

Year 10, Subject Curriculum Overview



	Autumn Term 1 Iceni Chem Unit 1 Iceni Phy Unit 1 Iceni Bio Unit 1	Autumn Term 2 Iceni Phy Unit 2 Iceni Bio Unit 3 Iceni Chem Unit 2	Spring Term 1 Iceni Bio Unit 2 Iceni Phy Unit 3
Overview of Scheme of Learning	<p>Iceni Chem Unit 1</p> <ul style="list-style-type: none"> - Understand that all substances are made up of atoms. - Understand that atoms are represented by chemical symbols which are capital and lower case letters. - Know there are about 100 different elements and they are found on the periodic table. - Understand that compounds are formed from elements by chemical reactions. - Chemical reactions always involve the formation of one or more new substances, and often involve a detectable energy change. - Compounds contain two or more elements chemically combined in fixed proportions. - Compounds can only be separated into elements by chemical reactions. - Chemical reactions can be represented by word and symbol equations. - Define a mixture. - Describe and explain the methods of separating mixtures, including: 	<p>Iceni Phy Unit 2</p> <ul style="list-style-type: none"> - Describe the main energy sources available on Earth. - Distinguish between renewable and non-renewable energy resources. - Explain why some energy sources are more reliable than others. - Describe the environmental impact from the use of different energy resources. - Explain patterns and trends in energy use. <p>Iceni Chem Unit 2</p> <ul style="list-style-type: none"> - Name the 3 types of bonding. - Explain chemical bonding in terms of electrostatic forces and the transfer or sharing of electrons. - Explain that when a metal atom reacts with a non-metal atom electrons in the outer shell of the metal atom are transferred. - Understand that metal atoms lose electrons to become positively charged ions. Non-metal atoms gain electrons to become negatively charged ions. - To know that an ionic compound is a giant structure of ions. 	<p>Iceni Bio Unit 2</p> <ul style="list-style-type: none"> - Define a cell, tissue, organ and system. - Explain the function of the Human Digestive system. - Name the parts and functions of the digestive system. - Define an enzyme. - Describe the link between enzyme function and metabolism. - Understand that enzymes catalyse specific reactions only. - Describe the effect of temperature and pH on enzyme activity. - Be able to name the enzymes in the digestive system, their sites of production, the molecules they breakdown, and the products. - Explain the lock and key hypothesis of enzyme activity. - Describe the functions of Bile including where it is made and stored. - Required practical 3. - Required practical 4. - Be able to state the function of the heart. - Name the parts of the Heart and how it works.



