

Science department - Year 9 scheme of work

National curriculum: https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study Combined Science Syllabus https://qualifications.pearson.com/content/dam/pdf/GCSE/Science/2016/Specification/GCSE_CombinedScience_Spec.pdf				
Term	Title	Unit content	Key vocabulary	Resource links:
Autumn one (seven weeks)				
ELC – Paper 1A - Cells, genetics, inheritance and modification				
Week 1	Eukaryotic cells / Prokaryotic cells	<p>Key knowledge taught: (also look at combined science syllabus – page 13- 1.1,1.2,1.3, 1.4, 1.5,1.6,)</p> <p>1A.1 Describe the functions of the: a) nucleus b) cell membrane C) cytoplasm in animal cells 1A.2 Describe the functions of the: a) nucleus b) cell membrane c) cytoplasm d) chloroplast in plant cells 1A.3 Describe how growth takes place in organisms by: a cell division in animals and plants b cell elongation in plants 1A.4 Describe the importance of cell differentiation in the development of specialised cells 1A.5 Describe how the following specialised cells are adapted to their function: a) sperm cells b) egg cells c) nerve cells d muscle cells</p> <p>Practical ideas:</p> <ul style="list-style-type: none"> • Prepare onion cells • Investigate animal and plant cells using a light microscope 		ELC - 1A - Paper 1 Biology

Week 2	Nerve cells /reflex arc	<p>Key knowledge taught:</p> <p>1A.7 Recall the functions of the following nerve cells: a sensory neurones b relay neurones in the spinal cord c motor neurones</p> <p>1A.8 Describe the role of neurotransmitters in allowing an impulse to cross a synapse</p> <p>1A.9 Recall the function of the myelin sheath to insulate neurones</p> <p>A.10 Describe the processes involved in a reflex arc, including: a receptor cells detecting a stimulus b the path taken by the impulse through sensory, relay and motor neurones c the impulse arriving at the effector</p> <p>Practical ideas:</p> <ul style="list-style-type: none"> • Reaction time practical 		ELC - 1A - Paper 1 Biology
Week 3	DNA / inheritance	<p>Key knowledge taught: (also look at combined science syllabus – (page 17 3.3,3.4,3.5,3.6, 3.12,3,13,3.14,3.15,3.16,3.16,3.19,3.20,3.21, 3.22, 3.23)</p> <p>1A.11 Recall the structure of DNA as: a two strands b coiled to form a double helix</p> <p>1A.12 Recall that: a DNA is found in a) cell's nucleus, packaged into chromosomes b) each chromosome contains several genes c) a gene is a section of a DNA molecule d) a gene contains the information needed to make a protein</p> <p>1A.13 Define the terms allele, dominant and recessive</p> <p>1A.14 Use genetic diagrams and Punnett squares to show monohybrid inheritance</p> <p>1A.15 Recall that a person's sex is determined at fertilisation by the inheritance of an X chromosome from the mother, and either: a) an X chromosome (in girls) or b) a Y chromosome (in boys) from the father</p> <p>Practical ideas:</p> <ul style="list-style-type: none"> • Extract DNA from fruit • Build a model of DNA 		ELC - 1A - Paper 1 Biology

Week 4	Natural selection	<p>Key knowledge taught: (also look at combined science syllabus – page 19-4.2,4.3,4.4,4.5,4.7,4.8,4.10,4.11,4.14)</p> <p>1A.16 Recall that differences in characteristics within organisms in a species is called variation 1A.17 Describe genetic variation as the variation that arises because organisms inherit different combinations of alleles from their parents 1A.18 Recall that genetic variation mostly occurs because of small changes to the structure of DNA, known as a mutation</p> <p>Practical ideas</p> <ul style="list-style-type: none"> • 		ELC - 1A - Paper 1 Biology
Week 5	Variation/natural selection	<p>1A.19 Describe environmental variation as the variation that arises because an organism's environment makes it develop different characteristics 1A.20 Explain Darwin's theory of evolution by natural selection 1A.21 Describe the process of selective breeding, including: a) producing wheat that is resistant to disease b) producing cows with a high yield of milk</p> <p>Practical ideas</p> <ul style="list-style-type: none"> • 		ELC - 1A - Paper 1 Biology
Week 6	Genetic Variation / genetic engineering	<p>Key knowledge taught:</p> <p>1A.22 Describe genetic engineering as a process that involves modifying the DNA of an organism to introduce desirable characteristics 1A.23 Describe the benefits and risks of genetic engineering</p> <p>Practical ideas:</p>		ELC - 1A - Paper 1 Biology

