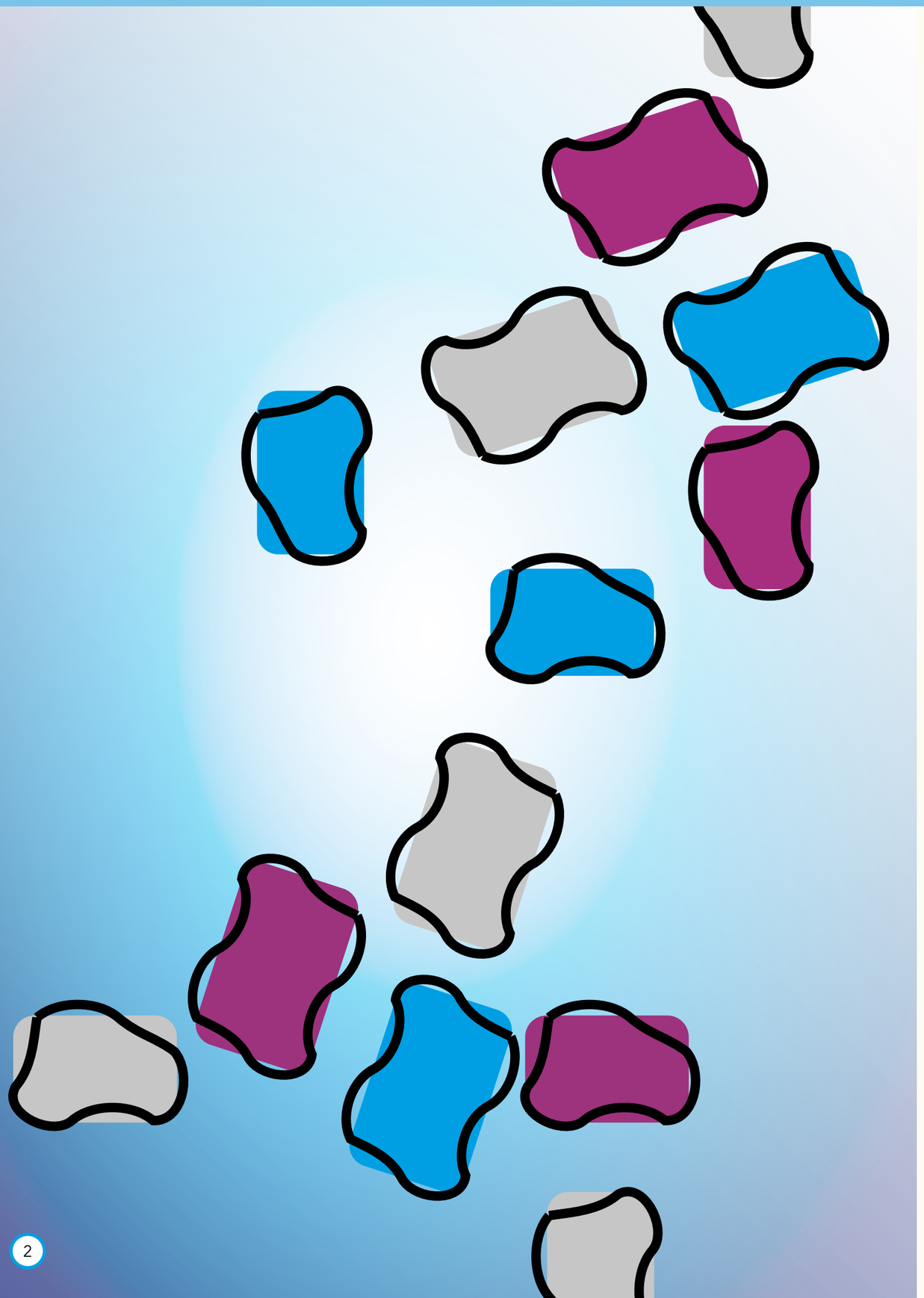
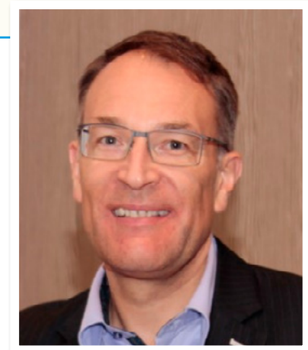
EXPLORING SCIENCE

WORKING SCIENTIFICALLY

Exploring Science, the Ofsted Framework and high-quality science education

Pearson





As a science educator I have always been determined that science should be presented as a living, breathing subject full of ideas, evidence and debate, rather than one of 'facts'.

