

Group Weekly Science Masterclasses beginning Sept 2021-May 2022

For each weekly group session there will be an online course to follow via the website, which will include around an hours' work for each Science. There will be pre-recorded video lessons covering the key skills required, a quiz to complete, exam-style questions to try out (with answers), and an optional 1-hour live interactive group session. Once the live session has happened, a post-session recording of any sticking spots will be placed into the zoom call area.

Greyed out sessions have no live Zoom call component and the unit is fully complete without the live zoom.

Please check the schedule carefully: The dates and times below are of the access times when each masterclass opens online to begin study of the pre-recorded classes and the quiz activity; and then also the date of the live zoom masterclass. The work for the week needs to be completed **BEFORE** the date of the Zoom session as the time in the live zoom session denoted below is devoted to any problems that arose with the material for the preceding week and checking understanding – the items in the pre-recorded video lessons **will not** be covered again in the live call.

E.g. **Session 1.01: Access opens: Mon 6 Sept** (students will be able to get into course material from this date). **Zoom: Sun 12 Sept** (date of the optional live help call, should assistance be needed for any of that weeks' materials).

Bio: Cells & Viruses;

Chem: Atoms & Atomic structure;

Phys: Scalars & Vectors.

} The topics covered in this Masterclass session (name listed in red).

All group sessions are paid for via the website so that you get direct access to the resources. Payment must be received a minimum of 5 days before the date of the live session (before the 'Access opens' date is ideal) – as there is work to be done in the week before the live session and a student beginning late is at a disadvantage. The best advice is to pop onto the website with the student, sort out access to the sessions (in their name) for the upcoming month all at once, and then you only need to remember to do that step once a month. (1-2-1 sessions will continue to be arranged and paid for separately).

Masterclass 1.0 – Basic items; mostly Paper 1 topics Sundays 5-6pm	Masterclass 2.0 – More advanced items; mostly Paper 2 topics Sundays 6:50-7:50pm
Session 1.01: Access opens: Mon 6 Sept. Zoom: Sun 12 Sept. Bio: Cells & Viruses; Chem: Atoms & Atomic structure; Phys: Scalars & Vectors, and Physics formulae.	Session 2.01: Access opens: Mon 6 Sept. Zoom: Sun 12 Sept. Bio: Photosynthesis; Chem: Electrolysis – Molten (Prac); Phys: The National Grid.
Session 1.02: Access opens: Mon 13 Sept. Zoom: Sun 19 Sept. Bio: Microscopy (Prac); Chem: The Periodic table & its' history (&labels); Phys: Energy Conservation: Kinetic Energy and Gravitational Potential Energy.	Session 2.02: Access opens: Mon 13 Sept. Zoom: Sun 19 Sept. Bio: Leaf Structure; Chem: Electrolysis – Aqueous (Prac); Phys: Transformers.
Session 1.03: Access opens: Mon 20 Sept. Zoom: Sun 26 Sept. Bio: Enzyme action (Prac) & Enzyme graphs; Chem: Models of the Atom; Phys: Velocity-time & Distance-time graphs, and accompanying calculations.	Session 2.03: Access opens: Mon 20 Sept. Zoom: Sun 26 Sept. Bio: Effect of light intensity on photosynthesis (Prac); Chem: Electrolysis of Aluminium; Phys: Circuit Symbols.
Session 1.04: Access opens: Mon 27 Sept. Zoom: Sun 3 Oct. Bio: Transport: diffusion, osmosis & active transport (Prac); Chem: Reactions of metals and acids to form salts (Prac); Phys: Momentum and the conservation of momentum.	Session 2.04: Access opens: Mon 27 Sept. Zoom: Sun 3 Oct. Bio: Plant hormones & their uses; Chem: Half Equations; Phys: Circuits, calculations and rules of current and voltage.