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Week 7	Assessment	Consolidation, revision and assessment. <i>ELC Paper 1: Biology 1A: Cells, genetics, Inheritance and modification</i>		
Paper 3 – Chemistry 1A: Atoms, compounds and states and matter				
Week 8	Atomic structure	<p>Atoms, compounds and states and matter (<i>atomic structure, the periodic table, ionic bonding, covalent bonding, metallic bonding, states of matter</i>)</p> <p>Key knowledge taught:</p> <p>0.1 Recall the formulae of elements and simple compounds in this specification 0.2 Write word equations 0.3 Describe the use of hazard symbols on containers to: a indicate the dangers associated with the contents b inform people about safe working precautions with these substances in the laboratory 0.4 Recognise the risks in a practical procedure and suggest suitable precautions for a range of practicals, including those mentioned in the specification</p> <p>1A.1 Describe the structure of an atom as: a a nucleus containing protons and neutrons b a nucleus surrounded by electrons arranged in shells (of the first 20 elements of the periodic table) 1A.2 Describe the nucleus of an atom as very small compared to the overall size of the atom 1A.3 Recall the relative charge and relative mass of: a a proton b a neutron c an electron 1A.4 Recall that most of the mass of an atom is concentrated in the nucleus 1A.5 Describe atoms of a given element as having the same number of protons in the nucleus and that this number is unique to that element and known as the atomic number 1A.6 Recall the meaning of the term mass number of an atom 1A.7 Recall that atoms of the same element with different numbers of neutrons are called isotopes</p> <p>Practical ideas:</p>		ELC - 1A - Paper 3 Chemistry

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Autumn two				
Week 1	The periodic table	<p>Key knowledge taught:</p> <p>1A.8 Describe how Mendeleev arranged the elements, known at that time, in a periodic table by using properties of these elements and their compounds</p> <p>1A.9 Describe how Mendeleev used his table to predict the existence and properties of some elements not then discovered</p> <p>1A.10 Describe that in the periodic table elements: a) are arranged in order of increasing atomic number, in rows called periods b) with similar properties are placed in the same vertical columns called groups</p> <p>1A.11 Identify elements as metals or non-metals according to their position in the periodic table</p> <p>1A.12 Describe most metals as shiny solids that have high melting points, high density and are good conductors of electricity, whereas most non-metals have low boiling points and are poor conductors</p> <p>1A.13 Explain how the arrangement of electrons in an element is related to its position in the periodic table</p> <p>1A.14 Recall that when elements react, their atoms join with other atoms to form compounds</p> <p>Practical ideas:</p> <p>•</p>		ELC - 1A - Paper 3 Chemistry
Week 2	Ionic Bonding	<p>Key knowledge taught:</p> <p>1A.15 Describe how ionic bonds are formed: a between a metal atom and a non-metal atom b by the transfer of electrons to produce positive and negative ions, including the use of dot-and-cross diagrams</p>		ELC - 1A - Paper 3 Chemistry

