Pride | Ambition | Care | Excellence

Science | Curriculum Map

Co-op Academy
Florence MacWilliams

Curriculum | Intent

Science is changing our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. The Florence Science Mastery programme aims to improve opportunities for all young people. This means enabling every child to develop a comprehensive understanding of the big picture of science, and leave school with the science capital required to inform life-long decision making. Our programme aims to prepare all pupils academically for further scientific study and a career in science, and to inform pupils about the dynamic complexities of the natural world and their place in it. Our curriculum is therefore broad, coherent, practical and rigorous, allowing pupils to be 'inspired and challenged by the subject and its achievements'.

The Florence Science Mastery curriculum builds on pupils' scientific understanding from KS1 and KS2. Pupils are first introduced to the subject disciplines of biology, chemistry and physics at KS3, and the principal focus of science teaching at this stage is to allow pupils to 'develop a deeper understanding of content within each of the three subject disciplines'. This remains the principal focus into KS4, which explains why the Science Mastery curriculum shows a five-year progression of content and skills within each of the three subject disciplines. By the end of KS4, pupils are expected to 'appreciate the achievements of science in showing how the complex and diverse phenomena of the natural world can be described in terms of a number of key ideas relating to the sciences which are interlinked, and which are of universal application'. To ensure all young people are able to do this, the Florence Science Mastery curriculum sequences the knowledge and content pupils must learn across the five years of secondary education under a series of 'big ideas'. This provides the foundations for understanding the natural world by ensuring the delivery of accurate scientific knowledge and supplying relevant and engaging example applications of this knowledge. The curriculum allows pupils to appreciate how our increasingly technological society is evolving using engaging news stories and novel applications.

