Curriculum Overview - Science

Principles and Purpose of the Science Curriculum

The purpose of the science curriculum is to develop children's scientific understanding so they can be scientifically informed citizens and, if they wish, pursue careers in science, or in careers that require some scientific understanding. To be scientifically informed requires a broad knowledge of scientific ideas, an appreciation of how experimentation and observation develop this knowledge, and an ability to think rationally and analytically when applying this knowledge in new contexts.

The following principles have informed the planning of the United Learning curriculum across all subjects.

- **Entitlement:** All pupils have the right to learn what is in the United Learning curriculum, and schools have a duty to ensure that all pupils are taught the whole of it.
- **Coherence:** Taking the National Curriculum as its starting point, our curriculum is carefully sequenced so that powerful knowledge builds term by term and year by year. We make meaningful connections within subjects and between subjects.
- **Mastery:** We ensure that foundational knowledge, skills and concepts are secure before moving on. Pupils revisit prior learning and apply their understanding in new contexts.
- **Adaptability:** The core content – the 'what' – of the curriculum is stable, but schools will bring it to life in their local context, and teachers will adapt lessons – the 'how' – to meet the needs of their own classes.
- **Representation:** All pupils see themselves in our curriculum, and our curriculum takes all pupils beyond their immediate experience.
- **Education with character:** Our curriculum - which includes the taught subject timetable as well as spiritual, moral, social and cultural development, our co-curricular provision and the ethos and 'hidden curriculum' of the school – is intended to spark curiosity and to nourish both the head and the heart.

Here we explore these principles in the context of the science curriculum:

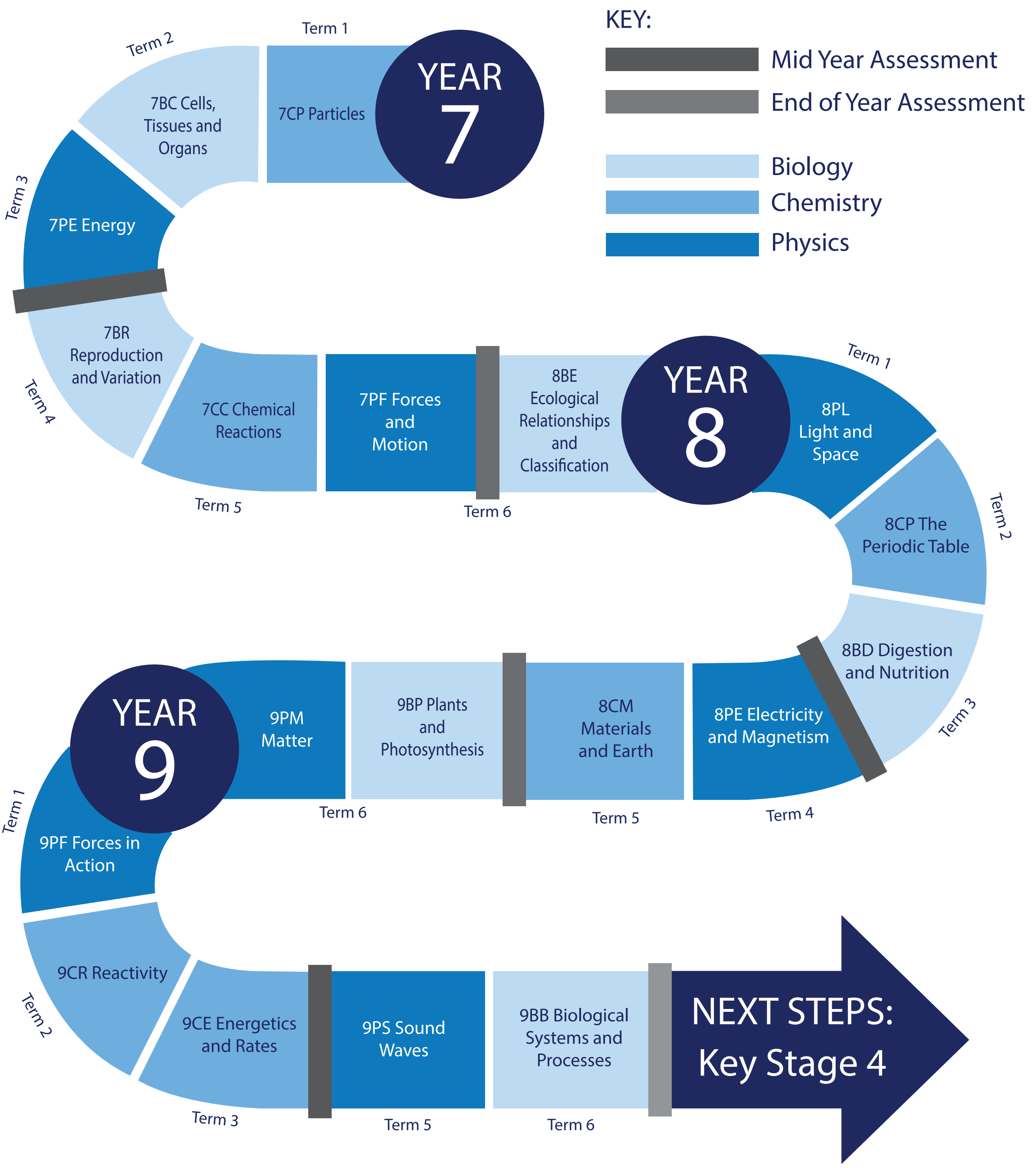
- **Entitlement:** The United Learning science curriculum covers the National Curriculum. We have added to the content covered by the National Curriculum, but we have not removed any content specified in the National Curriculum.
- **Coherence:** We sequence our units to introduce knowledge and new ideas in a way that begins with the simplest and builds to the more complex, including a range of vertical concepts developed over time in a variety of contexts.
- **Mastery:** Reviewing prior knowledge is threaded throughout all units, with concepts and skills revisited, built upon, and developed in new contexts.
- **Adaptability:** All lesson materials are editable, with advice included to help teachers adapt lessons to suit their context, including scaffolding examples and assessment tools to identify gaps in learning.
- **Representation:** A diverse range of names, images and scientists are used in resources throughout the curriculum so that students from all backgrounds recognise the relevance of science.
- **Education with character:** The science curriculum raises several ethical, culturally significant, or sensitive questions which students will want to explore in ways that go beyond the curriculum. We encourage teachers to respond sensitively to these and use their professional judgement to help students to reflect and have informed opinions on these.

Roadmap of the Science Curriculum

- The roadmap diagram on the following page sets out the route that we expect pupils to take through our curriculum. The roadmap shows the suggested route-through of topics in the curriculum – all of which must be taught. There is some flexibility for schools in terms of the precise sequence of units. When considering adapting the unit sequence, schools should take the following into account:
    - In Key Stage 3, we take a year-by-year approach to teaching the curriculum. Each unit has a code, which specifies the year in which it will be assessed in the United Learning end of year exams, the subject, and the unit title (e.g., **7PF** (Year **7** **P**hysics **F**orces). **All schools are expected to teach those units assigned for assessment in a given year, by the end of the year.** For example, '8BE Ecological Relationships and Classification' is sequenced at the end of Year 7 but is assessed in the Year 8 end of year exam. The suggested route-through is flexible *within* each year, but not from year to year. For example, schools can teach '8BE Ecological Relationships and Classification' at any time of their choosing before the Year 8 exam but must teach all Year 7 units before doing so. All units with a code beginning with a 7 must be taught before those with a code beginning with an 8, and so on.
    - In Key Stage 4, we suggest a unit sequence for each of the three sciences. Schools may teach their own unit sequence providing that **all paper 1 units are taught in time for the Year 10 common mock, and before the teaching of paper 2 content begins**.

United Learning
The best in everyone™

SCIENCE
Key Stage 3



'Why This, Why Now?'

