

Biology Curriculum journey



- Prepared for the future
- Life long learners
- Responsible citizens
- Working Scientifically
- Required practical
- Required Practical- DEMO
- Triple Science only
- Key Building Block (Schema)

KS1: Working scientifically, simple classification of organisms, labelling the organs responsible for senses, compare substances based on physical properties, seasons, day & night.
KS2: Habitats, life processes, classification food chains, photosynthesis, plant growth, importance of exercise & a balanced diet, solubility, states of matter.

Yr7

KS1 and KS2

Hazards in the laboratory: Lab rules, Bunsen burner, hazard symbols and safety.
Cells: Animal & plant cells, Specialised cells, microscopes and magnification.
Organisation: Organs and organ systems
Skeleton: Skeletal system, joints, ligaments & tendons.

Autumn

Food chains & Food webs: Food chains/webs, interdependence, pyramids of number & biomass.
Competition: Predator prey relationships, Population graphs, bioaccumulation, habitats & ecosystems.
Variation: Genetic & environmental variation, continuous & discontinuous data.

Spring

Plant fertilisation: Flowers & pollination, germination & seed dispersal.
Human reproduction: Reproductive system, Fertilisation, development of a foetus, menstrual cycle, adolescence.

Summer

Knowledge transfer
 Practical Scientific skills, Scientific terms and keywords, Cells (Yr9), Food chains & interdependence (Yr11), Variation & human reproduction (Yr10).

Knowledge transfer
 Practical Scientific skills, Scientific terms and keywords, Breathing & respiration (Yr9), Digestive system (Yr9), Evolution (Yr10), Photosynthesis (Yr9), DNA (Yr10)

Yr9

Respiration: Aerobic & anaerobic respiration, effects of exercise, biotechnology.
Photosynthesis: Process of photosynthesis, why photosynthesis is important for the environment, structure of a leaf, limiting factors of photosynthesis, plant minerals and growth.

Summer

Evolution: Charles Darwin, natural selection, extinction, biodiversity, human impact on biodiversity.
DNA: Genetic & environmental variation, genetic cross diagrams, genetic modification.
Human reproduction: Reproductive system, Fertilisation, menstrual cycle, adolescence. – (moved from yr 7 for current yr 8 temporarily due to COVID)

Spring

Breathing: The respiratory system, Composition of air, adaptation of the alveoli, the effects of smoking on the lungs.
Drugs: Recreational & medical drugs, drug addition.
Nutrients: Balanced diet, obesity, food tests.
Digestive system: Role of the organs and enzymes involved in digestion and how they're adapted to perform their functions.

Autumn

Knowledge transfer
 Practical Scientific skills, Scientific terms and keywords, Cells (unit 6), Bioenergetics (unit 7), Organisation (unit 5).

Knowledge transfer
 Practical Scientific skills, Scientific terms and keywords, Ecology (unit 7).

Yr11

Unit 1: Cells: Eukaryote & prokaryote cells, plant & animal cells, specialised cells, Microscopy, cell division, stem cells, osmosis, diffusion & active transport, Binary fission & culturing microorganisms.
Unit 2: Organisation Organ systems, The heart & blood vessels, plant tissue & organs, food tests, enzymes.

Autumn

Unit 3: Infection Communicable & non-communicable diseases, vaccinations, antibiotics, developing drugs, monoclonal antibodies & plant diseases & defences.
 Microscopy, magnification – (moved from Unit 1 to allow pupils to cement standard form in maths)

Spring

Unit 4: Bioenergetics: Process of photosynthesis, why photosynthesis is important for the environment, structure of a leaf, limiting factors of photosynthesis, plant minerals and growth.

Summer

Unit 7: Ecology Competition between species, adaptations, food chains, interdependence, using quadrats & transects, abiotic & biotic factors.

Summer

Unit 6: Inheritance DNA, reproduction, meiosis, X & Y chromosomes, genetic cross diagrams, inherited disorders, variation, evolution, selective breeding, genetic engineering, fossils, antibiotic resistant bacteria, the work of Mendel & cloning.

Spring

Unit 4: Bioenergetics: Respiration & metabolism, anaerobic & aerobic respiration & exercise.
Unit 5: Homeostasis & response: Homeostasis, Nervous system, the endocrine system, controlling blood glucose levels (diabetes), puberty & the menstrual cycle, controlling fertility, adrenaline & thyroxine, the eye, brain, kidney, kidney failure, plant hormones & commercial uses of plant hormones.

