Science

Curriculum Vision

Students at Holderness Academy will experience a broad and ambitious Science curriculum, rich in knowledge, which ignites curiosity and prepares them well for future learning or employment regardless of their starting points.

Curriculum Principles	Curriculum Intent
Curiosity of Science	We want students to develop a love and curiosity for learning and understanding Science. We will ensure we foster a lifelong interest in Scientific developments and understanding of the world.
Breadth, depth & application of science knowledge and skills.	The curriculum model centres around re-visiting topics sequentially, offering opportunity to further increase, embed and secure knowledge, skills and understanding throughout. Carefully embedded practical opportunities encourage students to actively seek solutions, design investigations and problem solve, becoming actively involved in making observations, collecting and analysing information that build from Y7 through to Y11, and Y13.
High aspirations for careers in a STEM based society	Links to further study and careers is intricately woven into every topic throughout all key stages, to continually raise the aspirations of our students at all levels. Extensive wider curriculum opportunities are thoroughly embedded, to constantly expose our students to guest speakers, educational visits, FE and HE opportunities.
Outstanding future Scientists	We want to inspire and encourage students to build cultural capital, have an appreciation and understanding of the relevance and impact that Science has on the local community and wider world.
Transferrable scientific skills	We aim to give students a greater understanding of science with regards to the content, skills and presentation of data to be able to think and analyse information critically, for their lifelong benefit and to make informed scientific decisions in society and the world

Science

Curriculum Implementation

Key Principles

The science curriculum is heavily knowledge based which means the sequencing of our teaching must be designed to allow students to develop **disciplinary knowledge** alongside the **substantive knowledge**.

At Holderness Academy, the key principles of effective teaching focus on promoting active engagement and fostering long-term understanding. These principles include.

- **reviewing prior learning** to build on what students already know and **connect new concepts**
- **assessing comprehension** through questioning and feedback to **check understanding** throughout the lesson
- **scaffolding and modelling** by providing support, clear examples as students develop new skills & knowledge

offering opportunities for both **guided and independent practice** to reinforce learning.

Science Knowledge Rich Curriculum Structure

Subject Discipline	Domain Knowledge Threads	Domain Concepts / Skills
Biology	**Organisms** The hierarchy of complex biological systems and structures	**Scientific Attitudes** The desire to know and understand the universe through data and unbiased reasoning. **Working Scientifically** The understanding of nature, process, and methods of science. **Experimental and Investigative Skills** Understanding how to manipulate the investigative tools and techniques associated with science and working scientifically. **Numeracy Skills** The ability to understand, reason with and apply simple numerical concepts to analysis and evaluate processes in science. **Literacy Skills** The ability, confidence, and willingness to engage with language (subject specific) to acquire, construct and communicate meaning in all aspects of daily living.
	Ecosystems The interaction between a community of living animals and their environment	
	Inheritance The process of passing genetic information on from a parent to its' offspring	
Chemistry	**Matter** Materials that constitute the observable universe	
	Reactions A process in which one or more substances interact undergoing a change in arrangement	
	Earth The study of the earth's structure, properties, and processes	
Physics	**Forces** A push or pull force that acts upon an object	
	Energy The ability to do work	
	Waves A disturbance in a medium that carries energy without the net movement of particles.	

Building on prior learning – What can learners do by the end of Key Stage 2?

BIOLOGY

Organisms

- Identify and describe the functions of different parts of flowering plants: roots, stem-trunk, leaves, and flowers and the requirements of plants for life and growth.
- Identify that humans and some other animals have skeletons and muscles for support, protection, and movement.
- Describe the ways in which nutrients and water are transported within animals, including humans.
- Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels, and blood.

Ecosystems

- Explore and use classification keys to help group, identify, and name a variety of living things in their local and wider environment.
- Describe the simple functions of the basic parts of the digestive system in humans including the different types of teeth in humans and their simple functions.
- Construct and interpret a variety of food chains, identifying producers, predators, and prey.
- Identify how animals and plants are adapted to suit their environment in different ways and know that adaptation may lead to evolution.

Inheritance

- Describe the life process of reproduction in some plants and animals.
- Describe the difference in the life cycles of a mammal, an amphibian, an insect and a bird.
- Describe the changes as humans develop into old age.
- Know the part that flowers play in the life cycle of flowering plants, including pollination, seed formation, and seed dispersal.

CHEMISTRY

Matter

- Compare and group materials together, according to whether they are solids, liquids or gases.
- Observe that some materials change state when they are heated or cooled.
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.
- Compare and group together everyday materials based on their properties including hardness, solubility, transparency, conductivity and response to magnets.
- Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.

Reactions

- Distinguish between an object and the material it is made from.
- Recognise that a material being used may be natural or man-made.
- Describe how changes in substances can be irreversible or reversible.

Earth

- Compare and group together different kinds of rocks based on their appearance and simple physical properties.
- Describe in simple terms how fossils are formed.
- Recognise that soils are made from rocks and organic matter.

PHYSICS

Energy

- Describe magnets as having two poles
- Compare and group together a variety of everyday materials based on whether they are attracted to a magnet and identify some magnetic materials
- Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches, and buzzers.
- Use recognised symbols when representing a simple circuit in a diagram.
- Recognise some common conductors and insulators, and associate metal with being good conductors.
- Identify how sounds are made, associating it with vibration and how loudness changes as distance from the source increases.

Forces

- Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.
- Recognising that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Waves

- Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.
- Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eye
- Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
- Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.
- Describe the movement of the Moon relative to the Earth.

What scientific skills should students have by the end of KS2?

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Identifying scientific evidence that has been used to support or refute ideas or arguments.

What are the knowledge gaps from Key Stage 2?

- Some students have issues drawing tables and recording data accurately including writing correct units in headings.
- Some students have difficulties in drawing bar and line graphs, identifying the correct variables to place onto each axis.
- Some students have difficulties with reading scales and digits on apparatus such as thermometers, balances, and stop watches.
- Some students have issues with describing chemical change as reversible or non-reversible.
- Using key science vocabulary relating to scientific enquiry including independent variable, dependent variable and control variable.
- There is sometimes a confusion between what makes a test fair and what makes results accurate, this includes the role of control variables & repeats.

