

Year 8: Curriculum Intent			
The intent of the Year 8 curriculum is to build on knowledge acquired in Year 7 and both broaden and deepen pupil knowledge in the different areas of science at the Kingsway school: • in Biology - Cells and Systems, Plants and the Environment, and Variation and Inheritance. • in Chemistry - Particles and Matter, Chemical reactions, and Earth and Atmosphere. • in Physics - Forces and Motion, Energy, and Waves. • and across all three sciences - how to Work Scientifically. Pupils will be taught key knowledge and skills in both theory and practical science. They will learn about the scientific method, how to keep safe and how to draw valid conclusions from data.			
Year 8 Biology Essential Knowledge Summary			
Schemata 1: Cells and Systems	Schemata 2: Cells and Systems	Schemata 3a: Plants and the environment	Schemata 3b: Cells and Systems
Composite Knowledge: Pupils will gain fundamental knowledge about diet and the human digestive system and how food can be tested experimentally. Component Knowledge: Foundational Knowledge: Declarative Knowledge: • Recall the components that make up a balanced diet. • Evaluate how different lifestyles • Recall issues related to unhealthy diets. • Label the parts of the digestive system. • Explain the structure and function of each part of the digestive system. • Describe the role of bacteria and enzymes in the digestive system. Procedural Knowledge: • Describe possible health effects of unbalanced diets from data provided. • Calculate food requirements for a healthy diet, using information provided. • Describe how organs and tissues involved in digestion are adapted for their role. • Describe the events that take place in order to turn a meal into simple food molecules inside a cell. Upper Hierarchical Knowledge • Critique claims for a food product or diet by analysing nutritional information. • Make deductions from medical symptoms showing problems with the digestive system. Working Scientifically Testing food for starch, proteins and glucose: • WSAN 1 make and record observations and measurements and present data using appropriate methods including tables with repeat measurements. Modelling the path of digestion from gum to bum: - WS5 make predictions using scientific knowledge and understanding Modelling the small intestine using visking tubing:	Composite Knowledge: Pupils will gain an understanding of the structure of the human body, the role of the respiratory system considering health implications. Component Knowledge: Foundational Knowledge: Declarative Knowledge: • Recall the parts of the skeletal system. • Describe the role of joints and muscles. • Recall the components of inhaled and exhaled air. • Recall the parts of the gas exchange system. • Define diffusion. • Define the process of respiration. • Recall the word equation for aerobic respiration. • Recall the products of anaerobic respiration. • Recall the word equation for anaerobic respiration. • Explain what an antagonistic muscle is. Procedural Knowledge: • Describe how parts of gas exchange system are adapted to their function. • Use word equations to describe aerobic and anaerobic respiration. • Explain how specific activities involve aerobic or anaerobic respiration. Upper Hierarchical Knowledge • Suggest how organisms living in different conditions use respiration to get their energy. • Describe similarities and differences between aerobic and anaerobic respiration. Working Scientifically Investigating antagonistic muscles in worms. • WSSK 3 select appropriate apparatus and techniques based on accuracy and precision for an investigation within the laboratory Investigating breathing rate- Huff and Puff investigation. • WSSK 2 identify independent, dependent and control variables and use these to plan and carry out a range of investigations to test a prediction, considering	Composite Knowledge: Pupils will gain an understanding of the process of photosynthesis that takes place in a plant and how the structure of the leaf is adapted to support this. Component Knowledge: Foundational Knowledge: Declarative Knowledge: • Recall where photosynthesis takes place in a plant. • Recall the function of the chloroplast. • Recall the products produced by photosynthesis • Recall the photosynthesis word equation. • Label the parts of a leaf. • Recall the minerals required by a plant for healthy growth. Procedural Knowledge: • Explain the function of the stomata in a leaf. • Describe ways in which plants obtain resources for photosynthesis. • Explain why other organisms are dependent on photosynthesis. • Sketch a line graph to show how the rate of photosynthesis is affected by changing conditions, including limiting factors. • Use a word equation to describe photosynthesis in plants and algae. Upper Hierarchical Knowledge • Suggest how particular conditions could affect plant growth. • Suggest reasons for particular adaptations of leaves, roots and stems. • Compare the movement of carbon dioxide and oxygen through stomata at different times of day. Working Scientifically Testing a leaf for starch: • WSAT 2 identify hazards and risks and suggest appropriate ways to reduce the