Autumn

Unit 7: Ecology The water cycle, the nitrogen cycle, the carbon cycle, biodiversity & waste management, global warming, deforestation, maintaining ecosystems & diversity, decay & investigating decay, Trophic levels, biomass transfer, food security, farming & biotechnology.

Autumn

Exam preparation & walking talking mocks on key biological concepts and core practicals:
Unit 1: Cell biology: Cells, microscopy, diffusion, osmosis, active transport, exchange surfaces & substances.
Unit 2: Organisation: Enzymes, investigating enzymes, food tests, the heart, health & disease, transpiration & translocation.
Unit 3: Infection & response: Communicable & non-communicable diseases,

Spring

Exam preparation & walking talking mocks on key biological concepts and core practicals:
Unit 4: Bioenergetics: Process of photosynthesis, structure of a leaf, limiting factors of photosynthesis.
Unit 5: Homeostasis: Homeostasis, controlling blood glucose levels (diabetes), menstrual cycle, controlling fertility, adrenaline & thyroxine.
Unit 6: Inheritance: Genetic cross diagrams, evolution * selective breeding.

Summer

All the content taught across our 5 year curriculum can be applied to further education and or employment.

Saint John Rigby
 A level biology
 BTEC Level 3 Subsidiary Diploma in Applied Biology
 BTEC Level 3 National Extended Diploma in Biomedical Science
 BTEC First Award in Principles of Applied Science

Winstanley College
 A level biology
Apprenticeships
 Allergan, Liverpool
 AstraZeneca, Liverpool
 Jaguar Land rover, Liverpool



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Chemistry Curriculum journey

KS1: Working scientifically, distinguishing between an object and the material from which it is made, identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock, describe the simple physical properties of materials,
 KS2: Working scientifically, group solids, liquids and gases, understand evaporation and condensation, demonstrate that dissolving is reversible, explain that some changes result in the formation of new materials

KS1 and KS2

Yr7

Hazards in laboratory – lab rules, Bunsen burner, hazard symbols, safety
Particle model – particles, diffusion, states of matter, properties of solids liquids and gases
Solubility– pure substances, mixtures, solutions, dissolving

Autumn

Separating techniques – filtration, distillation and evaporation, chromatography
Acids and alkalis – pH, litmus paper and universal indicator, neutralisation, household solutions, naming salts

Spring

Metals – properties of metals, periodic table
Chemical Reactions – metal and oxygen reactions, metal and acid reactions, testing for gases, displacement reactions

Summer

Knowledge transfer
 Practical Scientific skills, Scientific terms and keywords, Particle model (Yr9), Acids & alkalis (Yr10), Chemical reactions (Yr10) Chromatography (Yr11).

Knowledge transfer
 Practical Scientific skills, Scientific terms and keywords, Periodic Table (Yr9), Atomic structure (Yr 9) Combustion, Exo/endothemic reaction (Yr 10)

Yr9

Global Warming – combustion and effect on environment, carbon cycle, climate change
Recycling – extracting metals, reduce reuse recycle, recycle debate

Summer

Combustion – atoms in chemical reactions, naming products, thermal decomposition, conservation of mass
Endo/exothermic reactions – examples of reactions, reaction profiles/energy level diagrams, bond energies

Spring

Periodic Table – groups of periodic table, transition metals, history and development, trends and reactivity
Atomic structure – atoms, elements, mixtures, compounds, particle diagrams, chemical formulae

Autumn

Yr8

Knowledge transfer
 Practical Scientific skills, Scientific terms and keywords, Chemical change (Unit 9)

Yr11

Unit 1: Atomic Structure and Periodic Table – atoms, elements, compounds, development of atom, atomic structure, development of periodic table, groups of periodic table, nanoparticles

Autumn

Unit 2: Bonding – ionic and covalent bonding, metallic bonding, states of matter, properties of compounds, polymers, diamond graphite and silica,

Spring

Unit 3: Quantitative Chemistry – conservation of mass, Ar and Mr, moles, amount of substance, limiting reagents, concentration of solutions, percentage yield, atom economy, using concentration calculations

Summer

Knowledge transfer
 Practical Scientific skills, Scientific terms and keywords, Quantitative Chemistry (Unit 4), Bonding (Unit 5 + 6) Quantitative Chemistry (Unit 6)

Unit 7: Organic Chemistry – crude oil and hydrocarbons, fractional distillation, properties of hydrocarbons, combustion and burning fossil fuels, cracking and alkenes, alkenes and alcohols, carboxylic acids, polymers

Summer

Unit 5: Energy – exo/endothemic reactions, reaction profiles, bond energy calculations, investigating energy changes, fuel cells
Unit 6: Rates of Reaction – calculating rate, factors affecting rate, concentration and its effect on rate, catalysts, reversible reactions, equilibrium

