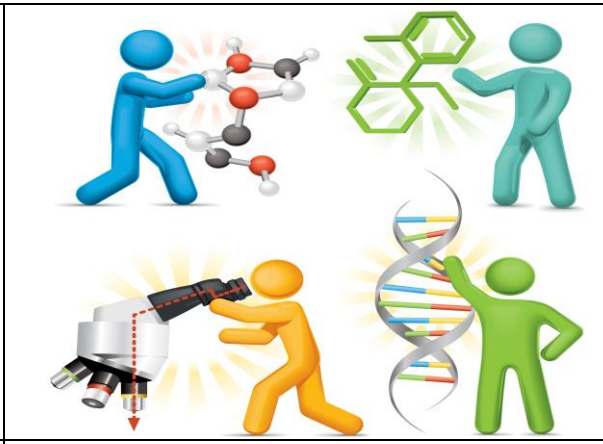
St Richard Reynolds Catholic High School

SUBJECT: Science **YEAR GROUP: 10** **TOPICS COVERED** **Biology:** Cells, Organisation, Infection and response, Bioenergetics **Chemistry:** Atomic structure and the periodic table, Bonding, structure and the properties of matter, Quantitative chemistry, Chemical changes, Energy changes **Physics:** Forces, Energy, Waves, Electricity	
PROGRAMME OF STUDY	**METHOD OF ASSESSMENT**
<u>Autumn Term:</u> **Atomic structure and the periodic table:** The structure of an atom, Elements and compounds, Mixtures and methods of separating mixtures, Electronic configuration, Isotopes, The history of an atom, The history of the periodic table, Properties of group 8 (0) elements, Properties of group 7 elements, Properties of group 1 elements. **Bonding, structure and the properties of matter:** Ionic bonding and properties of ionic compounds, Simple covalent (molecular) and properties of molecular substances, Giant covalent structures including diamond, graphite, silica, graphene and fullerenes, Polymers, Nanoscience and nanoparticles, Metallic bonding and properties of metallic substances, The three sates of matter, Required practical **Cells:** Animal and plant cells, Specialised cells and cell differentiation, Stem cells, Bacterial cells, Eukaryotic and Prokaryotic cells, Microscopy (light and electron microscope), Cell division – mitosis, Chromosomes, Diffusion, Osmosis, Plant organs and plant tissues, Active transport, Plant transport systems, Required practical.	End of topic test after each unit Practical skills assessment in class Assessed HW tasks

Organisation: The human digestive system, Properties of enzymes, Required practical, Human digestive enzymes, The heart and blood vessels, The structure and function of arteries, veins and capillaries, Coronary heart disease, Blood, Communicable and non-communicable diseases and their effect on lifestyle, cancers. **Forces:** Scalar and vector quantities, Contact and non-contact forces, Weight and gravitational fields, Resultant forces and free body diagrams, Work done and energy transfers, Elastic and inelastic deformation, Hooke's law, Work done in stretching springs	
<u>Spring Term</u> **Forces:** Distance and displacement, Speed, Distance time graphs, Velocity, Acceleration, Velocity-time graphs, Newton's 1st, 2nd and 3rd law, Inertial mass, Thinking distance, breaking distance, stopping distance, Momentum and conservation, required practical **Infection and response:** Communicable diseases, Pathogens, Viruses, bacteria, AIDS, HIV, Malaria, Human defence systems, Vaccinations, Antibiotics, Painkillers, Discovery and development of drugs, Required practical **Quantitative chemistry:** The law of conservation of mass, The relative formula mass, Mole (HT only), Calculation of the masses of reactants and products from balanced symbol equations (HT only), Required practical **Energy changes**: Exothermic and endothermic reactions, Bond breaking and bond forming, Required practicals. **Waves:** Transverse and longitudinal waves, Properties of waves, Earthquakes, The electromagnetic spectrum, The properties of electromagnetic waves, radio waves and electrical circuits, uses of electromagnetic waves.	End of topic test after each unit Practical skills assessment in class Assessed HW tasks

Summer Term

Bioenergetics: Photosynthesis, Rate of photosynthesis, Use of glucose, Aerobic respiration, Anaerobic respiration, Response to exercise, Metabolism
Chemical changes

Energy: Energy transfers and efficiency, Kinetic energy and calculations, Gravitational potential energy and calculations, Specific heat capacity, Power, How to increase efficiency, Energy resources.

Electricity: Circuit symbols, Current in series and parallel circuits, Potential difference in series and parallel circuits, Resistance and Ohm's law, Properties of series and parallel circuits, Resistance in series and parallel circuits, AC and DC, Colours and functions of each wire in a three core cable, Electrical power and calculations, Work done when charge flows in a circuit, The national grid.

Chemical changes: Reactivity series, Extraction of metals, Oxidation, Reduction, Reactions of metals with acids, neutralisation, Making soluble salts from acids and insoluble substances, Description of strong acids and alkalis, The pH scale, Electrolysis.

End of topic test after each unit

Practical skills assessment in class

Assessed HW tasks

Key Skills:

- Experimental work
- Collecting data
- Interpreting, analysing and evaluating data
- Research and hypothesising
- Predicting and concluding
- Evaluating