ROAD MAP TO

SEPARATE SCIENCE CURRICULUM

Future careers in NHS

Future careers with AWE

Careers in Chemistry including Chemical engineer, Forensic scientist, Food scientist

Careers in Biology including Marine engineer, Climate scientist, Botanist

Careers in Physics including Laser physicist, Astronaut, Acoustic engineer

YEAR 11

BIOLOGY
Responsive revision of the Biology curriculum

CHEMISTRY
Responsive revision of the Chemistry curriculum

PHYSICS
Responsive revision of the Physics curriculum

BIOLOGY
Key ideas in Biology
Life processes
Ecosystems
Photosynthesis and respiration
Evolution

CHEMISTRY
Key Ideas in Chemistry
Atoms and elements
Periodic table
Bonding and Chemical Reactions
Conservation of energy in reactions

PHYSICS
Solar system
Satellites and the stability of orbital motions

BIOLOGY
Key ideas in Biology
Life processes
Ecosystems
Photosynthesis and respiration
Evolution

CHEMISTRY
Key Ideas in Chemistry
Atoms and elements
Periodic table
Bonding and Chemical Reactions
Conservation of energy in reactions

PHYSICS
Magnets and Electromagnets
Permanent and Induced magnets
The Motor Effect
Electric Motors

INHERITANCE & EVOLUTION
DNA
Classification of living organisms
Evolution and variation
Genetic engineering

CHEMISTRY OF THE ATMOSPHERE
Evolution of the Earth's atmosphere
Carbon cycle
Greenhouse gases and climate change

USING RESOURCES
Finite and Renewable resources
Obtaining potable water
Waste water treatment
Life cycle assessment and recycling

WAVES
Waves in air, fluids and solids
The Electromagnetic spectrum
Reflection and refraction of waves

ECOLOGY
Biodiversity
The impact of environmental change
The effect of human interaction on ecosystems

ORGANIC CHEMISTRY
Hydrocarbons
Fractional Distillation
Uses and Cracking of Crude Oil

CHEMICAL ANALYSIS
Purity of substances and chromatography
Tests for gases, cations and anions

FORCES
Contact and non contact forces
Resultant forces
Newtons Laws
Speed and velocity equations
Reaction time required practical
Momentum

Zone 11 starts

INHERITANCE, VARIATION & EVOLUTION
Evolution and variation

ORGANIC CHEMISTRY
Polymers and carbon compounds as fuels and feedstock

FORCES
Pressure and pressure differences in fluids
Conservation of momentum

Zone 10 starts

YEAR 10

CELL ORGANISATION
Plant tissues
Organs and systems

BONDING, STRUCTURE AND THE PROPERTIES OF MATTER
States of matter
Polymers
Allotropes of Carbon
Nanoparticles

ELECTRICITY
Energy transfers in everyday appliances
The National Grid

STEM PROJECT

INFECTION & RESPONSE
Communicable diseases
The Immune system
Plant diseases
Plant Defences

QUANTITATIVE CHEMISTRY
Chemical measurements
Conservation of mass
The quantitative interpretation of chemical equations
Use of amount of substances
Yield and atom economy of chemical reactions
Using concentrations of solutions
Amounts of gases

PARTICLE MODEL OF MATTER
Internal energy
Density
Pressure

BIOENERGETICS
Photosynthesis
Respiration
Metabolism

CHEMICAL CHANGES
Reactivity of metals
Reactions of acids
Electrolysis

ATOMIC STRUCTURE
Types of radiation
Radiation hazards
Uses of radioactive emissions
Half Life

HOMEOSTASIS
The human nervous system
The brain
Controlling blood sugar level
The menstrual cycle
Controlling fertility
Kidneys

ENERGY CHANGES
Exothermic and endothermic reactions
Chemical cells and fuel cells

FORCES
Interactions
Free body force diagrams
Parallelogram of forces

HOMEOSTASIS
The human nervous system, the brain, controlling blood sugar level , the menstrual cycle and controlling fertility

ENERGY CHANGES
Exothermic and endothermic reactions
Chemical cells
Fuel cells

FORCES
Interactions
Newton's Laws

INHERITANCE & VARIATION
Classification of living organisms
Genetic engineering
Selective breeding

RATE & EXTENT OF CHEMICAL CHANGE
Rates of reactions
Reversible reactions
Dynamic equilibrium

FORCES
Moments
Levers and Gears

CELL ORGANISATION
Plant tissues
Organs
Systems

BONDING, STRUCTURE AND THE PROPERTIES OF MATTER
States of matter
Polymers
Allotropes of Carbon
Nanoparticles

