

Group Weekly Science Masterclasses beginning Sept 2020-May 2021

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 7 Sept** (students will be able to get into course material from this date). **Zoom: Sun 13 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 6:30-7:30pm	Masterclass 2.0 – More advanced items; mostly Paper 2 topics Wednesdays 6:30-7:30pm
Session 1.01: Access opens: Mon 7 Sept. Zoom: Sun 13 Sept. Bio: Cells & Viruses; Chem: Atoms & Atomic structure; Phys: Scalars & Vectors, and Physics formulae.	Session 2.01: Access opens: Thurs 10 Sept. Zoom: Weds 16 Sept. Bio: Photosynthesis; Chem: Electrolysis – Molten (Prac); Phys: The National Grid.
Session 1.02: Access opens: Mon 14 Sept. Zoom: Sun 20 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: Thurs 17 Sept. Zoom: Weds 23 Sept. Bio: Leaf Structure; Chem: Electrolysis – Aqueous (Prac); Phys: Transformers.
Session 1.03: Access opens: Mon 21 Sept. Zoom: Sun 27 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: Thurs 24 Sept. Zoom: Weds 30 Sept. Bio: Effect of light intensity on photosynthesis (Prac); Chem: Electrolysis of Aluminium; Phys: Circuit Symbols.
Session 1.04: Access opens: Mon 28 Sept. Zoom: Sun 4 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: Thurs 1 Oct. Zoom: Weds 7 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 5 Oct. Zoom: Sun 11 Oct. Bio: Aerobic Respiration (Prac); Chem: Strong & Weak acids; Phys: Forces & Resultant Forces.</p>	<p>Session 2.05: Access opens: Thurs 8 Oct. Zoom: Weds 14 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 12 Oct. Zoom: Sun 18 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: Thurs 15 Oct. Zoom: Weds 21 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 19 Oct. Zoom: Sun 1 Nov. Bio: Surface Area; Chem: Chromatography and Rf calculations (Prac); Phys: Newton's three laws of motion.</p>	<p>Session 2.07: Access opens: Thurs 22 Oct. Zoom: Weds 4 Nov. Bio: Transpiration and Translocation; Chem: Crude oil and fractional distillation; Phys: Earthing.</p>
Oct 25 (Half term)	Oct 28 Skills Focus 1: How examiners mark. Access opens 24 October.
<i>Session 1.07 spans over the half term break – live is on Sun 1 Nov.</i>	<i>Session 2.07 spans over the half term break – live is on Weds 4 Nov.</i>
<p>Session 1.08: Access opens: Mon 2 Nov. Zoom: Sun 8 Nov. Bio: Cell division: Mitosis; Chem: Bonding I: Covalent; Phys: Acceleration and the trolley practical.</p>	<p>Session 2.08: Access opens: Thurs 5 Nov. Zoom: Weds 11 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 9 Nov. Zoom: Sun 15 Nov. Bio: Cell division: Meiosis; Chem: Bonding II: Ionic; Phys: Motion and Forces.</p>	<p>Session 2.09: Access opens: Thurs 12 Nov. Zoom: Weds 18 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 16 Nov. Zoom: Sun 22 Nov. Bio: Stem cells & differentiation; Chem: Bonding III: Metallic & alloys; Phys: Energy Efficiency.</p>	<p>Session 2.10: Access opens: Thurs 19 Nov. Zoom: Weds 25 Nov. Bio: Non-communicable diseases: cancer, screening; Chem: Polymers, esters; Phys: Dynamos, alternators & electric motors.</p>
<p>Session 1.11: Access opens: Mon 23 Nov. Zoom: Sun 29 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: Thurs 26 Nov. Zoom: Weds 2 Dec. Bio: Selective Breeding; Chem: Amines, Amino Acids; Phys: Loudspeakers and microphones.</p>

