



Science curriculum overview COMBINED SCIENCE

Curriculum intent:

Science is everywhere in today's world. It is part of our daily lives, from cooking and gardening, to recycling and comprehending the daily weather report, to reading a map and using a computer. Advances in technology and science are transforming our world at an incredible pace, and our children's future will surely be filled with leaps in technology we can only imagine. Being "science literate" will no longer be just an advantage but an absolute necessity. We cannot underestimate the significance of science in our world.

We aim to promote a love of science and to equip pupils with the skills necessary to understand the impact of science on their lives and equip them with the skills and knowledge they need to be successful in the future.

IMPLEMENTATION

For combined science, all key topics from the GCSE scheme are covered with most classes having individual teachers for Biology, Chemistry and Physics; some lower ability classes do have a singular teacher for all three to ensure that building relationships with staff is paramount alongside content specificity.

All students will receive two GCSE results from six exams at the end of the course which vary from 1-5 in Foundation and 4-9 in Higher. These results are directly linked and are based on an average score from all six exams completed. (one grade is NOT linked to each paper as with previous years)

Core practicals are required to be completed by all students and as such are identified in the lesson order part of the scheme, but also in a specific 'Core practical' session to ensure staff plan and understand the number of core practicals they must carry out in a given period.

Assessments will take place at the end of each topic

Support GCSE is aimed to ensure that less able students are 'supported' to achieve the best possible grade in their GCSEs. The content will mirror the standard GCSE spec and all students will sit the combined science foundation papers, but the teaching will be at a slower pace to ensure understanding and mastery. Key higher level concepts will be removed from the scheme to ensure adequate time can be spent on the core principles and accessible

content.

Assessments will take place at the end of each topic

Entry Level Certificate

An alternate pathway for students who struggle to access the volume of content in the standard GCSE. This will run for year 10 only and will then feed into the standard GCSE, but bridge the gap in skills and knowledge for those groups that need it. Pupils will be assessed in an experiment and test for each topic, this is submitted to the exam board and students receive a Pass, Merit or Distinction for the ELC upon successful completion

	Autumn Term	Spring Term	Summer term
	Paper 1 – Combined Science		
Year 10 and 11	Biology – 54 lessons + 4 testing	Chemistry – 52 lessons + 5 testing	Physics – 47 lessons + 4 testing
	<u>Topic 1 - Cell biology</u> <ol style="list-style-type: none"> 1. Types of cell 2. Specialised cells 3. Introducing microscopes 4. RP: Using microscopes 5. Types of microscope 6. Mitosis and the cell cycle 7. Stem cells 8. Evaluating stem cells 9. Diffusion 10. Surface area and volume ratio 11. Diffusion in action 12. Osmosis 13. Osmosis in action 14. RP: Osmosis investigation 15. Active transport 	<u>Topic 1 - Atomic structure and the periodic table</u> <ol style="list-style-type: none"> 1. Atoms and elements 2. Compounds and formulae 3. Word and symbol equations 4. Balancing equations 5. Separation techniques 6. RP: Chromatography 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. Metals and non-metals 14. Alkali metals (Group 1) 15. Halogens (Group 7) 16. Noble Gases (Group 0) 	<u>Topic 1 – Energy</u> <ol style="list-style-type: none"> 1. Types of energy and energy transfers 2. Open and closed systems 3. Insulation 4. Non-renewable resources 5. Renewable resources 6. Comparison of energy resources 7. Work done 8. Power 9. Efficiency calculations 10. Gravitational potential energy 11. Kinetic energy

