

# Curriculum Map - Science

## Curriculum Intent

Through a well thought out curriculum and well executed lessons we hope to play a part in creating confident and courageous young people who are liberated through the knowledge we teach them to be critical evaluators in an ever-changing world.

We hope to inspire all students to feel passionately about the science of everyday life to see how the big ideas of science have developed throughout time and are a continuum of ideas and theories that at times involve paradigm shifts in our cultures and beliefs. We hope that in doing so we are preparing our young people to question and embrace further developments and to use scientific fact to differentiate from the fake news and scaremongering that is all around us.

Lastly, we want to instil in our students a sense of pride in their achievements and the achievements of others as we provide opportunities for all students to experience success and to provide information on the exciting career pathways that science can lead them to.

## Key Stage 3

| TERM |        | 1                                                    | 2                                                         | 3                                                      | 4                                                              | 5                                                                                     | 6                                            |
|------|--------|------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------|
| Y7   | T1 (3) | <a href="#">Matter - Solids, Liquids &amp; Gases</a> | <a href="#">Matter - Atoms, Elements &amp; Compounds</a>  | <a href="#">Waves - Sound &amp; Light</a>              |                                                                | <a href="#">Matter - Types of Reaction</a>                                            | <a href="#">Ecosystems - Interdependence</a> |
|      | T2 (3) | <a href="#">Forces - Balanced &amp; Unbalanced</a>   | <a href="#">Organisms - Cells &amp; Microscopy</a>        | <a href="#">Earth - Solar System &amp; Space</a>       | <a href="#">Organisms - Organisation</a>                       |                                                                                       |                                              |
|      | Lit    | <a href="#">Autumn Literacy &amp; Numeracy</a>       |                                                           | <a href="#">Spring Literacy &amp; Numeracy</a>         |                                                                | <a href="#">Summer Literacy &amp; Numeracy</a>                                        |                                              |
|      |        |                                                      |                                                           |                                                        |                                                                |                                                                                       |                                              |
| Y8   | T1 (3) | <a href="#">Matter - Separating Mixtures</a>         | <a href="#">Electromagnets - Electricity &amp; Static</a> | <a href="#">Genes - Human &amp; Plant Reproduction</a> | <a href="#">Genes - Variation, Evolution &amp; Inheritance</a> | <a href="#">Electromagnets - Magnets, Electromagnets &amp; Generating Electricity</a> |                                              |
|      | T2 (3) | <a href="#">Energy - Stores &amp; Transfers</a>      | <a href="#">Forces - Forces at Work</a>                   | <a href="#">Reactions - Acids &amp; Alkalis</a>        | <a href="#">Reactions - Energy in Reactions</a>                | <a href="#">Earth - Structure, Climate &amp; Resources</a>                            |                                              |
|      | Lit    | <a href="#">Autumn Literacy &amp; Numeracy</a>       |                                                           | <a href="#">Spring Literacy &amp; Numeracy</a>         |                                                                | <a href="#">Summer Literacy &amp; Numeracy</a>                                        |                                              |

### Year 9 (GCSE)

| TERM |    | Autumn                                                    | Spring                                      | Summer                                                      |
|------|----|-----------------------------------------------------------|---------------------------------------------|-------------------------------------------------------------|
| Y9   | T1 | <a href="#">4.1 Cell Biology</a>                          | <a href="#">6.1 Energy</a>                  | <a href="#">4.4 Bioenergetics (inc. Plant Organisation)</a> |
|      | T2 | <a href="#">5.1 Atomic Structure &amp; Periodic Table</a> | <a href="#">5.2 Structure &amp; Bonding</a> | <a href="#">6.3 Particle Model of Matter</a>                |

