

Yr10 (KS4)	Topic Area	Key knowledge/skills (what <u>has</u> to be learnt)	Examples of key compulsory practicals for students	Knowledge/Skills revisited and to be revisited	What does good look like?	Resources/support at home
B4	Organising animals and plants	<p>The structure and function of the human circulatory system. The role and components of blood. The structure and function of the different blood vessels and the heart. The way of solving problems with heart and blood supply to the heart.</p> <p>The structure and function of the human gas exchange system. The adaptations of the alveoli of the lungs for effective gas exchange. The mechanisms of breathing. The importance of ventilating the lungs to maintain steep concentration gradients.</p> <p>The tissues and organs in plants. The role of the leaf stomata in gas exchange in a plant. How evaporation and transpiration are controlled in plants.</p>			Please see the published checklists on the website.	Kerboodle Google classroom BBC Bitesize My GCSE Science
B5	Communicable disease	<p>The role of bacteria, viruses, protists and bacteria in diseases.</p> <p>How the human defense responses work. How your white blood cells protect you from disease.</p>	Required practical: Light intensity and the rate of photosynthesis			Kerboodle Google classroom BBC Bitesize My GCSE Science

B6	Preventing and treating disease	How the immune system works and how vaccination protects people against disease. How antibiotics and painkillers work. How some drugs were discovered and how scientists look for new drugs. The stages involved in testing and trialling new drugs.				Kerboodle Google classroom BBC Bitesize My GCSE Science
B7	Non-communicable diseases	What is meant by a non-communicable disease. How cancer spreads. The difference between malignant and benign tumours. Smoking and the risk of disease. The effect of diet and exercise on the risk of developing different diseases. How alcohol affects the body.				Kerboodle Google classroom BBC Bitesize My GCSE Science
B8	Photosynthesis	The process of photosynthesis in plants and the factors that limit the rate. How plants use the glucose they make.	Practical: Light intensity and rate of photosynthesis Practical: testing for starch			Kerboodle Google classroom BBC Bitesize My GCSE Science
B9	Respiration	The importance of aerobic and anaerobic respiration. How the body responds to exercise. The metabolic reactions that take place in the body and the role of the liver.				Kerboodle Google classroom BBC Bitesize My GCSE Science
C4	Chemical calculations	Relative atomic mass, relative formula mass and the mole. Equations and reacting masses.	RP2 Titration			Kerboodle Google classroom BBC Bitesize My GCSE Science

		Expressing concentration.				
C5	Chemical Changes	Metals and the reactivity series. Extracting metals, oxidation and reduction. Making salts and neutralisation.	RP1 Preparation of salt			Kerboodle Google classroom BBC Bitesize My GCSE Science
C6	Electrolysis	Electrolysis of a molten ionic substance. Equations for the reactions at the anode and cathode. The manufacture of aluminium. Electrolysis of aqueous solutions; predicting the product at the cathode.	RP3 Electrolysis RP4 Temperatures changes			Kerboodle Google classroom BBC Bitesize My GCSE Science
C7	Energy Changes	Exothermic and endothermic reactions and their uses. Energy profile diagrams and activation energy. Using bond energies to calculate energy changes.				Kerboodle Google classroom BBC Bitesize My GCSE Science
C8	Rates of Reaction	Measuring the rate of a reaction - different methods. Collision theory - factors that affect the rate of a reaction; surface area, concentration, temperature and	RP5 Rates of reaction (concentration)			Kerboodle Google classroom BBC Bitesize My GCSE Science

		<p>catalysts.</p> <p>Reversible reactions and equilibrium.</p> <p>Le Chatelier's principle and the effect of changing conditions.</p>				
C9	Crude Oil	<p>Crude oil and alkanes.</p> <p>Hydrocarbons and combustion.</p> <p>Fractional distillation of oil - making useful products.</p> <p>Cracking - breaking long molecules into shorter ones.</p>				<p>Kerboodle</p> <p>Google classroom</p> <p>BBC Bitesize</p> <p>My GCSE Science</p>
C10	Chemical analysis	<p>Pure substances and mixtures and formulations.</p> <p>Paper chromatography.</p> <p>Testing for gases (H₂, O₂, CO₂, Cl₂)</p>				
C11	The Earth's atmosphere	<p>How the atmosphere developed.</p> <p>The current composition of the atmosphere.</p> <p>The greenhouse effect.</p> <p>Global warming and its consequences.</p> <p>Atmospheric pollutants.</p>				
C12	The Earth's resources	Finite and renewable resources.				

