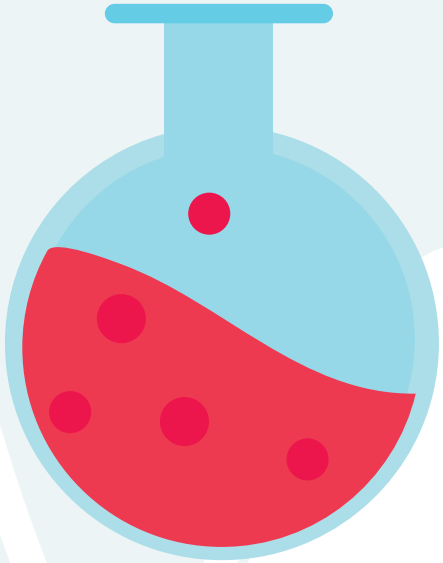
Harrow Way Community School

Learning for life, success for all



KS3 End Points

SCIENCE

Harrow Way Science Department

KS3 Science End Points – What Your Child Will Know and Be Able to Do

In Science, we build the core knowledge and thinking skills that students need to succeed at GCSE and beyond. We focus on learning that is:

- **Durable** – Students *remember* important knowledge over time.
- **In-depth** – Students *understand* it clearly, not just repeat it.
- **Flexible** – Students can *apply* their knowledge to new questions, places and problems.
  Each year builds on the one before. Below is a summary of what students should be able to do at the end of each year, alongside what they study. We use four levels:

Level	What it means
Platinum	Exceptional understanding with deep, flexible thinking. Can explain clearly and make insightful links.
Gold	Strong understanding with clear explanations and well-chosen examples. Applies knowledge with growing confidence.
Silver	Basic understanding, can describe ideas but needs support to explain or apply them.
Bronze	Early stage understanding, mostly factual recall with limited clarity. Needs frequent support.

Year 7 – Building Big Ideas: Organisms, Matter, Forces, Energy, Ecosystems, Reactions, Genes, Electricity

What students study: Year 7 Science: Topics and Enquiry Questions

- **Organisms**

  Students study how living things are built and how their structures work together to sustain life. They learn to observe and compare plant and animal cells, explore how cells become specialised, and discover how these form tissues, organs and systems. The topic concludes with how the skeleton and muscles combine to support, protect and move the body.
  Enquiry Question: *How do the structures within living organisms work together to keep them alive?*

- **Matter**

  Students explore how all materials are made of tiny particles and how their arrangement and movement explain the properties of solids, liquids and gases. They learn how changes in temperature cause substances to change state, and how diffusion and gas pressure can be explained by particle motion. The topic then moves to mixtures, where students distinguish between pure substances and solutions, investigate solubility, and use practical methods such as filtration, evaporation and chromatography to separate and analyse materials.
  Enquiry Question: *How does the particle model help us explain the properties and behaviour of matter?*

- **Forces**

  Students explore how forces affect the motion and shape of objects. They learn to identify balanced and unbalanced forces and how these cause changes in speed or direction. Through studying friction, drag, and elasticity, they investigate how different materials and surfaces influence movement. The topic develops their understanding of speed and distance–time graphs before introducing gravity as the force that gives weight and controls motion on Earth and in space.
  Enquiry Question: *How do forces change the way objects move and interact?*

- **Energy**

  Students learn how energy is stored, transferred and transformed in different systems. They explore how food and fuels provide energy, compare renewable and non-renewable resources, and calculate power as a measure of how quickly energy is used. The topic develops understanding of how energy moves between objects and environments, and how much of it is wasted or used efficiently in everyday life.
  Enquiry Question: *How is energy transferred and used efficiently in the world around us?*

- **Ecosystems**

  Students explore how living things depend on one another and their environment to survive. They learn how energy flows through food chains and webs, how these can be disrupted by human activity, and how organisms compete for limited resources. The topic ends with plant reproduction, showing how pollination, fertilisation and seed dispersal sustain life within ecosystems.
  Enquiry Question: *How do living things depend on each other and their environment for survival?*

- **Reactions**

  Students investigate how substances interact to form new materials and learn to recognise the signs of chemical reactions. They explore acids and alkalis, using indicators and neutralisation to understand pH, and learn how salts are made through controlled reactions. The topic continues with metals, examining how they react with oxygen, water and acids, and how displacement explains reactivity.
  Enquiry Question: *How do different substances react to form new materials?*

