

Year 11 Combined Science Cycle One

Key Vocabulary	Week One	Week Two
<ol style="list-style-type: none"> 1. Aerobic respiration: chemical reaction releasing energy using oxygen 2. Alveoli: air sacs found in the lungs. The site of gaseous exchange 3. Anaerobic respiration: chemical reaction releasing a small amount of energy without oxygen present 4. Arteries: blood vessels which carry oxygenated blood around body 5. Capillaries: small blood vessels that reach cells 6. Erythrocytes: red blood cells, these carry oxygen 7. Lactic acid: the product of anaerobic respiration 8. Lymphocytes: a type of white blood cell which releases antibodies to neutralise pathogens 9. Phagocytes: a type of white blood cell which engulfs pathogens to detect its type 10. Plasma: watery content of blood which carries dissolved glucose, urea and mineral ions 11. Platelets: cell fragments found in blood which are responsible for clotting 12. Respirometer: used to measure the rate of respiration 13. Veins: blood vessels containing valves, which carry deoxygenated blood around the body 14. Insulin – hormone that causes cells in the liver and other organs to take in glucose 15. Homeostasis – maintaining constant conditions inside the body 16. BMI – mass (kg) / height² (m) 17. Hormone – a chemical messenger carried by the blood 	<ol style="list-style-type: none"> There are a range of substances that need to be transported in and out of body organs: <ol style="list-style-type: none"> a) Oxygen: from alveoli (in lungs) to blood b) Carbon dioxide: from blood to alveoli c) Food molecules: from small intestines to blood d) Urea: from cells to blood and into kidney These substances diffuse across surface membranes. We can calculate SA:V by: Surface area: ÷ volume The alveoli in the lungs are adapted for gaseous exchange in the following ways: <ol style="list-style-type: none"> a) Large capillary network to increase exchange rate b) One cell thick to speed up diffusion c) They have a large surface area 	<ol style="list-style-type: none"> There are 4 main components of blood: erythrocytes (red blood cells), white blood cells (phagocytes and lymphocytes, plasma and platelets. The blood vessels have several adaptations: <ul style="list-style-type: none"> Veins: carry deoxygenated blood to heart. <ol style="list-style-type: none"> a) These have a large lumen (internal hole) b) Have valves to keep blood moving in one direction back to heart. Arteries: carry oxygenated blood away from heart. These have: <ol style="list-style-type: none"> a) Thick layers of muscle to withstand the high pressure generated by left ventricle b) Elastic tissue Capillaries: site of exchange between blood and body tissues: one cell thick to enable rapid diffusion to occur.
	Week Three	Week Four
	<ol style="list-style-type: none"> Respiration is the chemical reaction which takes place in the cells. Its purpose is to release energy. It is an exothermic reaction. Aerobic respiration: <ol style="list-style-type: none"> a) Takes place in the mitochondria of cells b) Releases a large amount of energy c) Reaction uses oxygen d) Glucose + oxygen → carbon dioxide + water Anaerobic respiration: <ol style="list-style-type: none"> a) Takes place in the cytoplasm of cells b) No oxygen is present c) Less energy is released d) Lactic acid is formed as a by-product 	<ol style="list-style-type: none"> The menstrual cycle is a cycle of changes in a women's reproductive system that takes about 28 days: <ol style="list-style-type: none"> a) Days 1- 5: Menstruation occurs – the uterus lining is broken down and lost b) Day 14: Ovulation occurs – an egg is released from the ovary The menstrual cycle is controlled by the sex hormones oestrogen and progesterone, which are both produced by the ovaries Contraception is the prevention of fertilisation. There are many contraception methods: <ol style="list-style-type: none"> a) Barrier methods e.g. condom and diaphragm b) Hormonal methods e.g. hormone pill

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Week Five	Week Six	Week Seven
<ol style="list-style-type: none">1. The reactivity series is a list of metals in order of reactivity2. A more reactive metal will displace a less reactive metal from its compound3. Very unreactive metals e.g. gold are found naturally in their native state4. Metals less reactive than carbon can be extracted by heating with carbon5. Metals more reactive than carbon must be extracted by electrolysis<ol style="list-style-type: none">a) Electrolysis requires a lot of energyb) Electrolysis is expensive6. Oxidation is the gain of oxygen by a substance7. Reduction is the loss of oxygen by a substance	<ol style="list-style-type: none">1. A reversible reaction occurs when the products react to form the reactants2. A reversible reaction is represented by the symbol \rightleftharpoons3. Dynamic equilibrium occurs when the forward and backward reactions are happening at the same rate4. During an exothermic reaction, energy is transferred from stores of energy in chemical bonds to the surroundings. The temperature of the surroundings increases5. During an endothermic reaction, energy is transferred from the surroundings to stores of energy in chemical bonds. The temperature of the surroundings decreases.	<ol style="list-style-type: none">1. Crude oil is:<ol style="list-style-type: none">a) a mixture of hydrocarbonsb) a finite resourcec) made up of hydrogen and carbon atoms onlyd) an arrangement of carbon atoms in chains or rings2. Petrol, kerosene and diesel oil are fossil fuels that are obtained from crude oil.3. Methane is a non-renewable fossil fuel made from natural gas.4. Crude oil is an important source of useful substances:<ol style="list-style-type: none">a) Fuelsb) Feedstock for petrochemical industry
Week Eight	Week Nine	Week Ten
<ol style="list-style-type: none">1. Fractional distillation is used to separate hydrocarbons into simpler, more useful mixtures because they have different boiling points.2. During fractional distillation:<ol style="list-style-type: none">a) Crude oil is heatedb) The crude oil evaporatesc) The vapours rise up the columnd) The column is hottest at bottom so the vapours cool as they risee) The vapours condense when they reach a part of the column that is below their boiling point3. The compounds in crude oil fractions are mostly alkanes.4. The general formula for alkanes is C_nH_{2n+2}	<ol style="list-style-type: none">1. Complete combustion of hydrocarbons occurs when oxygen is present and releases carbon dioxide, water and energy.2. Incomplete combustion of hydrocarbons occurs when there is not enough oxygen present and can produce carbon, carbon monoxide and water.3. Sulfur dioxide can be produced due to impurities in fuels.4. Acid rain occurs when sulfur dioxide dissolves in rain water.5. Oxides of nitrogen form when oxygen and nitrogen react in engines.6. A high temperature is needed for oxygen and nitrogen to react.7. Oxides of nitrogen are pollutants.	<ol style="list-style-type: none">1. The Earth's early atmosphere is thought to have been :<ol style="list-style-type: none">a) mainly carbon dioxide,b) smaller amounts of water vapourc) smaller amounts of other gasesd) little or no oxygen2. Volcanoes affected the early atmosphere by releasing large amounts of gases3. The water vapour in the atmosphere condensed to form the oceans4. The amount of carbon dioxide in the atmosphere has decreased because it dissolved in the oceans.5. The amount of oxygen in the atmosphere has increased as primitive plants grew and released oxygen via photosynthesis.6. Oxygen gas will relight a glowing splint