<p>Session 1.05: Access opens: Mon 4 Oct. Zoom: Sun 10 Oct. Bio: Aerobic Respiration (Prac); Chem: Strong & Weak acids; Phys: Forces & Resultant Forces.</p>	<p>Session 2.05: Access opens: Mon 4 Oct. Zoom: Sun 10 Oct. Bio: Plant diseases & mineral deficiencies; Chem: Fuel and chemical cells; Phys: The 5 circuit components and their graphs.</p>
<p>Session 1.06: Access opens: Mon 11 Oct. Zoom: Sun 17 Oct. Bio: Anaerobic Respiration; Chem: Separating substances: filtration, evaporation, crystallisation, simple distillation, fractional distillation, separating funnel, chromatography; Phys: Terminal Velocity & falling objects.</p>	<p>Session 2.06: Access opens: Mon 11 Oct. Zoom: Sun 17 Oct. Bio: Mendel & pea plants; Chem: Extracting metals from ores by electrolysis or by carbon; Phys: The Plug and power calculations.</p>
<p>Session 1.07: Access opens: Mon 18 Oct. Zoom: Sun 24 Oct. Bio: Surface Area; Chem: Chromatography and Rf calculations (Prac); Phys: Newton's three laws of motion.</p>	<p>Session 2.07: Access opens: Mon 18 Oct. Zoom: Sun 24 Oct. Bio: Transpiration and Translocation; Chem: Crude oil and fractional distillation; Phys: Earthing and resistance of a wire practical.</p>
<p>Oct 25 (Half term)</p>	<p>Oct 28 Skills Focus 1: How examiners mark. Access opens 25 October.</p>
<p>Session 1.08: Access opens: Mon 1 Nov. Zoom: Sun 7 Nov. Bio: Cell division: Mitosis; Chem: Bonding I: Covalent; Phys: Acceleration and the trolley practical.</p>	<p>Session 2.08: Access opens: Mon 1 Nov. Zoom: Sun 7 Nov. Bio: Human immune system; Chem: Alkanes & Alkenes, and addition polymerisation; Phys: Left and right hand rules.</p>
<p>Session 1.09: Access opens: Mon 8 Nov. Zoom: Sun 14 Nov. Bio: Cell division: Meiosis; Chem: Bonding II: Ionic; Phys: Motion and Forces and stopping distances.</p>	<p>Session 2.09: Access opens: Mon 8 Nov. Zoom: Sun 14 Nov. Bio: Communicable diseases: bacteria, viruses, fungi and protists; Chem: Alcohols & carboxylic acids and condensation polymerisation; Phys: Magnetism, Permanent magnets and electromagnets.</p>
<p>Session 1.10: Access opens: Mon 15 Nov. Zoom: Sun 21 Nov. Bio: Stem cells & differentiation; Chem: Bonding III: Metallic & alloys; Phys: Energy Efficiency.</p>	<p>Session 2.10: Access opens: Mon 15 Nov. Zoom: Sun 21 Nov. Bio: Non-communicable diseases: cancer, screening; Chem: Polymers, esters; Phys: Dynamos, alternators & electric motors.</p>
<p>Session 1.11: Access opens: Mon 22 Nov. Zoom: Sun 28 Nov. Bio: Circulatory system: vessels & blood; Chem: Factors affecting the rates of reactions; Phys: Renewable and non-renewable resources.</p>	<p>Session 2.11: Access opens: Mon 22 Nov. Zoom: Sun 28 Nov. Bio: Selective Breeding; Chem: Amines, Amino Acids; Phys: Loudspeakers and microphones.</p>