Year 7					
Half Term 1	**Half Term 2**	**Half Term 3**	**Half Term 4**	**Half Term 5**	**Half Term 6**
7 Science safety Identify common laboratory apparatus & describe their uses. **Skill** Use apparatus safely. **Plan,** select and **carry out a fair test** investigation using laboratory apparatus. **Tier 3 vocabulary** **7I Energy** Recall some energy stores and transfers. Describe factors affecting human energy requirements. Recall examples of renewable and non-renewable energy sources. Recall causes of global warming. **Skill** **Calculate** efficiency from given data. **Tier 3 vocabulary** Gravitational Potential, Kinetic, Thermal, Joule, Transfer, Efficiency, Fuel Renewable. **7G Particle model** Draw diagrams to represent particles in different states of matter. Explain Brownian motion.	**7A Cells, tissues, organs, systems** Recall the 7 Life Processes. Name organelles in Plant & Animal cells and describe their functions. Name parts of a microscope. Recall cell to organism organisation. **Skill** **Use** a light microscope to observe plant and animal cells. **Tier 3 vocabulary** Cell, tissue, organ, system, nucleus, membrane, cytoplasm, mitochondria, chloroplast. **7K Forces** Recall Names of specific forces & their effects on objects and springs. Describe the effect of friction on objects. Use forces and area to calculate pressure. Describe effects of balanced/Unbalanced forces. **Skill** **Measure** forces using a force meter. **Tier 3 vocabulary** Contact, Non-contact, Lubricant, Resultant, Friction, Tension, Compression,	**7H Atoms, Elements & Compounds** Identify element symbols Recall observations which indicate chemical reactions. Describe reactions using word equations. Identify thermal decompositions & their products. **Skill** I**dentify** metals & non-metals using the periodic table. **Tier 3 vocabulary** Atom, Element, Compound, Mixture, Molecule, Reactant, Product, Reaction, Equation **7C Muscles & breathing** Describe aerobic respiration using a word equation. Explain adaptations of red blood cells. Describe how muscle action is controlled by nerve impulses. Describe action of antagonistic pairs. Recall the effects of commonly misused substances. **Skill** **Interpret** a timeline for drug testing. **Tier 3 vocabulary** Organism, respiration,	**7J Current Electricity** Recall specific circuit symbols. Describe current in series & parallel circuits. Describe the effect of resistance in circuits. Describe voltage in series & parallel circuits. Describe dangers of electricity & suitable precautions. **Skill** **Build and test** series & parallel circuits using voltmeters and ammeters. **Tier 3 vocabulary** Ammeter, Voltmeter, Current, Voltage, Resistance, Series, Parallel, Fuse **7F Acids and alkalis** Identify common hazard symbols. Recall indicator colours in acids and alkalis. Name salts formed during neutralisation reactions. Describe neutralisation reactions using word equations. Describe some common everyday examples of neutralisation. **Skill** **Conduct** a neutralisation	**7L Sound** Describe how sounds are produced. Describe properties of sounds. Compare speed of sound in different media. Describe the structure & function of parts of the ear Compare different types of waves. **Skill** **Draw and label** a soundwave. Identify a range of sounds and describe pitch and volume related to frequency. **Tier 3 vocabulary** Oscillate, Amplitude, Frequency, Pitch Vacuum, Hertz , Wavelength, Absorb, Reflect, Transmit. **7E Mixtures and separation** Recall the terms, solute, solvent and solubility. Select appropriate separation technique from properties of the mixtures. **Skill** **Separate substances** using the practical techniques filtering, evaporation, chromatography and distillation. **Tier 3 vocabulary** Matter, Evaporation, Condensation,	**7D Ecosystems** Identify variations within species. Explain how adaptations in organisms affects survival Recall some innate & learned behaviours. Describe relationships using food webs. **Skill** **Construct** a food chain, food web & pyramid of number & biomass. **Tier 3 vocabulary** Species, Hybrid, Variation, Population, Biomass **End of year 7 assessment**

Describe link between concentration & diffusion. Describe factors which affect gas pressures using particle theory. **Skill** **Classify** common substances as solids, liquids & gases. **Tier 3 vocabulary** Particle, Volume, Diffusion, Pressure, Concentration	**7B Sexual reproduction in animals** Identify the gametes used in fertilisation. Describe the adaptations in male/female gametes Describe the transfer of substances between mother & baby. Describe changes which occur during the menstrual cycle Describe changes occurring during puberty. **Skill** **Interpret** diagrams including cycle, tables and graphs of data. **Tier 3 vocabulary** Reproduction, Sexual, Asexual, Gamete, Fertilisation, Gestation, Placenta, Umbilical cord, Implantation	arteries, capillaries, antagonistic, Ligaments, Tendons, Cartilage,	reaction using indicators. **Tier 3 vocabulary** corrosive, Indicator, Hazard, Neutralisation, Physical & Chemical change	Distillation, Chromatography	

Assessment

- Learners are continually assessed in lessons including quick quizzes, application of knowledge to exam style questions and use of whiteboards to show retrieval.
- Learners complete one extended written task for each unit where they are asked to apply their knowledge to an unfamiliar situation.
- Learners complete one end of unit test which comprises 10 retrieval questions, 10 multiple choice questions and application questions. The retrieval questions ask students to recall the meaning of words from the tier 3 vocabulary list. These retrieval questions are given to students one week prior to the assessment to take home to learn. The multiple choice & application questions are used to show us if they can apply their learning. An end of year assessment will be carried out in June. This will be an in class assessment comprising of short and longer answer questions including all topics covered in year 7.

