Year 7 Long term plan

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic: Particles (Chemistry) 1. Routines and Expectations (optional) 2. Variables 3. Accuracy 4. Equipment 5. Following a method 6. Drawing graphs 7. Maths in Science 8. States of matter (inc. density) 9. Changes of state 10. Melting and boiling points 11. Practical Inquiry - Melting and Boiling Points (1) 12. Practical Inquiry - Melting and Boiling Points (2) 13. Expansion and contractions 14. Brownian Motion and the particle model 15. Types of transport 16. Atoms and elements 17. Compounds and mixtures 18. Symbols and formulae 19. Atomic Structure	**Topic: Types of reaction and the periodic table (Chemistry)** 1. Physical and Chemical reactions 2. Pure substances and solubility 3. Practical Inquiry - Rates of dissolving (1) 4. Practical Inquiry - Rates of dissolving (2) 5. Crystallisation (linking to evaporation) (Practical) 6. Filtration (Practical) 7. Simple Distillation (Demonstration) 8. Chromatography 9. Chromatography (Practical) 10. Acids and Alkalis 11. Indicators (Practical) 12. Neutralisation (Practical) 13. Atomic Structure (Aut 1 recap) 14. The periodic table – structure 15. History of the periodic table 16. Metals and non-metals 17. Alloys (EXT) 18. Ceramics 19. Polymers 20. Composites	**Topic: Forces (Physics)** 1. Identifying forces – contact vs non-contact 2. Measuring forces 3. Balanced and unbalanced forces 4. Newton's Laws (EXT) 5. Friction 6. Streamlining 7. Speed calculations 8. Distance- time graph 9. Velocity-time graph 10. Hooke's Law- (Practical pt 1) 11. Hooke's law practical Pt2) 12. Moments (EXT) 13. Gravity, weight and mass 14. Solar system 15. Day and night 16. Seasons 17. Light year	**Topic: Energy (Physics)** 1. Energy Stores 2. Energy transfers 3. Efficiency calculations 4. Sankey diagrams (EXT) 5. Efficiency calculations 6. Energy in food 7. Conduction 8. Convection 9. Radiation 10. Preventing heat loss- practical pt1 11. Preventing heat loss practical pt2 12. Generating Electricity – renewables 13. The national grid 14. Calculations: power and energy costs (mini quiz 1 & 2)	**Topic: Interdependence and cells (Biology)** 1. Living things: MRS NERG 2. Kingdoms and classes 3. Classification and keys 4. Food chains 5. Food webs 6. Pyramids of numbers and biomass 7. Ecosystems and interdependence 8. Competition 9. Predator prey relationships 10. Sampling techniques (EXT) (Practical) 11. Animal cells 12. Plant cells 13. Prokaryotic vs eukaryotic 14. Microscopes (practical) 15. Microscope calculations (EXT) 16. Viewing plant cells (practical) 17. Specialised cells 18. Stem cells 19. Cells tissues and organ systems	**Topic: Reproduction and Variation (Biology)** 1. Male and female reproductive organs in humans and plants 2. Gametes – humans and plants 3. Fertilisation in humans 4. Pregnancy and gestation 5. Effect of maternal lifestyle 6. Menstrual cycle 7. Pollination and seed dispersal 8. Quantitative investigations of dispersal mechanisms 9. Genetic cross diagrams (EXT) 10. Genetic diseases and sexual determination (EXT) 11. Genetic and environmental Variation 12. Adaptation 13. Natural Selection 14. Selective Breeding 15. Endangered species and extinction 16. Biodiversity 17. Extremophiles (EXT)