This was one of the founding principles on which ***Exploring Science*** *was originally built. The course was not designed to provide a rigidly prescriptive approach with the sole aim of getting students to pass exams; it was developed as a flexible resource to encourage and motivate as many students as possible to take an active interest in science, its relationship with themselves and the world around them. Obviously, the course also included all the necessary materials to help students pass their exams!*

Over two decades, and various editions later, this is still at the core of ***Exploring Science****. It is a course that provides materials to help all students achieve their best, while encouraging them to explore; to think about the deeper hows and whys of science, rather than simply to learn the 'right answers' from a revision guide.*

It is in this spirit that the Oftsed Framework is to be welcomed.

Mark Levesley, series editor.

Ofsted updated its Education Inspection Framework for use from September 2019.

In April 2021 Ofsted published a science research review as part of a new series looking at what makes for a high-quality education in different subjects across the curriculum.

Here we consider how Exploring Science supports the Education Inspection Framework and uses many of these principles in the design of the well-loved series, now in its 4th edition.

How *Exploring Science* supports the Ofsted framework

Quality of education – **Intent**

Leaders take on or construct a curriculum that is ambitious and designed to give all learners, particularly the most disadvantaged and those with special educational needs and/or disabilities (SEND) or high needs, the knowledge and cultural capital they need to succeed in life.

- Four levels of differentiation (Access, Developing, Securing, Exceeding) ensuring that all students can work and be challenged an appropriate level.
- Targeted development of scientific skills (through Working Scientifically activities), many of which are applicable to many aspects of life.
- Targeted development of literacy and communication skills (through Literacy & Communication activities); skills that increase confidence and success.

The provider's curriculum is coherently planned and sequenced towards cumulatively sufficient knowledge and skills for future learning and employment.

- Exploring Science introduces new material in a step-wise, spiral fashion, building on previous learning throughout.
- Exploring Science is coherently planned using both conceptual and cognitive developmental aims underpinned by a detailed and comprehensive analysis of curriculum requirements and pedagogical research.
- Skills (Scientific, Literacy, Communication) as above.

The provider has the same academic, technical or vocational ambitions for almost all learners. Where this is not practical – for example, for some learners with high levels of SEND – its curriculum is designed to be ambitious and to meet their needs.

- Four levels of differentiation, with students encouraged to move through them as and when they are ready.

Learners study the full curriculum. Providers ensure this by teaching a full range of subjects for as long as possible, 'specialising' only when necessary.

- Planning covers all of KS3 Curriculum but is not limited by it (e.g. including basic coverage of circulatory system in preparation for KS4 work.)

Quality of education – **Implementation**

Teachers have good knowledge of the subject(s) and courses they teach. Leaders provide effective support, including for those teaching outside their main areas of expertise.

- Background information for non-specialist teachers.
- Clear instructions for all activities, including ideas for each to lower or increase demand.

Teachers present subject matter clearly, promoting appropriate discussion about the subject matter they are teaching. They check learners' understanding systematically, identify misconceptions accurately and provide clear, direct feedback. In doing so, they respond and adapt their teaching as necessary, without unnecessarily elaborate or differentiated approaches.

- Student Book is clearly laid out but in an engaging 'magazine' style that promotes interest and enquiry.
- Student progress can be checked and monitored in many different ways (some formative and some summative) including:
  - Topic by topic assessment (Student Book questions, Quick Check Sheets, Progression Check sheets)
  - Unit by unit (Quick Quizzes, Assess yourself sheets, Open-ended assessment task, Working Scientifically investigations, differentiated End of Unit tests)
  - Year by year (End of Year tests).
- Intervention materials (Worksheets, Summary Sheets, Word Lists, Plenary activities all of which have Assessment, Feedback and Action Plan components).

Over the course of study, teaching is designed to help learners to remember in the long term the content they have been taught and to integrate new knowledge into larger concepts.

- Interesting asides to encourage and motivate (including Opener unit pages in Student Book, Fact boxes, activities that move beyond the curriculum).
- Material builds throughout a unit and through the year (including Closer unit pages in Student Book, and repeated coverage of previous material).
- Links given for cross-curricular opportunities.

