Parkside Academy
Key Stage 4 Science Policy

Origins of the Curriculum

The KS4 Haven pathway science curriculum is firmly derived from the National Curriculum for Science. It takes into account the diverse range of exam boards pupils may have previously followed, ensuring alignment with core content and requirements. This curriculum also recognises the temporary nature of placements on the Haven pathway, making it adaptable to varying lengths of stay.

Progression Across a Phase or Key Stage is mapped to build coherently on substantive and disciplinary knowledge acquired at KS3. The sequence of learning is carefully planned to develop and consolidate core concepts in biology, chemistry, and physics. This ensures that pupils strengthen foundational knowledge and scientific skills in a structured way, ready to transition successfully back into mainstream settings where appropriate or support next steps.

Organisation of Subject Content is delivered through clearly defined units in biology, chemistry, and physics. These are organised sequentially to support logical progression and cumulative understanding of key ideas. At the same time, a concentric element is built into revisit and reinforce core scientific skills—particularly practical and investigative skills—throughout the year. As such, working scientifically is embedded within each unit which ensures pupils understand the scientific method. Mathematical skills are taught and used through units as appropriate.

The Purpose Beyond the National Curriculum is beyond meeting statutory requirements, the curriculum equips pupils with the ability to observe, question and explain phenomena in the world around them. It builds their capacity for scientific reasoning, evaluation, and informed decision-making. They will enhance their decision-making ability: they will be better able to predict the effects of both their actions and those of wider society. Pupils gain valuable transferable skills in problem-solving and critical thinking, supporting not just exam success but college pathways and future career opportunities.

Designed for Alternative Provision (AP) this curriculum is deliberately tailored for the Raedwald Trust's AP context and Pathways available at Parkside Keys Stage 4 *(see table below*). It prioritises key content to maximise learning during potentially short placements, with the flexibility to adapt to gaps in prior knowledge resulting from disrupted mainstream schooling. Practical science is emphasised wherever possible, recognising that many pupils have had limited access to hands-on learning experiences. This ensures pupils are not only ready to re-engage with mainstream education but also have a positive, relevant, and confidence-building experience of science.

Pathways	**Roll Status (full time/fractional)**
KS4 Haven Plus Double PEX (up to 2 years)	Single Roll
KS4 Haven Plus CiC (up to 2 years)	Dual Roll – fractional placement
Haven Highly Complex KS4 (up to 2 years)	Dual Roll – fractional placement

Content and Sequencing

The Science curriculum covers the three core disciplines of Biology, Chemistry, and Physics, structured around the breadth of the KS4 National Curriculum. Within these disciplines, we prioritise key topics that serve as building blocks for broader scientific understanding:

- **Biology:** Living cells, the human body, genetics, variation, evolution, health, and disease.
- **Chemistry:** Atomic structure, the periodic table, structure and bonding, acids and alkalis, rates of reaction, and atmospheric science.
- **Physics:** Forces and energy, waves and electromagnetism, circuits and electricity, and energy resources.

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Scientific skills—including scientific attitudes, experimental investigation, and analysis and evaluation—are embedded throughout all units to develop pupils' ability to think critically and work scientifically.

Organisation of Learning Objectives
The curriculum is sequenced to move from fundamental principles to more complex concepts in a logical progression. Each discipline begins with foundational topics (e.g., cells, atomic structure, forces) and systematically builds on prior knowledge. Key concepts and skills are revisited through concentric planning to reinforce retention and deepen understanding.

Baseline assessments are used to identify gaps in prior learning, enabling staff to adapt sequencing and delivery to meet individual pupil needs.

Curriculum Coverage
Due to the short-term and sometimes fractional nature of placements on the Haven pathways, it is not always possible to deliver the entire Science GCSE syllabus. Instead, the curriculum focuses on the fundamental concepts and key skills that underpin KS4 Science, supporting reintegration into mainstream education.
Where possible, content is aligned to the AQA Double Award specification, which is the most common pathway locally and nationally, to provide maximum continuity for pupils. Opting for double science rather than single science also helps to protect pupils' post-16 progression routes.

Curriculum Intent
Our overarching aim in Science is to deepen pupils' understanding of the world around them and their place within it. We support pupils in exploring how scientific processes shape their daily lives and society, encouraging reflection on their own impact and contribution. Alongside scientific knowledge, the curriculum develops pupils' social, technological, mathematical, verbal reasoning, and literacy skills.

The curriculum is carefully structured to provide balanced coverage across Biology, Chemistry, and Physics, closely linked to pupils' prior KS3 learning and what they will continue with in mainstream settings. Regular revisiting and reinforcement help secure long-term knowledge retention.

While the ambition is to cover the full National Curriculum, delivery is adapted to meet the diverse needs of pupils, particularly those on shorter or part-time placements. Teaching is underpinned by evidence-informed strategies—including scaffolding, modelling, and cognitive science principles (e.g., Rosenshine's Principles of Instruction, Fiorella & Mayer's Generative Learning theory)—to make lessons engaging, accessible, and appropriately challenging for all learners.