ELECTRICITY
Domestic uses and safety
Alternating current

STEM PROJECT

CELL ORGANISATION
The heart and heart disease
Cancer

BONDING, STRUCTURE AND THE PROPERTIES OF MATTER
Ionic bonding
Covalent bonding
Metallic bonding

ELECTRICITY
Electrical current
Potential difference
Resistance

STEM PROJECT

ATOMIC STRUCTURE
Groups 1, 7, 0 and transition metals
Development of the periodic table,

ENERGY
Kinetic energy
Gravitational potential energy
Elastic potential energy
National and global energy resources
Advantages and disadvantages

CELL BIOLOGY
Cell division
Stem cells
Transport in cells

ATOMIC STRUCTURE
Groups 1, 7, 0 and transition metals
Development of the periodic table

ENERGY
Kinetic energy
Gravitational potential energy
Elastic potential energy
National and global energy resources
Advantages and disadvantages

STEM PROJECT

CELL BIOLOGY
Cell structure
Specialisation
Required Practical microscopy

ATOMIC STRUCTURE
Elements and compounds
Separating mixtures
The development of the model of the atom
Size and mass of atoms

ENERGY
Energy stores and changes conservation of energy

YEAR 9

ADAPTION & INHERITANCE
Competition and adaption
Adapting to change
Variation
Continuous and discontinuous variation
Inheritance
Natural selection
Extinction

Guided Choices

YEAR 8

REACTIONS
Chemical reactions
Word equations
Burning fuels
Thermal decomposition
Conservation of mass
Exothermic and Endothermic

HEALTHY LIFESTYLE
Nutrients
Food tests
Unhealthy diet
Digestive system
Bacteria and enzymes in digestion
Drugs
Alcohol
Smoking

PERIODIC TABLE
Metals and non metals
Groups and periods
Group 1 elements
Group 7 elements
Group 0 elements

ENERGY
Food and fuels
Energy adds up
Energy and temperature
Energy transfer - particles
Energy transfer - radiation
Energy resources
Energy and power
Work, energy and machines

Futures

MOTION & PRESSURE
Speed
Motion graphs
Pressure in gases
Pressure in liquids
Pressure on solids
Turning forces

ACIDS
Acids and alkalis
Indicators and pH
Neutralisation
Making salts

Medical Mavericks

METALS & ACIDS
Acids and metals
Metals and oxygen
Metals and water
Metal displacement reactions
Extracting metals
Ceramics
Polymers
Composites

BODY SYSTEMS
Breathing
Gas exchange

ECOSYSTEMS
Photosynthesis
Leaves
Plants minerals
Chemosynthesis
Aerobic respiration
Anaerobic respiration
Food chains and webs
Disruption to food chains and webs
Ecosystems

THE EARTH
The Earth and its atmosphere
Sedimentary rocks
Igneous and metamorphic rocks
The rock cycle
The carbon cycle
Climate change
Recycling

YEAR 7

VARIATION
Variation
Continuous and discontinuous variation
Adapting to change

HUMAN REPRODUCTION
Adolescence
Reproductive systems
Fertilisation and implantation
Development of a fetus
The menstrual cycle

ELEMENTS
Elements
Atoms
Compounds
Chemical formulae
Polymers

PLANT REPRODUCTION
Flowers and pollination
Fertilisation and Germination
Seed dispersal

ELECTRICITY
Potential difference resistance
Series and parallel circuits
Current
Charging up

SOUND
Sound waves and speed
Loudness and amplitude
Frequency and pitch
The ear and hearing

LIGHT
Light
Reflection
Refraction
The eye and vision
Colour

PARTICLE MODEL
The particle model
States of matter
Melting and freezing
Boiling
More changes of state
Diffusion
Gas pressure
Inside particles

ENERGY
Food and fuels
Energy resources
Energy and power
Energy adds up
Energy dissipation

CELLS
Observing cells
Plants and animal cells
Specialised cells
Movement of substances
Uni-cellular organisms

Futures

MOVEMENT
Levels of organisation
The skeleton
Joints
Muscles

INTERDEPENDENCE
Food chains and webs
Disruption to food chains and webs
Ecosystems
Competition

EARTH STRUCTURE
The structure of the Earth
Sedimentary rocks
Igneous and metamorphic rocks
The rock cycle
Ceramics

SPACE
The night Sky
The Solar System
The Earth
The Moon and changing ideas

SEPARATING MIXTURES
Pure substances and mixtures
Solutions
Solubility
Filtration
Evaporation and distillation
Chromatography

FORCES
Introduction to forces
Balanced and unbalanced forces
Speed
Distance-time graphs
Gravity