		<p>1A.16 Describe the formation of ions in ionic compounds from their atoms, limited to compounds of elements in groups 1 and 7</p> <p>1A.17 Describe the structure of an ionic compound as a giant structure of positive and negative ions</p> <p>1A.18 Describe the properties of ionic compounds limited to: a) high melting points and boiling points, because energy is needed to overcome the strong forces between the ions b) solubility in water c) whether or not they conduct electricity as solids, when molten and in aqueous solution</p> <p>1A.19 Describe how a covalent bond is formed when a pair of electrons is shared between two non-metal atoms</p> <p>1A.20 Recall that covalent bonding usually results in the formation of simple molecules</p> <p>1A.21 Describe the formation of simple molecular, covalent substances using dot-and-cross diagrams, including: a hydrogen b hydrogen chloride c water (double bonds are not required)</p> <p>1A.22 Describe the properties of typical covalent, simple molecular compounds limited to: a low melting points and boiling points, because of weak forces between molecules (intermolecular forces) b poor conduction of electricity</p> <p>Practical ideas:</p> <ul style="list-style-type: none"> • 		
Week 3	Covalent / Metallic Bonding	<p>Key knowledge taught:</p> <p>1A.23 Recall that covalent bonding sometimes results in the formation of giant molecules</p> <p>1A.24 Describe the properties of giant covalent compounds, limited to: a high melting and boiling point b poor conduction of electricity (except graphite) c insoluble in water</p> <p>1A.25 Recall that graphite and diamond are different forms of carbon and that they are examples of giant covalent substances</p> <p>1A.26 Describe the uses of graphite in electrodes or as a lubricant, and diamond in cutting tools, and relate them to their properties</p> <p>1A.27 Describe, using poly(ethene) as the example, that simple polymers consist of large molecules containing chains of carbon atoms</p> <p>1A.28 Describe the properties of metals, including: a) the ability to conduct electricity, because of free moving electrons b) malleability, because layers of metal atoms can slide over each other</p>		ELC - 1A - Paper 3 Chemistry

		<p>Practical ideas:</p> <ul style="list-style-type: none"> • <p>Key skills developed:</p>		
Week 4	States of Matter	<p>Key knowledge taught:</p> <p>1A.29 Describe the arrangement and movement of particles in each of the three states of matter: solid, liquid and gas</p> <p>1A.30 Recall the names used for the interconversions between the three states of matter</p> <p>1A.31 Describe the changes in arrangement and movement of particles during these interconversions</p> <p>1A.32 Recognise that these interconversions are physical changes, unlike chemical reactions that result in chemical changes</p> <p>Practical ideas:</p> <ul style="list-style-type: none"> • 		ELC - 1A - Paper 3 Chemistry
Week 5		<p>Consolidation, revision and assessment.</p> <p><i>ELC Paper 3: Chemistry 1A: Atoms, compounds and states of matter</i></p>		ELC - 1A - Paper 3 Chemistry
Paper 5 – Physics 1A: Forces, Movement and energy				
Week 6		<p>Paper 5 - Forces, Movement and energy</p> <p>Key knowledge taught:</p> <p>1A.1 Recall that all forces have size and direction, including friction which acts in the opposite direction to a moving object</p> <p>1A.2 Be able to use: speed =</p> <p>1A.3 Be able to relate speed to the steepness of the gradient on a distance-time graph</p> <p>1A.4 Recall that large acceleration means large speed changes or small times or both</p>		ELC - 1A - Paper 5 Physics

		<p>1A.5 Be able to use: time taken change in speed</p> <p>1A.6 Be able to relate acceleration to the steepness of the gradient on a speed-time graph</p> <p>1A.7 Be able to relate the distance travelled to the area under a speed-time graph</p> <p>1A.8 Understand relative speeds for everyday contexts such as walking, running, cycling, for a car, for a train, for an airplane and the speed of sound</p> <p>Practical ideas:</p> <ul style="list-style-type: none"> • Be able to measure speed in a laboratory and in everyday situations (links to CS 2.19). • Measure the speed of sound in air by direct methods 		
Week 7	Forces	<p>Key knowledge taught:</p> <p>1A.9 Recall that (unbalanced) forces cause a change of: a) position b) speed c) shape</p> <p>1A.10 Recall that the forces acting on an object are balanced or zero when the object: a) is not moving b) moves at constant speed</p> <p>1A.11 Recall that forces cause objects to speed up or slow down</p> <p>1A.12 Be able to use: weight of an object in Newton (N) = its mass in kilogram (kg) × 10</p> <p>1A.13 Be able to use: the stopping distance of a vehicle = the thinking distance + the braking distance</p> <p>1A.14 Recall that the stopping distance of a vehicle is changed by the: a mass of the vehicle b speed of the vehicle c driver's reaction time d condition of the vehicle's brakes and tyres e state of the road</p> <p>1A.15 Recall that a driver's reaction time is increased when using drugs (medicines and alcohol) or when being distracted</p> <p>Practical ideas:</p> <ul style="list-style-type: none"> • 		ELC - 1A - Paper 5 Physics
Spring one				