Year 8

Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
8J Light Describe reflection, refraction and scattering of light using ray diagrams. Describe why objects appear coloured. Explain how shadows are formed and to explain image formation in pinhole cameras. **Skill** **Measure** angle of incidence and angle of reflection accurately. **Tier 3 vocabulary** Reflected, refracted, incident, ray, **8K Energy transfers** Explain the difference between heat & temperature Describe heat transfers in solids Describe heat transfers in fluids **Skill** **Calculate** efficiencies for devices using data Calculate payback times using data. **Tier 3 vocabulary** Joule, Conduction, Convection, Radiation, Absorption, reflect, Reflection, Emit, Emission, Insulate	**8E Combustion** Describe combustion using a word equation Recall what oxidation means Recall the sides of the fire triangle Describe formation of acid rain due to hydrocarbon combustion Describe the link between CO_2 and global temperatures **Skill** **Test** for the products of combustion **Tier 3 vocabulary** combustion, Reactant, Product Oxidation, Fossil Fuel, **8F The Periodic Table** Identify common chemical symbols for elements Describe simple chemical reactions using word equations Identify names groups in the periodic table Use properties to predict if substances are metals/ non-metals **Skill** **Identify** reactivity patterns for alkali metals in water **Tier 3 vocabulary** Chemical	**8L Earth & Space** Describe differences in the seasons in terms of day length and the height of the Sun. Explain the changes in day length and height of the Sun in terms of the tilt of the Earth's axis Explain why the weight of an object changes if taken to the Moon, but not its mass. **Skill** **Draw** magnetic field lines using a plotting compass. **Tier 3 vocabulary** Galaxy, light year, orbit, exoplanet, gravitational field strength **8C Breathing & Respiration** Describe process of pulmonary ventilation Describe the process of aerobic respiration Describe gas exchange in plants & animals Describe effects of smoking on health Describe the process of anaerobic respiration. **Skill** **Evaluate** a model (bell jar) **Tier 3 vocabulary** Trachea, Bronchi, Bronchioles, Alveoli,	**8H Rocks** Describe how rocks are extracted from the Earth Describe the formation of igneous rocks Describe the effects of weathering on rocks Describe the formation of sedimentary rocks Describe the formation of metamorphic rocks. **Skill** **Identify** rocks as igneous, sedimentary or metamorphic. **Tier 3 vocabulary** Weathering, Erosion, Mineral, Sedimentary Igneous, Metamorphic, Ore, Extraction, Natural resources, **8I Fluids** Describe particle energy & arrangements during state changes Describe pressure in gases/ liquids using the particle model Explain why objects float Describe how drag affects objects **Skill** **Calculate** the density of an object.	**8G Metals and their uses.** Recall some common properties of metals and non-metals. Describe the reactions of metals with oxygen, water and acids. Describe ways to preventing rusting. **Skill** **Use observations** to place metals into their order of reactivity. **Tier 3 vocabulary** Chemical reaction, physical reaction, reactants, products, bond, oxidation, reduction **8D Biodiversity** Classify microorganisms using characteristics Describe reproduction in microorganisms Describe how bacteria reproduce Describe energy flow in terms of food chains Describe the role of decomposers in the carbon cycle **Skill** **Use** a quadrat to sample a plant population. **Tier 3 vocabulary** Unicellular,	**8B Plants and their reproduction** Describe the process of sexual and asexual reproduction in plants. Describe flower structure, pollination and fertilisation. **Skill** **Match** pollen structure to pollination type. **Tier 3 vocabulary** Species, hybrid, pollination, dispersal, germination, photosynthesis **End of year 8 assessment**

	properties, Physical properties, Group, Period, **8A Food & nutrition** Recall sources & uses of the 7 essential nutrients Describe tests to identify the nutrients foods. Describe the effect of diet deficiencies on health Describe the role of organs in the digestive system Describe how nutrients are absorbed by the small intestine **Skill** **Carry out food tests** for glucose, starch, protein and fats. **Tier 3 vocabulary** Carbohydrate, Protein, Lipid, fibre Vitamin, Mineral, intestine, Enzyme,	Diaphragm, aerobic respiration, Anaerobic respiration	**Tier 3 vocabulary** Mass, Density, Friction, Drag, pascal, Streamlined, Newton, Equilibrium, Pressure Upthrust, deformation	Multicellular Prokaryote, Eukaryote Mitochondria, Chloroplasts Diffusion, Fermentation Ecosystem.	

Assessment

- Learners are continually assessed in lessons including quick quizzes, application of knowledge to exam style questions and use of whiteboards to show retrieval.
- Learners complete one extended written task for each unit where they are asked to apply their knowledge to an unfamiliar situation.
- Learners complete one end of unit test which comprises 10 retrieval questions, 10 multiple choice questions and 10 marks of application questions. The retrieval questions ask students to recall the meaning of words from the tier 3 vocabulary list. These retrieval questions are given to students one week prior to the assessment to take home to learn. The multiple choice & application questions are used to show us if they can apply their learning. An end of year assessment will be carried out in June. This will be an in class assessment comprising of short and longer answer questions including all topics covered in year 8.

Year 9					
Half Term 1	**Half Term 2**	**Half Term 3**	**Half Term 4**	**Half Term 5**	**Half Term 6**
9C1 Atoms & Mixtures Define the terms atom, element, compound and mixture. Describe and explain methods of separating mixtures. **Skill** **Select** appropriate techniques to separate mixtures **Tier 3 vocabulary** aqueous mixture atom product chromatography reactant compound solute element solution fraction solvent **9C2 Atomic structure** Describe and explain how the models for the atom have changed. Explain the terms ions and isotopes. Represent the electronic structure of the first 20 elements in the periodic table. **Skill** **Use calculations** to describe the structure of atoms. **Tier 3 vocabulary** atom, element, atomic number group, electron, ion,	**9P1 Energy stores** Identify energy stores and the mechanisms used to transfer from one store to another. Apply the law of conservation of energy. Use calculations to measure gravitational, kinetic and elastic energy stores **Skill** **Apply** equations to complete calculations **Tier 3 vocabulary** Work done, Energy store, Energy pathway, Gravitational field strength, Weight, Mass, Gravitational potential, Kinetic **9P2 Energy changes** Explain how energy is dissipated during energy transfers. Compare the efficiency of devices in terms of energy transfers. **Skill** **Use equations** to complete calculations **Tier 3 vocabulary** Conservation of energy, Power, Dissipated, Efficiency, Friction, Watts, Kilowatt, Kilowatt-hour, Closed system	**9C3 Periodic table** Describe significant developments in the periodic table of elements Explain how electron structure of atoms affects the reactions of elements and their position in the periodic table. Describe and compare the reactions of elements in group 1 with oxygen and water. Describe and compare trends in physical and chemical properties of group 7 including displacement reactions. Explain the trends in reactivity of group 1 and 7 elements in terms of gaining or losing outer shell electrons. **Skill** **Recognise patterns** in the periodic table. Using equations to describe chemical reactions. **Tier 3 vocabulary** alkali, group, alkali metal, halogen, atom, inert, displacement reaction, period, electronic structure, transition	**9B3 Human digestion** Name the main compounds found in foods and explain the purpose of their digestion. Explain enzyme action using the lock and key theory. Explain factors that affect enzyme action. Use Benedict's, Biuret and Iodine solutions to test for sugar, protein and starch in foods. Investigate the effect of pH of the rate of a reaction catalysed by amylase. **Skill Required practical:** Investigate the effect of pH on the rate of an enzyme catalysed reaction. **Tier 3 vocabulary** Amylase, bile, carbohydrase, catalyst, denatures, enzyme, glycerol, lipase, protease, lipids, fatty acids, glycerol, amino acids, denatured, active site. **9P4 Electrical circuits** Use circuit symbols to represent and build electrical circuits. Define the terms current,	**9C4 Ionic and covalent bonding** Describe and explain the properties of materials in terms of the arrangement of particles in the 3 states of matter. Describe the chemical bonding involved in ionic, covalent and metallic substances. Explain how the type of bonding in a substance affects the physical properties of that substance. **Skill** **Investigating and compare** the properties of ionic and simple covalent molecules **Tier 3 vocabulary** covalent bond liquids delocalised electron particle theory giant lattice solids intermolecular forces states of matter ionic bond **9B4 Transport in animals** Describe the composition of blood. Describe the structure of the heart and blood vessels. Explain how the blood	**9C5 Giant covalent & metallic bonding** Explain how the size of a structure affects the physical properties of a substance. Explain how intermolecular forces affect the properties of substances simple and giant molecular substances **Skill** **Investigate and compare** the properties of giant covalent molecules and metals **Tier 3 vocabulary** alloy intermolecular forces covalent bond ionic bond delocalised electron particle theory fullerene polymer giant lattice states of matter **9B5 Transport in plants** Explain how plants are adapted to transport substances. Explain the process of transpiration and factors that affect its rate **Skill** **Calculate and compare rates** from given data. **Tier 3 vocabulary** epidermal,