	<p><u>Topic 2 – Organisation</u></p> <ol style="list-style-type: none"> 1. Tissues, organs and systems 2. Plant cells, tissues and organs 3. Enzymes 4. RP: pH and enzymes 5. RP: pH and enzymes 6. Digestion 7. RP: Testing food groups 8. The lungs 9. The heart 10. Blood vessels and heart rate 11. Blood composition 12. Cardiovascular disease 13. Disease data 1 14. Disease data 2 15. Non-communicable diseases 16. Cancer 17. Transpiration and translocation 18. Transpiration experiments 	<p><u>Topic 2 - Bonding, structure, and the properties of matter</u></p> <ol style="list-style-type: none"> 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. Graphene and fullerenes 8. Metallic Bonding 9. Changing states of matter 10. Comparing and contrasting types of bonding 	<p><u>Topic 2 – Electricity</u></p> <ol style="list-style-type: none"> 1. Electrical circuits Introduction 2. Calculating current 3. Current in circuits 4. Series and parallel circuits 5. Ohm’s Law 6. Resistance in circuits 7. RP: Factors affecting resistance 8. Light Dependent Resistors 9. Thermistors 10-11 RP: investigating non-ohmic conductors 11. Mini Quiz 12. Mains electricity and AC & DC 13. Plugs 14. Power calculations 15. Work done calculations 16. Equations practice 17. National Grid and Transformers
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	<u>Topic 3 - Infection and response</u> <ol style="list-style-type: none"> 1. Health 2. Pathogens 3. Bacterial diseases 4. Viral diseases 5. Fungal and protists 6. Our barriers to diseases 7. White blood cells 8. Vaccinations 9. Antibiotics 10. Antibiotic resistance 11. Developing new drugs 12. Data 1 13. Data 2 14. Data 3 	<u>Topic 3 – Quantitative chemistry</u> <ol style="list-style-type: none"> 1. Relative Formula Mass 2. Introducing moles 3. Word equations and conservation of mass (Higher only) 4. Reacting masses 5. Balancing equations using moles (Higher only) 6. Introduction to concentration 7. Percentage yield 8. All calculations for Chemistry 	<u>Topic 3 - Particle model of matter</u> <ol style="list-style-type: none"> 1. Particle model – density and states 2. RP : Calculating density 3. Change of state 4. Latent heat 5. Heating and cooling graphs 6. Specific heat capacity 7. RP : Investigate the specific heat capacity of a given object 8. Comparing specific heat capacity and latent heat (H only) 9. Pressure in gases
	<u>Topic 4 – Bioenergetics</u> <ol style="list-style-type: none"> 1. Photosynthesis 2-3. RP: Photosynthesis 4. Limiting factors (H only) 5. Aerobic respiration 6. Anaerobic respiration 7. Using glucose and nitrogen in plants 	<u>Topic 4 - Chemical changes</u> <ol style="list-style-type: none"> 1. Acids and bases 2. Acids - weak and strong (H only) 3. Neutralisation 4. RP: Soluble Salts 5. Metals and oxygen 6. Metals and acid 7. Metals and water 8. Reactivity series and extraction methods 9. Electrolysis of molton compounds 10. Electrolysis of aqueous compounds 11. RP: Electrolysis part 1 	<u>Topic 4 -Atomic structure</u> <ol style="list-style-type: none"> 1. Atomic recap 2. Changing atomic theories 3. Atoms, electrons and energy levels 4. Introduction to radioactive decay 5. Alpha, beta and gamma – part 1 6. Alpha, beta and gamma – part 2 7. Half life – part 1 8. Half life - part 2 9. Irradiation and contamination 10. Radiation – practice exam questions
		<u>Topic 5 - Energy changes</u> <ol style="list-style-type: none"> 1. Exothermic and endothermic reactions 2. RP Temperature Changes 3. Reaction profiles 4. Bond energies 	

<p><u>Core practicals</u></p> <ol style="list-style-type: none"> 1. Preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate, using a Bunsen burner to heat dilute acid and a water bath or electric heater to evaporate the solution. 2. Investigate what happens when aqueous solutions are electrolysed using inert electrodes. 3. Investigate the variables that affect temperature changes in reacting solutions such as, eg acid plus metals, acid plus carbonates, neutralisations, displacement of metals. 	<p><u>Core practicals</u></p> <ol style="list-style-type: none"> 1. Use a light microscope to observe, draw and label a selection of plant and animal cells. A magnification scale must be included. 2. Investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue 3. Use qualitative reagents to test for a range of carbohydrates, lipids and proteins. To include: Benedict's test for sugars; iodine test for starch; and Biuret reagent for protein. 4. Investigate the effect of pH on the rate of reaction of amylase enzyme <p>Investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed.</p>	<p><u>Core practicals</u></p> <ol style="list-style-type: none"> 1. An investigation to determine the specific heat capacity of one or more materials. The investigation will involve linking the decrease of one energy store (or work done) to the increase in temperature and subsequent increase in thermal energy stored. 2. Use circuit diagrams to set up and check appropriate circuits to investigate the factors affecting the resistance of electrical circuits. This should include: <ul style="list-style-type: none"> • the length of a wire at constant temperature • combinations of resistors in series and parallel. 3. Use circuit diagrams to construct appropriate circuits to investigate the I–V characteristics of variety of circuit elements including a filament lamp, a diode and a resistor at constant temperature. <p>Use appropriate apparatus to make and record the measurements needed to determine the densities of regular and irregular solid objects and liquids. Volume should be determined from the dimensions of regularly shaped objects and by a displacement technique for irregularly shaped objects. Dimensions to be measured using appropriate apparatus such as a ruler, micrometer or Vernier callipers.</p>
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Paper 2 – Combined Science

