Year 7 Learning Journey

1. Observing cells
2. Plant and animal cells
3. Specialised cells
4. Movement of substances
5. Uni-cellular organisms
6. Levels of organisation
7. The skeleton
8. Movement: joints
9. Movement: muscles

1. Introduction to forces
2. Balanced and unbalanced forces
3. Speed
4. Distance – time graphs
5. Gravity

Organisms 8.2, 8.1

Forces 1.1, 1.2

YEAR 8

YEAR 7

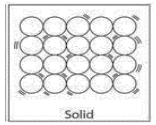
Matter 5.1, 5.2

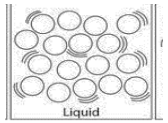
Ecosystems 9.1, 9.2

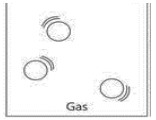
Energy 3.1, 3.2

Working scientifically

1. The particle model
2. States of matter
3. Melting and freezing
4. Boiling
5. More changes of state
6. Diffusion
7. Gas pressure
8. Pure substances and mixtures
9. Solutions
10. Solubility
11. Filtration
12. Evaporation and distillation
13. Chromatography







1. Food chains and food webs
2. Distribution to food chains and webs
3. Ecosystems Competition
4. Flowers and pollination
5. Fertilisation and germination
6. Seed dispersal

1. Energy and fuels
2. Energy resources
3. Energy and power
4. Energy adds up
5. Energy dissipation

1. Safety in science
2. Laboratory Equipment
3. Designing Investigations
4. Asking scientific questions
5. Planning investigations
6. Collecting, recording and presenting data
7. Analysing patterns in data
8. Evaluating data and methods

Year 8 Learning Journey

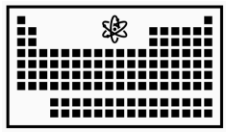
YEAR 9

Organisms 8.3, 8.4

1. Gas exchange
2. Breathing
3. Drugs
4. Alcohol
5. Smoking
6. Nutrients
7. Food tests
8. Unhealthy diet
9. Digestive system
10. Bacteria and enzymes in digestion

Matter 5.4.1, 5.3

1. The Periodic Table
2. Elements
3. Atoms
4. Compounds
5. Chemical formulae
6. Polymers

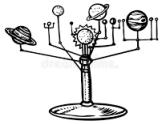


Waves 4.1, 4.2

1. Sound waves and speed
2. Loudness and amplitude
3. Frequency and pitch
4. The ear and hearing
5. Light
6. Reflection
7. Refraction
8. The eye and vision
9. Colour

Earth 7.1, 7.2

1. The structure of the Earth
2. Sedimentary rocks
3. Igneous and metamorphic rocks
4. The rock cycle
5. Ceramics
6. The night sky
7. The solar system
8. The Earth
9. The Moon and changing ideas



Genes 10.1, 10.2

1. Variation
2. Continuous and discontinuous variation
3. Adapting to change
4. Adolescence
5. Reproductive systems
6. Fertilisation and implantation
7. Development of a foetus
8. The menstrual cycle

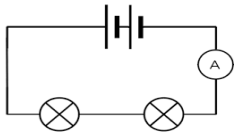
YEAR 8

Energy 3.3, 3.4

1. Work, energy and machines
2. Energy and temperature
3. Energy transfer: particles
4. Energy transfer: radiation and insulation

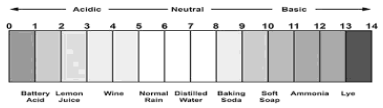
Electromagnets 2.1, 2.2

1. Charge
2. Building circuits
3. Series and parallel circuits general overview
4. Current in series and parallel
5. Voltage in series and parallel
6. Resistance and calculating resistance



Reactions 6.1, 6.2

1. Chemical reactions
2. Acids and alkalis
3. Indicators and pH
4. Acid strength
5. Neutralisation
6. Making salts
7. More about elements
8. Chemical reactions of metals and non-metals
9. Metals and acids
10. Metals and oxygen
11. Metals and water
12. Metal displacement reactions



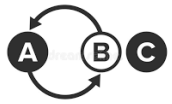
Year 9 Learning Journey

YEAR 10

Introduction to GCSE Biology, Chemistry and Physics

You will learn about the structure of cells, how substances are transported in/out of cells, what is inside atoms, the patterns of elements on the periodic table, energy stores, how to calculate different types of energy.