electronic structure, isotope **9B1 Cell structure** Draw and label the structures of basic animal, plant and prokaryotic cells. Describe the roles of cell organelles Explain how a variety of specialised cells are adapted to their functions. Compare the properties of light and electron microscopes **Skill Required practical:** **Use** a light microscope to draw and label a plant and animal cell and calculate its real size using the image size and magnification. **Tier 3 vocabulary** Cellulose, diffusion, eukaryotic, prokaryotic, mitochondria, resolution, ribosomes, kinetic, gravitational.	**9B2 Cell division & transport in cells** Describe the process of mitosis. Describe the functions of embryonic stem cells, adult stem cells and plant meristems. Evaluate the use of stem cells Compare and contrast the processes of diffusion, osmosis and active transport. Investigate the effect of concentration on osmosis. **Skill Required practical:** **Measure the rate** of osmosis in vegetable tissue. **Tier 3 vocabulary** Clone, differentiate, embryonic, mitosis, therapeutic, zygote, osmosis, diffusion, active transport.	element. **9P3 Energy resources** Explain why we need to produce electricity using energy resources. Identify energy resources as renewable and non-renewable. Describe advantages and disadvantages of energy resources. Evaluate the use of energy resources. Explain why some energy resources are more reliable than others. **Skill** **Compare** energy resources and their suitability **Tier 3 vocabulary** Renewable, Non-renewable, Biofuel , Fossil fuel, Nuclear, Hydroelectric, Solar, Carbon dioxide , Start-up time.	potential difference and resistance. Use Ohm's law to calculate resistance Recognise and explain the shapes of IV graphs for a fixed resistor, a lamp and a diode. Compare the patterns for current, potential difference and resistance in series and parallel circuits. **Skill Required practical:** **Measure** voltage and current in a circuit and produce I-V graph to describe resistance in Ohmic resistors, filament lamps and diode. **Tier 3 vocabulary** Current Potential difference, Resistance, Ohm's Law, Series circuit , Parallel circuit.	vessels are adapted to their functions. **Skill** **Interpret data from graphs** to compare composition of inhaled and exhaled air **Tier 3 vocabulary** Aorta, atria, capillaries, coronary, haemoglobin, platelets, pulmonary, stent, statin	palisade, mesophyll, phloem, .

Assessment

- Learners are continually assessed in lessons including quick quizzes, application of knowledge to questions and use of whiteboards to show retrieval.
- Learners complete one extended written task for each unit where they are asked to apply their knowledge to a specific situation.
- Learners complete one end of unit test which comprises 15 retrieval questions and 35 application questions. The retrieval questions are short one word recall questions usually from the tier 3 vocabulary list. These retrieval questions are given to students one week prior to the assessment to take home to learn. The 35 marks of application questions are to allow students to apply their learning. These include a range of short recall 1 or 2 mark questions to extended written application questions worth up to 6 marks.

Year 10					
Half Term 1	**Half Term 2**	**Half Term 3**	**Half Term 4**	**Half Term 5**	**Half Term 6**
10B1 Non communicable disease **D**efine the term health. Explain the ideas of correlation and causation. Describe the effects of lifestyle choices such as diet, smoking, alcohol and exposure to carcinogens on health. Explain causes of cancer, coronary heart disease and type 2 diabetes. Evaluate treatments for coronary heart disease **Skill** **Identify** patterns and trends in graphs to discuss the difference between correlation and causation. **Tier 3 vocabulary** Correlation, causal, Tumour, Benign, Ionising Malignant, Carcinogen, Coronary, Stent, Statin, **10B2 Communicable disease** Describe what a pathogen is and how they are spread. Explain ways to reduce the spread of communicable diseases Describe diseases caused	**10B4 Photosynthesis** Recall the word and symbol equation for photosynthesis Describe photosynthesis as an endothermic reaction. Explain the effects of light intensity, carbon dioxide concentration, temperature and amount of chlorophyll on the rate of photosynthesis. Interpret graphs showing how these variables affect the rate of photosynthesis. Investigate the effect of light intensity on rate of photosynthesis in an aquatic plant. **Skill Required practical:** **Investigate** the effect of light intensity on the rate of photosynthesis **Tier 3 vocabulary** Photosynthesis, Chloroplast, Endothermic, Cellulose, **10P3 Molecules and matter** Use the particle model to describe and explain changes of state when temperature increases or decreases. Describe methods to investigate the density of regular and irregular shaped objects. Explain the concept of internal	**10B5 Respiration** Recall the word and symbol equations for aerobic and anaerobic respiration. Describe respiration as an exothermic reaction and explain the importance of energy in cells. Describe the differences between aerobic and anaerobic respiration. Describe how the body reacts to an increased demand for energy. Define the term metabolism and give examples of metabolic reactions **Skill** **Calculate** percentage change **Tier 3 vocabulary** Anaerobic, Exothermic, metabolism, **10P4 Radioactivity** Define radioactivity in terms of decay of unstable nuclei. Describe types of radiation in terms of particles, charges, ionisation power and penetration. Use balanced equations to represent the decay of nuclei by emitting α, β and γ radiation. Define and explain the term half-life of a radioactive	**10B6 Nervous coordination** State the role of the nervous system. Explain how the nervous system is adapted to its functions Sequence the series of events which leads to a reaction to a change in your surroundings (normal and reflex). Explain the importance of reflexes. Carry out an investigation into factors that affect human reaction times. **Skill Required practical:** **Investigate** a factor that affects reaction times using the drop ruler test. **Tier 3 vocabulary** Homeostasis, Receptor, Stimulus, Effector, Response, Neurone, reflex, **10C4 Energy changes** Describe energy changes in reaction in terms of exothermic and endothermic reactions. Define the term activation energy Use reaction profiles to represent energy changes in exothermic and endothermic reactions	**10B7 Hormonal control** Identify the major glands in the human body. Define the term hormone. Explain how blood glucose is regulated. Explain how blood glucose is affected and controlled in type 1 and 2 diabetic patients. Explain how hormones regulate the menstrual cycle. Explain how the hormones of the female reproductive system can be used in contraception or in treating infertility. **Skill** **Compare and contrast** hormonal and nervous control. **Tier 3 vocabulary** Endocrine, Pituitary, Insulin, **d**iabetes, progesterone, menstrual, contraception, infertility **10P7 Forces & motion** Use Newton's laws to describe the effect of forces on objects Describe how forces affect the motion and speed of an object Describe how thinking distance and breaking distance affect the overall	**Year 10 revision, assessments & intervention**

