Archbishop Beck Catholic College Long Term Plan for **Science**

Key Stage 4

Key: Physics Chemistry Biology

Year 10

Autumn Half Term 1	Half Term 2	Key Vocabulary/Reading Opportunities		
Topic Areas to be covered: Conservation and dissipation of energy Energy transfer by heating Physics required practical: specific heat capacity Atomic structure Periodic table Cell structure and transport Biology required practical: using a microscope Biology required practical: osmosis	Topic Areas to be covered: Energy resources Electric circuits Physics required practicals : investigating resistance and investigating electrical components Structure and bonding Cell division Organisation and the digestive system Biology required practical: food tests	Energy Conservation Dissipation Conductor Insulator Biofuel Renewable Non-renewable Carbon-neutral Geothermal Hydroelectric Environment Potential difference Efficiency power Charge Current Resistance parallel	Nucleus Neutrons Protons Electrons Atom Ion Isotope Halogen Group Period Ionic Covalent Metallic fullerene Reactants Mixture Compound Molecule	Resolving power Mitochondria Ribosomes Eukaryote Prokaryote Diffusion Osmosis Active transport Mitosis Differentiation Stem cell Tissue Organ Oesophagus Gall bladder Intestine Stomach Pancreas Enzyme Amylase Lipase

				Protease Metabolism Amino acids Denatured bile
		Reading: AQA Physics for Combined Sciences: Trilogy, Breithaupt et al. AQA Biology for Combined Sciences: Trilogy, Fullick et al. AQA Chemistry for Combined Sciences: Trilogy, Ryan et al. Journal articles as appropriate		

Spring Half Term 3	Half Term 4	Key Vocabulary/Reading Opportunities		
Topic Areas to be covered: Electricity in the home Molecules and matter Chemical calculations Chemical changes Biology required practical: enzymes Organising animals and plants	Topic Areas to be covered: Physics required practical: density Radioactivity Chemistry required practical: making a salt electrolysis Communicable disease Preventing and treating disease	Alternating current Direct current Fuse Efficiency Density Kinetic internal energy specific latent heat radiation atom isotope half life count rate	Relative atomic mass Relative formula mass Concentration Reduction Oxidation Reactivity series Displacement Acid alkali Base Salt Neutralisation Electrolysis	Plasma Platelets Red blood cells White blood cells Haemoglobin Arteries Veins Capillaries Alveoli Mesophyll Phloem Translocation Xylem Transpiration

			Electrolyte Electrode Anode Cathode Inert Ionic Aqueous	Communicable disease Bacteria Virus Fungus Protist Antibiotic Vaccination Herd immunity Preclinical trials Clinical trials Double blind trails placebo
		Reading: AQA Physics for Combined Sciences: Trilogy, Breithaupt et al. AQA Biology for Combined Sciences: Trilogy, Fullick et al. AQA Chemistry for Combined Sciences: Trilogy, Ryan et al. Journal articles as appropriate		
Summer Half Term 5	**Half Term 6**	**Key Vocabulary/Reading Opportunities**		
Topic Areas to be covered: Forces in balance Physics required practical: force and extension Motion	Topic Areas to be covered: Physics skills focus on equations met so far and maths skills Space Physics Rates and equilibrium	Vector Scalar Displacement Magnitude Driving force Friction Newtons Resultant force	Exothermic Endothermic Activation energy Reaction profile Rate of reaction	Vaccine Herd immunity Antibiotic Clinical trials Double blind trial Carcinogen Correlation

Chemical required practical: electrolysis Energy changes Chemistry required practical: investigating temperature changes Non communicable disease Photosynthesis Biology required practical: photosynthesis	chemistry required practical: investigating effect of concentration Respiration Adaptation interdependence and competition Biology required practical: measuring population size	Centre of mass Equilibrium Elasticity extension Stopping distance Momentum Solar System Planet Satellite	Collision theory Kinetic Temperature Concentration Catalyst Pressure Reversible Equilibrium	Benign Malignant Photosynthesis Endothermic Limiting factors Chlorophyll Aerobic Anaerobic Exothermic Glycogen Oxygen debt Metabolism Community Ecosystem Interdependence Abiotic Biotic Distribution Quadrat Transect Competition adaptation
		Reading: AQA Physics for Combined Sciences: Trilogy, Breithaupt et al. AQA Biology for Combined Sciences: Trilogy, Fullick et al. AQA Chemistry for Combined Sciences: Trilogy, Ryan et al. Journal articles as appropriate		

Year 10

Capital Cultural Experiences throughout the Academic Year	Learning Characteristics instilled in the curriculum	Career Opportunities
Please stipulate term and approx. date. Half term 5= possible "Science Show" in the hall- visitors from university and our Chemistry staff involving energy changes e.g. liquid nitrogen demo, whoosh bottle etc Half term 6- Biology fieldwork to complete required practical.	**Confidence** Manipulation of apparatus, consolidation tasks, knowledge tests to build confidence, weekly quiz, group work, practical work to involve different students being leaders of their group, required practicals completed more than once but with different variables to build confidence with them. **Positive** Use of praise and rewards. Engaging lessons. Competitions. Positive feedback and encouragement to participate. Use of positive comments/texts home. Practical work. **Respectful** Class rules to be followed, meet and greet at door. Encourage respect for all. Treat equipment with respect.	Half term 1- possible presentation/ speaker from BioGrad to discuss careers in science