Teachers and leaders use assessment well, for example to help learners embed and use knowledge fluently or to check understanding and inform teaching. Leaders understand the limitations of assessment and do not use it in a way that creates unnecessary burdens for staff or learners.

- Quick Quizzes and the first page of each Unit in the Student Book can be used for baseline assessment.
- Plenary activities contain action plans to ensure that assessment has a purpose.
- Formative assessment is embedded using a three-step model: Assessment – Feedback – Action. For example, Quick Checks which can be used to check understanding and inform teaching (assessment), self-assessment support (feedback) and summary sheets and skills sheets (action).
- Progress & Assess provides a full range of baseline and summative assessment opportunities.

Teachers create an environment that allows the learner to focus on learning. The resources and materials that teachers select – in a way that does not create unnecessary workload for staff – reflect the provider's ambitious intentions for the course of study and clearly support the intent of a coherently planned curriculum, sequenced towards cumulatively sufficient knowledge and skills for future learning and employment.

- Huge range of teaching and learning materials, and activity ideas, all of which come with further ideas for differentiation. This allows materials to be matched closely to the needs, abilities and aspirations of individual students.
- Many activity ideas are also suitable for after school science club work.
- Skills opportunities as above.

A rigorous approach to the teaching of reading develops learners' confidence and enjoyment in reading. At the early stages of learning to read, reading materials are closely matched to learners' phonics knowledge.

- Literacy & Communication Student Book pages, activities and Skills Sheets, highlight how and why language is used. This includes an emphasis on basic English grammar.
- Word lists and glossary are complete with pronunciations to increase confidence.

Quality of education – **Impact**

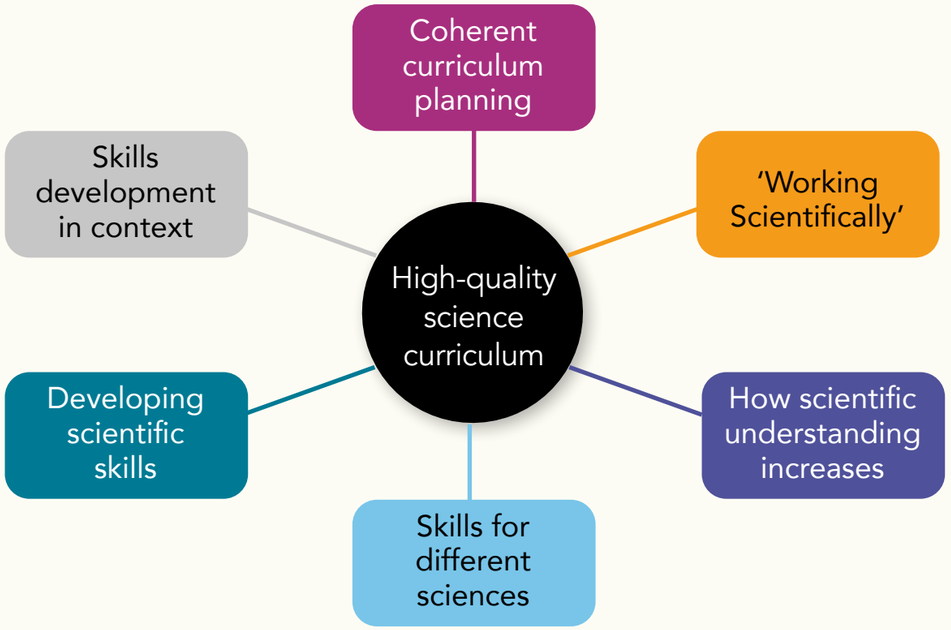
Learners develop detailed knowledge and skills across the curriculum and, as a result, achieve well. Where relevant, this is reflected in results from national tests and examinations that meet government expectations, or in the qualifications obtained.

- Whole KS3 Curriculum covered, with additional materials included to better support learning at GCSE.
- Clear support for answer exam style questions (e.g. command word identification).

Learners are ready for the next stage of education, employment or training. Where relevant, they gain qualifications that allow them to go on to destinations that meet their interests, aspirations and the intention of their course of study. They read widely and often, with fluency and comprehension.

- Student materials are not revision guide-style (although all units have full revision notes, and there are revision units). The overall style of student materials is to foster a sense of wonder, to promote curiosity, to understand the reach and impact of science, to debate and ponder the possibilities for the future. We are about exploring science not learning science.
- Scientific, Literacy and Communication skills as above.