risks. Investigating plant mass and gas exchange in a plant. (Washing line and vaseline): - WSSK 2 identify independent, dependent and control variables and use these to plan and carry out a range of investigations to	Composite Knowledge: Pupils will gain fundamental knowledge of how microbes cause disease, how disease can be prevented and how drugs affect the body. Component Knowledge: Foundational Knowledge: Declarative Knowledge: • Recall the difference between medicinal and recreational drugs. • State the 3 types of pathogens and give examples • State how the body prevents microbes from entering • Pupils will be able to identify uses of microbes in the real world Procedural Knowledge: • Describe the effect of alcohol and smoking on behaviour, health and the effect on conception and pregnancy. • Describe how communicable diseases can be spread • Explain how microbes cause illness. • Describe how the immune system and medical treatments prevent disease Upper Hierarchical Knowledge • Explain how recreational drugs might affect different body systems. • Explain how vaccinations prevent infections • Explain the role of anaerobic respiration in the production of beer and bread • Explain how white blood cells produce antibodies to fight off infection • Describe how antibiotic resistance develops due to the overuse of antibiotics Working Scientifically Fermentation of yeast: • WSAN 3 relate results to predictions and hypotheses, giving reasoned explanations, and identify further questions from their results Investigating the effect of washing your hands with soap: • WSSK 2 identify independent, dependent and control variables

- WSS make predictions using scientific knowledge and understanding RSE Link How to maintain healthy eating and the links between a poor diet and health risks, including tooth decay and cancer. Eating disorders (additional content).	repeatability and reproducibility within their plan. Investigating the effect of exercise on heart rate: WSAN 1 make and record observations and measurements and present data using appropriate methods including tables with repeat measurements Anaerobic respiration in yeast: WSSK 3 select appropriate apparatus and techniques based on accuracy and precision for an investigation within the laboratory RSE Link The characteristics of a healthy lifestyle, including physical activity and maintaining a healthy weight, including the links between an inactive lifestyle and ill health, including cancer and cardiovascular ill-health. Factual information about the prevalence and characteristics of more serious health conditions. Physical activity can promote wellbeing and combat stress.	test a prediction, considering repeatability and reproducibility within their plan. Investigating photosynthesis: Comparing different sizes of leaves and the production of oxygen: WSSK 3 select appropriate apparatus and techniques based on accuracy and precision for an investigation within the laboratory	and use these to plan and carry out a range of investigations to test a prediction, considering repeatability and reproducibility within their plan. RSE Link How the different sexually transmitted infections (STIs), including HIV/AIDs, are transmitted, how risk can be reduced through safer sex (including through condom use) and the importance of and facts about testing. The prevalence of STIs, the impact they can have on those who contract them and key facts about treatment. How the use of alcohol and drugs can lead people to take risks in their sexual behaviour. The facts about which drugs are illegal, the risks of taking illegal drugs, and potential health implications including the link to mental health. The law relating to the supply and possession of illegal substances. The physical and psychological risks associated with alcohol consumption and what constitutes low risk alcohol consumption in adulthood. The physical and psychological consequences of addiction, including alcohol dependency. The dangers of drugs which are prescribed but still present serious health risks. The facts about the multiple serious harms from smoking tobacco (particularly the link to lung cancer), the benefits of quitting and how to access support to do so. The facts about the risks of nicotine and non-nicotine vaping, including potential harm to the developing adolescent brain. Personal hygiene, germs including bacteria, viruses, how they are spread, treatment and prevention of infection, and about antibiotics. The facts and science relating to immunisation, vaccination and antimicrobial resistance.
Year 8 (biology) Final Composite Knowledge End Point			
- Recall the parts of a balanced diet. - Describe the journey of food along the digestive system. - Describe how villi in the small intestine is adapted to it’s function. - Describe how enzymes break down food in simple steps. - Explain the importance of bacteria in breaking down food. - Define diffusion - Label the parts of the breathing system - Recall the aerobic word equation - Recall the anaerobic word equation. - Label joints, ligaments, muscles and bone on a given diagram. - Define an antagonistic muscle. - Recall the function of the chloroplast.			