### Key Stage 4 (GCSE)

| TERM |    | Autumn                                        |                                                            | Spring                                                     |                                                 | Summer                                  |                  |
|------|----|-----------------------------------------------|------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------|-----------------------------------------|------------------|
| Y10  | Bi | <a href="#">4.2 Organisation</a>              |                                                            | <a href="#">4.3 Infection &amp; Response</a>               |                                                 | <a href="#">4.7 Ecology</a>             |                  |
|      | Ch | <a href="#">5.4 Chemical Changes</a>          |                                                            | <a href="#">5.5 Energy Changes</a>                         |                                                 | <a href="#">5.6 Rates of Reaction</a>   |                  |
|      | Ph | <a href="#">6.2 Electricity</a>               | <a href="#">6.3 Particle Model of Matter (Triple Only)</a> | <a href="#">6.4 Atomic Structure</a>                       |                                                 | <a href="#">6.5 Forces</a>              |                  |
|      |    |                                               |                                                            |                                                            |                                                 |                                         |                  |
| Y11  | Bi | <a href="#">4.5 Homeostasis</a>               |                                                            | <a href="#">4.6 Inheritance, Variation &amp; Evolution</a> |                                                 | Revision & Exams                        |                  |
|      | Ch | <a href="#">Finish 5.6 Rates (if needed)</a>  | <a href="#">5.7 Organic</a>                                | <a href="#">5.8 Chemical Analysis</a>                      | <a href="#">5.9 Chemistry of the Atmosphere</a> | <a href="#">5.10 Using Resources</a>    | Revision & Exams |
|      | Ph | <a href="#">Finish 6.5 Forces (if needed)</a> | <a href="#">6.6 Waves</a>                                  | <a href="#">6.7 Magnetism &amp; Electromagnetism</a>       |                                                 | <a href="#">6.8 Space (Triple Only)</a> | Revision & Exams |

## **GCSE Assessments**

### **AQA GCSE Combined Science: Trilogy** (1h15, 70 marks each)

- **Biology Paper 1:** Cell Biology; Organisation, Infection & Response; and Bioenergetics
- **Biology Paper 2:** Homeostasis & Response; Inheritance, Variation & Evolution; and Ecology
- **Chemistry Paper 1:** Atomic Structure & Periodic Table; Bonding, Structure and Properties of Matter; Quantitative Chemistry; Chemical Changes, and Energy in Reactions
- **Chemistry Paper 2:** The Rate and Extent of Chemical Change; Organic Chemistry; Chemical Analysis; Chemistry of the Atmosphere; and Using Resources
- **Physics Paper 1:** Energy; Electricity; Particle Model of Matter; and Atomic Structure
- **Physics Paper 2:** Forces; Waves; and Magnetism & Electromagnetism

### **AQA GCSE Biology (Triple Science)** (1h45, 100 marks each)

- **Biology Paper 1:** Cell Biology; Organisation, Infection & Response; and Bioenergetics
- **Biology Paper 2:** Homeostasis & Response; Inheritance, Variation & Evolution; and Ecology

### **AQA GCSE Chemistry (Triple Science)** (1h45, 100 marks each)

- **Chemistry Paper 1:** Atomic Structure & Periodic Table; Bonding, Structure and Properties of Matter; Quantitative Chemistry; Chemical Changes, and Energy in Reactions
- **Chemistry Paper 2:** The Rate and Extent of Chemical Change; Organic Chemistry; Chemical Analysis; Chemistry of the Atmosphere; and Using Resources

### **AQA GCSE Physics (Triple Science)** (1h45, 100 marks each)

- **Physics Paper 1:** Energy; Electricity; Particle Model of Matter; and Atomic Structure
- **Physics Paper 2:** Forces; Waves; Magnetism & Electromagnetism; and Space Physics

**Key Stage 5 (A-Level)**

| TERM |    | 1                                              | 2                                        | 3                            | 4                   | 5                                                                        | 6                                                                      |                         |                 |
|------|----|------------------------------------------------|------------------------------------------|------------------------------|---------------------|--------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------|-----------------|
| Y12  | Bi | <a href="#">3.1 Biological Molecules</a>       |                                          |                              |                     | <a href="#">3.3 Organisms Exchange Substances with their Environment</a> |                                                                        |                         |                 |
|      |    | 3.2 Cell Biology                               |                                          |                              |                     |                                                                          | 3.4 Genetic Information, Variation and Relationships between Organisms |                         |                 |
|      | Ch | Atomic Structure                               | Amount of substance                      | Energetics                   | Chemical equilibria | Equilibrium constant                                                     | Oxidation, reduction and redox                                         | Periodicity and group 2 | Halogens        |
|      |    | Electronic Structure                           | Bonding                                  | Introduction to Organic      | Alkanes             | Halogenoalkanes                                                          | Kinetics                                                               | Alkenes                 | Alcohols        |
|      | Ph | <a href="#">3.1 Measurements &amp; Errors</a>  | 3.2 Particle Physics & Quantum Phenomena | 3.4.1 Mechanics - Part 1 & 2 |                     |                                                                          | 3.6.1 Further Mechanics                                                |                         |                 |
|      |    | 3.3 Waves                                      |                                          |                              | 3.4.2 Materials     |                                                                          | 3.4.1 Mechanics - Part 3                                               | 3.5 Electricity         | Year 1 Revision |
|      | Sc | Unit 1: Principles & Applications of Biology   |                                          |                              |                     |                                                                          |                                                                        |                         |                 |
|      |    | Unit 2: Principles & Applications of Chemistry |                                          |                              |                     |                                                                          |                                                                        |                         |                 |
|      |    | Unit 3: Principles & Applications of Physics   |                                          |                              |                     |                                                                          |                                                                        |                         |                 |