What makes a high-quality science curriculum?



Based on the above, high-quality science education may have the following features

- The curriculum is planned to build increasingly sophisticated knowledge of the products (substantive knowledge) and practices (disciplinary knowledge) of science.
- Disciplinary knowledge (identified in the 'working scientifically' sections of the national curriculum) comprises knowledge of concepts as well as procedures.
- When pupils develop their disciplinary knowledge, they learn about the diverse ways that science generates and grows knowledge through scientific enquiry. This is not reduced to a single scientific method or taken to mean just data collection.
- The curriculum outlines how disciplinary knowledge advances over time and teaches pupils about the similarities and differences between each science.
- Pupils are not expected to acquire disciplinary knowledge simply as a by-product of taking part in practical activities. Disciplinary knowledge is taught.
- Scientific processes such as observation, classification or identifying variables are always taught in relation to specific substantive knowledge. They are not seen as generalisable skills.

Coherent curriculum planning

How scientific understanding increases

Developing scientific skills

'Working Scientifically'

Skills for different sciences

Skills development in context

Ofsted (April 2021) ***Research review series: science***, page 10.

Coherent curriculum planning

This edition of ***Exploring Science*** is the result of a year-long planning process, working with teachers and leading educational consultants. That process was further supported by detailed feedback, analysis and monitoring of three prior editions of this incredibly successful course.

However, the core ethos of ***Exploring Science*** has not changed; to foster a sense of wonder, to promote curiosity, to understand the reach and impact of science, and to debate and ponder the possibilities for the future.

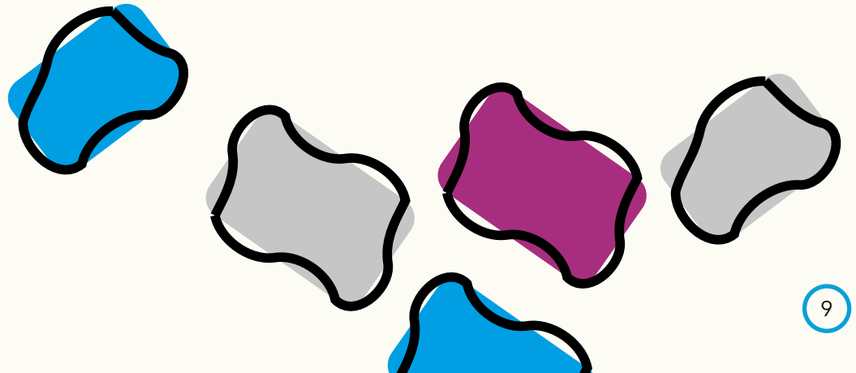
The course is about ***exploring*** science. It is about helping and inspiring students to become confident scientists, who are more than ready for the next steps in their education. And as they develop a solid understanding of substantive knowledge and disciplinary skills, they are motivated to become rounded, thinking citizens who are ready to take charge of the challenges of the future.

Some details on the planning

We are all used to the idea that students learn new ideas as they progress through school. But they also need to develop their abilities to use and think about those new ideas; they need to develop higher order thinking skills.

Bloom's was the taxonomy on which we based our planning, partly due to its familiarity but also due to its flexibility. We started by breaking down all the statements in KS1 to KS4 into their conceptual ('knowledge') and cognitive ('thinking') components. We sequenced all of the statements; the conceptual components in terms of perceived level of demand of concepts and procedures and the cognitive components using a version of Bloom's.

> *An ambitious curriculum therefore needs to identify the most important concepts for pupils to learn. It must also teach pupils how these concepts are related so that, over time, the logical structure of each scientific discipline is made explicit.*
>
> Ofsted (April 2021) ***Research review series: science***, page 6.



As students progress through the course, they should develop their understanding both conceptually and cognitively (as shown by the arrow on the diagram). This grid structure was developed for us to build the course. The completed grid allows us to see how different objectives relate to one another in terms of concepts and cognition, and the context in which any particular part of learning sits (where students are coming from and where they are going to).