Year 8 Long term plan

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic: Waves and Pressure (Physics) 1. Transverse and longitudinal 2. Producing sounds 3. How sound travels 4. Hearing sounds 5. Using sound: (ext) 6. EM Spectrum 7. Introduction to light 8. Comparing sound & light waves 9. Wave calculations 10. Mini quiz 11. Reflection 12. Reflection (Practical) 13. Refraction 14. Refraction (practical) 15. Seeing colour (EXT) 16. Pressure (in liquids) 17. Pressure (in gases) 18. Pressure (in over area)	**Topic: Electricity and Magnetism (Physics)** 1. Conductors and Insulators 2. Conductors and insulators (Practical) 3. Electrical circuits 4. Series and parallel circuits 5. Current 6. Current in series and parallel 7. Potential difference 8. Measuring potential difference 9. Resistance in a circuit 10. Power in a circuit 11. Static electricity 12. Mini quiz 13. Magnets 14. Magnetic fields 15. Electromagnets 16. Making electromagnets practical 17. Using Electromagnets	**Topic: Chemical reactions (Chemistry)** 1. Atomic Structure 2. Electronic Configuration 3. Ar and Mr (EXT) 4. Halogens 5. Alkali metals 6. Noble Gases (Group 0) 7. Reactivity of Group 1 and 7 (EXT) 8. Naming compounds (EXT) 9. Writing formulae (EXT) 10. Exothermic and endothermic reactions 11. Testing for gases 12. Word and symbol equations 13. Balancing equations 14. Metals and oxygen 15. Metals and acid reactions 16. Acids and hydroxides 17. Practical (metals and acids) 18. Acids and carbonates 19. Practical (carbonates) 20. Combustion 21. Conservation of mass	**Topic: Reactions and the environment (Chemistry)** 1. The Reactivity series Displacement reactions 2. Extracting metals 3. Rates of reaction (EXT) 4. Thermal decomposition and catalysts 5. Practical: Thermal decomposition 6. Composition of the Earth 7. Structure of the Earth 8. Igneous rocks 9. Metamorphic rocks 10. Sedimentary rocks 11. Rock cycle 12. Fossil fuel formation 13. The Earth's Atmosphere 14. The carbon cycle 15. Climate change and the greenhouse effect 16. Recycling	**Topic: Energy from food (Biology)** 1. Food groups 2. Balanced and unbalanced diets 3. Energy in food 4. Energy in food (Practical) 5. Energy in food (practical continued) 6. Tissues and organs of the digestive system (Demonstration) 7. Digestion 8. Enzymes in the digestive system 9. Mini quiz 10. Photosynthesis 11. Investigating Photosynthesis (practical) 12. Investigating photosynthesis (practical pt 2) 13. Leaf adaptations – Gas exchange 14. Root adaptation - Absorption of water 15. Transpiration/translocation (EXT) (Practical) 16. Testing for starch (Practical)	**Topic: Keeping Healthy (Biology)** 1. Sub cellular structures (recap) 2. Cells, tissues, organs and systems 3. The lungs (Demonstration) 4. Breathing 5. Gas exchange 6. The heart and blood (Demonstration) 7. The circulatory system 8. The skeletal & muscular system 9. Aerobic respiration 10. Anaerobic respiration 11. Exercise and respiration (Practical) 12. Mini quiz 13. Communicable vs non communicable diseases 14. Microorganisms 15. Pathogens 16. Antibiotics 17. Human defences 18. Vaccination 19. Drugs & lifestyle choices