Spring

Unit 4: Chemical Change – Reactivity of metals, reactions of acids, pH and neutralisation, making soluble salts, electrolysis, electrolysis of aqueous solutions, titrations, determining unknown concentrations

Autumn

Yr10

Unit 8: Analysis – purity, formulations and chromatography, testing for gases, ion tests
Unit 9: Atmosphere – gases, development of atmosphere, climate change, carbon footprint, atmospheric pollutants

Autumn

Unit 10: Using Resources – potable water, purification of water, waste water treatment, extracting copper, life cycle assessments, reducing resources, using materials, haber process
Exam preparation
 Exam preparation & walking talking mocks on key chemistry concepts

Spring

Exam preparation & walking talking mocks on key Chemistry concepts and core practicals:

Summer

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- Saint John Rigby**
 A level Chemistry
 BTEC Level 3 Subsidiary Diploma in Applied Science
 BTEC First Award in Principles of Applied Science
- Winstanley College**
 A level Chemistry
- Apprenticeships**

Physics Curriculum journey



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- Required practical
- Required practical- DEMO
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- Key Building Block (Schema)

KS1: Working scientifically, four seasons, day & night., find out how materials can be changed by squashing, bending, twisting and stretching.

KS2: Working scientifically Light & shadows, Forces, magnetism, Sound

KS1 and KS2

Yr7

Autumn

Hazards in laboratory – lab rules, Bunsen burner, hazard symbols, safety
Energy – energy stores and dissipation, energy in foods, efficiency and power, non-renewable energy
Forces – Newton’s 3rd law, mass and weight, calculating speed, distance

Spring

Circuits – drawing circuit symbols/diagrams, series and parallel, potential difference
Electricity – $V=IR$ equation, resistance, current, static electricity, power in the home

Summer

The solar system – planets, seasons, orbits and satellite debate, gravity, lifecycle of a star
Sound waves – Types of waves, speed of sound, hearing sound, echoes & echolocation

Knowledge transfer
 Practical Scientific skills, Scientific terms and keywords, Energy (Yr9), Electricity & Circuits (Yr10), Forces & motion (Yr10), Sound Waves (Yr11), Star life cycle (Yr11 Separates)

Knowledge transfer

Practical Scientific skills, Scientific terms and keywords, Waves & Light (Yr11), Forces & magnetism (Yr10), Conduction and insulation (Y9)

Summer

Waves-Types of waves recap, EM waves, uses of EM waves, Doppler effect
Light – reflection and refraction, seeing colour, filters

Spring

Forces – friction and drag, squashing and stretching, Hooke’s law, turning forces, resultant forces
Magnetism – magnets and magnetic fields, electromagnetism, uses of electromagnets

Autumn

Work done – calculating work equation, work, energy and machines, Pulley systems
Energy – particles recap, conduction, convection and radiation, Insulation & payback

Yr8

Yr9

Autumn

AQA Trilogy/Separates
Unit 1: Energy – energy stores and systems, energy changes, power, conservation of energy, national and global resources
 Required practical: S.H.C & thermal conductivity

Spring

AQA Trilogy/Separates
Unit 4: Atomic Structure – mass number, atomic number and isotopes, development of atom, radioactive decay, nuclear equations, half life, radioactive contamination

Summer

AQA Trilogy/Separates
Unit 3: Particle model – density of materials, internal energy, change of state and latent heat, particle motion in gases
 Required practical: Density

Knowledge transfer
 Practical Scientific skills, Scientific terms and keywords, Energy stores Elastic(Yr10) nations & global resources (Yr10), Particle theory (Yr10) Fusion/Fission (Yr11-SEP’s)

Knowledge transfer

Practical Scientific skills, Scientific terms and keywords,

Yr11

Autumn

AQA Trilogy/Separates
Unit 6: Waves – transverse and longitudinal, properties, electromagnetic spectrum, properties and uses of electromagnetic waves,
 Sep’s Only – Light topic
 Required practical: Standing waves, water waves. Sep’s only- reflection & refraction &

Spring

AQA Trilogy/Separates
Unit 8: Space (Separates only) – Solar system, life cycle of a star, orbital motion, redshift
Exam Preparation

Summer

AQA Trilogy/Separates
Exam preparation – revision of key physics topics with a focus on required practical skills and exam technique using practise exam questions

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 Diploma in Biomedical Science
 BTEC First Award in Principles of Applied Science

Winstanley College
 A level physics

Apprenticeships
 Jaguar land rover, Liverpool