Science
LEARNING JOURNEY

Science Club

Big Bang Trip / Visit

Astronomy Club

Science Museum Trip

STEM Events

Science Journal Club

Skills Development Club

Physics Olympiad

Chemistry Olympiad

Biology Olympiad

Year 13

A Level Exams

- The Control of Gene Expression — How have the advances in DNA technology helped to develop an understanding of life?
- Genetic populations evolution & ecosystem — How can the genotype of an organism result in inheritable conditions? What factors can effect population size?

Mock Exam

- Organisms responding to dangers in their environment — What mechanisms do organisms use to increase the chance of survival?

Mock Exam

- Energy Transfer between organisms — What is the light & light independent reactions? What is the importance of oxidative phosphorylation? How do organisms interact with each other?

Progression Exam

- Required Practicals
- Genetic Variation & Relationships — What is the role of the genetic code plays in protein synthesis? What causes Variation? What is the importance of biodiversity?

Mock Exam

- Organisms exchanging substances with their environment — Why/how is it important for substances to be exchanged in/out of cells?
- Biological Molecules — How do the properties of carbohydrates, proteins, nucleic & lipids relation to their function?
- Required Practicals
- Cells — How are cells the fundamental building blocks of all living things? How do the components of an immune system protect organism from disease?

Biology

- Engineering Physics — Why can an ice skater spin so quickly? How does a 4-stroke gasoline engine work and why are we phasing them out?
- Nuclear Physics — Wider reading. Why is Potassium-210 in your tea a frightening prospect? What went wrong at Chernobyl?

A Level Exams

- Fields — How are particles accelerated in the Large Hadron Collider? How does a super-capacitor work?

Mock Exam

- Thermal Physics — Why is water surprisingly great at transporting heat? How can we derive the fundamental laws that describe gases?

Mock Exam

Progression Exam

- Required Practicals
- Further Mechanics — Why do engineers have to be the Millennium Bridge?
- Material Properties & Mechanics — Why do objects bend and why do some shatter? How can we predict the motion of an object before it happens? Work as a team
- Particles & Quantum Phenomena — What are the members of the particle zoo? How can we apply scientific theory to explain electricity?

Mock Exam

- Properties & Applications of Waves — How can we prove light behaves like a wave and not a particle? Why does shining light through two slits challenge everything we know about physics?
- Electricity — How can we use sensing circuits to control a greenhouse? How can we apply scientific theory to explain electricity?
- Required Practicals

Physics

Year 13

- Inorganic Chemistry (transitions metals & reactions of ions) — How do electron transitions explain the colour of chemistry? Co
- Organic Chemistry (isomerism organic synthesis, NMR) — How do forensic scientists use instrumental techniques to identify unknown substances?

A Level Exams

Mock Exam

- Physical Chemistry (thermodynamics & rate equations) — How are redox reactions used in power mobile devices? Why are buffers so important in maintaining pH to support life? Rate = k[A]^m[B]^n

Progression Exam

- Required Practicals
- Inorganic Chemistry (the periodic table) — How do we use the periodic table to predict chemical and physical properties? H

Mock Exam

- Organic Chemistry (alkanes, alkenes, alcohols) — How do electron transfers influence the mechanism of organic reaction? How do improvements in technology help us change reactions to reduce our impact on our environment?
- Required Practicals
- Physical Chemistry (Kinetics & energetics) — What factors influence the rate and progress in reaction? What is the structure of the atom?

Chemistry

Year 12

GCSE Exams

- Revision
- Global Challenges — What is sampling? How do we monitor and maintain health? What are non-communicable diseases? Problem solving. Work as a team: Sampling, Conservation, Biodiversity
- Global Issues

Mock Exam

- Genetics — What is inheritance? What is natural selection? How do organisms evolve?

Mock Exam

Mock Exam

GCSE Exams

- Revision

Mock Exam

Mock Exam

- Global Challenges — What influences motion? How do we power the earth? What's in our solar system? Researching energy sources. Debate

Mock Exam

- Global Challenges — How are processes and products improved? What interacts with the atmosphere?

Mock Exam

Year 11

- Required Practicals
- Community-level systems — What is an ecosystem? How do we recycle nutrients? Problem Solve: What happens if the cycles are imbalanced?

