

Long Term Plan – Key Stage 3 - Science

The intent of Key Stage 3 Science is to develop students' scientific knowledge, literacy and problem solving ability. This course will foster a spirit of independent inquiry, nurture curiosity, and bring current real world science into the classroom. Key Stage 3 Science will encourage a culture of questioning, and feed the natural inquisitiveness of students. It will develop an awareness of the social, economic and environmental implications of Science which will enable students to contribute positively to society. Students will examine a wealth of scientific concepts, both theoretically and through investigations, in order formulate conclusions and evaluate processes. This course will introduce a variety of data collection and analytic tools through practical investigation. Finally, the course will build cultural capital through external providers and visits to various science museums. Students will develop their knowledge and skills to expand the SMSC provision at Nightingale, and represent student voice through STEM Ambassadors.

Year 7

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<p>Introduction to Science Biology: Movement</p> <ul style="list-style-type: none"> • Introduction to the laboratory • Develop understanding of scientific investigation • Describe the structure and function of joints, muscles and the skeleton 	<p>Biology: Cells, tissues, organs & systems Chemistry: Particle models</p> <ul style="list-style-type: none"> • Describe, Draw, label and compare various cells • Understanding multi-cellular organisms and organ systems • Comparing uni-cellular organisms' functions vs, multi-cellular organisms, • Using the particle model to understand energy • Explain changes of state involving solids and liquids, gas pressure and diffusion. 	<p>Chemistry: Metals/ Non Metals Physics: Light; The Universe</p> <ul style="list-style-type: none"> • Describe differences in physical properties between typical metal and non-metal oxides. • Describing and writing word equations for reactions of metals • Ordering metals by their reactivity. • Recognising light as a form of energy store and describe its properties • Investigate reflection and refraction using different surfaces and lens • Name the parts of the eye and describe how lenses may be used to improve vision. • Use filters and light to determine colour mixing 	<p>Biology: Interdependence & plant reproduction Physics: Voltage & Resistance; Current</p> <ul style="list-style-type: none"> • Explain effects of environmental changes and toxic materials on a species' population. • Describe ways in which organisms affect the habitat and communities • Explain issues with human food supplies in terms of insect pollinators. • Using models to explain potential difference • Calculating resistance • Investigate the functions and components of circuits • Using physical models to explain circuits 	<p>Chemistry: Earth Structure Physics: Sound</p> <ul style="list-style-type: none"> • Describe properties and structure of various rock types • Describe the rock cycle • Explain how night and day and seasons occur • Explain how sound is made and how it is amplified • Understanding how sound is formed and travels and represent changes in sound using wave diagrams 	<p>Biology: Reproduction in Animals Physics: Energy Sources</p> <ul style="list-style-type: none"> • Labelling the main parts of male and female reproductive systems and their functions • Explain how the sperm and egg are adapted to their functions • Describe fertilisation and how sexual intercourse leads to fertilisation and implantation • Explain how a pregnant woman cares for her foetus • Describe and what happens during adolescence. • Recognising how bodies use energy we get from food • Explain how energy is stored in the body

Year 8

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<p>Biology: Food & Nutrition Chemistry: The Periodic Table</p> <ul style="list-style-type: none"> Describe the importance of a balanced diet and the parts and functioning of the digestive system Explain how diffusion enables absorption by small intestines Describe Dalton's Atomic theory Introduction to the Periodic Table Describe how the periodic table was made and Understanding the properties of the 3 main groups of elements Distinguish between elements, mixtures, and compounds 	<p>Chemistry: Metals and Acids Physics: Light</p> <ul style="list-style-type: none"> Name and investigate properties and reactions of everyday and laboratory acids and alkalis Making predictions and writing word equations for reactions with acids Comparing light and sound waves Investigating colour mixing and the properties of light, Using ray diagrams Comparing parts of a camera and the eye and state their functions 	<p>Physics: Energy Biology: Adaptation & Inheritance</p> <ul style="list-style-type: none"> Understanding different types of reactions Using word equations to model combustion reactions Defining and differentiating between work, energy, temperature and power Investigating and interpreting data on energy Describing energy transfers Introduction to Adaptation and Inheritance Describing how organisms adapt to their environment Understanding environmental changes on species variation Comparing environmental and inherited variation; continuous and discontinuous variation Describing factors which lead to extinction 	<p>Physics: Electricity & Magnetism Chemistry: Separation Techniques</p> <ul style="list-style-type: none"> Measuring potential difference Review on circuit components Comparing conductors and insulators Distinguishing pure substances and mixtures Using particle model to describe solutions and solubility Applying and justifying knowledge of chromatography, evaporation, distillation and filtration to select methods of separation 	<p>Biology: Lifestyle and Ecosystem processes</p> <ul style="list-style-type: none"> State some effects of alcohol tobacco and drugs on health Describe how alcohol and drugs affect social activities Explore concepts of respiration and photosynthesis using word equations Compare the structures of leaves and the lungs as well as their adaptations Construct and describe food chains and food webs Describe how different organisms compete and co – exist in an ecosystem 	<p>Physics: Motion & Pressure Chemistry: The Earth</p> <ul style="list-style-type: none"> Describe speed and the quantitative relationship between average speed, distance and time Represent a journey on a distance-time graph Describing the functions of atmospheric pressure Explain and apply knowledge about pressure in solids and Name the main components of the atmosphere Differentiate between sedimentary, metamorphic and igneous rocks Describe the rock and carbon cycles Discuss the impacts of climate change. Analyse the advantages and disadvantages of recycling

Year 9

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<p>Biology: The human body</p> <ul style="list-style-type: none"> • Understanding cell organelles and their functions • Compare the similarities and differences between plant and animal cells • Understanding cells as the fundamental unit of living organisms • Observe, interpret and record cell structures using a light microscope • Investigate pulse rate • Describe how vaccination works 	<p>Chemistry: Elements Mixtures and Compounds</p> <ul style="list-style-type: none"> • Distinguishing atoms, elements and compounds • Recognise chemical symbols and formulae for elements and compounds • State the law of conservation of mass • Describe changes of state and chemical reactions. • Review the history of the Periodic Table • Describing the Periodic Table: periods and groups; metals and non-metals • Investigating the patterns in reactions and predict reactivity 	<p>Physics: Energy, forces and the structure of Matter</p> <ul style="list-style-type: none"> • Describe changes in energy stores and conservation • Distinguish between renewable and non-renewable energy sources • Define and differentiate between force, work done, energy and power • Investigate and calculate speed acceleration and friction • Explain the three types of ionising radiation 	<p>Biology: Environment, evolution & inheritance</p> <ul style="list-style-type: none"> • Explore concepts of processes of photosynthesis using word equations • Suggest some factors that decrease biodiversity • Differentiate between dominant and recessive alleles, heterozygous and homozygous • Use a Punnett square to show a genetic cross 	<p>Chemistry: Chemistry in our World</p> <ul style="list-style-type: none"> • Investigating the properties and reactions of acids and alkalis with word equations • Investigate factors which affect rate of reaction • Describe how the earth's atmosphere has evolved over time • Explaining the Greenhouse Effect • Describe ways of distilling water • Investigate the amount of dissolved salts in different water samples 	<p>Physics: Electricity Magnetism & Waves</p> <ul style="list-style-type: none"> • Describe the difference between alternating and direct current • Calculate the power of an appliance • Examine concepts of magnets and electro magnets • Distinguish between transverse and longitudinal waves • Calculate speed using the wave equation • Calculate density