- **Genes**

  Students learn how genetic information determines characteristics and how variation arises through inheritance and environmental factors. They explore how adaptations help organisms survive in different conditions and study human reproduction, including the changes during adolescence, fertilisation, and the menstrual cycle.
  Enquiry Question: *How do genes and reproduction create variation within living things?*

- **Electricity**

  Students learn how electric circuits work and how current, potential difference and resistance interact to control the flow of electricity. They explore how components behave in series and parallel circuits and investigate how resistance affects current. The topic concludes with static electricity, explaining how charges build up and cause forces or sparks.
  Enquiry Question: *How does electricity flow and what affects the way it behaves in a circuit?*

End points	Platinum	Gold	Silver	Bronze
Knowledge of Concepts	Makes clear links between ideas such as how particles explain states, how forces cause motion, and how organ systems keep us alive.	Explains key ideas accurately using examples from topics like cells, forces or energy.	Describes main ideas within each topic, e.g. what cells or particles are.	Recalls a few simple facts, e.g. “solids have particles close together.”
Understanding of Processes	Explains how and why processes happen, e.g. how diffusion moves substances or how heating changes particle movement.	Explains what happens in familiar processes such as dissolving or muscle contraction using key terms.	Describes what happens but not why, e.g. “ice melts when warm.”	Identifies that change happens without explaining it.
Applying Knowledge	Applies knowledge confidently to new contexts, e.g. predicting what happens when gas pressure changes or how a new diet affects health.	Applies knowledge to guided examples like new force diagrams or energy transfers.	Applies knowledge in familiar class examples only.	Struggles to apply ideas beyond recall.
Using Evidence	Interprets data and observations to justify conclusions, e.g. linking graph patterns to reaction rate or movement speed.	Uses data to describe patterns, e.g. “as temperature increases, diffusion is faster.”	Spots simple trends in data but gives limited explanation.	States what data shows without linking to ideas.
Scientific Communication	Communicates ideas clearly using accurate vocabulary such as cell membrane, conduction and force.	Uses key terms to give short explanations, e.g. “energy is transferred as heat.”	Uses some scientific words but not always correctly.	Gives basic descriptions with limited scientific vocabulary.

🔷 Year 8 – Deepening Understanding: Systems 2, Mixtures, Forces 2, Interdependence, Reactions, Waves, Digestion, Earth and Rocks, Inheritance, Electricity and Magnets

What students study: ***Year 8 Science: Topics and Enquiry Questions***

- **Systems 2**

  Students learn how the human body changes during adolescence and how the reproductive and breathing systems work. They explore fertilisation, pregnancy and gas exchange, and consider how drugs, alcohol and smoking affect health.
  Enquiry Question: *How do our bodies grow, reproduce, and stay healthy?*

- **Mixtures**

  Students learn how substances are made from atoms and how elements combine to form compounds and mixtures. They investigate solutions and solubility, exploring methods such as filtration, evaporation and chromatography to separate and analyse materials.
  Enquiry Question: *How can we identify and separate difference substances in a mixture?*

- **Forces 2**

  Students explore how forces affect the movement and shape of objects. They learn how to calculate speed, analyse distance–time graphs, and investigate friction, drag and pressure in gases and liquids. The topic ends with how turning forces and stress act on solid materials.
  Enquiry Question: *How do different forces shape the way objects move and behave?*

- **Interdependence**

  Students learn how living things depend on each other and their environment for survival. They study food chains, food webs and the impact of disruptions, before exploring how plants make food through photosynthesis and how minerals and leaf structure support growth.
  Enquiry Question: *How do living things depend on one another to survive and grow?*

- **Reactions**

Students investigate how substances react to form new materials and how energy changes during chemical reactions. They explore combustion, thermal decomposition and conservation of mass, comparing exothermic and endothermic reactions and learning how metals are extracted.
Enquiry Question: *How do chemical reactions transform materials and transfer energy?*

- **Waves**

  Students explore how waves transfer energy through air, water and solids. They investigate how sound and light travel, learning about reflection, refraction and colour, and how the ear and eye detect different types of waves.
  Enquiry Question: *How do waves help us see, hear and understand the world around us?*

- **Digestion**

  Students learn how food is broken down and absorbed to provide energy and nutrients for the body. They investigate the roles of enzymes and bacteria in digestion, test foods for different nutrients, and explore the effects of an unhealthy diet.
  Enquiry Question: *How does the digestive system break down food to keep us healthy?*