1. Atoms in chemical reactions
2. Combustion
3. Thermal decomposition
4. Conservation of mass
5. Exothermic and endothermic reactions
6. Energy level diagrams
7. Bond energies



Reactions 6.3, 6.4

1. Aerobic respiration
2. Anaerobic respiration
3. Biotechnology
4. Photosynthesis
5. Leaves
6. Investigating photosynthesis
7. Plant minerals

Ecosystems 9.3, 9.4

1. Global warming
2. The carbon cycle
3. Climate change
4. Extracting metals
5. Recycling

Earth 7.3, 7.4

Electromagnets 2.3 2.4

Genes 10.3, 10.4

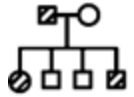
Forces 1.3, 1.4

1. Friction and drag
2. Squashing and stretching
3. Turning forces
4. Pressure in gases
5. Pressure in liquids
6. Stress on solids

YEAR 9

1. Magnets and magnetic fields
2. Electromagnets
3. Using electromagnets

1. Natural selection
2. Charles Darwin
3. Extinction
4. Preserving biodiversity
5. Inheritance
6. DNA
7. Genetics
8. Genetic modification



Year 10 Learning Journey Biology

B4 Bioenergetics

1. Photosynthetic reaction
2. Rate of photosynthesis
3. Limiting factors (HT only)
4. Use of glucose
5. Aerobic respiration
6. Anaerobic respiration
7. Response to exercise
8. Metabolism

YEAR 11

YEAR 10

B3 Infection &response

1. Communicable diseases
2. Viral, bacterial, fungal diseases
3. Protist diseases
4. Human defence systems
5. Vaccination
6. Antibiotics and painkillers
7. Discovery and development of drugs
8. ***Monoclonal Antibodies (B)***
9. ***Detection and identification of plant diseases (B)***
10. ***Plant defence responses (B)***

B2 Organisation

1. Animal tissues, organs and organ systems and hierarchy
2. The human digestive system
3. Biological molecules
4. Enzymes and human digestive enzymes
5. Lungs and gas exchange
6. Blood
7. Structure and function of blood vessels
8. The heart
9. Non-communicable diseases / Coronary heart disease / health issues
10. Cancer
11. Plant tissues and organs
12. Plant transport

B1 Cell Biology

1. Cell structure: animal and plant cells
2. Microscopy
3. Eukaryotes and Prokaryotes
4. Cell specialisms and cell differentiation
5. Cell division: chromosomes
6. Mitosis and the cell cycle
7. Stem cells
8. Transport in cells: Diffusion
9. Transport in cells: Osmosis
10. Transport in cells: Active transport

Year 10 Learning Journey Chemistry

C4 Chemical changes

1. Reactions of acids with metals
2. Neutralisation of acids and salt production
3. Soluble salts
4. The pH scale and neutralisation
5. Strong and weak acids (HT only)
6. Metal oxides
7. Genetics
8. Genetic modification

C5 Energy changes

8. The reactivity series
9. Extraction of metals and reduction
10. Oxidation and reduction in terms on electrons (HT only)
11. Electrolysis of molten ionic compounds
12. Using electrolysis to extract metals
13. Electrolysis of aqueous solutions
14. Representation of reactions at electrodes as half equations (HT only)

YEAR 11

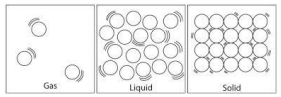
1. Energy transfer during exothermic and endothermic reactions
2. Reaction profiles
3. The energy change of reactions (HT only)
4. ***Cells and batteries (C)***
5. ***Fuel cells (C)***

C3 Quantitative chemistry

1. Conservation of mass and balanced chemical equations
2. Mass changes when a reactant or product is a gas
3. Relative formula mass
4. Moles (HT only)
5. Amounts of substances in equations (HT only)
6. Using moles to balance equations (HT only)
7. Limited reactants (HT only)
8. Concentration of solutions
9. ***Using concentrations of solutions in mol/dm^{-3} (C)***
10. ***Use of amount of substance in relation to volumes of gases (C)***
11. ***Percentage yield (C)***
12. ***Atom economy (C)***

