Year 9 Combined						
Half term	Unit title with hyperlink to scheme of work	Unit summary	Skills & content covered	Skills & content revisited	Summary of formative marking, feedback and student response	Summative assessment schedule, including assessment criteria
Autumn Half-term 1	B1 Cell Biology	Cells are the basic unit of all forms of life. In this section we explore how structural differences between types of cells enables them to perform specific functions within the organism. These differences in cells are controlled by genes in the nucleus. For an organism to grow, cells must divide by mitosis producing two new identical cells. If cells are isolated at an early stage of growth before they have become too specialised, they can retain their ability to grow into a range of different types of cells. This phenomenon has led to the development of stem cell technology. This is a new branch of medicine that allows doctors to repair damaged organs by growing new tissue from stem cells	1. Animal and plant cells 2. Eukaryotic and Prokaryotic Cells 3. Cell specialisation and differentiation 4. Organisation 5. Microscopy 6. RP Microscopy 7. Culturing Organisms (triple only) 8. RP Growing bacteria (triple only) 9. Cell Division 10. Stem Cells 11. Diffusion 12. Osmosis 13. RP Osmosis 14. Active Transport	Multicellular organisms are composed of cells which are organised into tissues, organs and systems to carry out life processes. There are many types of cell. Each has a different structure or feature so it can do a specific job. Explain why multi-cellular organisms need organ systems to keep their cells alive. Suggest what kind of tissue or organism a cell is part of, based on its features. Explain how to use a microscope to identify and compare different types of cells. Explain how uni-cellular organisms are adapted to carry out functions that in multi-cellular organisms are done by different types of cell.	Seneca HW, in class teacher questioning, MCQ's, starter tasks	EOTT
Autumn Half-term 1	C1 Atomic Structure	Introduction to the structure of the atom. Electron arrangements. The periodic table, metals, non metals halogens and noble gases. This module also covers mixtures.	Introduction to the model of the atom. Structure of the nucleus and the surrounding shells. This is linked to chemical symbols and their atomic number and mass number. Word equations and symbol equations introduced and covered in numerous chemistry modules throughout the course. Mixtures definition and seperation by chromatography. Periodic table - metals and non metals, halogens and noble gases and their positions in the table. History of the atomic model and the periodic table.	*Word equations and symbol equations. Seperating mixtures. Periodic table coontetn from KS3 developed further.*	Seneca HW, in class teacher questioning, MCQ's, starter tasks	EOTT

Autumn 2	P1 Energy	Students must understand energy changes in a system, and the ways energy is stored before and after such changes. You should be able to calculate the amount of energy associated with a moving object, a stretched spring and an object raised above ground level. Next, you should become familiar with the concept of power: the rate at which energy is transferred. The more powerful a device is, the more energy it will transfer per second. Students must know the equation of power: Power = Work / time You should be able to give examples that illustrate the definition of power. For energy demands and efficiency, students must understand that all humans transfer energy and be able to recall and apply relevant equations.	Energy syllabus topics included are: 1. Changes in energy stores 2. Energy and heating 3. Energy demands 4. Work, power and efficiency	Students must understand energy changes in a system, and the ways energy is stored before and after such changes. You should be able to calculate the amount of energy associated with a moving object, a stretched spring and an object raised above ground level. Next, you should become familiar with the concept of power: the rate at which energy is transferred. The more powerful a device is, the more energy it will transfer per second. Students must know the equation of power: Power = Work / time You should be able to give examples that illustrate the definition of power. For energy demands and efficiency, students must understand that all humans transfer energy and be able to recall and apply relevant equations.	Seneca HW, in class teacher questioning, MCQ's, starter tasks	EOTT
Autumn 2	B2 Organisation	In this section we will learn about the human digestive system which provides the body with nutrients and the respiratory system that provides it with oxygen and removes carbon dioxide. In each case they provide dissolved materials that need to be moved quickly around the body in the blood by the circulatory system. Damage to any of these systems can be debilitating if not fatal. Although there has been huge progress in surgical techniques, especially with regard to coronary heart disease, many interventions would not be necessary if individuals reduced their risks through improved diet and lifestyle. We will also learn how the plant's transport system is dependent on environmental conditions to ensure that leaf cells are provided with the water and carbon dioxide that they need for photosynthesis.	1. Tissues and organs 2. Digestive System 3. RP Food Tests 4. Enzymes 5. RP Amylase and pH 6. Blood 7. Heart 8. Coronary Heart Disease 9. Breathing 10. Health, lifestyle and risk factors 11. Cancer 12. Plant tissues and organs 13. Plant transport	In gas exchange, oxygen and carbon dioxide move between alveoli and the blood. Oxygen is transported to cells for aerobic respiration and carbon dioxide, a waste product of respiration, is removed from the body. Breathing occurs through the action of muscles in the ribcage and diaphragm. The amount of oxygen required by body cells determines the rate of breathing. Explain how exercise, smoking and asthma affect the gas exchange system. Explain how the parts of the gas exchange system are adapted to their function. Explain observations about changes to breathing rate and volume. Explain how changes in volume and pressure inside the chest move gases in and out of the lungs. Explain why multi-cellular organisms need organ systems to keep their cells alive. Describe how organs and tissues involved in digestion are	Seneca HW, in class teacher questioning, MCQ's, starter tasks	EOTT

