

Year 7: Curriculum Intent		
<p>The intent of the Year 7 curriculum is to build on knowledge acquired in Key Stage 2 and introduce pupils to the different areas of science at the Kingsway school:</p> <ul style="list-style-type: none">• 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. <p>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.</p>		
Year 7 Biology Essential Knowledge Summary		
Schemata 1: Cells and Systems	Schemata 2: Cells and Systems	Schemata 3: Plants and the environment
<p>Composite Knowledge: Pupils will gain a fundamental understanding of the structure of animal and plant cells, the structures they contain, the function of each of those parts and how they can look different as specialised cells.</p> <p>Component Knowledge: Foundational Knowledge: Declarative Knowledge:</p> <ul style="list-style-type: none">• Label the parts of an animal cell and explain what the parts do.• Label parts of a plant cell and explain what the parts do.• Recall given specialised cells.• Recall the hierarchy of organisation in multicellular organisms.• Label the parts of a light microscope• Define diffusion• Explain the difference between unicellular and multicellular organisms. <p>Procedural Knowledge:</p> <ul style="list-style-type: none">• Describe how to set up a light microscope to observe plant and animal cells.• Describe how to prepare a microscope slide• Follow a method to observe cells under the microscope to identify the different parts. <p>Upper Hierarchical Knowledge</p> <ul style="list-style-type: none">• Explain the similarities and differences of plant and animal cells.• Explain how specialised cells are adapted to perform certain functions.• Calculate magnification• Describe the process of diffusion and how gases move in and out of cells. <p>Working Scientifically Making a microscope slide: To make a specimen slide and observe under a light microscope.</p> <ul style="list-style-type: none">• WSAN 1 make and record observations and measurements and present data using appropriate methods including tables with repeat measurements. <p>Modelling diffusion: 1. Using skittles to model the movement of colour in water. 2. Agar Jelly and acid.</p> <ul style="list-style-type: none">• WSAN 1 make and record observations and measurements and present data using appropriate methods including tables with repeat measurements. <p>To be revisited in Year 9, to look at surface area to volume ratio and diffusion.</p> <p>Observing specimen under a microscope- Observe amoeba under the microscope. Making observational drawings.</p> <ul style="list-style-type: none">• WSAN 1 make and record observations and measurements and present data using appropriate methods including tables with repeat measurements.	<p>Composite Knowledge: Pupils will gain a fundamental understanding of the reproductive systems in humans.</p> <p>Component Knowledge: Foundational Knowledge: Declarative Knowledge:</p> <ul style="list-style-type: none">• Label the parts of the male reproductive system.• Label the parts of the female reproductive system.• Define puberty.• Define fertilisation and explain where it takes place.• Define the menstrual cycle.• Define gestation and birth <p>Procedural Knowledge:</p> <ul style="list-style-type: none">• Explain why the changes happen during puberty.• Describe the functions of different parts of the reproductive systems.• Explain what happens during the different stages of the menstrual cycle and why it happens.• Explain what fertilisation is and why it happens• Explain what is happening during the different stages of birth and why they happen .• Explain whether substances are passed from the mother to the foetus or not.• Use a diagram to show stages in development of a foetus from the production of sex cells to birth. <p>Upper Hierarchical Knowledge.</p> <ul style="list-style-type: none">• Explain why pregnancy is more or less likely at certain stages of the menstrual cycle.• Describe causes of low fertility in male and female reproductive systems. Identify key events on a diagram of the menstrual cycle.• Make deductions about how contraception and fertility treatments work.• Predict the effect of cigarettes, alcohol or drugs on the developing foetus. <p>Working Scientifically Interpretation of a graph detailing the menstrual cycle:</p> <ul style="list-style-type: none">• WS12 interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions. <p>RSE Link The main changes which take place in males and females, and the implications for emotional and physical health.</p> <p>The key facts about puberty, the changing adolescent body, including brain development.</p> <p>About menstrual and gynaecological health, including</p>	<p>Composite Knowledge: Pupils will gain a fundamental understanding of the reproductive system in plants and the interdependence within an ecosystem.</p> <p>Component Knowledge: Foundational Knowledge: Declarative Knowledge:</p> <ul style="list-style-type: none">• Recall that plants have adaptations to disperse seeds using wind, water or animals.• Identify parts of the flower and link their structure to their function.• Recall that plants reproduce sexually to produce seeds, which are formed following fertilisation in the ovary.