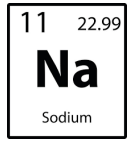
C2 Bonding structure and properties

1. The states of matter
2. State symbols
3. Chemical bonds
4. Ionic bonding
5. Ionic compounds
6. Properties of ionic compounds
7. Covalent bonding
8. Properties of small molecules
9. Giant covalent structures
10. Diamond
11. Graphite
12. Graphene and fullerenes
13. Metallic bonding
14. Properties of metals and alloys / Metals as conductors
15. ***Sizes of particles and their properties (C)***
16. ***Uses of nanoparticles (C)***

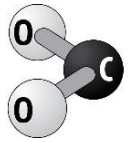


C1 Atomic structure and the periodic table

YEAR 10

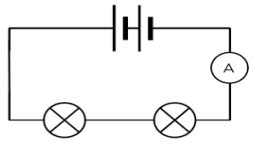


1. Overview of the Periodic Table
2. Atoms, elements and compounds
3. Mixtures: separation techniques
4. The development of the model of the atom
5. Relative electrical charges of subatomic particles
6. Size and mass of atoms
7. Relative atomic mass (revisit in C3) / isotopes
8. Electronic structure
9. The Periodic Table / Development of the periodic table
10. Metals and non-metals
11. Group 0
12. Group 1
13. Group 7
14. ***Transition metals (C)***



Year 10 Learning Journey Physics

1. Standard circuit diagram symbols
2. Current, resistance and potential difference incl. RP to investigate factors affecting resistance and RP to investigate I-V characteristics and RP resistors
3. Series and parallel circuits
4. Domestic uses and safety incl. AC and DC, mains electricity
5. Power
6. Energy transfers in everyday appliances
7. The National Grid



P2 Electricity

YEAR 11

P4 Atomic structure

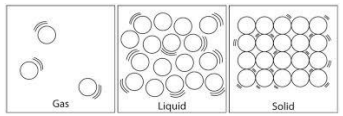
P3 Particle model of matter

P1 Energy

YEAR 10

1. The structure of the atom incl. Mass number, atomic number and isotopes
2. Development of the model of the atom (common with chemistry)
3. Radioactive decay and nuclear radiation
4. Nuclear equations
5. Half-lives and the random nature of radioactive decay
6. Radioactive contamination
7. ***Hazards and uses of radioactive emissions and of background radiation (P)***
8. ***Nuclear fission and fusion (P)***

1. Changes of state and the particle model
2. RP. Density
3. Internal energy and energy transfers
4. Particle model and pressure
5. ***Pressure in gases (P)***



1. Energy stores and systems
2. Changes in energy
3. Energy changes in systems
4. RP: Investigation to determine the specific heat capacity of materials
5. Power
6. Energy transfers in a system
7. Efficiency
8. National and global energy resources

Year 11 Learning Journey Biology

Final Exam Preparation

YEAR 11

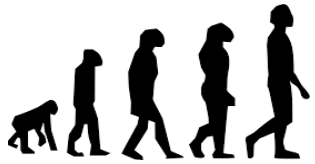
B7 Ecology

1. Adaptation, competition, biotic and abiotic factors
2. Levels of organisation, trophic levels, ***pyramids of biomass and transfer of energy (B)***
3. Decomposition, material recycling
4. Biodiversity, waste management, deforestation, global warming
5. ***Food production and sustainability, farming techniques, sustainable fishing, biotechnology (B)***

B5 Homeostasis and response

1. Homeostasis and negative feedback
2. Human nervous system: structure and function
3. RP 7 (Biology): Plan and carry out an investigation into the effect of a factor on human reaction time
4. ***Brain and eye (B)***
5. Hormonal control in humans: Human endocrine system
6. Control of blood glucose concentration
7. Hormones in human reproduction
8. Contraception and fertility treatment
9. ***Maintaining water balance and the kidney, ADH and kidney failure (B)***
10. ***Plant hormones and uses of plant hormones (B)***
11. ***RP 8 (Biology): investigate the effect of light or gravity on the growth of newly germinated seedlings (B)***

B6 Inheritance, variation and evolution



1. Sexual and asexual reproduction
2. Meiosis
3. DNA structure and the genome
4. Genetic inheritance, inherited disorders / sex determination / understanding of genetics
5. Classification
6. Variation
7. Theory of evolution
8. ***Speciation (B)***
9. ***Evidence for evolution (B)***
10. Fossils, extinction
11. Resistant bacteria
12. Selective breeding
13. Genetic engineering, ***cloning (B)***