Year 9 Long term plan

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic: Chemistry Fundamentals **Knowledge:** 1. Changing states of matter 2. Atoms and elements 3. Compounds and formulae 4. Pure substances and solutions 5. Separation techniques (Demonstration) 6. Chromatography (R.Practical) 7. Changing Atomic Theories 8. Protons, Neutrons and Electrons 9. Electron configuration 10. Isotopes and relative atomic mass 11. The periodic table 12. The modern periodic table 13. Mini Quiz 14. Metals and non-metals 15. Uses of metals 16. Corrosion (Separate only) 17. Corrosion prevention (Separate only) (Practical) 18. Transition metals (Separate only) 19. Typical properties (Separate only) 20. Alloys 21. Properties and uses of alloys 22. Alkali metals (Demonstration) 23. Halogens 24. Noble Gases 25. Gas tests (Demonstration/Practical	**Topic: Investigative Chemistry** **Knowledge:** 1. Ionic bonding part 1 2. Ionic bonding part 2 3. Properties of ionic bonding 4. Covalent bonding 5. Properties of covalent structures 6. Giant covalent structures 7. Nanoparticles (Separate only) 8. Metallic Bonding 9. Comparing and contrasting types of bonding 10. Word and symbol equations 11. Balancing equations 12. Conservation of mass 13. Metals and oxygen (Demonstration) 14. Metals and acid (Demonstration) 15. Metals and water (Demonstration) 16. Redox reactions (Higher only) 17. Acids and bases 18. Acids - weak and strong (Separate only) (Demonstration) 19. Neutralisation 20. RP: Soluble Salts 21. Reactivity series and displacement reactions (Practical) 22. Ionic half equations for displacement (Higher only) 23. Reactivity series and extraction methods 24. Electrolysis of molten compounds (ionic half equations - higher only) 25. Electrolysis of aqueous compounds (ionic half equations - higher only) 26. Electrolysis part 1 (R.Practical) 27. Electrolysis part 2 (R.Practical)	**Topic: Physics - Energy and Waves** **Knowledge:** 1.Energy stores and energy transfers 2.Open and closed systems 3. Work done 4.Power 5.Efficiency calculations 6.Insulation 7.Investigating thermal insulators (Practical – R for Separate only) 8. Gravitational potential energy 9.Kinetic energy 10.Elastic potential energy 11.Multi-step calculations (GPE/KE/EPE/Efficiency) 12.Non-renewable resources 13.Renewable resources 14.Comparison of energy resources 15.Mini Quiz 16.Introduction to waves 17.Wave Speed equation 18.Calculating period of a wave 19.RP: Measuring speed of a wave using a ripple tank (Part 1) 20.RP: Measuring speed of a wave using a ripple tank (Part 2) 21.Measuring the speed of wave using a piece of string 22.Types of Electromagnetic Waves Properties and Uses of Electromagnetic Waves	**Topic: Forces** **Knowledge:** 1. Scalar and vector quantities 2. Types of forces 3. Weight 4. Resultant forces 5. Vector diagrams (Higher only) 6. Speed and velocity 7. Distance time graphs 8. Acceleration and deceleration 9. Velocity time graphs 10. Terminal Velocity 11. Newton's first law 12. Newton's second law 13. Inertia and inertial mass ((higher only) 14. Investigate Newton's Second Law of motion (R. Practical) Part 1 15. Investigate Newton's Second Law of motion (R. Practical) Part 2 16. Newton's third law 17. Stopping distances 18. Energy transfers in stopping 19. Momentum (higher only) 20. Momentum calculations (higher only) 21. RP - Relationship between force and extension (Part 1) 22. RP - Relationship between force and extension (Part 2) 23. Magnets 24. Magnetic fields 25. Electromagnets	**Topic: Cell Biology** **Knowledge:** 1. Types of cells 2. Specialised cells 3. Tissues, organs and systems 4. Introducing microscopes 5. RP: Using Microscopes 6. Types of microscope 7. DNA 8. The structure of DNA (separate only) 9. Mitosis and the cell cycle 10. Incredible stem cells 11. Therapeutic cloning 12. Cloning plants (separate only) 13. Cloning animals (Separate only) 14. Asexual reproduction 15. Sexual Reproduction 16. Meiosis 17. Inheritance (genetic cross diagrams) 18. Sex determination 19. Family trees 20. Genetic diseases 21. Protein Synthesis (Separate only)	**Topic: Communicable Diseases** **Knowledge:** 1. Viral diseases 2. Bacterial diseases 3. Fungal and protists 4. Our barriers to diseases 5. The immune system 6. Vaccinations 7. Medicines 8. Multiplying bacteria (Separate only) 9. Culturing microorganisms 10. Investigating Antiseptics (part 1) (Practical – R. separate only) 11. Investigating antiseptics (part 2) (Practical – R. separate only) 12. Antibiotic resistance 13. Developing new drugs (part 1) 14. Developing new drugs (part 2) 15. Monoclonal antibodies (Separate only) 16. Scatter Graphs and Health 17. Frequency tables and histograms 18. Analysis data 19. Mini Quiz 20. Plant diseases (Separate only) 21. Parts of the brain (Separate only) 22. Brain Surgery (Separate only) 23. The Eye (Separate only) 24. Myopia and hyperopia (Separate only)

