Science
In the Science Department at New Line Learning Academy our intent is to equip pupils with the knowledge, skills, and understanding to inspire pupils to be confident, resilient scientists by integrating practical discovery into learning. The curriculum considers the individual learning needs, strengths and starting points of all. We develop successful learners who can apply their scientific knowledge and understanding in all contexts of the world. We enhance their understanding of how science fits into every aspect of the world and enable pupils to know which professions and employment routes embody scientific knowledge and understanding to encourage them to see how vital science is to their future endeavours. We develop mathematical thinking and cohesively link mathematical knowledge to their learning. We encourage all pupils to see the importance of their mathematical skills within the context of science and beyond into the worlds they live, and will work in. Digital skills are developed when necessary, and we use innovative technologies to enable pupils to evaluate and refine methods and models. Pupils' reading and writing are supported and developed through analysis of media articles that are relevant to the context they are being taught about. This is furthered as we support and develop oral debate and critical thinking. This means that all pupils leave the science department being able to: • Make links between science and the world they live in • Analyse qualitative and quantitative data • Be confident and competent readers, writers and speakers • Have a thirst for learning more science in their post-16 endeavours.

Year 8	
Term One	
Big Picture	Plants Pupils in Year 7 learned that living things are made of cells. Pupils will continue their learning by looking at where and why plants grow and the processes carried out by plants. Generating Electricity Our society is heavily reliant on electricity. Pupils will be aware of this and recognise all of the daily activities that require electricity, but where does it come from? Pupils study different methods of generating electricity and the associated costs. Variation Pupils in Year 7 learned that every human in the world is different and how sexual reproduction leads to these differences. Pupils will continue their journey

	by looking at these differences and deciding if they are caused by genetics or the environment.

Zoom in

Sampling and Quadrats	Plant and Animal Cells (Microscopes)	Ph
Photosynthesis Practical	Adaptations for Photosynthesis	E
Ecosystems	Fuels	I
Renewable Energy	Calc Electrical Energy	
Energy Cost	Payback time	
Variation Investigation Planning	Variation Investigation Practical	Variation I

Term Two

Big Picture

Magnetism

Pupils will have seen magnets on fridges and played with different types of magnets, but why do some magnets repel each other when we try to put them together? Pupils will study the properties of magnets and the earth's magnetic field and learn how to build electromagnets which power devices such as bells and loud speakers

Separating Techniques

In Year 7 pupils studies particle model and chemical reactions. Pupils will use this knowledge to decide whether substances are mixtures and investigate how they can be separated.

Electromagnetic Spectrum

Pupils looked at sound and light in Year 7 and now have the opportunity to study more waves and their uses. What damage does electromagnetic radiation do to the body and how can we harness this to our benefit?

Zoom in

Magnetism	Magnetic Fields	Magnetism
Electromagnetism	Uses of Electromagnets	Sc
Mixtures	Solutions	Dissolv
Filtration and Evaporation	Distillation	Chr
Waves and Wavespeed	EM Spectrum	
Infrared Radiation	Cooking with Waves	Commun

Term Three

Big Picture

Keeping Healthy

Our body is a temple! Pupils investigate how we can keep our bodies functioning well by looking at the effects of diet, exercise and drugs

The Earth

	Everything we need to live comes from the earth. Pupils discover the structure of the earth and how materials are recycled in the rock cycle Reactions Building up from knowledge gained in year 7, pupils investigate reactions of metals and finding out how chemical reactions transfer energy and the importance of these reactions

Zoom in

Healthy Diet	Obesity and Anorexia	
Drugs and Alcohol	Lung Disease and Smoking	The Earth
Sedimentary Rocks	Igneous and Metamorphic Rocks	
Introduction to Chemical Reactions	Metals and Non-metals	Metals and Oxygen
Metals and Acids	Metals and Water	The Reactivity Series
Metal Displacement	Exothermic and Endothermic Reactions	Thermal Decomposition

Term Four

Big Picture	The Body What's inside us? How does it work? Pupils delve into the human body to discover what happens inside our bodies daily. Electricity Electricity can be a bit of a mystery because we can't see what is happening inside the wires we use to charge our phones, power our televisions and turn our lights on. Pupils discover what is happening inside these wires by building circuits

Zoom in

The Body	Respiratory System	
The Heart	Circulation and Blood	
Respiration	Exercise and respiration	
Circuits and Current	Metals conduct electricity	
Ammeters	Voltmeters	

Term Five

Big Picture	The Periodic Table Pupils unlock the information in a table of tiles, numbers and symbols Ecology Our environment is very important. It gives us the things we need to live like food, water and shelter. We share our environment with many different types