		<p>Treating water to make it potable.</p> <p>Dealing with waste water.</p> <p>Extracting metals from their ores.</p> <p>Purification of copper using electrolysis.</p> <p>Bioleaching and phytomining.</p> <p>Life cycle assessments (LCA) and reusing / recycling.</p>				
P4	Electric circuits	<p>How to calculate the flow of charge</p> <p>How to work out the resistance and potential difference in an electric circuit</p>	<p>Investigating resistance</p> <p>Investigating different electrical components</p>	<p>Note: Year 7 Electric Circuits knowledge to be reviewed and consolidated due to COVID lockdown disruption in Spring/Summer 2020.</p>		<p>Kerboodle</p> <p>Google classroom</p> <p>BBC Bitesize</p> <p>My GCSE Science</p>
P5	Electricity in the home	<p>Applying the knowledge and understanding of current and pd behaviour in electric circuits to the context of mains electricity supplies in the home.</p> <p>Explaining alternative current and how earth wires and fuses wires protect users and appliances.</p> <p>Calculating the rates of energy transfer and these are necessary to understand: how resistance heating is both useful and wasteful; compare the efficiency of different appliances and discuss the most appropriate appliance for a given situation in the home.</p>		<p>Note: Year 7 Energy in the home (electrical aspects such as electrical costs and power) must be reviewed and consolidated due to COVID lockdown Spring/Summer 2020).</p>		<p>Kerboodle</p> <p>Google classroom</p> <p>BBC Bitesize</p> <p>My GCSE Science</p>
P6	Molecules and	How the density of materials can be	RP 5 Calculating densities			Kerboodle

	Matter	<p>found and how density affects the properties of materials in different states of matter.</p> <p>Use the particles model to explain changes of state and pressure in gases. and the effect on internal energy of changes of state; explain how the internal energy of a material is dependent on the temperature and state of a material.</p> <p>Calculate the energy transferred to change the internal energy of a substance when there is a change of state as well as a change in temperature (building on P2 Specific Heat Capacity)</p>				<p>Google classroom</p> <p>BBC Bitesize</p> <p>My GCSE Science</p>
P7	Radioactivity	<p>How an unstable nucleus changes when it becomes stable and why the radiation it gives out is harmful</p> <p>What nuclear fission and fusion are</p>				<p>Kerboodle</p> <p>Google classroom</p> <p>BBC Bitesize</p> <p>My GCSE Science</p>
P8	Forces in balance	<p>The difference between a vector and a scalar and how to represent a vector</p> <p>How to find the resultant of two forces and to resolve a force into perpendicular components</p>				<p>Kerboodle</p> <p>Google classroom</p> <p>BBC Bitesize</p> <p>My GCSE Science</p>

Yr11 (KS4)	Topic Area	Key knowledge/skills (what <u>has</u> to be learnt)	Examples of key compulsory practicals for students	Knowledge/Skills revisited and to be revisited	What does good look like?	Resources/support at home
B10	The human nervous system	The principles of homeostasis and why it is important for internal body			Please see the published checklists	<p>Kerboodle</p> <p>Google classroom</p>