Note: This curriculum is designed for a full-time offer; refinements to content and delivery may be made for pupils accessing provision through fractional and/or short-term placements. Please see the table of Haven Pathways on Page 1 for further detail.

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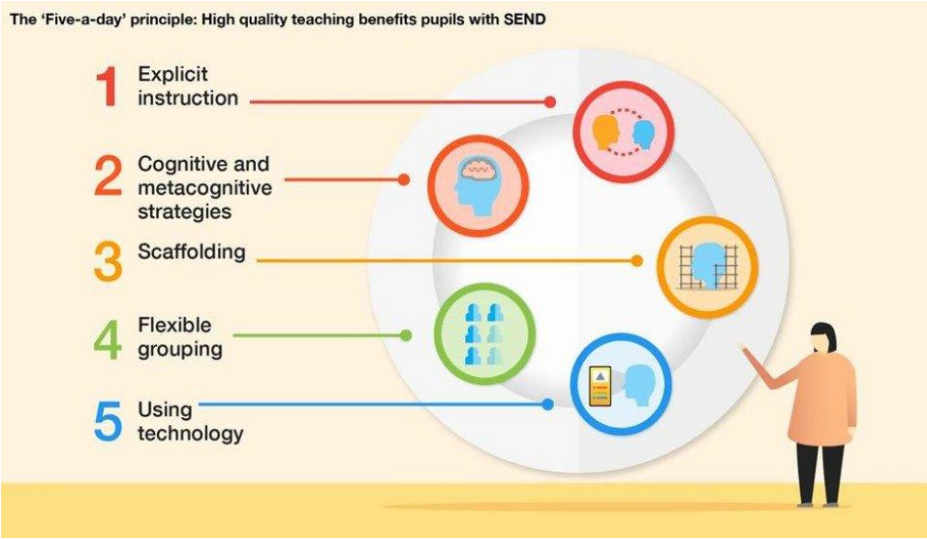
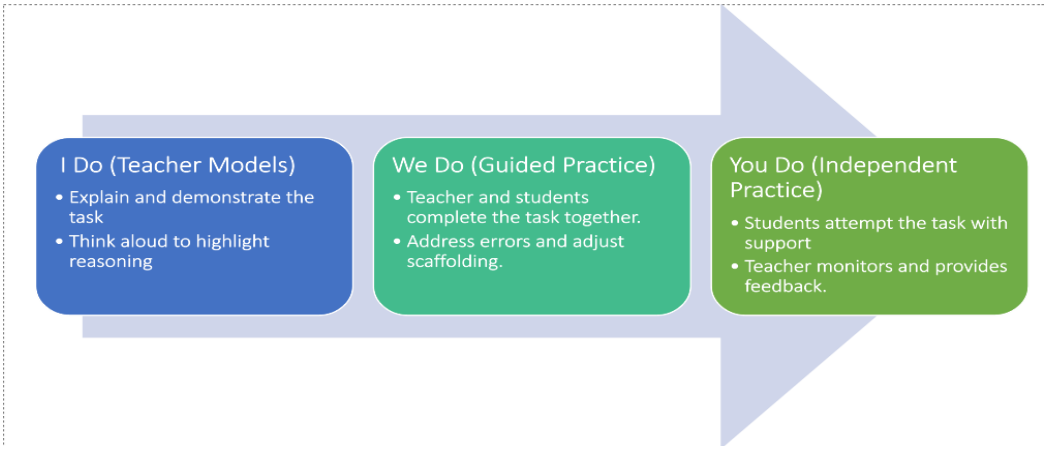
Adaptation of Teaching is based on a diet of high-quality teaching (EEF, 2022), comprehensive induction, baseline assessments and ongoing teacher evaluation.



Induction, Individual Learning Plans (ILPs) and SEND information guide the support needed, which may include:

- Use of overlays for Irlen's syndrome or dyslexia
- Additional scribing or use of technology
- Explicit vocabulary instruction, sentence starters and frameworks for scaffolding writing
- Practical learning and visual aids
- Flexible groupings and targeted interventions to close gaps in prior knowledge

These assessments identify each pupil's subject-specific knowledge and SEND requirements. Pupils are taught through our pedagogical approach (EDI – explicit direct instruction).



This responsive approach ensures every pupil can access the curriculum, engage with content, and make meaningful progress.

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Overview of Units of Study
The Science curriculum is delivered over a rolling programme of up to two years, with regular opportunities for consolidation and revision. Units are sequenced to prioritise foundational knowledge and include planned recap points to address any gaps due to disrupted prior learning.