Week 1	Energy	<p>Key knowledge taught:</p> <p>1A.16 Be able to use: a simple Sankey diagrams b energy transfer diagrams 1A.17 Recall that energy cannot be created or destroyed 1A.18 Understand that energy can be transferred from one form to another, including when: a vehicle slows down b water is heated by an electric kettle c a moving object hits another object 1A.23 Be able to use: $100 \frac{\text{useful energy output}}{\text{total energy input}} = \text{efficiency} \%$</p> <p>Practical ideas:</p> <ul style="list-style-type: none"> • 	ELC - 1A - Paper 5 Physics
Week 2	Wasted energy	<p>Key knowledge taught:</p> <p>1A.19 Understand that energy can be wasted or lost to the surroundings when an object: a gets hot b has a resistance force acting on it 1A.20 Recall that energy lost to the surroundings is not useful energy 1A.21 Understand that every time energy is transferred, some energy is always lost to the surroundings 1A.22 Describe how to reduce unwanted energy transfers, including using lubrication or thermal insulation</p> <p>Practical ideas:</p> <ul style="list-style-type: none"> • 	ELC - 1A - Paper 5 Physics
Week 3	Energy sources	<p>Key knowledge taught:</p> <p>1A.24 Describe the main energy sources that we can use on Earth, including: a fossil fuels b nuclear fuel c biofuel d wind e hydroelectric f the tides g the Sun</p>	ELC - 1A - Paper 5 Physics

		<p>1A.25 Classify sources of energy as either renewable or non-renewable</p> <p>1A.26 Explain why both renewable and non-renewable sources are used</p> <p>Practical ideas:</p> <ul style="list-style-type: none"> • 		
Week 4	ELC – Paper 5	Consolidation, revision and assessment. ELC Paper 5: Physics 1A: Force, movement and energy (1 week)		ELC - 1A - Paper 5 Physics
Paper 2: Biology 1A: Health, disease and the development of medicines				
Week 5	Communicable and non-communicable diseases	<p>Health, disease and the development of medicines</p> <p>Key knowledge taught:</p> <p>1B.1 Describe the difference between communicable and non-communicable diseases</p> <p>1B.2 Describe a pathogen as a disease-causing organism</p> <p>1B.3 Recall that pathogens can be bacteria, fungi, protists or viruses</p> <p>1B.4 Describe bacteria as single-cell organisms, with a: a circular chromosome of DNA, instead of a nucleus b flagellum, for movement</p> <p>1B.5 Describe fungi as organisms that: a may be single-celled (yeast) or multi-cellular (mushrooms) b digest food outside the organism and then absorb it</p> <p>1B.6 Describe viruses as non-living particles that: a contain genetic material b can only reproduce inside living cells</p> <p>Practical ideas:</p> <p>*</p>		ELC - 1B - Paper 2 Biology
Spring two				
Week 1	pathogens	Key knowledge taught:		ELC - 1B - Paper 2 Biology