In our planning, we have asked ourselves 'why this, why now?' In the science curriculum, we have several vertical concepts that appear in different units over the course of both Key Stage 3 and 4. A list of these can be found in Appendix A. Below we provide some examples of the curriculum choices we have made, based on these concepts, and why the units have been placed in the order we have chosen:

- **Example 1:**
  - Year 7 starts with 7CP Particles, in which we introduce the concept of diffusion. We have placed this unit here as an understanding of particle behaviour is fundamental to all three sciences, and that movement in and out of cells requires an understanding of diffusion, which is taught in the next topic, 7BC Cells, Tissues and Organs. The idea is developed later in 9 PM Matter and will be revisited in a range of topics at Key Stage 4, including Organisation.
- **Example 2:**
  - In 7PE Energy, we introduce the idea that energy is transferred between stores. This concept is applied in 8PE Electricity and Magnetism and developed further in Key Stage 4 in Energy, where energy is also quantified, using energy formulae. Energy is also linked to Forces via work done, which is introduced in 9PF Forces in Action, as well as Forces and Motion in Key Stage 4.
- **Example 3:**
  - In Year 8, we introduce the Bohr model of the atom. This is an important part of the vertical concept, 'reactions rearrange particles', which begins in Year 7 with 7CC Chemical Reactions. The Bohr model is revisited in Atomic Structure and Periodic Table in Key Stage 4 chemistry, as well as Atomic Structure in physics, and is prerequisite knowledge for the next chemistry topic, Bonding, which in turn is foundational to many of the remaining chemistry units.
- **Example 4:**
  - 'Forces affect motion' is a fundamental idea in physics and is explored at length in Year 11 when Newton's laws of motion are introduced formally for the first time. The fundamentals to this concept are first introduced in 7PF Forces, built upon in 9PF Forces in Action, before simple Newtonian mechanics are explored in depth in Forces and Motion in Year 11
- **Example 5:**
  - In biology, the idea that 'species show variation' is central to understanding how organisms have evolved. This idea is introduced in Year 7 with 7BR Reproduction and Variation, with Darwinian natural selection introduced in Year 8, with 8BE Ecological Relationships & Classification. The genetic underpinning of variation is introduced in 9BB Biological Systems and Processes and developed further, alongside evolution and speciation in Key Stage 4 in Inheritance and Selection.

Teaching the Science Curriculum

The lessons do not follow a single template, as science can vary widely in the ideal approach. However, the following elements will be present over the course of a topic:

- **'Do Now' slides that review prior learning** - this is usually in the form of a short, self-assessed quiz, but teachers are encouraged to adapt these to address or identify specific assessed gaps in learning. There are often slides following the 'Do Now' to cover essential prior knowledge, which teachers will need to use adaptively, depending on their class context.

- **Explanation guidance** - where relevant, we have included guidance for teachers when explaining key concepts. It is not expected that teachers will routinely 'click through' these explanations, but they are provided to support less experienced teachers and non-specialist teachers.
- **Modelling** – in many lessons, some slides provide models for teachers to exemplify best practice. In some cases (e.g., drawing a free body force diagram) the slides are provided to support teachers who are not confident in 'live' modelling using a whiteboard or visualiser. However, ideally, it is expected that teachers model these processes in 'real time' with students, using questioning to support and develop their construction. In writing, the resources contain model responses (WAGOLLS - What A Good One Looks Like) which exemplify a model of good writing for that concept (e.g. explaining natural section). As before, teachers are encouraged to use these to inform 'live' modelling of written responses as well as highlighting the features of good responses.
- **Guided practice** – in many lessons there are specific slides to support guided practice, with prompts to support teachers in working through an activity after it has been modelled. This often includes the use of mini-whiteboards to check for understanding as practice is being guided. It may also involve showing how to use scaffolds to frame written work.
- **Scaffolds** – where appropriate, examples of scaffolds have been provided to support student practice and structure their thinking. These include the provision of essential terminology to use in writing, tabular frameworks to help structure longer response writing and success criteria to inform self-review during a task.
- **Self/peer assessment** – in all lessons, there is an emphasis on students assessing their own work. Where relevant, the key terminology, or features of a correct response are highlighted so that teachers can direct students explicitly to these during self/peer assessment.