| TERM |    | 1                                                                            | 2                                   | 3                                                                | 4                                                   | 5                                                         | 6                                                |                                           |          |  |
|------|----|------------------------------------------------------------------------------|-------------------------------------|------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------|-------------------------------------------|----------|--|
| Y13  | Bi | 3.6 Organisms respond to changes in their internal and external environments |                                     |                                                                  | 3.7 Genetics, populations, evolution and ecosystems |                                                           | Essays & Revision                                |                                           |          |  |
|      |    | 3.5 Energy transfers in and between organisms                                |                                     |                                                                  | 3.8 The Control of Gene Expression                  |                                                           | Revision                                         |                                           |          |  |
|      | Ch | Thermodynamics<br>Born Haber cycles                                          | Thermodynamics<br>Gibbs and entropy | Equilibrium<br>$K_p$                                             | Electrode potentials and cells                      | Acids and bases                                           | Properties of Period 3 elements and their oxides | Transition metals                         | Revision |  |
|      |    | Optical isomerism                                                            | The carbonyl group                  |                                                                  | Aromatic chemistry                                  | Amines                                                    | Polymers, amino acids and DNA                    | Organic synthesis, NMR and chromatography | Revision |  |
|      | Ph | 3.7.1/2<br>Gravitational Fields                                              | 3.7.3 Electric Fields               | 3.7.4 Capacitance                                                |                                                     | 3.7.5 Magnetic Fields                                     |                                                  | Revision                                  |          |  |
|      |    | <a href="#">3.6.2 Thermal Physics</a>                                        |                                     | <a href="#">3.8 Nuclear Physics</a>                              |                                                     | <a href="#">Option Unit D - Turning Points in Physics</a> |                                                  | Revision                                  |          |  |
|      | Sc | Principles & Applications of Biology - Finish by Y13 November                |                                     | Unit 4: Practical Scientific Procedures & Techniques (Biology)   |                                                     |                                                           | Optional Unit 6: Contemporary Issues in Science  |                                           |          |  |
|      |    | Principles & Applications of Chemistry - Finish by Y13 November              |                                     | Unit 4: Practical Scientific Procedures & Techniques (Chemistry) |                                                     |                                                           | Optional Unit 6: Contemporary Issues in Science  |                                           |          |  |
|      |    | Principles & Applications of Physics - Finish by Y13 November                |                                     | Unit 4: Practical Scientific Procedures & Techniques (Physics)   |                                                     |                                                           | Optional Unit 6: Contemporary Issues in Science  |                                           |          |  |

### **AQA A-Level Biology:**

- **Paper 1:** Biological Molecules, Cell Biology, Organisms Exchange Substances with their Environment , Genetic Information, Variation and Relationships between Organisms, including relevant practical skills
- **Paper 2:** Energy transfers in and between organisms, Organisms respond to changes in their internal and external environments, Genetics, populations, evolution and ecosystems, The Control of Gene Expression, including relevant practical skills
- **Paper 3:** Any content from topics 1–8, including relevant practical skills PLUS Synoptic essay

### **AQA A-Level Chemistry:**

- **Paper 1:** Physical and Inorganic
- **Paper 2:** Physical and Organic
- **Paper 3:** Synoptic paper of full course, including practical skills

### **AQA A-Level Physics:**

- **Paper 1:** Particle Physic; Quantum Phenomena & Electromagnetic Radiation; Waves; Mechanics; Materials; Electricity; and Further Mechanics
- **Paper 2:** Thermal Physics; Gravitational Fields; Electric Fields; Capacitance; Magnetic Fields; and Nuclear Physics
- **Paper 3a:** Synoptic Practical Skills Paper
- **Paper 3b:** Option Topic – Turning Points in Physics

### **Pearson AAQ BTEC Applied Science:**

- **Unit 1:** Principles & Applications of Biology
- **Unit 2:** Principles & Applications of Chemistry
- **Unit 3:** Principles & Applications of Physics
- **Unit 4:** Practical Scientific Procedures & Techniques
- **Option Unit 6:** Contemporary Issues in Science