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
7	B1.1 - Cells Animal & Plant Cells, Microscopes, Specialised Cells, Tissues, Organs & Systems. C1.1 - Particles States of Matter, Particle Model, Properties of Matter, Changes of State, Diffusion, Variables, Gas Pressure, Density.	C1.1 - Particles P1.1 - Forces Balanced & Unbalanced Forces, Resultant Force, Springs & Deformation. Drag Forces & Friction. B1.2 - Reproduction	B1.2 - Reproduction Types of Reproduction, Gametes, Reproductive Systems, Pregnancy & Embryo Development, Plant Reproduction, Seed Dispersal. C1.2 Atoms, Elements & Compounds Elements, Atoms, The Periodic Table, Metals & Non-metals, Reactivity of Metals, Compounds, Chemical Formulae.	P1.2 - Space The Solar System, Gravity, Orbits, Day & Night, Seasons, Satellites, Eclipses. B1.3 - Interdependence Ecosystems, Sampling, Food Chains & Food Webs, Trophic Levels, Biotic & Abiotic Factors, Competition.	C1.3 - Mixtures Mixtures, Solutions, Melting & Boiling Points, Purity, Filtration, Crystallisation, Fractional Distillation, Chromatography. P1.3 - Energy Transfers Energy Stores, Energy Transfers, Energy in Food, Wasted Energy, Efficiency, Thermal Energy, Conductors & Insulators.	P1.4 - Electric Circuits Models of Circuits, Circuit Symbols, Series & Parallel, Current, Voltage & Potential Difference.
8	B2.1 Tissues & Organs Skeletal & Muscular Systems, The Respiratory System, Breathing, Gas Exchange, Drugs, Organ Donation. C2.1 - Acids & Alkalis The pH Scale, Indicators, Neutralisation, Making Salts, Writing Methods, Acids & Metal Carbonates.	P2.1 - Movement & Pressure Speed, Distance-Time Graphs, Pressure, Moments. B2.2 - Respiration & Photosynthesis Lifestyle Habits & Risks, Respiration, Exercise, Muscle Fatigue, Uses of Anaerobic Respiration, Photosynthesis, Plant Adaptations, Biodomes.	C2.2 - Changing Substances Chemical Changes, Conservation of Mass, Balanced Equations, Oxidation & Reduction, Reactions of Acids, Testing for Gases. P2.2 - Magnetism Magnetism, Magnetic Fields, Electromagnets, Earth's Magnetic Field.	P2.2 - Magnetism B2.3 - Life Diversity Variation, Inheritance, Artificial Selection, Natural Selection, Evolution. C2.3 - Earth Systems Igneous Rocks, Sedimentary Rocks, Metamorphic Rocks, Rock Cycle, Water Cycle, Material Cycling, Air Pollution.	C2.3 - Earth Systems B2.4 - Nutrition Diet & Nutrition, Food Tests, Food Samples, The Digestive System, The Small Intestine, Enzymes, Plant Nutrition.	P2.4 - Light Light, Reflection, Refraction, Lenses, Colour.
9	B3.1 - Growth & Differentiation Eukaryotic & Prokaryotic Cells, Aseptic Technique, Microscopes & Magnification, Diffusion, Osmosis, Active Transport, Cell Division, Cancer, Stem Cells. C3.1 - Periodic Table Atoms, Electron Configuration, Isotopes, The Periodic Table, Noble Gases, Alkali Metals, Halogens, Transition Metals, Reactivity.	C3.1 - Periodic Table P3.1 - Acceleration Scalar & Vectors, Resultant Vectors, Newton's Third Law, Newton's First Law, Acceleration, Velocity-Time Graphs.	B3.2 - Human Interaction Biodiversity, Pollution, Human Impacts, Global Warming. C3.2 Intro to Quantitative Chemistry Relative Formula Mass, Percentage by Mass, Conservation of Mass, Balancing Equations, Uncertainty, Concentration, Soluble Salts.	P3.2 - Heating Internal Energy, Thermal Transfers, Specific Heat Capacity, Specific Latent Heat. B3.3 - Genetics The Cell Cycle, Meiosis, Types of Reproduction, DNA & Proteins, Genes & Alleles, Punnett Squares, Inherited Disorders, Sex Determination.	B3.3 - Genetics C3.3 - Using Resources Reactivity Series, Treating Water, Testing Water, Using Materials, Life Cycle Assessments, Reduce Reuse Recycle. P3.3 - Sound & Waves Types of Wave, Properties of Waves, Velocity of Waves, Reflection & Refraction, Using Waves.	P3.3 - Sound & Waves P3.4 - Home Electricity Mains Electricity, Plugs, Power, Cost of Electricity, Power in Circuits, Energy Resources, The National Grid, Static Electricity.

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Careers Link	Biomedical scientist, Microbiologist, Laboratory Technician, Medicine, Nanotechnologist, Chemical Engineer, Forensic Scientist	Aeronautical engineer, Civil Engineer, Sports Scientist, Mechanic,Medicine, Midwife, Veterinary, Nurse	Chemical engineer, Pharmacy, Materials Scientist, Nanotechnology	Astronaut, Astronomer, Aerospace Engineer, Astrophysicist, Planetary Scientist, Robotics Engineer, Meteorologist, Marine Biologist, Ecologist, Conservation, Zookeeper	Forensic Scientist, Water treatments, Analytical Chemist, Food Scientist, Forensic Science, Electrical engineer, Renewable Energy Engineer, Wind Turbine Technician, Hydroelectric Pwer Research	Electrician, Electrical Engineer, Electronics, Robotics, Telecommunications, Computer Hardware Engineer