It is expected that teachers should adapt the lesson resources for their class contexts. Guidance on what should be considered when adapting the lesson materials can be found here.

So, when we walk into a science lesson, what should we expect to see?

- In **all** science lessons we expect to see:
  - A low stakes knowledge 'Do Now' quiz
  - A short review of any prior knowledge essential for that lesson (this may be included in the 'Do Now', or follow from it)
  - Lesson activities that relate clearly to each learning outcome and no activities that do not relate to them (excepting the 'Do Now').
  - Student self-assessment against success criteria/mark scheme/model answer for all written work carried out in the lesson.
  - Authentic lesson activities, by which we mean:
    - activities are both scientifically valid and;
    - representative of what students will be expected to do in exams (e.g., labelling organelles in cells rather than drawing cells, no poster work).
  - Written work that is always the product of a student's own thinking. There should be no copying of notes (any notes should be printed for students when required).

- Over the course of several science lessons we would expect to see:
  - Explicit command verb skills development (e.g., 'evaluate' 'compare' 'describe' 'explain' with appropriate modelling via 'I, we, you', **this should be particularly frequent in Key Stage 4**).

- Maths skills and working scientifically skills are taught in context and gaps are assessed and addressed via fluency quizzes.
- Independent practice that includes application activities, including core exam command verb practice, maths skills and WS skills where applicable.
- Homework set that is based on self-quizzing of core knowledge, topic question packs and further exam question practice (there are examples of homework activities in the curriculum materials).

- In Sixth Form science lessons we would not expect to see anything fundamentally different to the above, and all the features of Key Stage 3 and 4 lessons apply to Key Stage 5. However, some differences may be as follows:
  - Checks for understanding are likely to look different to those found in Key Stage 3 or 4, given the greater likelihood of smaller classes at Key Stage 5, but they should still be regular.
  - More new material can likely be delivered in larger chunks (given the ability and age of the students) before, for example, any guided practice.
  - Teacher modelling will likely involve more complex concepts which cannot easily be broken up without losing meaning, therefore we may expect to see longer direct instruction. Teachers should avoid lessons becoming long lectures, and student should still get the opportunity to consolidate new material before moving on.
  - 'Do Now' may be more complex at Key Stage 5 but will still involve regular retrieval practice.
  - The length and complexity of independent activities will be greater at Key Stage 5, as will the nature of any scaffolding, which will more likely be scientifically focused and will be less likely to guide students' general literacy.

Our curriculum is designed to provide a challenge for all learners. Teachers are expected to adapt resources for the needs of their students. For lower attaining students, this may involve adapting scaffolds. This will vary depending on the class context, but teachers should ensure that the students are being taught the same learning outcomes. The general principle is that the outcomes are the same for all students, but that the scaffolding is targeted to different students' needs.

Working scientifically skills are embedded in lessons, and always taught within a science context. We do not have standalone working scientifically units or lessons, and wherever possible each skill will be delivered across each of the three sciences.

The working scientifically content of lessons should be adapted by teachers for each class, based on formative assessment. Fluency quizzes (see assessment section below) are available in both Key Stage 3 and 4 and are intended to provide regular practice of the skills and core knowledge, as well as being a simple tool for teachers to identify gaps, informing future in-lesson interventions.

In Key Stage 4, we have taken the approach of assigning two lessons to each required practical activity, where appropriate, so that there is a lesson to complete the practical and one further lesson consolidating working scientifically skills in the context of that practical.