Progression Exam

- Organism-level systems — What is the nervous system? How does the endocrine system work? How do we maintain internal environments?

Required Practicals

Year 11

Progression Exam

- Energy — How is energy stored and transferred? How is heat energy transferred?
- Waves & Radiation — How do waves behave? What is the electromagnetic spectrum? What is radiation? Global issues: Wider reading. PAG
- Required Practicals
- Forces — What is speed & acceleration? What are Newton's laws? What is gravitational field and potential energy? 10KG 20KG
- STEM Event

Mock Exam

Year 11

Progression Exam

- Monitoring & Controlling Chemical Reactions — How do group 1, 7 & 0 elements react? How do you predict reactions? Solve problems: Atom economics
- Identifying reaction & products — How do group 1, 7 & 0 elements react? How do you predict reactions?
- STEM Event
- Chemical Reactions 2 — What are chemical reactions? What is electrolysis?
- Required Practicals
- Elements, compounds & mixtures 2 — What is bonding? What are the properties of materials?

Required Practicals

Physics

Biology — **Chemistry**

Option to study Combined Science or Triple Science

Year 10

- Working Scientifically — How do scientists plan investigations? How is high quality data obtained? How are errors minimised?
- Chemical Reactions 1 — What is energetics? What are the types of reaction?
- Elements, compounds & mixtures 1 — How do we purify and separate mixtures? O O H
- Cell-level systems — What's inside cells? What happens inside cells? What is respiration & photosynthesis? Roleplay the bloodstream. PAGs. Stem Cells: Wider Research. Ethical Debate
- Scaling up — How do we supply cells? What are the challenges of size?
- Electricity & Magnetism — What's the difference between static and charge? What are circuits? What are magnets? Roleplay. Working as a team
- The Atom & Materials — How has the model of the atom changed? How do springs behave? What is pressure?
- Matter — What is the particle model? What happens in changes of state? Roleplay
- Particles — What is a particle? What is the history of the atom? What is an isotope?

Year 9

- Ecosystems — How do plants obtain their energy? How do animals obtain their energy? How do organisms interact in ecosystems? Wider Research
- Energy — What is our atmosphere? What is the carbon cycle? How is carbon cycled?
- Motion & Pressure — What is speed? What is pressure? What is a turning force?
- The Earth — What's our earth made of? What's the composition of rocks? Debate global warming & the use of fossil fuels
- Metals & Acids — How do metals react? How do we extract metals? What are polymers?

Year 8

- Healthy Living — What makes up our food? How do we eat food? How does life-style influence health?
- Adaptions — What is variation? What is inheritance? What is natural selection? Wider Research
- Reproduction — Where are the reproductive organs? What is fertilization? What is the menstrual cycle? How do plants reproduce?
- Electricity & Magnetism — What is charge? What is an electromagnet? How do we make circuits?
- Light — What is light made up of? How does the eye work? How do we see colours?
- Forces — What is Hooke's law? When are forces balanced? How can forces require no contact? 10KG. IT Research
- Separation Techniques — What is filtration and crystallisation? What is chromatography? What is a mixture?
- Acids & Alkalis — What is an acid or alkali? How do we measure pH? What is neutralisation?
- The Periodic Table — How do metals and non-metals differ? What are the properties of group 1, 7 & 0 elements? H. IT PowerPoint Presentations e.g. development of the atom

Year 7

- Body Systems — How does breathing work? What makes up the skeleton? How do our joints work? Roleplay
- Cells — What is inside cells? How does structure = function? How do we observe cells? IT Skills
- Space — What is in our solar system? How does the earth move? What is the point of the moon?
- Sound — What is a sound wave? How do we detect sound? What are echoes and ultrasound? Roleplay
- Reactions — What is a chemical reaction? How do we write equations? What are the types of reactions?
- Atoms & Elements — What is a sub-atomic particle? How do we write chemical formulae?
- Particles — What are the 3 states of matter? What is diffusion? Roleplay

Physics

Biology — **Chemistry**

Working Scientifically — How do you think like a Scientist? How do you work safely in a laboratory? How do scientists carry out investigations?

Wider Curriculum

In Years 7 -11, modules are taught in rotation. Different teachers will teach them in different orders.