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8	HT1 B2.1 Tissues & Organs Skeletal & Muscular Systems, The Respiratory System, Breathing, Gas Exchange, Drugs, Organ Donation. C2.1 - Acids & Alkalis The pH Scale, Indicators, Neutralisation, Making Salts, Writing Methods, Acids & Metal Carbonates.	HT2 P2.1 - Movement & Pressure Speed, Distance-Time Graphs, Pressure, Moments. B2.2 - Respiration & Photosynthesis Lifestyle Habits & Risks, Respiration, Exercise, Muscle Fatigue, Uses of Anaerobic Respiration, Photosynthesis, Plant Adaptations, Biodomes.	HT3 C2.2 - Changing Substances Chemical Changes, Conservation of Mass, Balanced Equations, Oxidation & Reduction, Reactions of Acids, Testing for Gases. P2.2 - Magnetism Magnetism, Magnetic Fields, Electromagnets, Earth's Magnetic Field.	HT4 P2.2 - Magnetism B2.3 - Life Diversity Variation, Inheritance, Artificial Selection, Natural Selection, Evolution. C2.3 - Earth Systems Igneous Rocks, Sedimentary Rocks, Metamorphic Rocks, Rock Cycle, Water Cycle, Material Cycling, Air Pollution.	HT5 C2.3 - Earth Systems B2.4 - Nutrition Diet & Nutrition, Food Tests, Food Samples, The Digestive System, The Small Intestine, Enzymes, Plant Nutrition.	HT6 P2.4 - Light Light, Reflection, Refraction, Lenses, Colour.
Careers Link	Surgeon, Cardiologist, Physiotherapist, Biomedical Scientist, Analytical Chemist, Pharmacist, Food Scientist, Agricultural Scientist, Cosmetic Chemist	Car mechanic, Pilot, Aerospace Engineer, Civil Engineer, Hydraulic Engineer, Sports Scientist, Physician, Nurse, Exercise Physiologist, Biomedical Scientist	Chemist, Forensic Scientist, Electrical Engineer, Medical Imaging, Transport Engineer,	Paleontologist, Conservation Scientist, Zoologist, Microbiologist, Geologist, Volcanologist, Environmental Geoscientist	Nutritionist, Dietician, Sports Nutritionist, Food Scientist, Chef, Biomedical Scientist, Public Health Advisor	Optometrist, Photographer, Astronomer, Optical Engineer, Optician, Lighting Designer, Radiographer

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Careers Link	Stem Cell Researcher, Cancer Research Scientist, Biotechnologist, Materials Scientist, Forensic Scientist, Pharmacist	Aerospace Engineer, Motorsport Engineer, Mechanical Engineer,	Ecologist, Conservation Scientist, Marine Biologist, Zoologist, Analytical Chemist, Chemical Engineer, Laboratory Technician	Thermal Engineer, Renewable Energy, Nuclear Engineer, Forensic Scientist, Crop Scientist, Biotechnologist, Bioinformatician	Environmental Scientist, Water Treatment Engineer, Environmental Consultant, Carbon Footprint Analyst, Audiologist, Medical Sonographer, Seismologist	Electrician, Electrical Engineer, Green Energy Technologist, Electrical Appliance Technician, Domestic Energy Assessor

	Autumn Term 1	Autumn Term 2	Spring Term 2	Spring Term 2	Summer Term 1	Summer Term 2
10	Cells & Digestion (Paper 1) Cell Structure, Cell Division, Transport in Cells, Principles of Organisation, The Human Digestive System. Atoms & the Periodic Table (Paper 1) Simple model of the Atom, Symbols, Relative Atomic Mass, Electronic Charges and Isotopes, The Periodic Table, Properties of Transition Metals. Energy (Paper 1) Energy Changes in a System, Conservation & Dissipation of Energy, National and Global Energy Resources.	Respiration & Circulation (Paper 1) Animals Tissues, Organs & Organ Systems, The Heart, Blood Vessels & Blood, Respiration. Structure & Bonding (Paper 1) Chemical Bonds, Ionic, Covalent and Metallic, How Bonding and Structure are Related to the Properties of Substances, Structure and Bonding of Carbon. Electricity (Paper 1) Current, Potential Difference and Resistance, Series and Parallel Circuits, Domestic Uses and Safety, Energy Transfers, Static Electricity.	Infection & Response (Paper 1) Communicable Diseases, Monoclonal Antibodies. Metals & Electrolysis (Paper 1) Electrolysis	Plants (Paper 1) Plant Tissues, Organs & Systems, Plant Diseases, Photosynthesis. Acids & Salts (Paper 1) Quantitative Chemistry, Chemical Measurements, Conservation of Mass, Chemical Equations, Moles, Yield and Atom Economy, Concentrations, Chemical Changes, Reactivity of Metals, Reactions of Acids, Atomic Physics (Paper 1) Atoms and Isotopes, Nuclear Radiation, Hazards and Uses of Radioactive Emissions and Background Radiation	Changes in Chemical Reactions (Paper 1 & 2) Exothermic and Endothermic Reactions, Chemical Cells and Fuels Cells, The Rate and Extent of Chemical Change, Rate of Reaction, Reversible Reactions and Dynamic Equilibrium Materials & Thermal Physics (Paper 1 & 2) Particle Model of Matter, Changes of State and the Particle Model, Pressure.	Trust-wide Science Mock Examinations Pupils to sit 3 papers: AQA Paper 1 Biology AQA Paper 1 Chemistry AQA Paper 1 Physics or AQA Combined Science - Biology Paper 1 AQA Combined Science - Chemistry Paper 1 AQA Combined Science - Physics Paper 1