In Key Stage 3 many topics have a 'required' practical, and accompanied Working Scientifically KPI task, to mimic the approach at Key Stage 4. A list of these practicals can be found in Appendix B. Schools are free to adapt these resources, and the practicals, but whatever they choose, they are encouraged to have a set of required practicals to be delivered by all teachers, to ensure a minimum set of practicals in Key Stage 3 so that there is a consistent, guaranteed minimum offer of working scientifically across the key stage.

In both Key Stage 3 and 4, it is not intended that these practicals constitute the only experience of working scientifically for students. Teachers should be aiming to include elements of working scientifically in most lessons, and that these should be responsive to assessed gaps in students' knowledge or understanding (e.g., via fluency quizzes).

Safe Practical Work

It is the responsibility of all schools to add risk assessments to their schemes of work. The United Learning schemes of works do not include risk assessments or detailed advice on health and safety. It is expected that teachers should practice practicals before the lesson and consult with technicians or senior teachers where necessary to clarify the risks involved. In addition, all teachers will need to adapt the school risk assessment to ensure that **all practical work is risk assessed in the context of the individual laboratory and class in which it is carried out**. Further details on what risk assessments in science should look like can be found in CLEAPSS guidance document L196 and PS090 (available from the CLEAPSS website or the A-Z section of the H&S pages on the United Hub).

All United Learning schools are members of CLEAPSS and can access their resources via the group log-in, which is published on the A-Z section of the H&S pages on the United Hub. The United Learning Group Health & Safety Manager is Stuart Males, who is also the Radiation Protection officer for the group. If you are a Head of Department who wishes to make enquiries about United Learning policies concerning health and safety (e.g., radiation protection) in science should email him in the first instance at Stuart.Males@unitedlearning.org.uk. Queries about science in general (technical, procedural, etc.) should be directed to the CLEAPSS helpline.

Assessing the Science Curriculum

Formative Assessment in Science

We recommend that schools adopt whole class feedback when formatively assessing students' written work. The approach is outlined in this short pre-recorded CPD session and the accompanying resources can be found here.

Weekly fluency quizzes are an effective method of identifying and consolidating core knowledge and skills. Here is a short pre-recorded CPD session and with accompanying resources here, outlining how fluency quizzing can be used by teachers to identify and address gaps in working scientifically.

All lessons have 'Do Now', and these are mostly made of knowledge retrieval questions selected to cover relevant prior knowledge for the lesson. Teachers are expected to adapt these to meet any assessed gaps in knowledge, and they are intended to be part of a wider retrieval practice regime set by the school, for example using the knowledge organisers available for each topic.

All lessons have mark schemes, model answers or success criteria for all written work and it is expected that teachers ensure that students self assess and make corrections to their work based on these.

The Key Stage 3 curriculum has been divided into a series of statements to support formative assessment, called Key Performance Indicators (KPIs). KPIs are a summary of what a student should be able to do by the end of a topic, having been taught the curriculum content. There are also KPIs for working scientifically, which are intended to be assessed throughout the key stage.

There are editable tasks for each KPI, which schools can use to formatively assess students' progress against the KPIs. This applies to the Key Stage 3 'required' practicals, where there are tasks to assess students work against the WS KPIs. There is no requirement for schools to track or report the KPIs.

Summative Assessment in Science

The summative assessment provided includes three types of assessment: optional topic tests, optional mixed-topic tests, and compulsory end of year exams.

Topic tests have been produced for each topic – all are approximately 50 marks and include the elements of working scientifically that have been developed during the unit, in addition to the specified content for that unit. Schools may adapt these as they see fit.

Alternatively, if a school prefers to adopt a mixed topic testing approach there is a parallel set of summative tests to support this. These tests follow the suggested route, and a grid of how this might look can be found in Appendix C.

The mixed-topic tests will contain an approximate mix 75%:25% split of current content to previously taught content. As part of this approach, there is an optional mid-year assessment (but no United Learning wide data collection).