• Recall that organisms in a food web (decomposers, producers and consumers) depend on each other for nutrients. So, a change in one population leads to changes in others.• Recall that the population of a species is affected by the number of its predators and prey, disease, pollution and competition between individuals for limited resources such as water and nutrients. <p>Procedural Knowledge:</p> <ul style="list-style-type: none">• Describe the main steps that take place when a plant reproduces successfully.• Suggest how a plant carried out seed dispersal based on the features of its fruit or seed.• Explain why seed dispersal is important to survival of the parent plant and its offspring.• Describe how a species’ population changes as its predator or prey population changes.• Explain effects of environmental changes and toxic materials on a species’ population.• Combine food chains to form a food web. Explain issues with human food supplies in terms of insect pollinators. <p>Upper Hierarchical Knowledge</p> <ul style="list-style-type: none">• Describe similarities and differences between the structures of wind pollinated and insect pollinated plants.• Suggest how plant breeders use knowledge of pollination to carry out selective breeding.• Develop an argument why a particular plant structure increases the likelihood of successful production of offspring.• Suggest what might happen when an unfamiliar species is introduced into a food web.• Develop an argument about how toxic substances can accumulate in human food.• Make a deduction based on data about what caused a change in the population of a species. <p>Working Scientifically Observing abiotic and biotic factors (Woodlice behaviour within a choice chamber):</p>

	<p>what is an average period, period problems such as premenstrual syndrome, heavy menstrual bleeding, endometriosis, and polycystic ovary syndrome (PCOS), and when to seek help from healthcare professionals.</p> <p>The facts about reproductive health, including fertility and menopause, and the potential impact of lifestyle on fertility for men and women.</p> <p>The facts about the full range of contraceptive choices, efficacy and options available.</p> <p>There are choices in relation to pregnancy. Pupils should be given medically and legally accurate and impartial information on all options, including keeping the baby, adoption, abortion and where to get further help.</p> <p>How to get further advice, including how and where to access confidential sexual and reproductive health advice and treatment.</p>	<p>WSAN 1 make and record observations and measurements and present data using appropriate methods including tables with repeat measurements select appropriate apparatus and techniques based on accuracy and precision for an investigation within the laboratory.</p> <p>Plant Dissection: Applying the understanding of the structure of a plant, to label a plant specimen:</p> <ul style="list-style-type: none">● WS8 make and record observations <p>Helicopter seed dispersal investigation:</p> <ul style="list-style-type: none">● WSAN 1 make and record observations and measurements and present data using appropriate methods including tables with repeat measurements. <p>The use of quadrats to estimate the abundance of plant species:</p> <p>WSSK 4 select and use appropriate apparatus and sampling techniques for field and laboratory work</p>
Year 7 (biology) Final Composite Knowledge End Point		
<ul style="list-style-type: none">● Label the structures found in animal and plant cells.● Explain the functions of the structures in animal and plant cells.● Compare the structures in animal and plant cells.● Explain how the roles of the specialised cells- sperm, egg, muscle, ciliated cells and how they are adapted to their function.● Label the parts of the male and female reproductive system.● Explain where fertilisation takes place in the female reproductive system and where a foetus develops.● Describe each stage of the menstrual cycle.● Label the parts of a plant.● Explain how reproduction takes place in a plant.● Interpret a food chain.● Interpret a food web.		

Year 7 Chemistry Essential Knowledge Summary		
Schemata 1: Particles and Matter 1	Schemata 2: Particles and Matter 2	Schemata 3: Chemical Reactions
<p>Composite Knowledge: Pupils will gain fundamental knowledge about particles and matter. They will be able to apply the particle model to explain or describe properties of different states of matter</p> <p>Component Knowledge:</p> <p>Foundational Knowledge:</p> <p>Declarative Knowledge:</p> <ul style="list-style-type: none">● Name the states of matter.● Give examples of solids, liquids and gases.● Know the of pure substance.● Name the different changes of state.● Draw particle arrangements of solids, liquids and gases <p>Procedural Knowledge:</p> <ul style="list-style-type: none">● Recognise changes of state from particle diagrams and be able to name changes of state from diagrams● Label a Bunsen burner● Describe how to turn a Bunsen burner on safely● Collect data from practical● Plot a graph● Draw before and after diagrams of particles to explain observations about changes of state, gas pressure and diffusion. <p>Upper Hierarchical Knowledge</p> <ul style="list-style-type: none">● Explain properties of different states of matter using the particle model. e.g why can gases be compressed● Define Brownian motion and diffusion and explain examples of diffusion using the particle model.