	of plants and animals. Pupils discover how these organisms interact within ecosystems and use our vast fields to conduct sampling practical activities
Zoom in	The Periodic Table / Atomic Diagrams / [illegible] Group 7 / Trends / [illegible] Kingdom, Class and Keys / Food Chains and Food Webs / Predator, P[illegible] Interdependence / Adaptations / Nat[illegible] Sampling Practicals
Pitch it up	*Building on the skills established in Year 7, pupils in Year 8 tackle more complex scientific content and tasks that deepen their critical thinking. They encounter a broader range of exam-style questions, tailored to stretch higher ability learners while offering appropriate scaffolding to those needing additional support. Practical activities become more demanding, with a greater emphasis on pupil independence and team-based problem-solving. Teachers continue to uphold high expectations around correct scientific terminology and structured reflection, helping pupils refine their spoken and written responses. This heightened focus on metacognition and rigorous questioning ensures pupils progressively gain the cognitive tools needed for success in Key Stage 4.* *Practical activities become more complex and the independence of pupils during these activities increases.*
Pre-requisite knowledge	At New Line Learning Academy, in order to be successful during Year 8 science pupils will need a firm grasp on the contents of the Year 7 curriculum. Having confidence in the topics of particles, cells, energy and forces from Year 7 will be fundamental to pupils' progress through Year 8 and the second year of our 5 year curriculum plan. Pupils' will also be required to be confident in their knowledge of the procedures involved in practical activities and safety in the science lab. Basic equipment should be quickly identifiable and easily manipulated.
Wider framework next steps	All practical work throughout our curriculum plan will require the safety aspects and basic lab skills taught during Key Stage 3. Similarly, all future biology, chemistry and physics learning work is attached to pupils' learning from Key Stage 3 to support pupils in building their mental models of science and scientific concepts. Pupils moving into Year 9 and beyond will continue to study biology, chemistry and physics in preparation for GCSE science at Key Stage 4.
Curriculum hinterland	Developing an understanding of science is vital to having rounded view of the world and how things work. From how the electricity we use is generated in order to make environmentally sound decision to how our body functions so that we can look after it effectively. The world around us forms the hinterland of scientific knowledge which is delivered at New Line Learning Academy.
Authentic connections inc. SMSC	Interdisciplinary links with practical subjects including art, DT, Food allow pupils to be aware of their safety and surroundings in new areas while also being conscientious workers who are considerate of others and their safety too. Pupils will draw upon their mathematical skills as we complete mean calculations and construct graphs to present data from our investigations. Topics such as the

	body appear in PE and Health and Fitness so pupils will draw parallels with this. Pupils will also be able to make connections between science content and the content delivered during some PSHEE lessons. • Botanist – Studies how plants grow, reproduce, and interact with their environment, contributing to conservation, agriculture, and biodiversity. • Agricultural Scientist – Develops methods to improve crop yields and sustainable farming practices. • Electrical Engineer – Designs and maintains systems for producing and distributing electricity. • Renewable Energy Technician – Installs and maintains renewable energy technologies such as solar panels and wind turbines. • Energy Consultant – Advises businesses on how to use energy more efficiently and sustainably. • Wildlife Biologist – Researches variation within animal populations to support conservation efforts. • Research Scientist – Investigates how genetics and environment influence characteristics in living organisms. • Biotechnologist – Applies genetic knowledge to develop medical, agricultural, and industrial solutions. • Robotics Engineer – Utilises electromagnets in the design of automated systems and devices. • MRI Technician – Operates magnetic resonance imaging scanners in hospitals, using magnetism for medical diagnosis. • Product Designer – Incorporates magnets into innovative products and devices. • Water Quality Technician – Tests and purifies water to make it safe for human use.

	• Forensic Scientist – Applies separation methods to investigate crime scene evidence. • Food Technologist – Ensures food safety and quality through chemical analysis and separation techniques. • Environmental Scientist – Analyses environmental samples to detect pollutants and ensure ecological safety. • Dietitian – Advises individuals on healthy eating to prevent illness and improve wellbeing. • Sports Scientist – Studies how the body responds to exercise, optimising health and athletic performance. • Public Health Officer – Works to improve community health and prevent disease through education and policy. • Environmental Consultant – Advises on sustainable use of Earth's resources and environmental protection. • Mining Engineer – Works on extracting minerals safely and sustainably. • Genetic Counsellor – Advises patients on genetic health conditions. • Sports Scientist – Researches how the human body functions during exercise and sport. • Medical Laboratory Technician – Conducts tests to support medical diagnoses. • Doctor – Uses knowledge of the body's systems to diagnose and treat patients. • Materials Scientist – Uses the periodic table to develop new alloys, polymers, and advanced materials. • Chemical Analyst – Tests materials for purity and composition using the periodic table as a reference.

	• Pharmacologist – Understands how elements and compounds interact in medicines.

Resources
• *Photosynthesis - BBC Bitesize* • Generating electricity guide for KS3 physics students - BBC Bitesize • Types of variation - Inheritance and genetics - KS3 Biology - BBC Bitesize • Electromagnetism and magnetism - KS3 Physics - BBC Bitesize • Separation techniques - Separating mixtures - GCSE Chemistry (Single Science) Revision - WJEC - BBC Bitesize • What is a healthy lifestyle? - BBC Bitesize • Structure of the Earth - The Earth and atmosphere - KS3 Chemistry - BBC Bitesize • Chemical reactions - KS3 Chemistry - BBC Bitesize • Blood and Circulation - BBC Bitesize • Respiration and gas exchange - KS3 Biology - BBC Bitesize • Electricity - KS3 Physics - BBC Bitesize • Periodic table - KS3 Chemistry - BBC Bitesize • Ecosystems and habitats - KS3 Biology - BBC Bitesize
Assessments
Pupils will be assessed on knowledge taught in each unit at the end of each term. Assessments will assess both practical and theoretical aspects of science. There will be application questions and practice throughout the term and pupils will be assessed through a series of low tariff questions which will both theory and practical questions.