Olive AP Academy
NENE VALLEY
Olive Academies

Curriculum plan – Science

Year 9/10					
Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Summary **Human Body 1** Digestion and enzyme action Circulatory system Respiration **Energy, Forces and the Structure of Matter 1** Energy stores and transfers Reducing unwanted energy transfers	Summary **Human Body 2** Cells and levels of organisation Infectious diseases and the immune system **Energy, Forces and the Structure of Matter 1** Calculating electricity bills	Summary **Human Body** Medical drugs The nervous and endocrine systems Contraception **Elements, Mixtures and Compounds 1** Solids, Liquids and gases. Atoms and elements Chemical reactions	Summary **Energy Forces and Structure of matter 1** Energy resources- renewable and non-renewable **Elements, Mixtures and Compounds 1** Compounds and mixtures Separating mixtures	Summary **Energy, Forces and the structure of matter 2** Speed and stopping distances Types and effects of forces Radioactivity **Elements, Mixture and Compounds 2** Metals and alloys	Summary **Energy, Forces and the structure of matter 2** Chemical Bonding **Elements, Mixture and Compounds 2** Polymers
Knowledge **Human Body** Balanced diet. Structure and function of the digestive system. Structure and function of enzymes. Respiration (aerobic and anaerobic). Transport system of multicellular animals. Structure and functions of the human circulatory system. **Energy, Forces and the Structure of Matter 1** Energy. Skills Using a light microscope Table/Graph drawing	Knowledge **Human Body** Animal cell structure Plant cell structure Stem cells Cell, tissues, organs and systems. Relationship between health and disease. Communicable and non-communicable diseases. Bacteria, viruses and fungi as pathogens Body defences against pathogens Immune system Spread of infectious diseases in animals and plants. The process of discovery and development of new medicines	Knowledge **Human Body** Medicinal and recreational drugs. Human nervous system Reflex arc Hormones Methods of contraception Homeostasis **Atoms, Elements and Mixtures 1** Solids, Liquids and gases. Understand the processes that lead to a change in state Atoms, protons, neutrons and electrons. Periodic table	Knowledge **Energy Forces and Structure of matter 1** Energy sources Energy resources Renewable and non-renewable resources. Wind, solar, wave. Coal, oil, natural gas. **Elements, Mixtures and Compounds 1** Compounds and mixtures. Separation techniques for mixtures of substances: filtration, crystallisation, chromatography, simple and fractional distillation Skills TDA: Chromatography	Knowledge **Energy, Forces and the structure of matter 2** Distance (m, km) Speed Calculate distance (S=d/t) Stopping distance. Types of forces. Resultant force using a free-body diagram. Radiation (alpha, Beta, Gamma) Radioactive half-life of a radioactive isotope **Element, Mixture and Compound 2** Metal extraction (metal ore) Alloys Skills Graph Analysis	Knowledge **Energy, Forces and the structure of matter 2** Ions Bonding types (ionic, Covalent and Metallic) Dot and cross diagrams. **Elements, Mixture and Compounds 2** Polymers, monomers. Atoms in a polymer molecule Intermolecular forces between polymer molecules Polymers melting temperature Skills Past exam question practice

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	The impact of lifestyle factors on the incidence of non-communicable diseases **Energy, Forces and the Structure of Matter 1** Units called kilowatt-hours, kWh. Cost of electricity used and calculated Cost of using an electrical appliance. <u>Skills</u> Using a light microscope Calculating cost Using a calculator	<u>Skills</u> Using a periodic table to determine characteristics of an element.	Separate a mixture by filtration.	Calculating stopping distance Using a Calculator Determining the half-life of a radioactive isotope using a half-life graph.	
<u>Assessment:</u> Entry Level Certificate L1-3 test papers Progress tests (every 2 weeks) Mock exams (GCSE papers)					

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Year 11					
Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Summary **Environment, evolution and inheritance 1** Plants and photosynthesis Adaptations and feeding relationships Environmental change and pollution **Energy, Forces and the Structure of Matter** Energy stores and transfers reducing unwanted energy transfers Electricity bills Energy resources	Summary **Chemistry in our world 1** Acids and metals pH and neutralization Rates of reaction **Electricity, magnetism and waves 1** Current, potential difference and resistance a.c. and d.c. current	Summary **Environment, evolution and inheritance 2** Evolution, natural and artificial selection Sexual and asexual reproduction Genetics and genetic engineering **Electricity, magnetism and waves 2** Energy transfers in electrical appliances Magnets and electromagnets	Summary **Chemistry in our world 2** The Earth's atmosphere Crude oil and fuels Acid Rain Revise polymerisation Water for drinking **Electricity, magnetism and waves 3** Types of waves The wave equation The electromagnetic spectrum	Summary **Consolidation and revision for exams**	Summary **Revision & exams**
Environment, evolution and inheritance 1 Photosynthesis Factors affecting photosynthesis Adaptation of animals and plants. Biotic and abiotic factors Interactions between organisms Construct food chains and food webs. Trophic levels in a food chain/web. Human activity on the environment. Carbon cycle Pollution.	**Chemistry in our world 1** Acids, Alkalis and neutral substances. pH levels Common substances Neutralisation reaction Rate of a reaction Reaction rates (graph) **Electricity, magnetism and waves 1** Electrical component symbols Electrical current Current, potential difference and resistance.	**Environment, evolution and inheritance 2** Evolution Natural selection and artificial selection Fossils Sexual and asexual reproduction Phenotypes (multiple, rather than single genes) Genetic variation in populations Chromosomes Genetic material Genes/DNA/ Chromosomes	**Chemistry in our world 2** Earth's atmosphere (Nitrogen, Carbon Dioxide, Oxygen, trace gases) Pollutants of our atmosphere. Global Warming. Earth's climate Fractional distillation Acid rain Revision: Polymers Water cycle. **Electricity, magnetism and waves 3** Waves.	**Consolidation and revision** Review of past learning Review of required practical experiments. Highlight common misconceptions and gaps in knowledge. Skills Past exam question practice. Review of Required practical experiments.	**Consolidation and revision** Review of past learning for exam content. Highlight common misconceptions and gaps in knowledge. Skills Past exam question practice.

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Energy, Forces and the Structure of Matter Energy storing methods Methods of energy transfers. Energy Methods to reduce unwanted energy transfers. Electricity units Electricity cost calculations Energy resources Advantages and disadvantages of different energy resources. Energy resources inc renewable and non-renewable <u>Skills</u> Analyse Photosynthesis Required Practical Calculating the cost of an electrical appliance Using a calculator	Direct and alternating current. Circuit diagrams for series circuits and parallel circuits. <u>Skills</u> Graph Analysis Correctly draw circuit diagrams	Genetic variation. Genetic engineering **Electricity, magnetism and waves 2** Alternating and direct current Wiring a plug (Earth, Live, Neutral) Electrical appliances in the home Energy transfer diagram. Magnets (North/South) Magnetic force Magnetic metals (iron, cobalt, nickel) Magnetic field. Induced magnets and permanent magnets. Earth's electromagnetic field. Electromagnets <u>Skills</u> Using a light microscope to observe plant and animal specimens Draw and interpret a genetic diagram (Punnett Square)	Longitudinal and transverse waves. Mechanical and electromagnetic waves. Wave speed Electromagnetic spectrum. <u>Skills</u> Required practical: Waves Calculating the speed of a wave Using a calculator Graph analysis		
<u>Assessment:</u> Entry Level Certificate L1-3 test papers Progress tests (every 2 weeks) Mock exams (GCSE papers)					