		<p>1B.7 Describe some common infections, including: a cholera (bacteria) – causes diarrhoea b tinea (fungus) – causes athlete’s foot c malaria (protist) – causes damage to blood and liver d influenza (virus) – causes fever and cold-like ‘flu’ symptoms</p> <p>1B.8 Describe how pathogens are spread, including: a cholera (bacteria) – water b tinea (fungus) – direct contact, or through contaminated surfaces c malaria (protists) – mosquito vector d influenza (virus) – airborne</p> <p>1B.9 Describe methods for reducing or preventing the spread of pathogens, including: a simple hygiene, such as washing hands b treatment of water c control of vectors</p> <p>Practical ideas:</p> <ul style="list-style-type: none"> • 		
Week 2	STI	<p>Key knowledge taught:</p> <p>1B.10 Describe how sexually transmitted infections (STIs) are spread through sexual contact, including: a Chlamydia (bacteria) b HIV (virus)</p> <p>1B.11 Describe how STIs can be reduced or prevented by: a avoiding unprotected sexual activity b regular testing for infections</p> <p>1B.12 Describe how physical barriers of the human body provide protection from pathogens, including the skin (preventing pathogens entering the body) and mucus (trapping pathogens)</p> <p>1B.13 Describe how chemical defences of the human body provide protection from pathogens, including hydrochloric acid (in the stomach) and lysozymes (in tears, preventing infections through the eye)</p> <p>1B.14 Describe the role of the immune system of the human body in defence against disease, including the role of: a white blood cells that ingest pathogens b white blood cells that produce antibodies c memory white blood cells in preventing reinfection</p> <p>1B.15 Recall that antibiotics can only be used to treat bacterial infections</p> <p>1B.16 Describe how the process of developing new medicines has many stages, including: a discovery and development b preclinical and clinical testing</p>		ELC - 1B - Paper 2 Biology

		<p>Practical ideas:</p> <ul style="list-style-type: none"> • 		
Week 3	Non-communicable diseases	<p>Key knowledge taught:</p> <p>1B.17 Recall that many non-communicable human diseases, such as cancer, are caused by the interaction of a number of factors, such as diet, lifestyle and genetics</p> <p>1B.18 Describe cancer as the result of changes in cells that lead to uncontrolled cell division</p> <p>1B.19 Describe the effect of exercise and diet on obesity</p> <p>1B.20 Describe the use of BMI (body mass index) as a measure of obesity and perform simple BMI calculations</p> <p>Practical ideas:</p> <ul style="list-style-type: none"> • 		ELC - 1B - Paper 2 Biology
Week 4	Lifestyle (2)	<p>Key knowledge taught:</p> <p>1B.21 Describe the harmful effects of smoking on the: a lungs, leading to lung cancer b heart and circulatory system, leading to cardiovascular diseases</p> <p>1B.22 Recall that cardiovascular disease can be treated by: a life-long medication b surgical procedures c lifestyle changes</p> <p>Practical ideas:</p> <ul style="list-style-type: none"> • 		ELC - 1B - Paper 2 Biology
Week five- science				

Week 6		Consolidation, revision and assessment. ELC Paper 2: Biology 1B: Health, disease and the development of medicines (1 week)		ELC - 1B - Paper 2 Biology
Summer one				
Paper 4: Chemistry 1B: Separating mixtures, breaking down substances, acids and metals				
Week 1	Methods of separating and purifying substances	Separating mixtures, breaking down substances, acids and metals Key knowledge taught: 1B.1 Recall that a mixture contains two or more substances that are not chemically combined 1B.2 Describe the experimental techniques for separation of mixtures by: a simple distillation b fractional distillation c filtration d crystallisation e paper chromatography 1B.3 Describe an appropriate experimental technique to separate a mixture, knowing the properties of the components of the mixture 1B.4 Interpret a paper chromatogram to: a distinguish between pure and impure substances b identify substances by comparison with known substances 1B.5 Describe how waste and ground water can be made drinkable, including the need for sedimentation, filtration and chlorination Practical ideas: <ul style="list-style-type: none"> • 		ELC - 1B - Paper 4 Chemistry
Week 2	Breaking down ionic compounds	Key knowledge taught: 1B.6 Describe electrolysis as a process in which electricity decomposes ionic compounds in the molten state or dissolved in water 1B.7 Recall the formation of the products in the electrolysis, using inert electrodes, of some electrolytes, including: a copper chloride solution b water acidified with sulfuric acid c molten lead bromide (demonstration) 1B.8 Predict the products of electrolysis of other binary, ionic compounds in the molten state		ELC - 1B - Paper 4 Chemistry