<p>Session 1.12: Access opens: Mon 29 Nov. Zoom: Sun 5 Dec. Bio: Circulatory system: heart; Chem: The reactivity series; Phys: Power and work done.</p>	<p>Session 2.12: Access opens: Mon 29 Nov. Zoom: Sun 5 Dec. Bio: Genetic Engineering; Chem: Cracking; Phys: The Particle Model</p>
<p>Session 1.13: Access opens: Mon 6 Dec. Zoom: Sun 12 Dec. Bio: Food tests (Prac); Chem: Calculations I: Combining power, RAM, RFM; Phys: Conserving energy in the home and payback time.</p>	<p>Session 2.13: Access opens: Mon 6 Dec. Zoom: Sun 12 Dec. Bio: Cloning; Chem: Calculations VI: Gas volume calculations; Phys: Atomic structure and isotopes.</p>
<p>Session 1.14: Access opens: Mon 13 Dec. Zoom: Sun 19 Dec. Bio: DNA Structure and genes; Chem: Calculations II: Mass/Mr Mole, Empirical formulae & percentage composition; Phys: Simple Circuit Ideas and Electricity Basics.</p>	<p>Session 2.14: Access opens: Mon 13 Dec. Zoom: Sun 19 Dec. Bio: Coronary heart disease and other problems; Chem: Gas identification: oxygen, carbon dioxide, hydrogen, chlorine, ammonia, test for alkenes; Phys: Red shift and the Doppler effect.</p>
Dec 20	Dec 20
Dec 27	Dec 27
<p>Session 1.15: Access opens: Mon 3 Jan. Zoom: Sun 9 Jan. Bio: Inheritance; Chem: Calculations III: Mass of reactants & products and yield; Phys: Wave Investigations (Prac).</p>	<p>Session 2.15: Access opens: Mon 3 Jan. Zoom: Sun 9 Jan. Bio: Natural Selection; Chem: Flame tests: potassium, sodium, lithium, calcium, strontium, copper (prac); Phys: CMBR and BBT.</p>
<p>Session 1.16: Access opens: Mon 10 Jan. Zoom: Sun 16 Jan. Bio: Mutations and variations; Chem: Calculations IV: Bond Enthalpy; Phys: Wave calculations.</p>	<p>Session 2.16: Access opens: Mon 10 Jan. Zoom: Sun 16 Jan. Bio: Darwin & Lamarck; Chem: Positive ion tests: copper, iron II, iron III, calcium, magnesium, aluminium (Prac); Phys: Static electricity and electric fields.</p>
<p>Session 1.17: Access opens: Mon 17 Jan. Zoom: Sun 23 Jan. Bio: The endocrine system; Chem: Calculations V: Titrations; Phys: Ray diagrams.</p>	<p>Session 2.17: Access opens: Mon 17 Jan. Zoom: Sun 23 Jan. Bio: Evidence for evolution, and extinction. Chem: Negative ion tests: carbonate, sulphate, chloride, bromide, iodide (Prac); Phys: Spring constant and associated calculations</p>
<p>Session 1.18: Access opens: Mon 24 Jan. Zoom: Sun 30 Jan. Bio: Thermoregulation; Chem: Balancing Equations I: Beginner skills; Phys: Refraction in blocks (prac).</p>	<p>Session 2.18: Access opens: Mon 24 Jan. Zoom: Sun 30 Jan. Bio: Carl Linnaeus, classifications and domains; Chem: Phytomining and bioleaching; Phys: Elastic potential energy.</p>
<p>Session 1.19: Access opens: Mon 1 Feb. Zoom: Sun 6 Feb. Bio: Blood Glucose regulation & diabetes; Chem: Balancing Equations II: Advanced skills; Phys: The EM Spectrum.</p>	<p>Session 2.19: Access opens: Mon 1 Feb. Zoom: Sun 6 Feb. Bio: Adaptations, interdependence and competition; Chem: The Haber Process; Phys: Hooke's law (Prac).</p>