Year 10 Long term plan

Autumn 1	Autumn 2	Spring 1	Spring 2
1. Aerobic respiration 2. Anaerobic respiration 3. Lungs and Ventilation 4. Gas Exchange 5. Fermentation 6. The Heart 7. Blood vessels and Blood flow 8. Blood composition 9. CHD 10. Non communicable disease 11. Disease data 1 12. Mini quiz 13. Digestion 14. Enzymes 15. Optimal conditions for enzymes 16. Testing for food groups 1 (R.Practical) 17. Testing for good groups 2 (R.Practical) 18. pH and Enzymes 1 (R.Practical) 19. pH and Enzymes 2 (R.Practical) 20. Reaction rates in the body 21. Diffusion 22. Diffusion and Surface area (Practical) 23. Diffusion in action 24. Kidneys and the function (Separate only) 25. Kidneys and ADH (Separate only) 26. Treating Kidney failure dialysis (Separate only) 27. Treating Kidney failure transplant (Separate only)	**Topic: Plant Biology** 1. Food webs 2. Ecosystems 3. Predator and Prey 4. Ecological Sampling techniques 5. Quadrats (R.Practical) 6. Distribution of Species (Separate only) 7. Pyramids of biomass and tropic levels (Separate only) 8. Decomposers 9. Plant cells, tissues and organs 10. Osmosis 11. Osmosis in action 12. Osmosis 1 (R. Practical) 13. Osmosis 2 (R.Practical) 14. Active transport 15. Transpiration 16. Transpiration experiments (Part 1&2) 17. Translocation 18. Photosynthesis 19. Limiting factors (Higher only) 20. Inverse square law (Higher only) 21. Photosynthesis 1 (R. Practical) 22. Photosynthesis 2 (R.Practical) 23. Using glucose and nitrogen in plants 24. Mini Quiz 25. Tropisms (Separate only) 26. Plant hormones (Separate only) 27. Germination 1 (Separate only) (R.Practical) 28. Germination 2 (Separate only) (R. Practical) 29. Carbon Cycle 30. Water cycle 31. Rate of Decay (Separate only) 32. Biogas generators (Separate only) 33. Decay part 1 (Separate only) (R. Practical) 34. Decay part 2 (Separate only) (R. Practical) 35. Biodiversity and human impact 36. Maintaining biodiversity 37. Food security (Separate only)	**Topic: Nuclear and Thermal Physics** **Knowledge:** 1. Types of EM Spectrum 2. Properties and uses of electromagnetic waves 3. Investigating IR radiation (R.Practical) 4. Reflection of light (Separate only) 5. Refraction of light 6. Investigating reflection and refraction of light (separate only) (R.Practical) 7. Lenses (Separate only) (Demonstration) 8. Magnification (Separate only) 9. Colour (Separate only) 10. Atoms (recap) 11. Changing atomic theories (recap) 12. Physics of atoms 13. Radioactive decay 14. The three types of decay 15. Nuclear equations 16. Half life 17. Modeling radioactive decay 18. Contamination and Irradiation 19. Uses of radiation 20. Background radiation 21. Evaluating hazards 22. Nuclear Fission and Fusion (Separate only) 23. Mini Quiz 24. Particle model - density and states 25. RP investigating density 26. Changes of state 27. Heating and temperature 28. Latent heat 29. Specific heat 30. RP investigating specific heat 31. Comparing LH and SLT (higher only 32. Pressure in gases 33. Work done and pressure (Separate only) 34. Calculating Pressure (Separate only) 35. Pressure at different depths (Separate only) (Demonstration) 36. Floating and sinking (Separate only) 37. The Atmosphere (Separate only)	**Topic: Electricity and Astrophysics** **Knowledge:** 1. Electrical Circuits Introduction 2. Calculating current and Charge Flow 3. Current in Series and Parallel Circuits 4. Potential Difference in Series and Parallel Circuits 5. Ohm's Law 6. Resistance in Series and Parallel Circuits 7. Factors affecting resistance (R.Practical Part 1 and Part 2) 8. Light Dependent Resistors 9. Thermistors 10. Investigating non-Ohmic conductors (R.Practical) Part 1 11. Investigating non-Ohmic conductors (R.Practical) Part 2 12. Mini Quiz 13. Mains electricity and AC & DC 14. Plugs 15. Power calculations 16. Work done calculations 17. Equations practice (Optional) 18. Recap of electromagnets 19. National Grid and Transformers 20. Transformers structure and equation (Separate only) 21. Transformers power equation (Separate only) 22. Solar System (Separate only) 23. Life Cycle of a star (Separate only) 24. Orbits (Separate only) 25. Orbits 2 (Separate only) 26. Red Shift and Expanding Universe (Separate only) 27. The Big Bang Theory (Separate only) 28. Dark Mass and Dark Energy (Separate only) 29. Black bodies and radiation on Earth (Separate only)