- Recall the photosynthesis equation. - Describe the optimum conditions needed for photosynthesis. - Label the structure of a leaf. - Describe how smoking and alcohol affects human behaviour and the effect on conception and pregnancy. - Recall the difference between medicinal and recreational drugs. - State the 3 types of pathogens and give examples - State how the body prevents microbes from entering - Recall 3 uses of microbes.	
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Year 8 Chemistry Essential Knowledge Summary		
Schemata 1: Earth and Atmosphere 1	Schemata 2: Particles and Matter	Schemata 3: Earth and Atmosphere 2
Composite Knowledge: Pupils will learn how the earth is structured and how the atmosphere evolved. Pupils will link increasing levels of carbon dioxide to the greenhouse effect and climate change Component Knowledge: Foundational Knowledge: Declarative Knowledge: - the composition of the Earth - the composition of the atmosphere - the rock cycle and the formation of igneous, sedimentary and metamorphic rocks - the carbon cycle - the production of carbon dioxide by human activity and the impact on climate. - properties of ceramics, polymers and composites (qualitative).. Procedural Knowledge: - Compare the different layers of the Earth in terms of their properties - Testing the properties of all three types of rock - Testing the properties of ceramics, polymers and composites - Investigating crystal formation of igneous rocks Upper Hierarchical Knowledge - Describe the composition of the atmosphere in terms of abundance of components. - Explain the properties of all types of rocks and how they're linked to their formation - Explain changes in the levels of carbon dioxide using stages of the carbon cycle - State the impacts of increasing carbon dioxide levels in the atmosphere. - Explain the properties of ceramics, polymers and composites Working Scientifically Igneous rock crystal formation experiment: WSSK 1 develop a line of enquiry based on observations of the real world, and make predictions based on their prior knowledge and scientific understanding comparing properties of rocks: WSAN 1 make and record observations and measurements and present data using appropriate methods including tables with repeat measurements	Composite Knowledge: Pupils learn the fundamentals of the periodic table and be able to start to use the periodic table to predict element properties Component Knowledge: Foundational Knowledge: Declarative Knowledge: - Differences between atoms, elements and compounds - chemical symbols and formulae for elements and compounds - the varying physical and chemical properties of different elements - the Periodic Table: periods and groups; metals and non-metals - how patterns in reactions can be predicted with reference to the Periodic Table - the principles underpinning the Mendeleev Periodic Table Procedural Knowledge: - Demo of alkali metal reactions - Investigating properties of elements, mixtures and compounds Upper Hierarchical Knowledge - explain why certain elements are used for a given role in terms of its properties and compare the properties and uses of different elements. - Differentiate elements from compounds when given names and properties. - Use particle diagrams to explain why a compound has different properties to the elements in it - explain how the position of an element in the periodic table can be used to predict its properties Working Scientifically Demo of alkali metals in water: WSAN 3 relate results to predictions and hypotheses, giving reasoned explanations, and identify further questions from their results metals and non metals: WSSK 1 develop a line of enquiry based on observations of the real world, and make predictions based on their prior knowledge and scientific understanding History and development of periodic table: WSAT 1 explain how scientific methods and theories have developed, as new evidence and ideas are taken into account by the scientific community (e.g. the development of the periodic table)	Composite Knowledge: Pupils will learn how the earth is structured and how the atmosphere evolved. Pupils will link increasing levels of carbon dioxide to the greenhouse effect and climate change Component Knowledge: Foundational Knowledge: Declarative Knowledge:. - properties of ceramics, - properties of polymers - Properties of composites (qualitative). - Recall the 8 planets in the solar system - Recall objects and entities found in the solar system - Recall the seasons on earth - Name the phases of the moon Procedural Knowledge: - Testing the properties of ceramics, polymers and composites - Explaining how we get summer and winter on earth - Ordering the size of objects in the universe - Describing night and day Upper Hierarchical Knowledge - Explain the properties of ceramics, polymers and composites - Explaining why we get phases of the moon - Describe the appearance of planets or moons from diagrams showing their position in relation to the Earth and Sun. - Explain why places on the Earth experience different daylight hours and amounts of sunlight during the year. - Describe how space exploration and observations of stars are affected by the scale of the universe. - Explain the choice of particular units for measuring distance Working Scientifically comparing data of planets: WSAN 1 make and record observations and measurements and present data using appropriate methods including tables with repeat measurements
Year 8 (Chemistry) Final Composite Knowledge End Point		
- Define Element, compound and mixtures - Know symbols for common elements on the periodic table - Know the difference between a period and group - Link Mendeleev's ideas to the modern periodic table - Use knowledge of the periodic table to make predictions about different elements. - Will have knowledge of displacement reactions - Know the properties of metals and non metals - Know what combustion and oxidation reactions are - Know and describe the layered structure of the earth - Know what sedimentary, igneous and metamorphic rocks are - Be able to carry out investigations into properties of different rocks.		