	<p>filtration, distillation, and chromatography.</p> <ul style="list-style-type: none"> - Describe the changes to the model of the atom and the scientists involved. - Know the relative charge and mass of the subatomic particles. - Know the size of an atom and nucleus. - Be able to calculate the number of protons, neutrons and electrons in an atom from the information on the periodic table. - Define and calculate relative atomic mass. - Be able to draw the electronic structure for the first 20 elements. - Describe how the elements are arranged on the periodic table. - Describe the steps in the development of the periodic table. - Explain the differences between metals and non-metals in terms of physical and chemical properties. - Explain how positive and negative ions are created and that metals create positive ions. - Describe and explain the properties; including reactivity of the Group 1, 7 and 0 elements. <p>Iceni Phy Unit 1</p> <ul style="list-style-type: none"> - Explain that a system is an object or a group of objects. 	<ul style="list-style-type: none"> - Ionic compounds are held together by strong electrostatic forces of attraction between oppositely charged ions. These forces act in all directions in the lattice and this is called ionic bonding. - Explain that atoms share electron pairs in a covalent bond. - Understand that covalent bonds are strong. - Understand that covalently bonded substances may consist of small molecules. - Understand some covalently bonded substances have very large molecules, such as polymers. - Describe metallic bonding. - Understand the electrons in the outer shell of metal atoms are delocalised and so are free to move through the whole structure. The sharing of delocalised electrons gives rise to strong metallic bonds. - To know the 3 states of matter. - Understand the amount of energy needed to change state from solid to liquid and from liquid to gas depends on the strength of the forces between the particles of the substance. - To know and use the appropriate state symbols for states of matter. - Define a polymer. 	<ul style="list-style-type: none"> - Explain how the heart is Myogenic and how an artificial pacemaker can help. - Name the 4 key blood vessels that are attached to the Heart and where they carry blood to or from. - To be able to name the 3 types of blood vessel in the body and what they carry. - Describe how the structure of the vessels relates to their function. - Be able to label the key parts to the respiratory system. - Explain how the lungs are adapted for gaseous exchange. - Describe the components of the blood and their functions. - Be able to recognise the parts of the blood from pictures and relate structure to function. - Define Coronary Heart Disease. - Describe how stents can be used to treat coronary heart disease. - Explain that Statins can be used to lower the rate of fatty material deposit. - Understand that heart valves may be faulty. - Describe and explain the possible ways to treat faulty heart valves. - Describe the options available for if the heart fails. - Define Health.
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	<ul style="list-style-type: none"> - Describe the changes involved in the way energy is stored when a system changes. - Use calculations to show the distribution of energy. - Be able to calculate kinetic energy, gravitational potential energy and elastic potential energy. - Calculate the amount of energy stored or released from a system as a temperature change using the equation; change in thermal energy= mass x specific heat capacity x temp change. - Specific heat capacity is the energy needed to raise the temp by 1 degree of a 1kg block of a substance. - Complete required prac 15 - Be able to define power and use the equation. - Understand that energy can be transferred usefully, stored or dissipated but cannot be created or destroyed. - Describe ways to reduce the unwanted transfers. - Define thermal conductivity. - Calculate the energy efficiency of any energy transfer. <p>Iceni Bio Unit 1</p> <ul style="list-style-type: none"> - Define the structure of a Eukaryote cell. 	<ul style="list-style-type: none"> - To know that the intermolecular forces between polymer molecules are relatively strong and so these substances are solids at room temperature. - Define a giant covalent structure. - Define an alloy. - Explain how delocalised electrons affect conductivity. - Explain the structure and bonding of the different forms of carbon. <p>Iceni Bio Unit 3</p> <ul style="list-style-type: none"> - Understand that Chromosomes are made of DNA. - Know that chromosomes come in pairs. - Be able to describe the three stages of the cell cycle including mitosis. - Understand that mitosis is important for growth and development of multicellular organisms. - Define a Stem cell. - Describe the function of stem cells in embryos, in adult animals and in the meristems in plants. - Explain that adult bone marrow cells can become many different forms of cells. - Explain meristem tissue in plants can differentiate into any type of plant cell, throughout the life of the plant. 	<ul style="list-style-type: none"> - Define communicable and non-communicable disease. - Understand that other factors than disease can have an effect on health and wellbeing. - Understand that different types of disease may interact. - Be able to interpret epidemiological data in a number of different forms. - Explain the effects of lifestyle on some non-communicable diseases. - Define the term risk factor. - Interpret data about risk factors for specified diseases. - Define Cancer. - Explain the difference between benign and malignant tumours. <p>Iceni Phy Unit 3</p> <ul style="list-style-type: none"> - Define density using the density equation. - Use the particle model to explain differences in density. - Be able to recognise and/or draw diagrams to show the difference between solids, liquids, and gases. - Explain the differences in state and density using the arrangement of atoms. - Required prac 17. - Be able to describe how, when substances change state (melt, freeze,
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	<ul style="list-style-type: none"> - Define the structure of a Prokaryote cell. - Be able to name the organelles in eukaryote cells and relate them to their function. - Be able to state the substance that a plant cell wall is made from. - Required practical 1. - Explain how the structure of different types of cell relate to their function in a tissue, an organ or organ system, or the whole organism. - Explain the importance of cell differentiation. - Understand how microscopy techniques have developed over time. - Define the difference between resolution and magnification. - Explain how an electron microscope has improved our understanding of cell structure. - Carryout calculations using magnification, real size and actual size. - Define diffusion. - Explain the factors that affect diffusion rates. - Can calculate and compare surface area to volume ratios. - Explain why exchange surfaces and transport systems are necessary in multi-cellular organisms. 	<ul style="list-style-type: none"> - Understand that treatment with stem cells may be able to help conditions such as diabetes and paralysis. - Explain the steps in therapeutic cloning as well as the benefits and pitfalls of using cloning. - Explain how the structures of plant tissues are related to their functions. - Explain how certain organs and cells are adapted to their function. - Describe and explain how changing environmental conditions affect the rate of transpiration. - Describe the processes of Transpiration and Translocation. - Describe the structure and function of the key specialised cells in plant transport systems. - Be able to describe Aerobic respiration as an exothermic reaction occurring in living cells. - Understand respiration in cells can take place aerobically (using oxygen) or anaerobically (without oxygen), to transfer energy. - Explain what organisms require energy for. - To know the word and balanced symbol equation for Aerobic respiration. - Understand that as the oxidation of glucose is incomplete in anaerobic 	<p>boil, evaporate, condense or sublimate), mass is conserved.</p> <ul style="list-style-type: none"> - Explain why changes of state are physical and not chemical changes. - Define Internal energy. - Explain what heating does to the energy in a system and what that causes. - Understand that if the temperature in a system increases: the increase in temperature depends on the mass of the substance heated, the type of material and the energy input to the system. - Use the following equation: change in thermal energy = mass \times specific heat capacity \times temperature change. - Define Latent heat. - Understand that when a change of state occurs, the energy supplied changes the energy stored (internal energy) but not the temperature. - Be able to apply the following equation: energy for a change of state = mass \times specific latent heat. - Be able to interpret heating and cooling graphs that include changes of state. - Understand that the molecules of a gas are in constant random motion. The temperature of the gas is related to the
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	<ul style="list-style-type: none"> - Explain how specific exchange surfaces are adapted for their function. - How to increase the effectiveness of an exchange surface. - Define Osmosis. - Required prac 2 - Define Active Transport. 	<p>respiration much less energy is transferred than in aerobic respiration.</p> <ul style="list-style-type: none"> - Understand the process of fermentation. - To understand that during exercise the human body reacts to the increased demand for energy. The heart rate, breathing rate and breath volume increase during exercise to supply the muscles with more oxygenated blood. - To know that if insufficient oxygen is supplied anaerobic respiration takes place in muscles. The incomplete oxidation of glucose causes a build-up of lactic acid and creates an oxygen debt. During long periods of vigorous activity muscles become fatigued and stop contracting efficiently. - Define metabolism. - Explain the importance of sugars, amino acids, fatty acids and glycerol in the synthesis and breakdown of carbohydrates, proteins and lipids. 	<p>average kinetic energy of the molecules.</p> <ul style="list-style-type: none"> - Understand that changing the temperature of a gas, held at constant volume, changes the pressure exerted by the gas. - Explain how the motion of the molecules in a gas is related to both its temperature and its pressure. - Explain qualitatively the relation between the temperature of a gas and its pressure at constant volume
<p>Assessment Overview</p>	<p>Standardised end of topic test 45mins long. Foundation and higher available. Exam style questions in lesson 5 of each topic peer marked and assessed.</p>	<p>Standardised end of topic test 45mins long. Foundation and higher available. Exam style questions in lesson 5 of each topic peer marked and assessed.</p>	<p>Standardised end of topic test 45mins long. Foundation and higher available. Exam style questions in lesson 5 of each topic peer marked and assessed.</p>