Spring 1	C2 Structure and Bonding	Description of bonding between atoms. Three main types: 1. Ionic 2. Covalent 3. Metallic	Structure of the atom is discussed in further to include formation of ions, dot and cross diagrams and a description of the three types of bonding. Use of models to represent molecules. States of matter and their properties Electrolysis: the use of electricity to split up compounds into its consituent elements. Covers any ionic liquid ie molten salts and dissolved salts. Giant molecular structures: giant covalent, polymers and metals. Each structure described and explained. Graphite, Diamond and fullerenes covered in detail.	*Simple molecules revisited.* *States of matter revisited.*	Seneca HW, in class teacher questioning, MCQ's, starter tasks	EOTT
Spring 2	P2 Electricity	The GCSE physics syllabus states that for electric circuits, students should be able to draw and interpret circuit diagrams, including switch, lamp, fixed resistor and variable resistor. For mains electricity, you should be able to explain that a live wire may be dangerous even when a switch in the mains circuit is open and also the dangers of providing any connection between the live wire and earth. For static electricity, you should be able to: Describe the production of static electricity, and sparking, by rubbing surfaces Describe evidence that charged objects exert forces of attraction or repulsion on one another when not in contact Explain how the transfer of electrons between objects can explain the phenomena of static electricity	1. Electricity syllabus topics included are: 2. Current, Potential difference and resistance 3. Series and Parallel 4. Domestic uses and safety 5. Energy Transfer 6. Static Electricity (Physics Only)	Separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects The idea of electric field, forces acting across the space between objects not in contact Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as a ratio of potential difference (p.d.) to current Difference in resistance between conducting and insulating components (quantitative) Comparing power ratings of appliances in watts (W, kW) Comparing amount of energy transferred (J, kJ, KW hour) Other processes that involve energy transfers: completing an electrical circuit	Seneca HW, in class teacher questioning, MCQ's, starter tasks	EOTT

Summer 1	B3 Infection and Response	Pathogens are microorganisms such as viruses and bacteria that cause infectious diseases in animals and plants. They depend on their host to provide the conditions and nutrients that they need to grow and reproduce. They frequently produce toxins that damage tissues and make us feel ill. This section will explore how we can avoid diseases by reducing contact with them, as well as how the body uses barriers against pathogens. Once inside the body our immune system is triggered which is usually strong enough to destroy the pathogen and prevent disease. When at risk from unusual or dangerous diseases our body's natural system can be enhanced by the use of vaccination. Since the 1940s a range of antibiotics have been developed which have proved successful against a number of lethal diseases caused by	1. What are pathogens? 2. Viral diseases 3. Bacterial diseases 4. Fungal diseases 5. Protist diseases 6. Human defences 7. Vaccination 8. Antibiotics and painkillers 9. Discovery and development of drugs 10. Monoclonal antibodies (triple HT only) 11. Plant diseases (triple only)	Explain how uni-cellular organisms are adapted to carry out functions that in multi-cellular organisms are done by different types of cell.	Seneca HW, in class teacher questioning, MCQ's, starter tasks	EOTT
Summer 1	P3 Particle Model Of Matter	The particle model of matter is widely used to predict the behaviour of solids, liquids and gases. For this subject, the GCSE physics syllabus states that students should be able to: Recognise/draw simple diagrams to model the difference between solids, liquids and gases Explain the differences in density between the different states of matter in terms of the arrangement of atoms or molecules Describe how, when substances change state (melt, freeze, boil, evaporate, condense or sublimate), mass is conserved Interpret heating and cooling graphs that include changes of state Distinguish between specific heat capacity and specific latent heat Explain how the motion of the molecules in a gas is related to both its temperature and its pressure	Particle Model of Matter syllabus topics included are: 1. Density of materials 2. Particles in gases 3. Temperature changes and energy	Atomic model: The Dalton atomic model. Atoms and molecules as particles. Differences between atoms, elements and compounds. Changes of state: Solid, liquid and gas: The particle models Properties of the different states, including density differences. Conservation of material and mass, and reversibility, in melting, freezing, evaporation, sublimation, condensation, dissolving. Pressure: Atmospheric pressure as height increases. Pressure in liquids. Pressure measured by ratio of force over area. Changes with temperature in motion and spacing of particles	Seneca HW, in class teacher questioning, MCQ's, starter tasks	EOTT

Summer 2	P4 Atomic Structure	For this topic, the GCSE physics syllabus states that students should be able to: Understand the structure of isotopes and ions Describe why the new evidence from the scattering experiment led to a change in the atomic model Describe the difference between the plum pudding model of the atom and the nuclear model of the atom Use the names and symbols of common nuclei and particles Explain the concept of half-life and how it is related to the random nature of radioactive decay Compare hazards associated with contamination and radiation Draw/interpret diagrams representing nuclear fission and how a chain reaction may occur	Atomic Structure syllabus topics included are: 1. Atoms, isotopes and ions 2. Models of the atom 3. Nuclear fission and fusion 4. Radioactive decay 5.Uses and dangers of radiation	a simple (Dalton) atomic model differences between atoms, elements and compounds atoms and molecules as particles fuels and energy resources	Seneca HW, in class teacher questioning, MCQ's, starter tasks	EOTT