<p>Session 1.20: Access opens: Mon 7 Feb. Zoom: Sun 13 Feb. Bio: The Menstrual Cycle and Pregnancy; Chem: Displacement reactions and ionic equations; Phys: Investigating radiation (Prac).</p>	<p>Session 2.20: Access opens: Mon 7 Feb. Zoom: Sun 13 Feb. Bio: Biotic and abiotic factors; Chem: Reversible reactions and dynamic equilibrium (Le Chatelier's Principles); Phys: Moments, levers and gears.</p>
<i>Half Term</i>	<i>Half Term</i>
<p>Session 1.21: Access opens: Mon 21 Feb. Zoom: Sun 27 Feb. Bio: Osmoregulation; Chem: Precipitate reactions and ionic equations; Phys: Generating EM Waves, Uses and Hazards of EM waves.</p>	<p>Session 2.21: Access opens: Mon 21 Feb. Zoom: Sun 27 Feb. Bio: Sampling in an ecosystem (prac); Chem: Reactions of alcohol with carboxylic acids, with sodium, with water; Phys: Specific heat capacity (Prac).</p>
<p>Session 1.22: Access opens: Mon 28 Feb. Zoom Sun 6 March. Bio: The Kidneys; Chem: Nanoparticles and some composites; Phys: Alpha, Beta & Gamma Radiation.</p>	<p>Session 2.22: Access opens: Mon 28 Feb. Zoom Sun 6 March. Bio: Cycling nutrients through an ecosystem: carbon cycle, nitrogen cycle & water cycle; Chem: Soluble and insoluble salts; Phys: Specific latent heat.</p>
<p>Session 1.23: Access opens: Mon 7 March. Zoom Sun 13 March. Bio: Contraception; Chem: Allotropes of Carbon; Phys: Penetrating and Ionising powers of alpha, beta and gamma radiation.</p>	<p>Session 2.23: Access opens: Mon 7 March. Zoom Sun 13 March. Bio: living indicators: in water (invertebrates), in air (lichen and fungi) and temp (migration); Chem: REDOX reactions; Phys: Black body radiation.</p>
<p>Session 1.24: Access opens: Mon 14 March. Zoom Sun 20 March. Bio: IVF; Chem: Endothermic and exothermic reaction profiles; Phys: Half-life.</p>	<p>Session 2.24: Access opens: Mon 14 March. Zoom Sun 20 March. Bio: Human influences on the environment; Chem: Making fertilisers I; Phys: Soundwaves (infrasound; ultrasound).</p>
<p>Session 1.25: Access opens: Mon 21 Mar. Zoom: Sun 27 March. Bio: Monoclonal Antibodies; Chem: Making pure, dry samples; Phys: Fission and nuclear power stations</p>	<p>Session 2.25: Access opens: Mon 21 Mar. Zoom: Sun 27 March. Bio: Trophic levels and pyramids; Chem: Making fertilisers II; Phys: Earthquakes and seismic waves.</p>
<p>Session 1.26: Access opens: Mon 28 Mar. Zoom Sun 3 Apr. Bio: Digestive system; Chem: Types of reactions, hazard symbols & titrations (Prac); Phys: Fusion.</p>	<p>Session 2.26: Access opens: Mon 28 Mar. Zoom Sun 3 Apr. Bio: Parasitism & mutualism; Chem: Complete and incomplete combustion; Phys: Pressure in gases and fluids.</p>
<i>Easter Break</i>	<i>Easter Break</i>

<p>Session 1.27: Access opens: Mon 18 April. Zoom: Sun 24 April. Bio: Protein synthesis; Chem: The atmosphere past and present; Phys: Lifecycle of stars.</p>	<p>Session 2.27: Access opens: Mon 18 April. Zoom: Sun 24 April. Bio: Biotechnology and fermentation; Chem: Protecting metals from corrosion; Phys: $P_1 \times V_1 = P_2 \times V_2$.</p>
<p>Session 1.28: Access opens: Mon 25 April. Zoom: Sun 1 May. Bio: The brain, nervous system and the reflex arc; Chem: Greenhouse gases and global warming; Phys: Nuclear equations.</p>	<p>Session 2.28: Access opens: Mon 25 April. Zoom: Sun 1 May. Bio: Food security and farming techniques; Chem: Composites, ceramics, making glass and other polymers; Phys: Density calculations.</p>
<p>Session 1.29: Access opens: Mon 2 May. Zoom: Sun 8 May. Bio: The eye; Chem: LCAs and sustainability; Phys: Lenses and Lens diagrams.</p>	<p>Session 2.29: Access opens: Mon 2 May. Zoom: Sun 8 May. Bio: Investigating disinfectants; Chem: Making ethanol; Phys: Density (Prac).</p>
<p>Session 1.30: Access opens: Mon 9 May. Zoom: Sun 15 May. Bio: Long and short-sightedness; Chem: Producing potable water (Prac); Phys: The solar system, comets, satellites, asteroids, orbits, and the origins of the universe (models of Copernicus & Galileo).</p> <p>May 16 – June 5; Drop-in sessions for specific exam support questions will be at the same times on May 22, May 29 and June 5. Email in advance for the link, bring your questions for support.</p>	<p>Final GCSE Exams begin the week of 9 May</p> <p>Sun May 15- June 5: Drop-in sessions for specific exam support questions will be at the same times on May 15, May 22, May 29 and June 5. Email in advance for the link, bring your questions for support.</p>