science |
| B5 | Communicable disease | The role of bacteria, viruses, protists and bacteria in diseases. | | | | Kerboodle<br>Google classroom<br>BBC Bitesize |

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| | | How the human defense responses work. How your white blood cells protect you from disease. | | | | My GCSE Science |
| C1 | Atomic Structure | Understanding the key developments in our development of a model for the structure of the atom and how atoms bond to each other to form compounds.<br>Describing and explaining separation techniques. | | | | Kerboodle<br>Google classroom<br>BBC Bitesize |
| C2 | The Periodic Table | Understanding how the Periodic Table was developed based on the trends and patterns of reactions between elements.<br>Understanding how the properties of the different groups are related to their electronic structure with particular focus on groups 1 and 7. | Displacement Reactions | | | Kerboodle<br>Google classroom<br>BBC Bitesize |
| C3 | Structure and Bonding | Explaining the difference between metals and non-metals in terms of structure and bonding of atoms. | Cooling curves<br>Testing conductivity | | | Kerboodle<br>Google classroom<br>BBC Bitesize |
| P1 | Conservation and dissipation of energy | How to work out energy stored in a moving object or when it is lifted or stretched<br>How energy is stored and transferred and what happens afters it is used<br>How to compare machines and appliances in terms of their efficiency | | KS3 Revisited content: Food and fuels, energy and power, energy adds up, energy dissipation, work, energy and machines | | Kerboodle<br>Google classroom<br>BBC Bitesize |
| P2 | Energy transfer by heating | How energy is transferred by heating through conduction<br>How to work out the energy needed to heat an object | Determining the heat capacity of a metal<br>Testing sheets of materials as insulators | KS3 Revisited content: Energy and temperature, energy transfer: particles, | | Kerboodle<br>Google classroom<br>BBC Bitesize |

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| | | | | energy transfer: radiation and insulation | | |
| P3 | Energy resources | How to compare different renewable and non renewable energy resources<br>How the environment is affected by the use of different energy resources | | KS3 Revisited content: Energy resources | | Kerboodle<br>Google classroom<br>BBC Bitesize |
| P6 | Molecules and matter | How different states can be described using a particle model. How latent heat can be used to calculate the energy required for state change.<br>How the properties of pressure, volume and temperature are related in a gas. | Calculating density | KS3 Revisited content Energy transfer: particles | | Kerboodle<br>Google classroom<br>BBC Bitesize<br>My GCSE Science |