		<p>Practical ideas:</p> <ul style="list-style-type: none"> Investigate the composition of inks using simple distillation and paper chromatography (links to CS 2.11). Investigate the electrolysis of copper sulfate solution (links to 3.31) 		
Week 3	Acid	<p>Key knowledge taught:</p> <p>1B.9 Recall that a neutral solution has a pH of 7, acidic solutions have lower pH values and alkaline solutions higher pH values</p> <p>1B.10 Recall the effect of acids and alkalis on indicators, including litmus, pH indicator paper/universal indicator solution</p> <p>1B.11 Recall that acids are neutralised by: a metals b metal oxides c metal carbonates to produce salts</p> <p>1B.12 Recall that: a hydrochloric acid produces chloride salts b nitric acid produces nitrate salts c sulfuric acid produces sulfate salts</p> <p>1B.13 Describe the chemical test for: a hydrogen b carbon dioxide (using limewater)</p> <p>1B.14 Describe the process of preparing a soluble salt from an acid and an insoluble reactant, including: a excess of the reactant is added b the excess reactant is removed c the solution remaining is only salt and water d the salt is obtained by evaporation/crystallisation</p> <p>Practical ideas:</p> <p>Measure the pH of everyday substances and common laboratory reagents using pH indicator paper/universal indicator (links to CS 3.6).</p> <p>Carry out tests for hydrogen and carbon dioxide.</p>		ELC - 1B - Paper 4 Chemistry

Week 4	Metals	<p>Key knowledge taught:</p> <p>1B.15 Deduce the relative reactivity of some metals by their reactions with water, acids and salt solutions</p> <p>1B.16 Recall that: a most metals are extracted from ores found in the Earth's crust b unreactive metals are found in the Earth's crust as the uncombined elements</p> <p>1B.17 Explain why the method used to extract a metal from its ore is related to its position in the reactivity series and the cost of the extraction process, illustrated by: a heating with carbon (including iron) b electrolysis (including aluminium) (knowledge of the blast furnace and the aluminium electrolysis cell are not required)</p> <p>1B.18 Describe the uses of metals in relation to their properties, including: a) aluminium b) copper c) gold d) steel</p> <p>1B.19 Describe the advantages of recycling metals, including economic implications and how recycling can preserve both the environment and the supply of valuable raw materials</p> <p>Practical ideas</p> <p>*</p>		ELC - 1B - Paper 4 Chemistry
Week 5		<p>Key knowledge taught:</p> <p>Ensure previous knowledge is covered and embedded</p> <p>Practical ideas:</p> <ul style="list-style-type: none"> • 		ELC - 1B - Paper 4 Chemistry
Week 6		<p>Consolidation, revision and assessment. <i>ELC Paper 4: Chemistry 1B: Separating mixtures, breakdown substances, acids and metals.</i></p> <p>(1 week)</p>		ELC - 1B - Paper 4 Chemistry
Summer two				
Paper 6: Physics 1B: Waves and radiation				

Week 1	waves	<p><i>Waves and radiation</i> Key knowledge taught:</p> <p>1B.1 Recall that waves transfer energy and information 1B.2 Describe a wave using the terms: a) frequency b) wavelength c) amplitude d wave speed 1B.3 Be able to use: wave speed = frequency × wavelength 1B.4 Recall that waves change direction and speed at a boundary (refraction)</p> <p>Practical ideas:</p> <p>*</p>		ELC - 1B - Paper 6 Physics
Week 2	Electromagnetic spectrum	<p>Key knowledge taught:</p> <p>1B.5 Recall that electromagnetic waves travel at the same speed in a vacuum 1B.6 Recall the order of electromagnetic spectrum: radio waves, microwaves, infrared, visible, ultraviolet, x-rays and gamma rays 1B.7 Describe the pattern in the frequency, wavelength and energy of waves in electromagnetic spectrum: radio waves (long wavelength, low frequency, low energy) to gamma rays (very short wavelength, very high frequency, very high energy) 1B.8 Recall that electromagnetic waves travel more slowly in some materials than in others 1B.9 Describe the harmful effects on people of excessive exposure to electromagnetic radiation, including: a microwaves – internal heating of body cells b infrared – skin burns c ultraviolet – damage to surface cells and eyes, leading to skin cancer and eye conditions d x-rays and gamma rays – mutation or damage to cells in the body 1B.10 Describe some uses of electromagnetic radiation a radio waves – broadcasting, communications and satellite transmissions b microwaves – cooking, communications and satellite transmissions c infrared – cooking, thermal imaging and television remote controls d visible light – vision, photography and illumination e ultraviolet – security marking (detecting forged bank notes), fluorescent lamps and disinfecting water f x-rays – observing the internal structure of objects, airport security scanners and medical x-rays</p>		ELC - 1B - Paper 6 Physics