Biology – 47 lessons + 3 testing

Chemistry – 35 lessons + 5 testing

Physics – 37 lessons + 3 testing

Topic 5 - Homeostasis and response

1. Homeostasis
2. The nervous system
3. Synapses
4. RP Investigating human reaction time
5. The endocrine system
6. Controlling blood glucose
7. Hormones and the menstrual cycle
8. IVF (H only)
9. Contraception
10. Negative feedback loops (H only)
11. Comparing nervous and hormonal responses

Topic 6 - The rate and extent of chemical change

1. Measuring the rate of reaction
2. Factors affecting rates of reaction
3. Drawing rates of reaction graphs
- 4-6. RP: Factors affecting rates of reaction
7. Catalyst
9. Reversible reactions

Topic 5 – Forces

1. Scalar and vector quantities
2. Types of forces
3. Centre of mass
4. Weight
5. Resultant force
6. Vector diagrams (HT only)
7. Elastic objects and Hooke's Law
8. Work done
9. RP : Relationship between force and spring
10. Speed, distance, displacement, velocity
11. Circular motion (H only)
12. Distance time graphs
13. Acceleration
14. Velocity time graphs
15. Mini quiz
16. Falling objects
17. Newton's First Law
18. Newton's Second Law
19. Inertia and inertial mass
20. RP : Investigating Newton's Second Law
21. Newton's Third Law
22. Stopping distance
23. Breaking distance
24. Momentum calculations

	<p><u>Topic 6 – Inheritance, variation and evolution</u></p> <ol style="list-style-type: none"> 1. Introduction to DNA 2. Structure of DNA 3. Mutations 4. Sexual reproduction 5. The cell cycle 6. Asexual reproduction 7. Comparing sexual and asexual reproduction 8. Inheritance 9. Family trees 10. Genetic diseases and sex determination 11. Variation 12. Natural selection and evolution 13. Genetic engineering modification 14. Selective breeding 15. Stem cells 16. Evaluating stem cells 17. Fossils 18. Speciation 19. Antibiotic resistant bacteria 20. Classification 21. Inheritance summary essay 	<p><u>Topic 7 – Organic chemistry</u></p> <ol style="list-style-type: none"> 1. Crude Oil 2. Fractional Distillation and the fractions 3. Cracking 1 4. Alkanes and alkenes 5. Properties of alkanes and alkenes 6. Combustion 	<p><u>Topic 6 – Waves</u></p> <ol style="list-style-type: none"> 1. Introduction to waves 2. Wave equations 3. Measuring speed of sound 4. Measuring period of a wave 5. RP ; Measure the speed of a wave using a ripple tank and speed 6. EM spectrum 7. RP : IR radiation
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	<u>Topic 7 – Ecology</u> <ol style="list-style-type: none"> 1. Competition (Need lesson) 2. Abiotic and biotic factors (Need lesson) 3. Adaptations (Need lesson) 4. Food chains (Need lesson) 5. RP Quadrats 6. Using transects (Need lesson) 7. Water cycle 8. Carbon cycle 9. Biodiversity & Human impact 10. Reducing Human impact 11. Global warming 12. Deforestation and land use 13. Pyramids of Biomass & tropic levels 14. Biomass transfer 15. Biotechnology 	<u>Topic 8 – Chemical analysis</u> <ol style="list-style-type: none"> 1. RP Paper chromatography 2. Gas tests 	<u>Topic 7 – Magnetism and electromagnetism</u> <ol style="list-style-type: none"> 1. Magnets 2. Electromagnets 3. Electromagnetic fields 4. Motor effect 5. $F = BIL$ (H only) 6. Applications of the motor effect and generators
		<u>Topic 9 – Chemistry of the atmosphere</u> <ol style="list-style-type: none"> 1. The Early Earth's Atmosphere 2. Theories of the atmosphere 3. The Greenhouse Effect 4. Evidence for the greenhouse effect 5. Effects of global warming 6. The Harmful Effects of Combustion 7. Resources used by Humans 	