The topic tests and mixed-topic tests are intended to be parallel summative assessment regimes, and as such, the pool of questions from which each is drawn is the same. This means that schools should follow *either* the topic testing route or the mixed-topic testing route. Adopting a mixture of the two approaches carries a risk of students meeting the same question more than once. **All tests are editable, except for the end of year exams.**

End of year exams are written for each of Year 7, 8 and 9, and these are not editable and are compulsory for all United Learning Academies. The end of year exams can be sat by students in the testing window as specified in the United Learning Assessment Calendar.

Recovery and Catch-up in Science

Students requiring catch up can be identified via internal assessment data or end of year exams. In addition, all students will likely have some gaps from lockdown learning that will require a form of catch up. There is likely considerable variation in the amount and nature of the curriculum that needs catching up in different students. Therefore, if this is the case for your school, we do not recommend specific catch up units at the beginning of term as these are unlikely to be well-targeted. The general approach we recommend is as follows:

- Teach the curriculum and formatively assess relevant prior knowledge as students progress through the curriculum, addressing gaps throughout the course of the year in the context of related topics.
- Use weekly fluency quizzes to identify gaps in fundamentals with teachers planning associated activities based on that information to address any identified gaps in lessons.
- Use whole class feedback to identify common gaps that can be closed in the feedback review lessons that should follow every piece of whole class feedback.

- Map additional 'pause point' lessons into the curriculum throughout the year to reteach fundamental knowledge, with working scientifically weaved into these (this is an area that online learning has likely neglected).

Progression in the Science Curriculum

Progression between Key Stages

Primary to Secondary:

- The United Learning Key Stage 3 curriculum is planned on the basis that students will arrive in Year 7 having been taught the National Curriculum in their primary school.
- The relevant prior knowledge for each unit in Year 8 (and where relevant in subsequent years) is outlined in the relevant schemes of work.
- Teachers should assess this on a unit-by-unit basis and address any gaps in required prior knowledge accordingly.

Key Stage 3 to Key Stage 4:

- The United Learning Key Stage 3 curriculum is an essential foundation to Key Stage 4, and GCSE exams assume knowledge of the Key Stage 3 curriculum. Therefore, **all Key Stage 3 content should be taught before starting any Key Stage 4 units**.
- There is flexibility allowed on when this transition will take place, for example by completing Key Stage 3 in the Spring term of Year 9, but any early start to Key Stage 4 must be justified by having a robust delivery of Key Stage 3 in the first instance. Superficial teaching of Key Stage 3 will lead to gaps in students' understanding requiring reteaching in Year 10 or 11.
- Heads of Department should take steps throughout Key Stage 3 to 'sell' separate science (see below) to higher attaining students, both as a pathway to Key Stage 5 study of science but also as an essential aspect of a rounded intelligence for higher attaining students.
- Teachers should ensure that careers in science and using science are referenced regularly in lessons and begin talking to students about separate science and further Key Stage 5 study from Year 7 onwards.
- Schools should make efforts throughout Key Stage 3 to communicate to students about the importance of science, and its relevance to their lives, regardless of their potential future choices at Key Stage 5. Teachers should not use the fact that science is a core subject to avoid selling the virtues of the subject to students at every opportunity.

Key Stage 4 to Key Stage 5:

- Separate science GCSE is the preferred pathway to Key Stage 5 study of science, and beyond. Ideally, separate science should be taught within an option block, to higher attaining students. Guidance on how students should be selected for separate science can be found here.
- The selection process for separate science should be clear to all students and parents from Year 7 and schools should continually review the target groups in the light of assessment evidence.
- A range of evidence from Key Stage 3 should be used to target the highest attaining students towards separate science.
- Students doing separate science should be aiming for a minimum of grade 6s in each of the sciences, which corresponds approximately to the 76th percentile rank in United learning Key Stage 3 exams. This should not be applied rigidly, and therefore students working at age-related grade 5 (59th percentile and above) could also be considered if other evidence indicates they are suitable for separate science.