● Explain unfamiliar observations about gas pressure in terms of particles.● Explain the properties of solids, liquids and gases based on the arrangement and movement of their particles.● Explain changes in states in terms of changes to the energy of particles.	<p>Composite Knowledge: Pupils will gain fundamental knowledge about particles and matter. They will be able to apply the particle model to explain or describe properties of different states of matter</p> <p>Component Knowledge:</p> <p>Foundational Knowledge:</p> <p>Declarative Knowledge:</p> <ul style="list-style-type: none">● Know the concept of pure substance.● Define filtration● Define Evaporation● Know what a mixture is● Define separation● Identify chromatography from a diagram● Define solute, solvent, solution and saturated solution <p>Procedural Knowledge:</p> <ul style="list-style-type: none">● Carry out simple separation techniques such as chromatography● Carry out filtration● Carry out evaporation <p>Upper Hierarchical Knowledge</p> <ul style="list-style-type: none">● Explain the process of distillation● Plan investigations into separation of: Sand and water Sand, water and salt● Explain how and why iron is separated from sulfur● Use evidence from chromatography to identify unknown substances in mixtures.● Choose the most suitable technique to separate out a mixture of substances.● Explain how temperature affects solubility <p>Working Scientifically</p> <p>Separating Mixtures (iron filings and sand)</p> <ul style="list-style-type: none">● WSSK 1 develop a line of enquiry based on observations of the real world, and make	<p>Composite Knowledge: Pupils will gain a fundamental understanding of the range of chemical reactions, chemical analysis and apply this to predict the products of a reaction.</p> <p>Component Knowledge:</p> <p>Foundational Knowledge:</p> <p>Declarative Knowledge:</p> <ul style="list-style-type: none">● Hazard symbols and their importance● defining acids and alkalis in terms of neutralisation reactions● Identifying household acids and alkalis● the pH scale for measuring acidity/alkalinity; and indicators● reactions of acids with alkalis to produce a salt plus water● displacement reactions● reactions of acids with metals to produce a salt plus hydrogen● the properties of metals and non-metals● the order of metals and carbon in the reactivity series <p>Procedural Knowledge:</p> <ul style="list-style-type: none">● Identify the hazards from a range of substances● Test and identify a range of household acids and alkalis● Use indicators and pH meter to identify substances● Make an indicator (red cabbage)● Make a salt● Use patterns of reactivity to make predictions for chemical reactions● Predict the formulae for products of reactions between acids and metals, or acids and bases● Describe in detail what happens to particles in a chemical reaction, compare and contrast

<p><u>Working Scientifically</u></p> <p>Boiling experiment:</p> <ul style="list-style-type: none"> ● WSAT 2 identify hazards and risks and suggest appropriate ways to reduce the risks <p>Modelling the Particle model</p> <ul style="list-style-type: none"> ● 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 	<p>predictions based on their prior knowledge and scientific understanding</p> <p>Separating mixtures (chromatography, filtration and evaporation):</p> <ul style="list-style-type: none"> ● WSSK 3 select appropriate apparatus and techniques based on accuracy and precision for an investigation within the laboratory 	<p>physical and chemical reactions</p> <p><u>Upper Hierarchical Knowledge</u></p> <ul style="list-style-type: none"> ● Offer suitable safety precautions when given a hazard ● Use a variety of indicators to measure acidity and alkalinity ● Categorise substances as strong or weak acids and alkalis using pH values ● Explain what salt formation displaces from the acid ● Predict the formulae for products of reactions between acids and metals, or acids and bases ● Describe combustion, thermal decomposition and oxidation, representing them as symbol equations ● Explain the link between the properties and uses of a metal to its position in the reactivity series ● Describe in detail what happens to particles in a chemical reaction, compare and contrast physical and chemical reactions ● Explain the differences in physical and chemical changes and categorise observations in terms of chemical reactions or physical changes <p><u>Working Scientifically</u></p> <p>Red cabbage indicator:</p> <p>House acids and alkalis:</p> <ul style="list-style-type: none"> ● WSAN 1 make and record observations and measurements and present data using appropriate methods including tables with repeat measurements <p>Properties of metals</p> <ul style="list-style-type: none"> ● WSSK 3 select appropriate apparatus and techniques based on accuracy and precision for an investigation within the laboratory <p>Reactivity of metals with acid:</p> <ul style="list-style-type: none"> ● 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 <p>Making salts</p> <p>WSSK 3 select appropriate apparatus and techniques based on accuracy and precision for an investigation within the laboratory</p>