bacteria, viruses, fungi and protists. Describe the natural defences that the body has to protect it from infection. Explain how vaccinations work. **Skill** **Evaluate** different methods of reducing the spread of disease. **Tier 3 vocabulary** Pathogen, Protist, Vector, Antibody, Antigen, **10B3 Treating disease** Describe uses and action of painkillers. Describe uses and actions of antibiotics. Give examples of drugs derived from natural sources. Explain the importance of clinical trials. Describe the stages of a clinical trial. **Skill** **Analyse data** from tables and graphs to draw conclusions on the effectiveness of antibiotics. **Tier 3 vocabulary** Placebo, Efficacy, Toxicity **10C1 Chemical calculations**	energy of materials. Define and explain the terms specific latent heat of fusion and evaporation. Use calculations to measure the latent heat of a material. **Skill Required practical:** **Investigate** the density of regular and irregular shaped of solids. **Tier 3 vocabulary** Density Internal energy , Specific latent heat, Specific latent heat of fusion, Specific latent heat of vaporisation, Pressure. **10C2 Chemical changes** Describe how the reactivity of metals can be compared. Use word and symbol equations to explain how displacement reactions can be used to compare the reactivity of metals. Describe and explain the steps used in methods to produce pure, dry soluble salt crystals. Use word and balanced symbol equations to represent chemical reactions from general equations. Use the pH scale to compare solutions and explain how neutralisation occurs. **Skill Required practical:** **Carry out** practical techniques to produce soluble salts by	sample. Describe the dangers and safety measure associated with using radioactive materials **Skill** **Interpret** a graph to calculate the half-life of a radioactive substance. **Tier 3 vocabulary** Isotope Atomic number, Relative atomic mass, Alpha radiation Beta radiation, Gamma radiation, Half-life Nuclear waste, Radioactive dating **10P5 Balanced forces** Describe quantities as vector or scalar. Describe the effect of forces on objects. Describe the effect of balanced and unbalanced forces. Represent forces using scale diagrams. Apply Newton's 3rd law. **Skill:** **Investigate** the centre of mass of an object. **Tier 3 vocabulary** Scalar Vector, Contact force, Non-contact force, Resultant force, Centre of mass, Perpendicular, Parallelogram Newton's third law of motion.	Describe energy changes in bond making and breaking. Calculate energy changes in reactions using beyond enthalpy calculations. **Skill – Required practical** **Calculate** energy changes in reactions **Tier 3 vocabulary** activation energy, bond energy, endothermic exothermic **10C5 Rates of reactions** Use the particle model to describe how the rate of a reaction can be altered. Describe and explain how surface area, temperature, concentration, gas pressure and catalysts can affect the rate of a reaction. Describe reversible reactions in terms of reactants and products. Define the term equilibrium in terms of rates of reaction. Explain factors that can affect the position of equilibrium **Skill Required practical –** **Investigate** the factors affecting rate of chemical reaction. **Tier 3 vocabulary** aqueous mixture atom product chromatography reactant compound solute element solution fraction solvent	stopping distance of a car Apply equations to calculate the momentum of objects Apply Hooke's law to describe the effect of stretching or compressing an elastic object **Skill** **Use calculations and graphs** to calculate the forces of moving objects. **Tier 3 vocabulary** Braking distance, thinking distance, stopping distance Momentum, Inertial mass Spring constant, Hooke's law, Limit of proportionality, Terminal velocity **10C6 Reversible reactions & equilibrium** Use the particle model to describe how the rate of a reaction can be altered. Describe and explain how surface area, temperature, concentration, gas pressure and catalysts can affect the rate of a reaction. Describe reversible reactions in terms of reactants and products. Define the term equilibrium in terms of rates of reaction. Explain factors that can affect the position of equilibrium **Skill** **Describe** the factors which	

Calculate the relative formula mass of molecules and compounds. Use the law of conservation of mass to predict the mass of reactants and products. Use balanced symbol equations to calculate the mass of reactants and products. Describe how the concentration of a solution can be changed **Skill Use** the periodic table to calculate the structure of atoms **Tier 3 vocabulary** Avogadro constant, reactant, chromatography, relative atomic mass A_r, compound, relative formula mass M_r, law of conservation of mass, solute, mole, solution, product, solvent. **10P1 Energy transfer by heating** Describe how the particle model can be used to explain the transfer of thermal energy and how to reduce thermal energy loss. **Skill required practical** **Calculate** specific heat capacity from given data.	reactions of acids with metals, bases, alkalis and metal carbonates **Tier 3 vocabulary** acid pH alkali reduced/ reduction base salt neutral strong acid neutralisation weak acid oxidised/oxidation **10C3 Extracting metals** Define the terms electrolysis, electrolyte, ion, oxidation and reduction. Describe the process of electrolysis of molten ionic compounds. Make predictions about the products of electrolysis. Explain the products of the electrolysis of aluminium oxide. Explain the products of the electrolysis of aqueous sodium hydroxide **Skill Required practical:** **Carry out** electrolysis of solutions. **Tier 3 vocabulary** aqueous oxidised/oxidation electrolysis reduced/reduction half equation salt metal ore molten		**10P6 Motion** Calculate velocity and acceleration Describe journeys using a distance-time graph Use gradients to describe and calculate velocities. Describe journeys using a velocity-time graph Use velocity-time graphs to calculate acceleration and total distance travelled, use tangents and gradients to calculate acceleration and **Skill** **Use calculations** and **rearranging equations.** **Tier 3 vocabulary** acceleration, deceleration, Displacement, gradient, tangent, velocity.	affect the equilibrium of a reversible reaction **Tier 3 vocabulary** anhydrous precise / precision catalyst hydrated reversible reaction closed system equilibrium Le Châtelier's Principle **10C7 Crude oil & fuels** Describe the formation of crude oil and explain why it is a finite resource. Describe and explain how fractional distillation can be used to produce useful fractions from crude oil. Use the general formula for alkanes to write formulae and draw structures of hydrocarbons. Describe and explain the processes involved in cracking. Test for and explain the difference between saturated and unsaturated hydrocarbons. **Skill** **Evaluate** the use of fuels **Tier 3 vocabulary** alkane general formula alkene hydrocarbon cracking mixture distillation oxidised double bond saturated flammable thermal decomposition	