<p>Session 1.12: Access opens: Mon 30 Nov. Zoom: Sun 6 Dec. Bio: Circulatory system: heart; Chem: The reactivity series; Phys: Power and work done.</p>	<p>Session 2.12: Access opens: Thurs 3 Dec. Zoom: Weds 9 Dec. Bio: Genetic Engineering; Chem: Cracking; Phys: The Particle Model</p>
<p>Session 1.13: Access opens: Mon 7 Dec. Zoom: Sun 13 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: Thurs 10 Dec. Zoom: Weds 16 Dec. Bio: Cloning; Chem: Calculations skills (all the important calculations); Phys: Atomic structure and isotopes.</p>
<p>Session 1.14: Access opens: Mon 14 Dec. Zoom: Sun 20 Dec. Bio: DNA Structure and genes; Chem: Calculations II: Mass/Mr Mole, Empirical formulae & percentage composition; Phys: Simple Circuit Ideas and Electricity Basics.</p>	Dec 23
Dec 27	Dec 30
Jan 3	<p>Session 2.14: Access opens: Thurs 31 Dec. Zoom: Weds 6 Jan. Bio: Coronary heart disease and other problems; Chem: Gas identification: oxygen, carbon dioxide, hydrogen, chlorine, ammonia, test for alkenes; Phys: Red shift, BBT and the Doppler effect.</p>
<p>Session 1.15: Access opens: Mon 4 Jan. Zoom: Sun 10 Jan. Bio: Inheritance; Chem: Calculations III: Mass of reactants & products and yield; Phys: Wave Investigations (Prac).</p>	<p>Session 2.15: Access opens: Thurs 7 Jan. Zoom: Weds 13 Jan. Bio: Natural Selection; Chem: Flame tests: potassium, sodium, lithium, calcium, strontium, copper (prac); Phys: CMBR.</p>
<p>Session 1.16: Access opens: Mon 11 Jan. Zoom: Sun 17 Jan. Bio: Mutations and variations; Chem: Calculations IV: Bond Enthalpy; Phys: Wave calculations.</p>	<p>Session 2.16: Access opens: Thurs 14 Jan. Zoom: Weds 20 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 18 Jan. Zoom: Sun 24 Jan. Bio: The endocrine system; Chem: Calculations V: Titrations; Phys: Ray diagrams.</p>	<p>Session 2.17: Access opens: Thurs 21 Jan. Zoom: Weds 27 Jan. Bio: Evidence for evolution; Chem: Negative ion tests: carbonate, sulphate, chloride, bromide, iodide (Prac); Phys: Stopping distances, thinking distances and braking distances.</p>
<p>Session 1.18: Access opens: Mon 25 Jan. Zoom: Sun 31 Jan. Bio: Thermoregulation; Chem: Balancing Equations I: Beginner skills; Phys: Refraction in blocks (prac).</p>	<p>Session 2.18: Access opens: Thurs 28 Jan. Zoom: Weds 3 Feb. 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 7 Feb. Bio: Blood Glucose regulation & diabetes; Chem: Balancing Equations II: Advanced skills; Phys: The EM Spectrum.</p>	<p>Session 2.19: Access opens: Thurs 4 Feb. Zoom: Weds 10 Feb. Bio: Adaptations, interdependence and competition; Chem: The Haber Process; Phys: Spring constant and Hooke's law (Prac).</p>
<p>Session 1.20: Access opens: Mon 8 Feb. Zoom: Sun 14 Feb. Bio: The Menstrual Cycle and Pregnancy; Chem: Displacement reactions and ionic equations; Phys: Investigating radiation (Prac).</p>	<p>Session 2.20: Access opens: Thurs 11 Feb. Zoom: Weds 17 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>Session 2.21 spans over the Half Term</i>
<p>Session 1.21: Access opens: Mon 15 Feb. Zoom: Sun 28 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: Thurs 18 Feb. Zoom: Weds 3 March. 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 1 Mar. Zoom Sun 7 March. Bio: The Kidneys; Chem: Nanoparticles; Phys: Alpha, Beta & Gamma Radiation.</p>	<p>Session 2.22: Access opens: Thurs 4 March. Zoom: Weds 10 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 8 March. Zoom Sun 14 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: Thurs 11 March. Zoom: Weds 17 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 15 March. Zoom Sun 21 March. Bio: IVF; Chem: Endothermic and exothermic reaction profiles; Phys: Half-life.</p>	<p>Session 2.24: Access opens: Thurs 18 March. Zoom: Weds 24 March. Bio: Human influences on the environment; Chem: Making fertilisers I; Phys: Soundwaves (infrasound; ultrasound).</p>
<p>Session 1.25: Access opens: Mon 22 Mar. Zoom: Sun 28 March. Bio: Monoclonal Antibodies; Chem: Making pure, dry samples; Phys: Fission and nuclear power stations</p>	<p>Session 2.25: Access opens: Thurs 25 March. Zoom: Weds 1 April. Bio: Trophic levels and pyramids; Chem: Making fertilisers II; Phys: Earthquakes and seismic waves.</p>
<p><i>Easter Break</i> Sunday Apr 4: Easter Sunday</p>	<p>Session 2.26: Access opens: Thurs 8 April. Zoom: Weds 14 April. Bio: Parasitism & mutualism; Chem: Complete and incomplete combustion; Phys: Pressure in gases and fluids.</p>

<p>Session 1.26: Access opens: Mon 12 April. Zoom Sun 18 Apr. Bio: Digestive system; Chem: Types of reactions & titrations (Prac); Phys: Fusion.</p>	<p>Session 2.27: Access opens: Thurs 15 April. Zoom: Weds 21 April. Bio: Biotechnology and fermentation; Chem: Protecting metals from corrosion; Phys: $P1 \times V1 = P2 \times V2$.</p>
<p>Session 1.27: Access opens: Mon 19 April. Zoom: Sun 25 April. Bio: Protein synthesis; Chem: The atmosphere past and present; Phys: Lifecycle of stars.</p>	<p>Session 2.28: Access opens: Thurs 22 April. Zoom: Weds 28 April. Bio: Food security and farming techniques; Chem: Composites, ceramics, making glass and other polymers; Phys: Density calculations.</p>
<p>Session 1.28: Access opens: Mon 26 April. Zoom: Sun 2 May. Bio: The brain, nervous system and the reflex arc; Chem: Greenhouse gases and global warming; Phys: Nuclear equations.</p>	<p>Session 2.29: Access opens: Thurs 29 April. Zoom: Weds 5 May. Bio: Investigating disinfectants; Chem: Making ethanol; Phys: Density (Prac).</p>
<p>Session 1.29: Access opens: Mon 3 May. Zoom: Sun 9 May. Bio: The eye; Chem: LCAs and sustainability; Phys: Lenses and Lens diagrams.</p>	<p>Session 2.30: Access opens: Thurs 6 May. Zoom: Weds 12 May. Bio: Extinction; Chem: Waste water treatment; Phys: Resistance of a wire (Prac).</p>
<p>Session 1.30: Access opens: Mon 10 May. Zoom: Sun 16 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>	