- Students studying science beyond Key Stage 5 should be supported with suitable transition materials that consolidate the fundamentals from Key Stage 4.
- Studying any of the three sciences at Key Stage 5 can lead to a wide variety of careers and further study, more details of which can be found via the UCAS links below.
- Students studying science at A level, and particularly those with aspirations of studying science at university should be encouraged to consider doing maths at A level. This is particularly important for students doing physics at A level where the study of maths at A level should be a requirement.

Progression to University and Careers

Key Stage 5 to University:

- Studying science at Key Stage 5 opens a huge range of possible degree choices, from aerospace engineering to zoology. Each will require a different transition from Key Stage 5 to degree and a range of reasons to study, depending on the ambitions of individual students. The UCAS website is a good source of information on the different destinations for Key Stage 5 scientists and can be used as a reference point for both teachers and students.

- The table below has links to each of these pages:

Aerospace engineering	Agriculture	Biological sciences	Chemistry	Civil engineering
Dentistry	Electrical and electronic engineering	Engineering and technology	Game design	Geology
Mathematical sciences	Mechanical engineering	Medicine	Midwifery	Molecular biology, biophysics and biochemistry
Nursing	Optometry	Paramedic science	Pharmacology	Physical sciences
Physiology, physiotherapy and pathology	Psychology	Radiography	Veterinary science	Zoology

The Science Curriculum Website

Our classroom resources are designed to put teachers in the driving seat. We provide centrally planned resources so that teachers can focus on preparing lessons for their classes and pupils. We have tried to be clear about the purpose of each resource, and all of the resources we have produced support the principles shared in this document. Ultimately, once a teacher downloads and adapts a resource, it becomes their lesson.

All resources can be found on the United Learning Curriculum Website.

Appendix A – Vertical Concepts

KEY STAGE 3					
Vertical Concept	**Unit 1**	**Unit 2**	**Unit 3**	**Unit 4**	**Unit 5**
Cells carry out life processes	Cells, tissues, and organs	Reproduction & Variation	Plants & photosynthesis	Biological Systems & Processes	
Multicellular organisms act as systems	Cells, tissues, and organs	Reproduction & Variation	Digestion & Nutrition	Plants & Photosynthesis	Biological Systems & Processes
Genes are inherited	Cells, tissues, and organs	Reproduction & Variation	Biological Systems & Processes		
Species show variation	Reproduction & Variation	Ecological Relationships & Classification			
Organisms are interdependent	Ecological Relationships & Classification	Plants & Photosynthesis			
Matter and energy are cycled in ecosystems	Ecological Relationships & Classification	Plants & Photosynthesis			
Properties are determined by the structure	Particles	Atoms & the Periodic Table	Matter		
Reactions rearrange particles	Chemical Reactions	Atoms & the Periodic Table	Reactivity	Energetics & Rates	
Reactions involve energy	Chemical Reactions	Atoms & the Periodic Table	Reactivity	Energetics & Rates	
Earth as a dynamic system & source of raw materials	Materials & the Earth	Plants & Photosynthesis			
Energy is transferred between stores	Energy	Light & Space			
Energy is transferred by different mechanisms	Energy	Light & Space	Electricity & Magnetism	Sound waves	
Forces act through fields	Light & Space	Electricity & Magnetism			
Forces affect motion	Forces & Motion	Light & Space	Forces in Action	Matter	
Mass and energy are conserved					