Topic 10 – Using resources

1. Uses of metals
2. Alloys
3. Potable Water
4. Waste and sewage
5. Evaluating potable water methods
6. RP Analysing water samples
7. Phytomining and bioleaching
8. Life Cycle Assessment
9. Reduce, Reuse, Recycle
10. Important materials
11. NPK Fertilisers

	<p><u>Core practicals</u></p> <ol style="list-style-type: none"> 7. Plan and carry out an investigation into the effect of a factor on human reaction time 8. Measure the population size of a common species in a habitat. Use sampling techniques to investigate the effect of a factor on the distribution of this species. 	<p><u>Core practicals</u></p> <ol style="list-style-type: none"> 5. Investigate how changes in concentration affect the rates of reactions by a method involving measuring the volume of a gas produced and a method involving a change in colour or turbidity. 6. Investigate how paper chromatography can be used to separate and tell the difference between coloured substances. Students should calculate R_f values. 7. Analysis and purification of water samples from different sources, including pH, dissolved solids and distillation. 	<p><u>Core practicals</u></p> <ol style="list-style-type: none"> 6. Investigate the relationship between force and extension for a spring. 7. Investigate the effect of varying the force on the acceleration of an object of constant mass and the effect of varying the mass of an object on the acceleration produced by a constant force. 8. Make observations to identify the suitability of apparatus to measure the frequency, wavelength and speed of waves in a ripple tank and waves in a solid and take appropriate measurements. 9. Investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface.
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	<p><u>Topic 5 - Homeostasis and response</u></p> <ol style="list-style-type: none"> 12. Homeostasis 13. The nervous system 14. Synapses 15. RP Investigating human reaction time 16. The endocrine system 17. Controlling blood glucose 18. Hormones and the menstrual cycle 19. IVF (H only) 20. Contraception 21. Negative feedback loops (H only) 22. Comparing nervous and hormonal responses 	<p><u>Topic 6 - The rate and extent of chemical change</u></p> <ol style="list-style-type: none"> 4. Measuring the rate of reaction 5. Factors affecting rates of reaction 6. Drawing rates of reaction graphs 4-6. RP: Factors affecting rates of reaction 7. Catalyst 9. Reversible reactions 	<p><u>Topic 5 – Forces</u></p> <ol style="list-style-type: none"> 25. Scalar and vector quantities 26. Types of forces 27. Centre of mass 28. Weight 29. Resultant force 30. Vector diagrams (HT only) 31. Elastic objects and Hooke's Law 32. Work done 33. RP : Relationship between force and spring 34. Speed, distance, displacement, velocity 35. Circular motion (H only) 36. Distance time graphs 37. Acceleration 38. Velocity time graphs 39. Mini quiz 40. Falling objects 41. Newton's First Law 42. Newton's Second Law 43. Inertia and inertial mass 44. RP : Investigating Newton's Second Law 45. Newton's Third Law 46. Stopping distance 47. Breaking distance 48. Momentum calculations
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Entry Level Certificate