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11	Nerves & Homeostasis (Paper 2) Homeostasis, The Human Nervous System, Hormonal Coordination in Humans. Plant Hormones. Organic Chemistry (Paper 2) Carbon Compounds as Fuels and Feedstock, Reactions of Alkenes and Alcohols, Synthetic and Naturally Occuring Polymers Forces & Motion (Paper 2) Forces and their Interactions, Work Done and Energy Transfers, Moments and Levers, Pressure in Fluids, Forces and Motion, Momentum.	Genetics (Paper 2) Reproduction, Variation & Evolution, Development of Understanding of Genetics & Evolution, Classification of Living Organisms. Earth's Resources & The Atmosphere (Paper 2) Purity, Formulations and Chromatography, Identification of Common Gases, Identification of Ions, The Composition and Evolution of the Earth's Atmosphere, Carbon Dioxide and Methane as a Greenhouse Gases, Common Atmospheric Pollutants, Using the Earth's Resources and Obtaining Potable Water, Life Cycle Assessment and Recycling, Using Materials, The Haber Process and the Use of Fertilisers. Waves & Space (Paper 2) Waves in Air, Fluids and Solids, Electromagnetic Waves, Black Body Radiation, Solar System, Orbital Motions and Satellites, Red-Shift.	Ecology (Paper 2) Adaptations, Interdependence & Competition, Organisation of an Ecosystem, Biodiversity and the Effect of Human Interactions on Ecosystems, Trophic Levels in an Ecosystem, Food Production Electromagnets (Paper 2) Permanent and Induced Magnetism, Magnetic Forces and Fields, The Motor Effect, Induced Potential and the National Grid,	Revision of AQA Paper 1 GCSE content Revision of AQA Paper 2 GCSE content Trust-wide Science Mock Examinations Pupils to sit 6 papers: AQA Paper 1 & 2 Biology AQA Paper 1 & 2 Chemistry AQA Paper 1 & 2 Physics or AQA Combined Science - Biology Paper 1 & 2 AQA Combined Science - Chemistry Paper 1 & 2 AQA Combined Science - Physics Paper 1 & 2	GCSE Examinations AQA Biology Paper 1 AQA Chemistry Paper 1 AQA Physics Paper 1 or AQA Combined Science - Biology Paper 1 AQA Combined Science - Chemistry Paper 1 AQA Combined Science - Physics Paper 1	GCSE Examinations AQA Biology Paper 2 AQA Chemistry Paper 2 AQA Physics Paper 2 or AQA Combined Science - Biology Paper 2 AQA Combined Science - Chemistry Paper 2 AQA Combined Science - Physics Paper 2



Co-op Academy Florence MacWilliams

At Co-op Academy Florence MacWilliams, colleagues and pupils work at 'PACE' ensuring pride, ambition, care, and excellence for self, school and city