<p><u>Year 7 (Chemistry) Final Composite Knowledge End Point</u></p> <ul style="list-style-type: none"> ● Name the states of matter and changes of state. ● Apply the particle model to explain or describe properties of different states of matter ● Be able to describe examples of the range of chemical reactions. Carry out various types of chemical analysis. ● Apply this to predict the products of a reaction. ● Collect data from practical ● Categorise substances as strong or weak acids and alkalis using pH values ● Predict the formulae for products of reactions between acids and metals, or acids and bases 		

Year 7 Physics Essential Knowledge Summary		
Schemata 1: Forces & Motion	Schemata 2: Energy	Schemata 3: Waves
<p><u>Composite Knowledge:</u> Pupils will gain fundamental knowledge about forces and forces affect motion. They will be able to use graphs to analyse motion and calculate speed.</p> <p><u>Component Knowledge:</u></p> <p><u>Foundational Knowledge:</u></p> <p>Declarative Knowledge:</p> <ul style="list-style-type: none"> ● What does a force cause ● State the difference between mass and weight. ● Examples of contact forces. ● Example of non-contact forces. ● The equation for speed. 	<p><u>Composite Knowledge:</u> Pupils will gain a fundamental understanding of energy stores and transfers and how energy is transferred by heating.</p> <p><u>Component Knowledge:</u></p> <p><u>Foundational Knowledge:</u></p> <p>Declarative Knowledge:</p> <ul style="list-style-type: none"> ● Name and describe energy stores. ● Name and describe energy transfers. ● Define conduction. ● Define convection. ● Define thermal radiation. ● State the law of conservation of energy. 	<p><u>Composite Knowledge:</u> Pupils will gain fundamental knowledge on the different types of waves; how sound waves travel and how sound waves interact with matter.</p> <p><u>Component Knowledge:</u></p> <p><u>Foundational Knowledge:</u></p> <p>Declarative Knowledge:</p> <ul style="list-style-type: none"> ● Name the types of waves. ● State how sound travels. ● State the human range of hearing. ● Define ultrasound. ● State uses of ultrasound. <p>Procedural Knowledge:</p>

<p>Procedural Knowledge:</p> <ul style="list-style-type: none">• Calculate the resultant force on an object• Calculate speed.• Calculate weight.• Draw free body diagrams.• Describe the motion from free body diagrams. <p>• Interpret distance/time graphs.</p> <p>Upper Hierarchical Knowledge</p> <ul style="list-style-type: none">• Analyse motion using a graph.• Manipulate the equation linking speed, distance, and time. <p>Working Scientifically</p> <p>Friction / drag experiment:</p> <ul style="list-style-type: none">• 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 <p>Distance/time graphs:</p> <ul style="list-style-type: none">• WSAN 2 use basic data analysis to calculate means, plot graphs with line of best fit and use this data to draw conclusions	<p>Procedural Knowledge:</p> <ul style="list-style-type: none">• Describe changes to energy stores.• Describe how to increase or decrease the transfer of energy by heating. <p>Upper Hierarchical Knowledge</p> <ul style="list-style-type: none">• Explain how an object reaches thermal equilibrium.• Explain energy transfers. <p>Working Scientifically</p> <p>Energy in food experiment:</p> <ul style="list-style-type: none">• WSSK 3 select appropriate apparatus and techniques based on accuracy and precision for an investigation within the laboratory <p>Conduction (demo – metal rod):</p> <ul style="list-style-type: none">• WSAN 3 relate results to predictions and hypotheses, giving reasoned explanations, and identify further questions from their results <p>Convection (demo – convection current):</p> <ul style="list-style-type: none">• WSAN 3 relate results to predictions and hypotheses, giving reasoned explanations, and identify further questions from their results <p>Radiation / colour:</p> <ul style="list-style-type: none">• WSAN 1 make and record observations and measurements and present data using appropriate methods including tables with repeat measurements	<ul style="list-style-type: none">• Compare types of waves.• Use the terms pitch and volume to describe sounds.• Interpret oscilloscope traces. <p>Upper Hierarchical Knowledge</p> <ul style="list-style-type: none">• Link the properties of a wave to frequency, wavelength and amplitude. <p>Working Scientifically</p> <p>Human range of hearing:</p> <ul style="list-style-type: none">• WSAN 4 evaluate the reliability of methods and data, suggesting possible improvements for the method to minimize sources of random and systematic error
<p>Year 7 (physics) Final Composite Knowledge End Point</p>		
<ul style="list-style-type: none">• Describe and give examples of forces and state how forces affect motion.• Analyse motion graphs and discuss the forces involved and they affect motion.• Calculate speed, distance or time using the relevant equation.• Name and give examples of energy stores & transfers and describe simple energy transfers.• Describe how energy is transferred by heating.• Name and give examples of different types of waves.• Describe how sound waves travel and how they interact with matter.		