Year 11 Learning Journey Chemistry

Final Exam Preparation

YEAR 11

C10 Using resources

1. Using the Earth's resources and sustainable development
2. Potable water
3. Waste water management
4. Alternative methods of extracting metals (HT only)
5. Life cycle assessment
6. Ways of reducing the use of resources
7. ***Corrosion and its prevention (C)***
8. ***Alloys as useful materials (C)***
9. ***Ceramics, polymers and composites (C)***
10. ***The Haber process (C)***
11. ***Production and uses of NPK fertilisers (C)***

C9 The Atmosphere

1. The proportions of different gases in the atmosphere
2. The Earth's early atmosphere
3. Greenhouse gases
4. Human activities which contribute to an increase in greenhouse gases in the atmosphere
5. Global climate change
6. The carbon footprint and its reduction
7. Atmospheric pollutants from fuels
8. Properties and effects of atmospheric pollutants

C8 Chemical analysis

1. Pure substances
2. Formulations
3. Test for hydrogen, oxygen, carbon dioxide and chlorine
4. Chromatography
5. ***Flame tests (C)***
6. ***Metal hydroxides (C)***
7. ***Carbonates, Halides and Sulfates (C)***
8. ***Instrumental methods (C)***
9. ***Flame emission spectroscopy (C)***

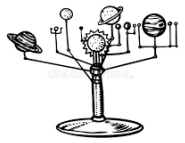
C7 Organic chemistry

1. Crude oil, hydrocarbons and alkanes
2. Fractional distillation and petrochemicals
3. Properties of hydrocarbons
4. Cracking and alkenes
5. Polymers
6. ***Structure and formulae of alkenes (C)***
7. ***Reactions of alkenes (C)***
8. ***Alcohols (C)***
9. ***Carboxylic acids / esters (C)***
10. ***Polymers (C)***
11. ***Addition polymerisation (C)***
12. ***Condensation and polymerisation (HT only)***
13. ***Naturally occurring polymers (C)***

C6 The rate and extent of chemical change

1. Calculating rates of reactions
2. Factors which affect the rates of chemical reactions
3. Collision theory and activation energy
4. Catalysts
5. Reversible reactions
6. The effect of changing conditions on equilibrium (HT only)
7. The effect of changing concentration (HT only)
8. The effect of temperature changes on equilibrium (HT only)
9. The effect of pressure changes on equilibrium (HT only)

Year 11 Learning Journey Physics



1. *Our solar system (P)*
2. *The life cycle of a star (P)*
3. *Orbital motion, natural and artificial satellites (P)*
4. *Red shift (P)*

1. Permanent and induced magnetism
2. Magnetic forces and fields
3. Electromagnetism
4. *Flemings left-hand rule (H)*
5. *Electric motors (H)*
6. *Loudspeakers (P H)*
7. *Induced potential, transformers and the National Grid (P H)*

Final Exam Preparation

P8 Space physics (P only)

P7 Magnetism

YEAR 11

P5 Forces

P6 Waves

1. Forces and their interactions (contact and non-contact, scalar and vector)
2. Gravity
3. Resultant forces
4. Work done and energy transfer
5. Forces and elasticity including RP force and extension of a spring
6. *Moments, levers and gears (P)*
7. *Pressure and pressure differences in fluids (P)*
8. Forces and motion incl. distance, displacement, speed, velocity and acceleration
9. Forces, accelerations and Newton's Laws of Motion incl. RP. acceleration
10. Stopping distance, reaction time and braking distance
11. Momentum (H) and *changes in momentum (P H)*

1. Waves in air, fluids and solids (including transverse and longitudinal waves)
2. Properties of waves incl. RP of observation of water waves and waves in a solid
3. *Reflection of waves (P) incl. RP for reflection of light by different materials*
4. *Sound waves (P H)*
5. *Waves for detection and exploration (P H)*
6. Types of electromagnetic waves
7. Properties of electromagnetic waves part 1 incl. RP infrared radiation
8. Properties of electromagnetic waves part 2
9. Uses and applications of electromagnetic waves
10. *Lenses (P)*
11. *Visible light (P)*
12. *Black body radiation (P)*