		Cognitive Statements					
		Remembering	Understanding	Applying	Analysing	Evaluating	Synthesising & Creating
Big Idea divided into **Conceptual Statements**	• most difficult conceptual statement	students remember this	students understand this	students apply this	students analyse this	students evaluate this	students synthesise and/or create this
	• conceptual statement	students remember this	students understand this	students apply this	students analyse this	students evaluate this	students synthesise and/or create this
	• conceptual statement	students remember this	students understand this	students apply this	students analyse this	students evaluate this	students synthesise and/or create this
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	• easiest conceptual statement	students remember this	students understand this	students apply this	students analyse this	students evaluate this	students synthesise and/or create this

Parts of this grid have been published in the teacher's guide to show the context of the learning objective for a topic – where students are coming from and where they are going to. Below is an example of the first section of the grid from 8Ea Burning fuels.

This grid shows the basic concepts met in this topic, together with a scheme of cognitive progression for each concept. Opportunities to cover learning and progression are given. Working Scientifically concepts are integrated throughout the materials.

Conceptual statement	Cognitive progress					
	Remembering (a)	Understanding (b)	Applying (c)	Analysing (d)	Evaluating (e)	Synthesising & creating (f)
Fuels are used to transfer energy, usually using combustion.	State the meaning of: fuel, combustion. Name the three sides of the fire triangle. Recall examples of renewable and non-renewable fuels and their sources. Recall the fuel used in fuel cells.	Describe the factors that make up a good fuel. Describe how ethanol can be produced and used. Describe what happens in a fuel cell.	Describe how energy is transferred in a fuel cell. Explain why different types of fire need to be put out in different ways.	Compare the temperature rise of water when some fuels are burnt.	Evaluate alternative fuels compared with fossil fuels. Evaluate data on burning fuels to deduce the [best value for money, most energy per gram of fuel].	

Throughout *Exploring Science* students increasingly build their **substantive knowledge** (the products of science, such as concepts, laws, theories and models). **Disciplinary knowledge** 'Working Scientifically' is incorporated throughout so it can be taught in relation to specific substantive knowledge.

'Working Scientifically'

> *In high-quality science curriculums, knowledge is carefully sequenced to reveal the interplay between substantive and disciplinary knowledge. This ensures that pupils not only know 'the science'; they also know the evidence for it and can use this knowledge to work scientifically.*
>
> Ofsted (April 2021) *Research review series: science*, page 6.

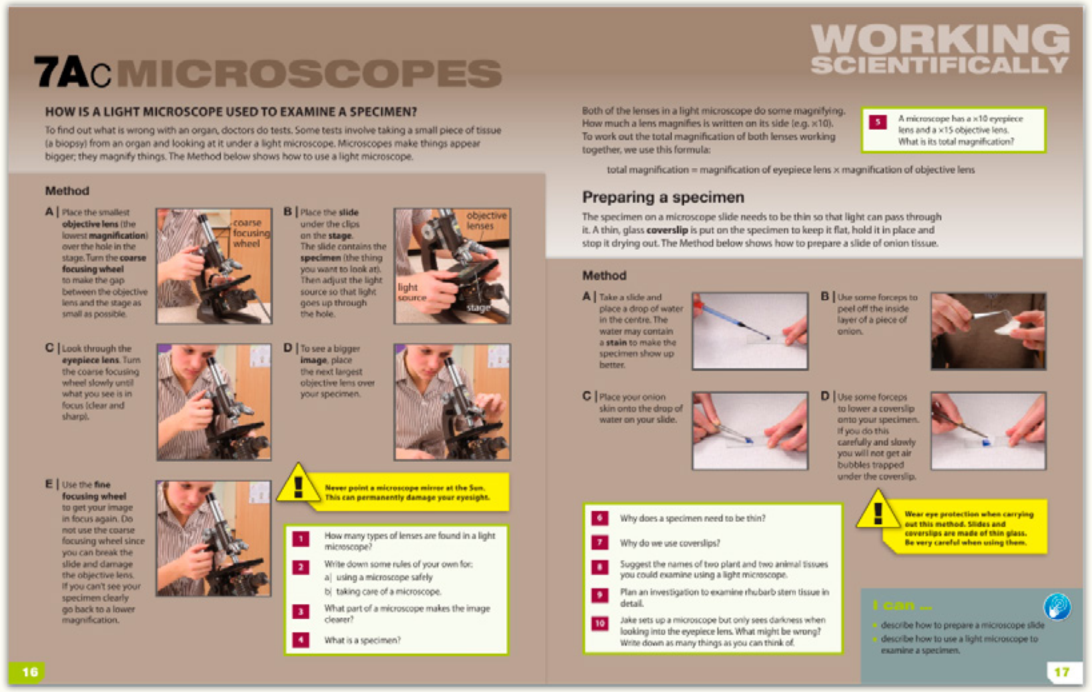
What is 'Working Scientifically'

'Working Scientifically' is essentially the set of skills that enable someone to work as a scientist. It is on this foundation of skills that the three main areas of content (biology, chemistry, physics) sit. 'Working Scientifically' covers both the skills needed for thinking about scientific problems and the skills needed to process and analyse the data.