Tier 3 vocabulary Specific heat capacity, Insulator, conductor, Insulation, payback time, vibration. **10P2 Electricity in the home** Describe the difference between a.c and d.c electrical sources. Explain the components in a 3-pin plug. Explain how energy is conserved in terms of current and p.d. during energy transfers by an electric current. Use the equations $E=Pt$, $P=VI$ and $P=I^2R$ and $Q=It$. Calculate and compare the electrical efficiency of an electrical device and the cost of using it. **Skill** **Wire a plug** correctly and **apply equations**. **Tier 3 vocabulary** Alternating current, Direct current, live, neutral, Earth wire, double insulated, frequency, amplitude, period, power.				fraction unsaturated viscosity	

Assessment
Learners are continually assessed in lessons including quick quizzes, application of knowledge to questions and use of whiteboards to show retrieval. Learners complete one extended written task for each unit where they are asked to apply their knowledge to a specific situation. Learners complete one end of unit test which comprises 15 retrieval questions and 35 application questions. The retrieval questions are short one word recall questions usually from the tier 3 vocabulary list. These retrieval questions are given to students one week prior to the assessment to take home to learn. The 35 mark application questions are to show if they can apply their learning. These include a range of short recall 1 or 2 mark questions to extended written application questions worth up to 6 marks.

Year 11 (combined/ trilogy students)

Half Term 1	Half Term 2	Half Term 3	Half Term 4		
11B1 Reproduction Compare sexual and asexual reproduction. Explain what gametes are and how they are formed by meiosis. Describe structure of DNA, chromosome, gene and genome. Discuss importance of human genome project. Explain using key terms how characteristics are inherited. Evaluate the ethics of genetic screening. **Skill** **Use probability, proportion**, simple **ratios,** and **draw and interpret** punnet square diagrams. **Tier 3 vocabulary** Allele, carrier, dominant, recessive, heterozygote, homozygote, meiosis,	**11B3 Evolution** State how fossils are formed and how they support the theory of evolution. Describe causes of an extinction How mutations can bring about antibiotic resistance and how we can reduce the rate of mutations. Describe how organisms are classified using Linnaeus system and how this system has evolved including the 3-domain system (Carl Woesse). **Skill** **Interpret** evolutionary trees. **Tier 3 vocabulary** Antibiotic resistance, mutations, classification, archaea, domain, extinction, speciation, species. **11B4 Ecology** Describe interdependence and	**11B5 Biodiversity** Define biodiversity and explain why maintaining it is important to the future of the human species. Describe the effects of an increasing human population including managing waste, land use, deforestation and global warming. Explain ways to maintain biodiversity **Skill** **Interpret** water cycle, carbon cycle and decay cycle diagrams. **Tier 3 vocabulary** Biomass, carbon cycle, decomposers, consumer, producer, detritivore. , **11C3 Earth's resources** Define the terms finite, renewable and sustainable in terms of the use of	**Revision and intervention**		

mutation, phenotype, polydactyly, punnet diagram. **11B2 Variation** Describe variation and its causes and describe the effects of mutations. Describe the process of evolution and speciation. Describe the process of selective breeding and identify some characteristics that are selected for and against. Describe genetic engineering and its uses including GM crops **Skill** **Evaluate** the benefits and risks of genetic engineering, cloning and GM crops. **Tier 3 vocabulary** mutation, variation, GM crops, genetic engineering. **11C1 Calculations for reactions** Describe the difference between pure and impure substances. Describe chemical tests for hydrogen, oxygen, carbon dioxide and chlorine gas. Explain the results of chemical tests. Evaluate analysis	competition. Define biotic, abiotic and what factors plants and animals compete for. Define what is a stable community. Interpret data from graphs and tables including food chains and webs, predator- prey graphs. Describe how organisms are adapted including extremophiles. **Skill** **Estimate** populations size using sampling techniques. **Tier 3 vocabulary** quadrat, biotic, abiotic, competition, extremophile, random interdependence, abundance, mode Quantitative, adaptation, median, transect, **11P1 Waves** Describe waves in terms of energy transfer and oscillation. Compare transverse and longitudinal waves. Describe observations of waves at boundaries. Measure the wavelength, frequency and speed of mechanical waves. Apply the wave equation $c=f\lambda$. **Skill required practical:** **Investigate** waves in solids and liquids **Tier 3 vocabulary** finite,	resources. Describe how water can be made potable. Describe and explain the stages involved in treating wastewater. Describe the processes in a Life cycle assessment of a product. Explain the issues arising from reduce, reuse and recycle. **Skill required practical:** **Apply** experimental techniques to purify water. **Tier 3 vocabulary** bioleaching, phytomining, blast furnace, potable, desalination, effluent, sewage filtration, sewerage finite, sustainable development, thermal decomposition.			