- Begin to explain how the earth's atmosphere has developed
- Know what the solar system consists of
- Order objects in size in our universe
- Know how we get night and day on the earth
- Know how we get seasons on earth
- Be able to explain why we see phases of the moon

Year 8 Physics Essential Knowledge Summary		
Schemata 1: Energy	Schemata 2: Forces & Motion	Schemata 3: Waves
Composite Knowledge: Pupils learn the fundamental parts of electricity (current, potential difference, resistance) and how they work together to produce energy changes. Component Knowledge: Foundational Knowledge: Declarative Knowledge: • Name / draw circuit symbols. • Define current and state how to measure it. • Define potential difference and state how to measure it. • State the difference between series and parallel circuits. Procedural Knowledge: • Measure current and potential difference. • Calculate resistance. • Predict the current in a circuit. • Predict the potential difference in a circuit Upper Hierarchical Knowledge • Use series and parallel circuit diagrams to predict current and potential difference. Working Scientifically Building circuits: • WSAN 1 make and record observations and measurements and present data using appropriate methods including tables with repeat measurements. • Investigating resistance of a wire	Composite Knowledge: Pupils will learn how magnets work and how they are used. Pupils will apply knowledge of particle theory to explain pressure and changes in density. Pupils will be able to calculate pressure and density using both primary and secondary data. Component Knowledge: Foundational Knowledge: Declarative Knowledge: • Draw magnetic fields. • Identify magnetic materials. • State useful features of an electromagnet. • Define pressure. • Describe the motion of particles in solids, liquids, and gases. • State the equation for density. Procedural Knowledge: • Describe how to change the strength of an electromagnet. • Describe how magnets and magnetic materials interact. • Calculate pressure. • Describe how the motion and energy of particles changes during changes of state. • Compare the density of different materials. Upper Hierarchical Knowledge • Link the features of an electromagnet to its properties. Working Scientifically Shape of magnetic field: • WSSK 3 select appropriate apparatus and techniques based on accuracy and precision for an investigation within the laboratory Strength of an electromagnet: • WSSK 2 identify independent, dependent and control variables and use these to plan and carry out a range of investigations to test a prediction, considering repeatability and reproducibility within their plan Calculate pressure: • WSAN 1 make and record observations and measurements and present data using appropriate methods including tables with repeat measurements Measuring density: • WSSK 3 select appropriate apparatus and techniques based on accuracy and precision for an investigation within the laboratory	Composite Knowledge: Pupils will learn how light waves travel and how light waves interact with matter. Component Knowledge: Foundational Knowledge: Declarative Knowledge: • Label a ray diagram. • Measure angles with a protractor. • State the law of reflection. • Define the terms: ‘transparent’, ‘translucent’ & ‘opaque’. • State the seven colours of the visible spectrum. • State the three primary colours of light. • State the three secondary colours of light. Procedural Knowledge: • Draw ray diagrams to show reflection and refraction. • Use ray diagrams to show how images are formed. • Explain why objects appear a particular colour in white light, in coloured light or when using a filter. Upper Hierarchical Knowledge • Gain knowledge of refraction to predict how lenses affect light. Working Scientifically Reflection & refraction: • WSAN 1 make and record observations and measurements and present data using appropriate methods including tables with repeat measurements
Year 8 (physics) Final Composite Knowledge End Point		
• Use measurements of current and potential difference to find the resistance of a component. • Explain how the shape of the magnetic field affects forces of attraction or repulsion. • Describe how magnetic fields interact. • Link features of an electromagnet to its properties. • Use knowledge of the arrangement and motion of particles in states of matter and during changes of state to properties of the material including density and pressure. • Use measurements to find the density of an object. • Use measurements to find the pressure exerted by an object. • Predict the current in series and parallel circuits • Predict the potential difference in series and parallel circuits. • Explain refraction and predict how lenses affect light using knowledge of refraction.		

- Explain the appearance of objects in different coloured light.