		<p>g gamma rays – sterilising food and medical equipment, and the detection of cancer and its treatment</p> <p>Practical ideas:</p> <ul style="list-style-type: none"> Investigate refraction in glass blocks in terms of the interaction of electromagnetic waves with matter (links to CS 5.9). 		
Week 3	Atoms	<p>Key knowledge taught:</p> <p>1B.11 Describe the structure of an atom as: a a positively charged nucleus made up of protons and neutrons b negatively charged electrons surrounding the nucleus c most of the mass in the nucleus</p> <p>1B.12 Understand that atoms of each element have the same number of protons in their nuclei</p> <p>1B.13 Recall that each element has a different number of protons in the nuclei of its atoms and that this is called the atomic number</p> <p>1B.14 Recall that atoms of the same element, with different numbers of neutrons, are called isotopes</p> <p>1B.15 Recall that the total number of protons and neutrons in an atom is called the atomic mass</p> <p>1B.16 Recall that: a protons have a mass of 1 and a charge of +1 b neutrons have a mass of 1 and no charge c electrons have a charge of -1</p> <p>1B.17 Recall that in an atom the number of protons equals the number of electrons and so the atom has no overall charge (is neutral)</p> <p>Practical ideas:</p> <ul style="list-style-type: none"> 		ELC - 1B - Paper 6 Physics
Week 4	Radiation	<p>Key knowledge taught:</p>		ELC - 1B - Paper 6 Physics

		<p>1B.18 Recall that when an unstable atom decays it emits an alpha particle, a beta particle or gamma rays and this is called radioactive decay</p> <p>1B.19 Recall that radioactive decay is random</p> <p>1B.20 Recall that when: a an alpha particle is emitted from a nucleus, the atom has become a different element b a beta particle is emitted from a nucleus, the atom has become a different element c a gamma ray is emitted from a nucleus, the atom stays the same element</p> <p>1B.21 Recall that the number of radioactive decays in a second is called the activity of a radioactive source</p> <p>Practical ideas:</p> <ul style="list-style-type: none"> • Simulation of radioactive decay of different sources (link to CS 10.17). 		
Week 5		<p>Key knowledge taught:</p> <p>1B.22 Describe how the activity of a radioactive source decreases with time</p> <p>1B.23 Describe how the activity of a radioactive source can be shown on a graph that never gets to zero</p> <p>1B.24 Understand that the half-life of a radioactive isotope is the time it takes for the activity to halve</p> <p>1B.25 Recall that radioactive isotopes can cause cells in the body to: a be damaged b die c mutate</p> <p>1B.26 Describe methods to minimise the exposure to radioactive isotopes, including: a no direct contact b increased distance from source c reduced time of exposure</p> <p>1B.27 Recall that irradiation is when alpha, beta or gamma radiation passes through an object, and contamination is when an object becomes in contact with a radioactive source</p> <p>Practical ideas:</p> <ul style="list-style-type: none"> • 		ELC - 1B - Paper 6 Physics
Week 6		<p>Consolidation, revision and assessment. ELC Paper 6: 1B: Physics 1B – Waves and Radiation</p>		ELC - 1B - Paper 6 Physics

Week 7		Key knowledge taught: Review assessment and reteach where needed Practical ideas: *		
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