Year 10 Long term plan

Summer 1	Summer 2
Topic: Reacting Substances **Knowledge:** 1. Exothermic and endothermic reactions 2. Temperature Changes (R.Practical) 3. Reaction profiles 4. Bond energies 5. Chemical cells and voltage (separate only) 6. Rechargeable and non-rechargeable batteries (separate only) 7. Fuel Cells (Separate only) 8. Half equations for fuel cells (Separate only) 9. Measuring the rate of reaction 10. Factors affecting rates of reaction 11. Drawing rates of reaction graphs 12. Factors affecting rates of reaction (R.Practical) 13. Catalysts 14. Mini Quiz 15. Reversible reactions (Demonstration) 16. Chatelier Principle (higher only) 17. Factors affecting equilibrium (higher only) 18. Word equations and conservation of mass 19. Relative Formula Mass 20. Reacting Masses (higher only)* 21. Calculating mass of a solute 22. Calculating moles in a solution (higher only) 23. Using titration to calculate concentration (Separate only) 24. Titrations Part 1 (separate only) (R.Practical) 25. Titrations Part 2 (separate only) (R.Practical) 26. Explaining concentration (higher only) 27. Calculating gas volume from relative formula mass (Separate only) 28. Calculating gas volumes from balanced equations (Separate only) 29. Testing for ions (Separate only) 30. Testing for ions part 1 (Separate only) (R.Practical) 31. Testing for ions part 2 (Separate only) (R.Practical)	**Topic: Humans and the Earth** **Knowledge:** 1. The Early Earth's Atmosphere 2. Theories of the atmosphere 3. The Greenhouse Effect 4. Effects of global warming 5. Reducing our carbon footprint 6. The Harmful Effects of Combustion 7. Resources used by humans 8. Sustainable development 9. Potable Water 10. Desalination 11. Evaluating potable water methods 12. Analysing water samples (R.Practical) 13. Waste Water 14. Sewage Treatment 15. Mini Quiz 16. Phytomining and bioleaching 17. Life Cycle Assessment 18. Reduce, Reuse, Recycle 19. Ceramics (Separate only) 20. Polymers (Separate only) 21. Thermosetting and thermosetting polymers (Separate only) 22. Glass (Separate only) 23. Reducing our human impact (Separate only) 24. The Haber process 1 (Separate only) 25. Conditions graphs (Separate only) 26. The Haber process 2 (Separate only) 27. NPK Fertilisers (separate only) 28. Atom economy (Separate only) 29. Percentage yield (Separate only)

Year 11 Long term plan

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1
Topic: Using biology to our advantage **Knowledge:** 1. Classification 2. Natural selection and evolution 3. Comparing theories of evolution (separate only) 4. Evidence for evolution 5. Genetic cross diagrams part 1 6. Genetic cross diagrams part 2 7. Mendal and inheritance (separate only) 8. Selective breeding 9. Genetic engineering and modification 10. Inheritance summary essay 11. The nervous system & synapses 12. Conscious and unconscious reponses 13. Investigating human reaction time (R. Practical) part 1 14. Investigating human reaction time (R. Practical) part 2 15. Homeostasis 16. Thermoregulation (Separate only) 17. Mini Quiz (optional) 18. The Endocrine system 19. Negative feedback loops (higher only) 20. Controlling glucose 21. Diabetes 22. Controlling water (Separate only) part 1 23. Controlling water (Separate only) part 2 24. Hormones and the Menstrual cycle 25. Contraception 26. IVF (higher only) 27. Embryo screening 28. Comparing nervous and hormonal responses	**Topic: Organic Chemistry & polymers** **Knowledge:** 1. Ionic bonding recap 2. Metallic bonding recap 3. Covalent bonding recap 4. Crude Oil 5. Alkanes 6. Alkenes 7. Bromine Test (Practical) 8. Fractional Distillation 9. The Fractions 10. Cracking 1 11. Cracking 2 12. Polymers (Combined only) 13. Reducing our human impact (Combined only) 14. Organic Compound diagrams (Separate only) 15. Alkene reactions 1 (Separate only) (Practical) 16. Alkene reactions 2 (Separate only) 17. The Alcohols (Separate only) (Practical) 18. Alcohol reactions (Separate only) 19. Fermentation (Separate only) 20. Carboxylic acid reactions (Separate only) 21. Carboxylic acid and water (Separate only) 22. Esters (Separate only) (Demonstration) 23. Addition Polymerisation (Separate only) 24. Condensation Polymerisation (Separate only) 25. Amino Acids and Polymerisation (Separate only) 26. Polymers in food (Separate only)	**Topic: Application of forces & waves** **Knowledge:** 1. Magnets 2. Magnetic fields 3. Electromagnets (Demonstration) 4. The Motor Effect (Flemings' left hand rule) (Demonstration) 5. Magnetic Flux Density (higher only) 6. Generating electricity (Demonstration) 7. National Grid and Transformers 8. Transformer structure (Separate only) 9. Transformer power equation (Separate only 10. Applications of the motor effect and generator effect (Separate only) 11. Radio waves (higher only) 12. Sound waves (Separate only) 13. Uses of sound waves (Separate only) 14. Vector diagrams (separate only) 15. Moments (Separate only) 16. Levers and gears (Separate only) 17. Static electricity (Separate only) (Demonstration) 18. Electric field patterns (Separate only) *lots of these topics covered earlier in the curriculum but revisited here because they are difficult concepts for students.	**Interleaved practice and application to different contexts** Address gaps in knowledge and build on links between different topics when applied to a range of scenarios Biology Paper 2 Chemistry Paper 2 Physics Paper 2 Paper 2 mock exams	**Interleaved practice and application to different contexts** Address gaps in knowledge and build on links between different topics when applied to a range of scenarios Physics Paper 1 Chemistry Paper 1 Biology Paper 1