Biology - lessons	Chemistry - lessons	Physics - lessons
Topic 1 The Human Body	Topic 1 Elements compounds and mixtures	Topic 1 Energy, forces and the structure of matter
<ol style="list-style-type: none"> 1. Animal cells 2. Tissues, organs and systems 3. The human digestive system 4. Respiration and life style 5. TDA comparing the energy content of food 6. 7. 8. 9. Infectious diseases 10. The role of white blood cells 11. Medicinal drugs 12. The nervous system 13. Hormonal control 14. Fertility treatment 15. Revision 16. Test 	<ol style="list-style-type: none"> 1. Atoms and elements 2. Elements and compounds 3. States of matter 4. Forms of carbon 5. Mixtures 6. Chromatography 7. TDA Chromatography in inks/ food colours 8. 9. 10. 11. Metals and ores 12. Properties of metals 13. Alloys 14. Polymers 15. Revision 16. Test 	<ol style="list-style-type: none"> 1. Changes in energy storage 2. Energy and efficiency 3. TDA the thermal conductivity of different materials 4. Energy resources 5. Types of forces 6. Effects of forces 7. Speed 8. Stopping distances 9. Reaction times and stopping distances 10. Weather conditions and braking distances 11. Radioactivity 12. Revision 13. Test
Topic 2 Environment , evolution and inheritance	Topic 4 Chemistry in our world	Topic 2 Electricity, magnetism and waves
<ol style="list-style-type: none"> 1. Photosynthesis 2. Adaptation 3. Food chains and webs 4. Decomposition and recycling 5. Competition 6. Environmental changes 7. Pollution and human population 8. TDA photosynthesis 9. 10. 	<ol style="list-style-type: none"> 1. Acids and metal reactions 2. TDA the amount of hydrogen produced when acids react with different metals 3. Neutralisation 4. Energy and rate of reaction 5. Increasing the rate of a chemical reaction 6. Changes in the earth's atmosphere 7. The current atmosphere 8. Crude oils and fuels 	<ol style="list-style-type: none"> 1. Current In a circuit 2. D.C and A.C. current 3. Wiring a plug 4. Energy transfer in electrical appliances 5. Magnets 6. Electromagnets and solenoids 7. TDA strength of an electromagnet 8. Longitudinal and transverse waves 9. Wave properties 10. The electromagnetic spectrum

11. Evolution and Natural and selective breeding 12. Sexual and asexual reproduction 13. Genetics 14. Revision 15. Test	9. Burning fuels 10. Human influences on the atmosphere 11. Water for drinking	11. Uses of the electromagnetic spectrum 12. Revision 13. test
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Paper 1 – Support Science

Biology – 38 lessons	Chemistry – 39 lessons	Physics – 40 lessons
<u>Topic 1 - Cell biology</u> <ol style="list-style-type: none"> 1. Types of cell 2. Specialised cells 3. Introducing microscopes 4. RP: Using microscopes 5. Types of microscope 6. Diffusion 7. Diffusion in action 8. Osmosis 9. Osmosis in action 10. RP: Osmosis investigation 	<u>Topic 1 - Atomic structure and the periodic table</u> <ol style="list-style-type: none"> 1. Atoms and elements 2. Compounds and formulae 3. Word and symbol equations 4. Balancing equations 5. Separation techniques 6. RP: Chromatography 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. Metals and non-metals 14. Alkali metals (Group 1) 15. Halogens (Group 7) 16. Noble Gases (Group 0) 	<u>Topic 1 – Energy</u> <ol style="list-style-type: none"> 1. Types of energy and energy transfers 2. Insulation 3. Non-renewable resources 4. Renewable resources 5. Comparison of energy resources 6. Work done 7. Power 8. Efficiency calculations 9. Gravitational potential energy 10. Kinetic energy
<u>Topic 2 – Organisation</u> <ol style="list-style-type: none"> 1. Tissues, organs and systems 2. Plant cells, tissues and organs 3. Enzymes 4. RP: pH and enzymes 5. Digestion 6. RP: Testing food groups 7. The lungs 8. The heart 9. Blood vessels and heart rate 10. Blood composition 11. Cardiovascular disease 12. Non-communicable diseases 13. Cancer 14. Transpiration and translocation 15. Transpiration experiments 	<u>Topic 2 - Bonding, structure, and the properties of matter</u> <ol style="list-style-type: none"> 1. Ionic bonding part 1 2. Properties of ionic bonding 3. Covalent bonding 4. Properties of covalent structures 5. Giant covalent structures 6. Metallic Bonding 7. Changing states of matter 	<u>Topic 2 – Electricity</u> <ol style="list-style-type: none"> 1. Electrical circuits Introduction 2. Calculating current 3. Current in circuits 4. Series and parallel circuits 5. Resistance in circuits 6. RP: Factors affecting resistance 7. Light Dependent Resistors 8. Thermistors 10-12 RP: investigating non-ohmic conductors 11. Mini Quiz 12. Mains electricity and AC & DC 13. Plugs 14. Power calculations 15. Work done calculations 16. National Grid and Transformers
<u>Topic 3 - Infection and response</u> <ol style="list-style-type: none"> 1. Health 2. Pathogens 	<u>Topic 3 – Quantitative chemistry</u> <ol style="list-style-type: none"> 1. Relative Formula Mass 2. Introducing moles 	<u>Topic 3 - Particle model of matter</u> <ol style="list-style-type: none"> 1. Particle model – density and states 2. RP : Calculating density