KEY STAGE 4							
Vertical Concept	**Unit 1**	**Unit 2**	**Unit 3**	**Unit 4**	**Unit 5**	**Unit 6**	**Unit 7**
Cells carry out life processes	Cell Biology	Organisation	Infection & Response	Bioenergetics	Homeostasis & Response		
Multicellular organisms act as systems	Organisation	Infection & Response	Bioenergetics	Homeostasis & Response			
Genes are inherited	Cell Biology	Inheritance, Variation & evolution					
Species show variation	Ecology	Inheritance, Variation & evolution					
Organisms are interdependent	Ecology	Inheritance, Variation & evolution					
Matter and energy are cycled in ecosystems	Bioenergetics	Ecology					
Properties are determined by the structure	Atomic Structure & the Periodic Table	Bonding, Structure & Properties of Matter	Chemical Changes	Particle Model of Matter			
Reactions rearrange particles	Bonding, Structure & Properties of Matter	Chemical Changes	Quantitative Chemistry	Organic Chemistry			
Reactions involve energy	Chemical Changes	Energy Changes	Rates of Reaction	Organic Chemistry			
Earth as a dynamic system & source of raw materials	Chemical Changes	Organic Chemistry	Chemistry of the Atmosphere	Using Resources			
Energy is transferred between stores	Energy	Electricity	Atomic Structure	Forces			
Energy is transferred by different mechanisms	Energy	Electricity	Particle Model of Matter	Forces	Waves		
Forces act through fields	Electricity	Forces	Magnetism & electromagnetism				
Forces affect motion	Forces	Magnetism & electromagnetism					
Mass and energy are conserved	Energy	Quantitative Chemistry	Chemical Changes	Ecology	Rates of reaction	Particle Model of Matter	Magnetism & Electromagnetism

Appendix B – Key Stage 3 ‘Required’ Practicals

YEAR 7		
Topic	**Practical**	**Skills covered**
7BC	Microscope	7BC1, WSME1
7BC	Diffusion	WSSK2, WSAN2
7CP	Distillation	WSAT2, WSAN 4
7CC	Acid & alkali titration	WSAN 1, WSAN 2
7PE	Energy in food	WSAT 2, WSSK 2
7PE	Cooling down	WSSK1, WSAN 3
7PF	The relationship between mass & weight	WSAN 2, WSME1

YEAR 8		
Topic	**Practical**	**Skills covered**
8BD	Food tests	WSAT 2, WSAN 1
8BD	Digestion of starch	WSSK1, WSAN 3
8BE	Sampling	WSSK4, WSAN2
8CP	Conservation of mass - MgO	8CP2, WSAN3
8PL	Law of reflection	WSSK2, WSAN2
8PE	Series and parallel circuits	8PE1, WSSK3
8PE	Ohms Law	8PE1, WSME1, WSAN 1

YEAR 9		
Topic	**Practical**	**Skills covered**
9BP	Observing stomata	WSAN1, 9BP3
9BP	Testing a leaf for starch	WSAT2, 9BP2
9BB	Building a DNA model	WSAT1, 9BB5
9CE	Measuring rates of reaction	WSSK2, WSAN 2
9CR	Displacement reactions	WSAN3, 9CR1
9PF	Hooke’s law	WSAN1, WSAN2
9PF	Balance	WMSE1, 9PF1

Appendix C – Suggested Mixed-Topic Test Assessment Schedule

<table>
<tr><th>Term</th><th>Year 7</th><th>Year 8</th><th>Year 9</th></tr>
<tr><td rowspan="4">Autumn Term</td><td>7CP</td><td>8PL</td><td>9PF</td></tr>
<tr><td>7BC</td><td>8CP</td><td>9CR</td></tr>
<tr><td>Mixed-topic test</td><td>Mixed-topic test</td><td>Mixed-topic test</td></tr>
<tr><td>7PE</td><td>8BD</td><td>9CE</td></tr>
<tr><td colspan="4">Mid-year exams (Dec to Jan testing window)</td></tr>
<tr><td rowspan="2">Spring Term</td><td>7BR</td><td>8PE</td><td>9PS</td></tr>
<tr><td>7CC</td><td>8CM</td><td>9BB</td></tr>
<tr><td></td><td>Mixed-topic test</td><td></td><td></td></tr>
<tr><td rowspan="3">Summer Term</td><td>7PF</td><td colspan="2">End of year exam</td></tr>
<tr><td>End of year exam</td><td>9BP</td><td rowspan="2">Start KS4 content</td></tr>
<tr><td>8BE</td><td>9PM</td></tr>
</table>