techniques. **Skill Required practical:** **Analyse** chromatograms. **Carry out and interpret tests** for positive and negative ions. **Tier 3 vocabulary** Avogadro constant, reactant, compound , relative atomic mass, A_r ,concentration, relative formula mass M_r , conservation of mass ,solute, limiting, reactant, solution, mole, solvent, percentage yield, viscosity. **11C2 Earth's atmosphere** Describe how the Earth's atmosphere was formed. Describe the composition of the Earth's atmosphere. Describe factors which are affecting the composition of the Earth's atmosphere. Describe the impact of changes to the Earth's atmosphere. Explain in detail how the greenhouse effect leads to climate change **Skill** **Use theories** to describe ideas about atmospheric and climate change **Tier 3 vocabulary** Atmosphere, nitrogen oxides,	transverse, longitudinal amplitude, wavelength, incidence, trough. **11P2 Electromagnetic spectrum** Describe the electromagnetic spectrum in order of increasing wavelength and frequency. Describe the uses and dangers associated with the electromagnetic spectrum. Describe and explain how parts of the electromagnetic spectrum can be used for communication. Describe and explain how the frequency of waves affects the energy transferred. **Skill** **Investigate** the rate of emission of infrared radiation. **Tier 3 vocabulary** Electromagnetic, radiation, microwaves, ultraviolet, gamma rays. **11P3 Electromagnetism** Describe the field pattern around a magnet Describe the magnetic field around a current carrying wire and solenoid Describe the generator effect Describe the use of transformers in electrical supplies **Skill**				

carbon capture, particulate, carbon footprint, climate change, global dimming, incomplete combustion.	**Investigate and draw** the magnetic field around a magnet using a plotting compass. **Tier 3 vocabulary** Absorption, Electromagnetic, Spectrum, Frequency				
Assessment	Learners are continually assessed in lessons including quick quizzes, application of knowledge to questions and use of whiteboards to show retrieval. Learners complete one extended written task for each unit where they are asked to apply their knowledge to a specific situation. Learners complete one end of unit test which comprises 15 retrieval questions and 35 application questions. The retrieval questions are short one word recall questions usually from the tier 3 vocabulary list. These retrieval questions are given to students one week prior to the assessment to take home to learn. The 35 mark application questions are to show if they can apply their learning. These include a range of short recall 1 or 2 mark questions to extended written application questions worth up to 6 marks.				

Year 11 Separate science (all combined topics shown above plus Separate Science only topics shown below)					
Half Term 1	**Half Term 2**	**Half Term 3**			
	11SP4 Using electromagnetism Describe static electricity in terms of charge particles Describe the uses and advantages of electromagnets in electrical devices Explain how electromagnetic induction is used in the generator effect Describe the structure of step-up and step-down transformers and explain how they are nearly 100% efficient **Skill** **Calculate** the output of a step-up and step-down transformer using the ratio of turns on the primary and secondary coils. **Tier 3 vocabulary**	**11SP2 Using forces** Explain how momentum is conserved in collisions Use the conservation of momentum to calculate the force of impact or velocity of an object in a collision Evaluate the use of safety features in cars and explain how they reduce the impact force on passengers Apply the principle of moments to a variety of scenarios **Skill** **Tier 3 vocabulary** **11SP3 Pressure** Complete calculations to measure the pressure acting	**11SC1 Calculations for chemistry** **Skill** **Tier 3 vocabulary** **11SC2 Organic reactions** **Skill** **Tier 3 vocabulary** **11SC3 Polymer chemistry** **Skill** **Tier 3 vocabulary** **11SC4 Chemistry for the future** **Skill** **Tier 3 vocabulary**		

	11SP1 Applications of radioactivity Explain how radioactive sources are used in medicine and the accompanying safety features Describe how energy is released in a nuclear fission and fusion reaction Describe the construction of a typical nuclear fission reactor and justify the design choices State how nuclear waste produced in nuclear reactors is disposed of. **Skill** **Tier 3 vocabulary**	on a surface Use equations to calculate the pressure in a liquid Apply the particle model to describe changes in atmospheric pressure Explain why an object will float or sink. **Skill** **Tier 3 vocabulary** **11SP5 Applications of waves** Use ray diagrams to describe the path of light at a boundary like mirrors of glass blocks Explain how light and filters affect the colour of objects Describe how convex and concave lenses affect the path of a ray of light and the images formed **Skill Required practical: Investigate r**eflection and refraction of light**.** **Tier 3 vocabulary** **11SP6 Astrophysics** Describe the objects found in space Describe the life cycle of stars Describe the forces on natural and artificial satellites Describe the evidence for	**11SC5 Chemical analysis and Haber process** **Skill** **Tier 3 vocabulary** **C15 Using our resources** Describe how corrosion in metals can be prevented Explain the use of alloys of metals Evaluate the use of polymers and plastics Explain how sustainability of resources affects the use of materials. Describe how glass, ceramics and composite materials are used to produce useful objects. Describe how the reversible reactions are used in industry Explain the use and production of fertilisers in the laboratory and in industry **Skill** **Tier 3 vocabulary** **C13 Atmosphere** Describe how the Earth's atmosphere was formed. Describe the composition of the Earth's		

		the “BIg Bang” theory Describe the use of evidence to alter scientific theories **Skill** **Tier 3 vocabulary** **11SB1 Plants & bacteria** Describe how to safely culture bacteria and analyse the effects of antimicrobial agents. Explain the effects of microbes on plants and their associated defence mechanisms. Explain ways in which plants respond to changes in their environments. **Skill required practical** **Use** aseptic technique to grow bacteria **Tier 3 vocabulary** Antimicrobial, **11SB2 Using DNA** Describe the importance of the structure of DNA and its importance in cellular processes. Explain the function of the DNA sequence. Explain the process of and uses of cloning. Explain how monoclonal antibodies are made and how they are used. **Skill** **Tier 3 vocabulary**	atmosphere. Describe factors which are affecting the composition of the Earth’s atmosphere. Describe the impact of changes to the Earth’s atmosphere. Explain in detail how the greenhouse effect leads to climate change. **Skill** **Tier 3 vocabulary** **C10 Organic chemistry** Describe the reactions of alkenes Describe the functional groups for carboxylic acids, alcohols and esters Describe the reactions and uses of carboxylic acids, alcohols and esters **Skill** **Tier 3 vocabulary** **C11 Polymers** Describe the formation of addition polymers. Describe the formation of condensation polymers Describe the structure of DNA and other natural polymers made from amino acids and sugars **Skill** **Tier 3 vocabulary**		

		Monoclonal antibodies, cloning, **11SB4 Evolution** Describe the discoveries of scientists Mendel, Lamarck and Darwin. Explain how their work has furthered understanding of inheritance and evolution. Explain how evolution leads to the development of new species. **Skill** **Tier 3 vocabulary** Natural selection,	**11SB3 Response in humans** Describe ways to maintain body temperature. Explain how and why the body removes waste and the function of the kidneys. Evaluate kidney failure treatments dialysis v. transplant. Describe the structure of the brain and consider key functions. Describe the function of the eye and explain how problems with vision can be corrected. **Skill** **Tier 3 vocabulary** **11SB5 Biomass and food security** Extend an understanding of feeding relationships, considering biomass and food pyramids in greater detail. Describe the impacts that humans have on the environment. Consider the role of decay in a natural habitat. Apply a knowledge of energy flows and efficiency in food changes to food production / agricultural examples. **Skill** **Tier 3 vocabulary**		