<ol style="list-style-type: none"> 3. Bacterial diseases 4. Viral diseases 5. Our barriers to diseases 6. White blood cells 7. Vaccinations 8. Antibiotics 9. Developing new drugs 	<ol style="list-style-type: none"> 3. Reacting masses 4. Introduction to concentration 5. Percentage yield 	<ol style="list-style-type: none"> 3. Change of state 4. Latent heat 5. Heating and cooling graphs 6. Specific heat capacity 7. RP : Investigate the specific heat capacity of a given object
<p><u>Topic 4 – Bioenergetics</u></p> <ol style="list-style-type: none"> 1. Photosynthesis 2. RP: Photosynthesis 3. Aerobic respiration 4. Anaerobic respiration 	<p><u>Topic 4 - Chemical changes</u></p> <ol style="list-style-type: none"> 1. Acids and bases 2. Neutralisation 3. RP: Soluble Salts 4. Metals and oxygen 5. Metals and acid 6. Metals and water 7. Reactivity series and extraction methods 8. RP: Electrolysis part 1 9. RP: Electrolysis part 2 	<p><u>Topic 4 -Atomic structure</u></p> <ol style="list-style-type: none"> 1. Atomic recap 2. Changing atomic theories 3. Introduction to radioactive decay 4. Alpha, beta and gamma – part 1 5. Alpha, beta and gamma – part 2 6. Half life 7. Irradiation and contamination
	<p><u>Topic 5 - Energy changes</u></p> <ol style="list-style-type: none"> 1. Exothermic and endothermic reactions 2. RP Temperature Changes 	
<p><u>Core practicals</u></p> <ol style="list-style-type: none"> 4. Preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate, using a Bunsen burner to heat dilute acid and a water bath or electric heater to evaporate the solution. 5. Investigate what happens when aqueous solutions are electrolysed using inert electrodes. 6. Investigate the variables that affect temperature changes in reacting solutions such as, eg acid plus metals, acid plus carbonates, neutralisations, displacement of metals. 	<p><u>Core practica's</u></p> <ol style="list-style-type: none"> 5. Use a light microscope to observe, draw and label a selection of plant and animal cells. A magnification scale must be included. 6. Investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue 7. Use qualitative reagents to test for a range of carbohydrates, lipids and proteins. To include: Benedict's test for sugars; iodine test for starch; and Biuret reagent for protein. 8. Investigate the effect of pH on the rate of reaction of amylase enzyme <p>Investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed.</p>	<p><u>Core practicals</u></p> <ol style="list-style-type: none"> 4. An investigation to determine the specific heat capacity of one or more materials. The investigation will involve linking the decrease of one energy store (or work done) to the increase in temperature and subsequent increase in thermal energy stored. 5. Use circuit diagrams to set up and check appropriate circuits to investigate the factors affecting the resistance of electrical circuits. This should include: • the length of a wire at constant temperature • combinations of resistors in series and parallel. 6. Use circuit diagrams to construct appropriate circuits to investigate the I-V characteristics of variety of circuit elements including a filament lamp, a diode and a resistor at constant temperature. <p>Use appropriate apparatus to make and record the measurements needed to determine the densities of regular and irregular solid objects and liquids. Volume</p>

should be determined from the dimensions of regularly shaped objects and by a displacement technique for irregularly shaped objects. Dimensions to be measured using appropriate apparatus such as a ruler, micrometer or Vernier callipers.

