Saint Michael's CE High School
A Church of England Academy
Therefore, choose

YEAR 10 SCIENCE 2023-2024

YEAR	TRINITY 2	MICHAELMAS 1	MICHAELMAS 2	LENT 1	LENT 2	TRINITY 1
10	**Big Idea: Energy** **Energy** In this unit pupils will learn how to calculate the amount of energy in kinetic stores, gravitational stores, elastic stores and thermal stores. They will also learn about work done, power and how these link to energy. **Big Idea: Organisms** **Organisation in plants** Pupils will learn about the structure of plants and the movement of substances through transpiration and translocation. **Big Idea: Organisms** **Infection and Response** In this unit pupils will learn about the different types of pathogens, how diseases are spread and how this can be prevented. Pupils will also learn about the different causes and treatment of diseases in humans before learning about vaccinations, antibiotics, painkillers and antibiotic resistance. They will also learn about new drugs are developed and the testing process.	**Big Idea: Matter** **Particle Model** In this unit pupils will learn about the arrangement of particles in different states and how this links to density, how to calculate the density of regular an irregular objects. Pupils will also learn about the changes of state, the changes in internal energy when these occur, specific latent heat and gas pressure. **Big Idea: Ecosystems** **Bioenergetics** In this unit pupils will learn about the process of photosynthesis, factors affecting the rate of photosynthesis and limiting factors. Pupils will also learn about the uses of glucose in plants, how to test for the presence of starch and how we can manipulate photosynthesis in greenhouses. They will also learn about aerobic respiration, anaerobic respiration, effects of exercise on respiration and metabolism.	**Big Idea: Matter** **Atomic Structure** In this unit pupils will learn about the structure of the atom, the development of the atomic model, types of radioactivity and their properties, decay equations and half-life. They will also learn about irradiation and contamination of materials and how to dispose of radioactive substances safely. **Big Idea: Reactions** **Chemical Changes and Energy Changes** In this unit pupils will learn about the reactions of metals, metal compounds and how the reactivity series can be used to determine how to extract metals. Pupils will represent chemical reactions using word, symbol and half-equations. They will also learn about the reactions of acids, the pH scale, neutralisation, making salts, strong and weak acids and pH concentration. They will also learn about the process of electrolysis of molten and aqueous solutions.	**Big Idea: Electromagnetism** **Electricity** In this unit pupils will learn about series and parallel circuits, charge, current and potential difference. They will also learn about resistance, Ohm's law, the relationship between current and potential difference in resistors, filament lamps and diodes. Pupils will also learn about resistance in series and parallel circuits as well as special resistors like LDRs and thermistors. Pupils will learn about AC and DC current, wiring a plug, mains electricity and the National Grid. They will also learn about calculating the energy transfer and power in circuits. **Big Idea: Reactions** **Quantitative Chemistry** In this unit pupils will learn about how to use chemical quantities including relative masses, percentage by mass, moles, reacting masses, limiting reactants and concentration of solutions. Pupils will also learn about the importance of conservation of mass.	**Big Idea: Forces** **Forces** In this unit pupils will learn about scalar and vector quantities, interaction of forces, resultant forces and how to determine the overall resultant force. Pupils will also learn about acceleration, interpretation of distance time graphs and velocity time graphs, Newton's second law and terminal velocity, reaction times, stopping distances and momentum. They will also learn about forces and elasticity and investigate Hooke's law.	**Big Idea: Organisms** **Homeostasis and Response** In this unit pupils will learn about the process of homeostasis, the responses from the nervous system including reflex actions and effects on reaction times. Pupils will also learn about the endocrine systems and the different hormones involved in controlling blood sugar levels, the menstrual cycles and in fertility treatments. **Big Idea: Reactions** **Rate and Extent of Reactions** In this unit pupils will learn about how to identify the rate of reaction from experimental data and graphs. They will also learn about the factors that affect the rate of reaction (temperature, concentration, pressure, surface area, catalysts) and link them to the collision theory. Pupils will also learn about reversible reactions, dynamic equilibrium and how to alter the conditions to maximise yield of products

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