		<p>conditions to be controlled.</p> <p>The differences between sensory and motor neurones and their role in coordination and control.</p>			on the website.	BBC Bitesize My GCSE Science
B10	B11 Hormonal coordination	<p>The principle of hormonal control. The role of the pancreas in monitoring and controlling blood glucose concentration. How diabetes is treated.</p> <p>How reproduction is controlled by hormones and how hormones can be used in the artificial control of fertility.</p>				Kerboodle Google classroom BBC Bitesize My GCSE Science
B13	Reproduction	<p>How the DNA of an organism can be analysed. Know about the variants of genes known as alleles.</p> <p>How meiosis in cell division forms gametes.</p> <p>How information is passed from one generation to another. How to use genetic diagrams, direct proportion, simple ratios and probability to predict outcomes of a genetic cross.</p>				Kerboodle Google classroom BBC Bitesize My GCSE Science
B14	Variation and evolution	<p>The importance of selective breeding in the development of plants and animals and the increasing use of genetic engineering to introduce desirable characteristics.</p>				Kerboodle Google classroom BBC Bitesize My GCSE Science

B15	Genetics and evolution	<p>The history of genetics and the work of Gregor Mendel.</p> <p>How fossils are formed and how they can reveal how organisms have changed over time.</p> <p>How the DNA based systems for classifying organisms work.</p>				<p>Kerboodle</p> <p>Google classroom</p> <p>BBC Bitesize</p> <p>My GCSE Science</p>
B16	Adaptations, interdependence and competition	<p>How to investigate and measure the distribution and abundance of species in a system. Know about the competition between organisms for resources and about the adaptations of organisms that result from natural selection and enable them to compete successfully in specific environments.</p>	<p>Practical: Investigate the population size of a common species in a habitat.</p>			<p>Kerboodle</p> <p>Google classroom</p> <p>BBC Bitesize</p> <p>My GCSE Science</p>
B17	Organising an ecosystem	<p>The importance of material cycles in nature that return chemicals from the bodies of organisms to the soil, water and air.</p>				<p>Kerboodle</p> <p>Google classroom</p> <p>BBC Bitesize</p> <p>My GCSE Science</p>
B18	Biodiversity and ecosystems	<p>The reasons for the growth in the human population and its impact in terms of pollution of the land, water and air.</p>				<p>Kerboodle</p> <p>Google classroom</p> <p>BBC Bitesize</p> <p>My GCSE Science</p>
C9	Crude Oil	<p>How fractional distillation can be used to separate crude oil into useful fractions.</p> <p>How the properties and usefulness of these fractions relate to their</p>				<p>Kerboodle</p> <p>Google classroom</p> <p>BBC Bitesize</p> <p>My GCSE Science</p>

		molecular structure. Understanding the process and importance of cracking. Describing complete and incomplete combustion of hydrocarbons with balanced symbol equations.				
C12	Chemical analysis	Identifying unknown gases and ions using a wide range of tests	RP Calculating Rf values			Kerboodle Google classroom BBC Bitesize My GCSE Science
C13	Earth's Atmosphere	How the composition of the Earth's atmosphere developed over its history, how climate change is caused by greenhouse gases and this needs to be addressed.				Kerboodle Google classroom BBC Bitesize My GCSE Science
C14	Earth's resources	How to analyse data on diminishing finite resources and carrying out Life Cycle Assessments to judge the impact of making new materials.	RP Purifying water			Kerboodle Google classroom BBC Bitesize My GCSE Science
P8	Forces in balance	The difference between a vector and a scalar and how to represent a vector How to find the resultant of two forces and to resolve a force into perpendicular components				Kerboodle Google classroom BBC Bitesize My GCSE Science
P9	Motion	The difference between speed and velocity and what is meant by acceleration				Kerboodle Google classroom BBC Bitesize My GCSE Science
P10	Forces and motion	What is meant by terminal velocity and why objects fall through water at a constant velocity What is meant by the conservation of momentum and when we can use the rule. How to measure the stiffness of a spring and what is meant by elasticity.	Investigate the relationship between force and extension of a spring (Stretch tests) Investigating forces and acceleration			Kerboodle Google classroom BBC Bitesize My GCSE Science

		How to calculate the weight on an object from its mass and the gravitational field strength of where it is.				
P15	Electromagnetism	How the strength of a magnetic field is measured and what a solenoid is. The motor effect.		KS3 Content revisited: Electromagnets Note: Magnetism and electromagnetism content from Year 8 must be reviewed and consolidated due to COVID lockdown disruption Spring/Summer 2020		Kerboodle Google classroom BBC Bitesize My GCSE Science