Paper 2 – Support Science

Biology – 27 lessons

Topic 5 - Homeostasis and response

1. Homeostasis
2. The nervous system
3. RP Investigating human reaction time
4. The endocrine system
5. Controlling blood glucose
6. Hormones and the menstrual cycle
7. Contraception

Chemistry – 28 lessons

Topic 6 - The rate and extent of chemical change

1. Measuring the rate of reaction
2. Factors affecting rates of reaction
3. Drawing rates of reaction graphs
- 4-6. RP: Factors affecting rates of reaction
7. Catalyst

Physics – 28 lessons

Topic 5 – Forces

1. Scalar and vector quantities
2. Types of forces
3. Centre of mass
4. Weight
5. Resultant force
6. Elastic objects and Hooke's Law
7. Work done
8. RP : Relationship between force and spring
9. Speed, distance, displacement, velocity
10. Distance time graphs
11. Acceleration
12. Velocity time graphs
13. Mini quiz
14. Falling objects
15. Newton's First Law
16. Newton's Second Law
17. RP : Investigating Newton's Second Law
18. Newton's Third Law
19. Stopping distance
20. Breaking distance

Topic 6 – Inheritance, variation and evolution

1. Introduction to DNA
2. Asexual reproduction

Topic 7 – Organic chemistry

1. Crude Oil
2. Fractional Distillation and the fractions

Topic 6 – Waves

1. Introduction to waves
2. Wave equations

<ul style="list-style-type: none"> 3. Comparing sexual and asexual reproduction 4. Inheritance 5. Variation 6. Natural selection 7. Evolution 8. Selective breeding 9. Fossils 10. Classification 	<ul style="list-style-type: none"> 3. Cracking 4. Alkanes and alkenes 5. Properties of alkanes and alkenes 6. Combustion 	<ul style="list-style-type: none"> 3. Measuring speed of sound 4. RP ; Measure the speed of a wave using a ripple tank and speed 5. EM spectrum 6. RP : IR radiation
<p><u>Topic 7 – Ecology</u></p> <ul style="list-style-type: none"> 1. Competition 2. Abiotic and biotic factors 3. Adaptations 4. Food chains 5. RP Quadrats 6. Water cycle 7. Carbon cycle 8. Biodiversity & Human impact 9. Global warming 10. Deforestation and land use 	<p><u>Topic 8 – Chemical analysis</u></p> <ul style="list-style-type: none"> 1. RP Paper chromatography 	<p><u>Topic 7 – Magnetism and electromagnetism</u></p> <ul style="list-style-type: none"> 1. Magnets 2. Electromagnets
	<p><u>Topic 9 – Chemistry of the atmosphere</u></p> <ul style="list-style-type: none"> 1. The Early Earth's Atmosphere 2. Theories of the atmosphere 3. The Greenhouse Effect 4. Effects of global warming 5. The Harmful Effects of Combustion 6. Resources used by Humans 	
	<p><u>Topic 10 – Using resources</u></p> <ul style="list-style-type: none"> 1. Uses of metals 2. Alloys 3. Potable Water 4. Waste and sewage 5. RP Analysing water samples 6. Life Cycle Assessment 7. Reduce, Reuse, Recycle 8. Important materials 	
<p><u>Core practical's</u></p>	<p><u>Core practical's</u></p>	<p><u>Core practical's</u></p>

<p>9. Plan and carry out an investigation into the effect of a factor on human reaction time</p> <p>10. Measure the population size of a common species in a habitat. Use sampling techniques to investigate the effect of a factor on the distribution of this species.</p>	<p>8. Investigate how changes in concentration affect the rates of reactions by a method involving measuring the volume of a gas produced and a method involving a change in colour or turbidity.</p> <p>9. Investigate how paper chromatography can be used to separate and tell the difference between coloured substances. Students should calculate Rf values.</p> <p>10. Analysis and purification of water samples from different sources, including pH, dissolved solids and distillation.</p>	<p>10. Investigate the relationship between force and extension for a spring.</p> <p>11. Investigate the effect of varying the force on the acceleration of an object of constant mass and the effect of varying the mass of an object on the acceleration produced by a constant force.</p> <p>12. Make observations to identify the suitability of apparatus to measure the frequency, wavelength and speed of waves in a ripple tank and waves in a solid and take appropriate measurements.</p> <p>13. Investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface.</p>
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