- **Earth and Rocks**

  Students explore the structure of the Earth and how rocks form, change and recycle over time. They learn how sedimentary, igneous and metamorphic rocks develop and how the rock cycle shapes the planet's surface.
  Enquiry Question: *How do rocks form and change to shape the surface of the Earth?*

- **Inheritance**

  Students learn how characteristics are inherited and how variation leads to evolution. They study Darwin's theory of natural selection, the causes of extinction and the importance of biodiversity, before exploring DNA, genetics and genetic modification.
  Enquiry Question: *How does genetic variation drive evolution and shape life on Earth?*

- **Electricity and Magnets**

  Students learn how electric circuits work and how current, voltage and resistance interact. They explore static electricity, magnetic fields and electromagnets, discovering how magnetism and electricity are used together in devices and machines.
  Enquiry Question: *How can electricity and magnetism be used to create movement and control systems?*

End points	Platinum	Gold	Silver	Bronze
Knowledge of Concepts	Makes clear links between ideas such as how digestion and respiration release energy, how atoms form elements, and how forces create pressure.	Explains key ideas accurately using examples from topics like elements, energy transfer or health.	Describes main ideas within each topic, e.g. what atoms, enzymes or forces are.	Recalls a few simple facts, e.g. “metals are elements” or “energy can be transferred.”
Understanding of Processes	Explains how and why processes happen, e.g. how photosynthesis stores energy or how pressure changes in gases.	Explains familiar processes such as breathing or chemical reactions using key terms.	Describes what happens but not why, e.g. “plants make food in leaves.”	Identifies that change happens without explaining it.
Applying Knowledge	Applies knowledge confidently to new contexts, e.g. predicting how temperature affects reaction rate.	Applies knowledge to guided examples like new circuits or pressure problems.	Applies knowledge in familiar class examples only.	Struggles to apply ideas beyond recall.
Using Evidence	Interprets data and observations to justify conclusions, e.g. analysing graphs on enzyme activity or changes in gas volume.	Uses data to describe patterns, e.g. “increasing light increases the rate of photosynthesis.”	Spots simple trends in data but gives limited explanation.	States what data shows without linking to ideas.
Scientific Communication	Communicates ideas clearly using accurate vocabulary such as enzyme, pressure, element and current.	Uses key terms to give short explanations, e.g. “magnetic fields attract or repel.”	Uses some scientific words but not always correctly.	Gives basic descriptions with limited scientific vocabulary.

🔷 Year 9 – Complex Thinking: Cells, Matter 1, Atoms and the Periodic Table, Energy 1, Introduction to Bonding, Systems 1, Foundations of Quantitative Chemistry, Electricity 1, Systems 2, Rates, Forces 1, Ecology 1

What students study:

- *Biology – Cells, Systems 1, Systems 2, Ecology 1*
- *Chemistry – Atoms and the Periodic Table, introduction to Bonding, Foundations of Quantitative Chemistry, Rates*
- *Physics – Matter, Energy 1, Electricity 1, Forces 1*

End points	Platinum	Gold	Silver	Bronze
Knowledge of Concepts	Makes clear links across biology, chemistry and physics, e.g. connecting energy changes in respiration with those in chemical reactions or electric circuits.	Explains key ideas accurately using examples such as cell structure, bonding, or energy transfer.	Describes main ideas within each topic, e.g. naming cell parts or types of bonds.	Recalls isolated facts, e.g. “metals form positive ions” or “energy is measured in joules.”
Understanding of Processes	Explains how and why processes happen using cause-and-effect reasoning, e.g. how enzymes control respiration.	Explains familiar processes such as photosynthesis, bonding or energy transfer using key terms correctly.	Describes what happens in processes like diffusion or melting but gives limited reasoning.	Identifies that change happens without explaining it.
Applying Knowledge	Applies knowledge confidently to new problems, e.g. predicting how a change in current affects resistance or how increasing temperature affects reaction rate.	Applies knowledge to guided examples, such as rearranging equations with support.	Applies knowledge in familiar examples only.	Struggles to apply ideas beyond recall.
Using Evidence	Analyses data and graphs to justify conclusions, e.g. interpreting rate-of-reaction graphs or evaluating energy-change results.	Uses data to identify patterns, e.g. linking concentration to rate or voltage to current.	Describes simple trends but with limited explanation.	States what data shows without linking to ideas.
Scientific Communication	Communicates ideas clearly using accurate scientific language such as chloroplast, ionic bond, and resistance.	Uses key terms appropriately in short explanations.	Uses some scientific words but not always correctly.	Gives basic descriptions with limited scientific vocabulary.