Year 13 Biology A level					
Half Term 1	**Half Term 2**	**Half Term 3**	**Half Term 4**	**Half Term 5**	**Half Term 6**
Students study populations in ecosystems, we look at human population, succession, competition, and conservation techniques. Students study the effects of stimuli and response including plant growth, eye structure and function and control of heart rate. Students will look at patterns of inheritance in a range of scenarios and apply this knowledge on a small scale, such as inheriting a trait within a family, and larger scale, in looking at the frequency of traits within a population.	Students study the effects of nervous coordination including nerve structure and conductance of impulses and the structure and function of the synapse. Students will further their knowledge of energy within Biology starting with the reactions involved in respiration.	Students study the gross and microscopic structure of muscle and explain sliding filament theory and compare slow and fast twitch muscles. Students will continue their learning of energy with an in depth look at photosynthesis and energy transfers and cycles within an ecosystem.	Students study homeostasis including control of blood glucose and diabetes, and kidney structure and its function in osmoregulation. Students will apply their knowledge of genetics to a variety of gene technologies such as cloning, genetic fingerprinting and gene screening, considering the ethical issues.		
Year 13 Chemistry A level					
Half Term 1	**Half Term 2**	**Half Term 3**	**Half Term 4**	**Half Term 5**	**Half Term 6**
Students study the effect of the carbonyl group on chemical reactions including carboxylic acids, ketones, aldehydes, and esters.	Students are introduced to aromatic chemistry, the amino acid homologous series and how these compounds undergo chemical reactions.	Students study the process of condensation polymerisation and the environmental impact of polymers.	Pupils consolidate ideas to develop links in organic synthesis to describe how a wide range of products can be made and tested using detailed chemical analysis techniques.		

Year 13 Physics A level					
Half Term 1	**Half Term 2**	**Half Term 3**	**Half Term 4**	**Half Term 5**	**Half Term 6**
The second year of the course begins with thermal physics – taking a deeper look at specific heat capacity and internal energy. This is then taken further as students learn about the gas laws (Boyle's and Charles's) and perform practical work to prove the theory.	Students begin their in-depth study of fields physics in this half term, starting with gravitational fields and Newton's laws of gravity before moving into electrical fields and the ideas of capacitance. The fields study continues with a transition into magnetic fields before combining the ideas of electricity and magnetism by looking at electromagnetic induction, generators, and transformers.	Students will explore the topic of nuclear physics in this half term. They start with the types of ionising radiation before moving into radioactive decay and the inverse square law. The topic finishes with a study of nuclear energy and the different types of nuclear reaction that could be used to power our homes in the future.	The final topic that student's study in A-level physics is the optional unit. Astrophysics brings a lot of what students have studied over the past year and a half and applies it to the lenses used in different telescopes, the evolution of stellar bodies and the life of our Universe.		
Year 12 Applied Science BTEC					
Half Term 1	**Half Term 2**	**Half Term 3**	**Half Term 4**	**Half Term 5**	**Half Term 6**
This year will focus on the exam content of the course. Students will begin to extend their knowledge of cells, microscopes, enzymes, atoms, waves and how they interact. While doing this they will also reinforce their practical skills focussing on how to effectively plan an investigation.	Student will apply their knowledge of the previous term's topics to new situations, identifying how structure and function are related in the specialisation of cells, bonding in a variety of compounds and the uses and applications of the electromagnetic spectrum. Their practical skills work will look at the importance of accurate data collection.	This half term sees students looking into the human body in further depth, considering the nervous and pulmonary systems and associated health issues, using their knowledge of groups in the periodic table to predict the outcomes of a range of reactions and identifying properties of electromagnetic waves They will spend time looking at a range of data analysis methods to interpret the data they obtain in their practical work.	During this half term students will continue to build on their written skills by investigating factors that affect where plants grow, energy in fuels and electrical circuits. They will have a key focus on drawing conclusions and evaluating results.	Exams will take place towards the end of this half term, so students will spend time putting all their skills into practice, completing investigations independently, with written work that shows a scientific fluency.	This term allows the students to prepare for next year. They will complete independent research tasks, practice techniques such as Harvard referencing and getting up to speed with Research skills

Year 13 Applied Science BTEC					
Half Term 1	**Half Term 2**	**Half Term 3**	**Half Term 4**	**Half Term 5**	**Half Term 6**
This year focuses on the coursework content for the course. The musculoskeletal system forms the basis of their first Biology unit, what does it do? What is its structure? What happens when something goes wrong? Chemistry considers key skills such as preparing standard solutions, calibration, sources of error and dilutions.	The Lymphatic System and disorders which affect it are the key Biology focus for this half term. In Chemistry, students will be completing practical work around the effects of cooling and completing a report following a calorimetry investigation	Students will research the human digestive system and the effects of deficiencies on our health and the use of chromatography to analyse the chemical makeup of several substances.	Biology finishes off with the uses of chemical methods to determine the nutrient content of a variety of foods and their impact on health. Students complete their course with a self-reflection analysis of the skills they have refined and how this will support them in their future careers.		

Local and Global Context Why is our curriculum relevant? How does it build understanding of the local area and international Issues?	**Holderness Academy Values** How does your curriculum develop our academy's values of **Aspiration, Resilience, Respect** and **Kindness**	**Literacy and Numeracy** How does our curriculum improve access to the world?	**Employability** How does our curriculum develop employability skills and enable effective planning and choices for the future?
Science is ever changing. We keep our curriculum relevant and interesting to current news and developments. Students are encouraged to use online resources such as BBC news and BBC bitesize.	Science is challenging and requires aspiration to succeed and the resilience to keep trying. We respect one another in our learning environment and show kindness during collaborative working in group discussions and practical work. We ensure that topics links to careers to encourage aspiration in our students. Students develop a better understanding of the world around us, the effects of man on our planet and how we can reduce our impact.	Use of science specific tier 3 keyword vocabulary is explicitly used in all lessons. The application of numeracy and literacy in science including extended response questions and exam command words such as describe, explain and evaluate. We use modelling to show students how to answer questions including scaffolding of extended answer questions and modelling of calculations and how to show their working.	Skills including both independence and collaborative group working skills, good communication, co-ordination, following verbal and written instructions, practical skills, using apparatus, accuracy, precision and application of knowledge to new situations and the World around us.

Careers

Careers in STEM related industries are explored in every lesson throughout the course from year 7 to 11. We look at specific professions and roles related to each of the individual topics including job description, career earnings for different regions across the UK as well as the career pathway including the qualifications and grades that are required to apply.