	Biology	Chemistry	Physics
Year 1	Cells, respiration, photosynthesis, transport (diffusion, osmosis, active transport), data interpretation, assessments	States of matter, mixtures, atoms and molecules, atomic structure, RAM and RFM, assessments	Physics 1: Forces, energy stores and transfers, stopping distances, energy conservation, assessments
Year 2	Human biology (digestive system, lungs, heart, blood, nervous system, endocrine system), assessments Health (non-communicable and communicable diseases), the immune system, vaccination, assessments Genetics, variation, evolution, natural selection, selective breeding, genetic engineering, assessments	Periodic table, alkali metals, halogens, structure and bonding, ions, assessments Acids and alkalis, rates of reaction, carbon emissions, atmospheric science, assessments	Waves, electromagnetic spectrum, magnetic fields and motor effect, assessments Energy recap, energy resources, circuits and electricity, series and parallel circuits, assessments

Throughout, scientific skills are explicitly taught and revisited, ensuring pupils develop transferable skills to take forward into mainstream education and beyond.

Assessment and Outcomes

How will assessments be made on an ongoing basis? (Formative Assessment)
Assessment is embedded throughout the curriculum using a range of ongoing formative strategies. Small class sizes enable teachers to closely monitor individual progress during each lesson, identifying misconceptions and addressing gaps immediately through targeted questioning, verbal feedback, and adaptive teaching.

A whole-school RAG rating system on a formative assessment tracker records each pupil's progress from their baseline assessment—completed during induction—and is updated regularly to reflect understanding of taught content and skills.

In addition to in-lesson checks, pupils complete end-of-module assessments for each science discipline. These are made up of mixed-format exam-style questions completed during timetabled lessons in an open book, staff-supported format to reduce anxiety while maintaining exposure to examination standards.

How will this information be used to inform practice?
Information from formative checks and module assessments directly shapes planning for subsequent lessons. Teachers adapt lesson content, revisit topics, and personalise support to address misconceptions or gaps identified through daily

monitoring and the RAG tracker. Assessment outcomes are shared with pupils to help them understand their strengths and areas for improvement, supporting effective revision strategies and building exam confidence.

Assessment data also informs feedback to pupils' mainstream schools, ensuring a joined-up approach that highlights areas requiring further intervention on return to mainstream provision.

What are the intended outcomes of delivering this curriculum?
The overarching outcome is for all pupils to be equipped to successfully reintegrate into mainstream education and continue working towards achieving a nationally recognised qualification in science. Through careful sequencing and reinforcement of fundamental concepts, pupils will develop the scientific knowledge, skills, and confidence required to re-engage with their GCSE pathway, access post-16 opportunities, and make informed decisions about future study and careers in STEM and beyond.

How will benchmark/statutory assessments be used to track progress and inform practice?
For core subjects, including Science, pupils' progress will be measured against their initial baseline assessment and monitored through internal formative tracking. Where appropriate, statutory benchmark assessments from their mainstream school will be used alongside the Haven assessment framework to:

a. Track progress—ensuring alignment with age-related expectations, national curriculum and external exam requirements
b. Inform practice—highlighting priority areas for intervention, shaping teaching sequences, and ensuring pupils are well prepared to succeed in formal examinations arranged and hosted by their mainstream setting (where they have one)

Science and the Wider Curriculum

How does this curriculum area support the delivery of British Values, SMSC and cultural capital?
Science has a significant impact on pupils' spiritual, moral, social, and cultural (SMSC) development. Lessons are designed to help pupils explore and debate the moral and ethical implications of scientific advances—for example, in medical research, environmental sustainability, and road safety—encouraging pupils to develop and engage their own moral compass.

The curriculum also promotes respect and tolerance by highlighting the global and multicultural nature of scientific progress. Pupils study the contributions of scientists from diverse backgrounds, both contemporary and historic, moving beyond Eurocentric narratives to foster a broader cultural awareness and appreciation. Collaboration is integral to science; pupils are encouraged to work together, share ideas, and evaluate findings—reflecting the British Values of democracy, mutual respect, and individual liberty within the scientific method.

By embedding discussions on the societal impact of science and exploring a wide range of cultural contexts, the curriculum actively builds cultural capital, helping pupils understand the role of science in shaping modern life.

How will reading be developed as a core part of this subject?
Reading is central to science teaching and learning. Pupils engage with scientific texts to develop comprehension, summarising, and note-taking skills. Teachers explicitly teach and model strategies to help pupils read and interpret scientific information, encouraging metacognitive approaches and classroom dialogue to build deeper understanding.
Scientific vocabulary is systematically introduced, defined, and revisited to enable pupils to read, understand, and confidently use technical language. Pupils are supported to interpret exam questions, scientific articles, and data presentations, which strengthens literacy across multiple contexts. This approach ensures pupils can communicate scientific ideas clearly and accurately in both written and spoken forms.

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How will this subject support pupils' knowledge and understanding for life beyond education?

Science supports pupils in becoming informed and critical thinkers who can interpret information, question evidence, and make reasoned decisions in everyday life. Pupils develop transferable skills—including data analysis, problem-solving, collaboration, and communication—that are valuable across a wide range of careers and contexts beyond school.

Through studying science, pupils also gain a better understanding of their physical environment, health, and the impact of science and technology on society. The curriculum aims to equip pupils with the knowledge and confidence to navigate scientific and technological developments, preparing them for further study, work, and participation in a rapidly changing world.