Metacognition Methods applied in Teaching

High 5 lesson format
Consolidation at the start of lesson – departmental format of 4 questions for all plus an extension question.
Modelling of practical technique and written answers
Questioning to stretch and challenge
Work of an appropriate level of challenge
Scaffolding where appropriate
Independent practice
mnemonics
Chunking of information, avoid overloading pupils with new concepts.
Opportunities to plan own investigations to develop planning and problem solving skills.
Use of key vocabulary and opportunities to use this in written work.
Knowledge tests.

Archbishop Beck Catholic College Long Term Plan for **Science**

Key Stage

Key: Physics Chemistry Biology

Year 11

Autumn Half Term 1	Half Term 2	Key Vocabulary/Reading Opportunities		
Topic Areas to be covered: Forces and motion	Topic Areas to be covered: wave properties physics required practical: ripple tank	Speed Velocity Acceleration	Hydrocarbon Alkane Alkene	Producer Consumer Photosynthesis

Physics required practical: force and acceleration Crude oil and fuels Chemical analysis Chemistry required practical: chromatography Organising an ecosystem Biodiversity and ecosystems	The Earth's atmosphere The nervous system Biology required practical: reaction time Hormonal coordination	Deceleration Terminal velocity Weight Mass Mechanical wave Transverse Longitudinal Oscillation Amplitude Wavelength Frequency Reflection refraction	Saturated Unsaturated Fractional distillation Combustion Cracking Thermal decomposition Pure substance Mixture Formulation Chromatogram Atmosphere Methane Greenhouse gas Climate change Pollution	Respiration Combustion Biodiversity Pollution Deforestation Global warming Greenhouse effect Homeostasis Neurones Receptors Effectors Synapse Central nervous system Reflex Endocrine system Pituitary gland Hormone Insulin Diabetes Puberty Oestrogen Testosterone Ovulation Contraception
		Reading:		

		AQA Physics for Combined Sciences: Trilogy, Breithaupt et al. AQA Biology for Combined Sciences: Trilogy, Fullick et al. AQA Chemistry for Combined Sciences: Trilogy, Ryan et al. Journal articles as appropriate

Spring Half Term 3	Half Term 4	Key Vocabulary/Reading Opportunities		
Topic Areas to be covered: Electromagnetic waves Physics required practical: infrared radiation Electromagnetism The Earth's resources Reproduction Variation and evolution Genetics and evolution	Topic Areas to be covered: Consolidation of topics students have underperformed on in assessments. Consolidation and extension of all required practicals.	Electromagnetic wave Infrared ultraviolet Magnetic field Field line Solenoid Electromagnet Motor	Finite Renewable Non-renewable Potable Ore Life cycle assessment Recycle Environment	Asexual Gamete Mitosis Meiosis Fertilisation Homozygous Heterozygous Allele Gene Genome Recessive Dominant Inheritance Chromosomes screening variation evolution natural selection selective breeding

				genetic engineering ethical extinction resistance classification
		Reading: AQA Physics for Combined Sciences: Trilogy, Breithaupt et al. AQA Biology for Combined Sciences: Trilogy, Fullick et al. AQA Chemistry for Combined Sciences: Trilogy, Ryan et al. Journal articles as appropriate		
Summer Half Term 5	**Half Term 6**	**Key Vocabulary**		
Topic Areas to be covered: Revision for exams	Topic Areas to be covered: Revision for exams			

Year 11

Capital Cultural Experiences throughout the Academic Year	**Learning Characteristics instilled in the curriculum**	**Career Opportunities**
Please stipulate term and approx. date. Half term 1: Presentation in the hall on how to revise for Science effectively.	**Confidence** Manipulation of apparatus, consolidation tasks, knowledge tests to build confidence, weekly quiz, group work, practical work to	

	involve different students being leaders of their group, required practicals completed more than once but with different variables to build confidence with them. **Positive** Use of praise and rewards. Engaging lessons. Competitions. Positive feedback and encouragement to participate. Use of positive comments/texts home. Practical work. **Respectful** Class rules to be followed, meet and greet at door. Encourage respect for all. Treat equipment with respect.	

Metacognition Methods applied in Teaching
High 5 lesson format Consolidation at the start of lesson – departmental format of 4 questions for all plus an extension question. Modelling of practical technique and written answers Questioning to stretch and challenge Work of an appropriate level of challenge Scaffolding where appropriate Independent practice mnemonics Chunking of information, avoid overloading pupils with new concepts. Opportunities to plan own investigations to develop planning and problem solving skills.

Use of key vocabulary and opportunities to use this in written work.
Knowledge tests.