	Spring Term 2 Iceni Chemistry Unit 3- Energy Changes Iceni Biology Unit 5- Respiration	Summer Term 1 Iceni Chemistry Unit 4- Chemical Changes Iceni Physics Unit 4 – Atomic Structure	Summer Term 2 Iceni Biology Unit 4 – Infection and Response Iceni Physics Unit 5 - Electricity
Overview of Scheme of Learning	<p><u>Iceni Chemistry Unit 3</u></p> <ul style="list-style-type: none"> - Energy Changes in a reaction - Required practical 10 - Bond Energies (HT) - Writing Formula - Classifying Substances - Balancing Equations - Ionic Equations (HT) - Half Equations (HT) <p><u>Iceni Biology Unit 5</u></p> <ul style="list-style-type: none"> - Aerobic Respiration - Response to exercise - Anaerobic Respiration - Metabolism in the Liver 	<p><u>Iceni Chemistry Unit 4</u></p> <ul style="list-style-type: none"> - The Reactivity Series - What are Displacement Reactions and how are they linked to the Reactivity Series. - How to Extract Metals - How to make Salts - Required Practical - Reactions of Acids - Electrolysis <p><u>Iceni Physics Unit 4</u></p> <ul style="list-style-type: none"> - Atomic Structure and Isotopes - The development of the Nucleus model. - Atoms and Radiation - Background Radiation(Triple Only) - Properties of Alpha, Beta, and Gamma Radiation. - Radioactive Decay - Half Life and radioactivity - Radiation Damage - Nuclear Radiation and Medicine (Triple Only) 	<p><u>Iceni Biology Unit 4</u></p> <ul style="list-style-type: none"> - Define Communicable Diseases and the Spread of Pathogens. - How to Growing Bacteria in a lab (Triple Only) - How to Preventing Bacterial Growth (Triple Only) - Preventing Infection - Define Viral Diseases - Define Bacterial Diseases - Define Fungal and Protist Diseases - Define Human Defense Response – non-specific. - Define Human Defence Response – the immune system. - Detection and identification of plant diseases (Triple Only) - Plant Defences (Triple Only) - Vaccination - Antibiotics and Painkillers - Discovery and development of drugs - Producing Monoclonal antibodies (Triple Only)



		<ul style="list-style-type: none"> - Nuclear Fission and Fusion (Triple Only) 	<ul style="list-style-type: none"> - Uses of Monoclonal Antibodies (Triple Only) <p><u>Iceni Physics Unit 5</u></p> <ul style="list-style-type: none"> - Define Electrical Circuits - Define Current, Charge and Potential Difference. - Explain Resistance - Required Practical - Describe Current-Potential Difference Graphs - Required Practical - Define Alternating Current - Describe Plugs and Cables - Electrical Power and Potential Difference. - Electrical Currents and Energy Transfer. - Appliances and Efficiency - Static Electricity (Triple Only)
<p>Assessment Overview</p>	<p>Biology - Energetics test 45 mins long. 80% will be new topic questions 20% will be knowledge recall.</p> <p>Chemistry - Chemical Changes test 45 mins long. 80% will be new topic questions 20% will be knowledge recall.</p>	<p>Chemistry – Chemical Changes test 45 mins long. 80% will be new topic questions 20% will be knowledge recall.</p> <p>Physics – Radioactivity test 45 mins long. 80% will be new topic questions 20% will be knowledge recall.</p>	<p>Physics – Electricity test 45 mins long. 80% will be new topic questions 20% will be knowledge recall.</p> <p>Biology – Infection and Response test 45 mins long. 80% will be new topic questions 20% will be knowledge recall.</p>