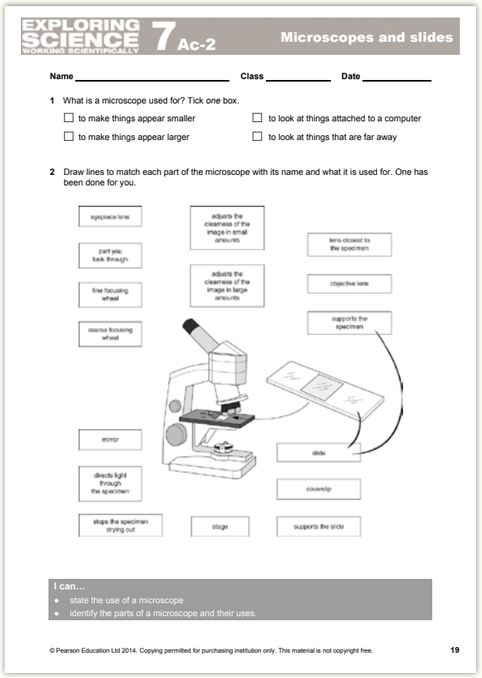
In *Exploring Science* students are not expected to acquire disciplinary knowledge simply as a by-product of taking part in practical activities. Disciplinary knowledge is taught.

'Working Scientifically' is tightly integrated throughout all the *Exploring Science* learning materials and this is highlighted at various points. Each unit has a section devoted to a specific skill.

'Working Scientifically' sections are supported by skills sheets and interactive activities. The same sets of skills can be practiced and developed multiple times and in many different ways, so that students don't get bored.



Example of a Working Scientifically section from *Exploring Science Year 7 student book*


EXPLORING SCIENCE WORKING SCIENTIFICALLY 7 Ac-2 Microscopes and slides

Name _____ Class _____ Date _____

1 What is a microscope used for? Tick *one* box.

- ☐ to make things appear smaller
- ☐ to make things appear larger
- ☐ to look at things attached to a computer
- ☐ to look at things that are far away

2 Draw lines to match each part of the microscope with its name and what it is used for. One has been done for you.

eyepiece lens
part you look through
fine focusing wheel
coarse focusing wheel
mirror
directs light through the specimen
stops the specimen drying out
adjusts the clearness of the image in small amounts
adjusts the clearness of the image in large amounts
stage
lens closest to the specimen
objective lens
supports the specimen
slide
coverslip
supports the slide

I can...
- state the use of a microscope
- identify the parts of a microscope and their uses.

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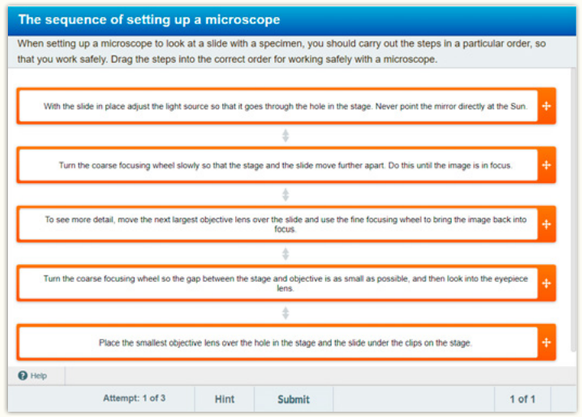
Example of a Working Scientifically skills sheet from *Exploring Science Year 7 Teacher and Technician Planning Pack*



Example of a Working Scientifically activity from *Exploring Science Year 7 ActiveTeach*

Mathematical skills

The 'Working Scientifically' material also provides links and cross-curricular teaching opportunities with Maths.

Working with a team of advisers, we have ensured that the maths in the course reflects the maths that is being taught in Years 7, 8 and 9. This means that students meet the same procedures in science as they do in maths, allowing them to practise the same skills in both subjects and to appreciate the range of scientific contexts in which mathematical understanding can be applied.

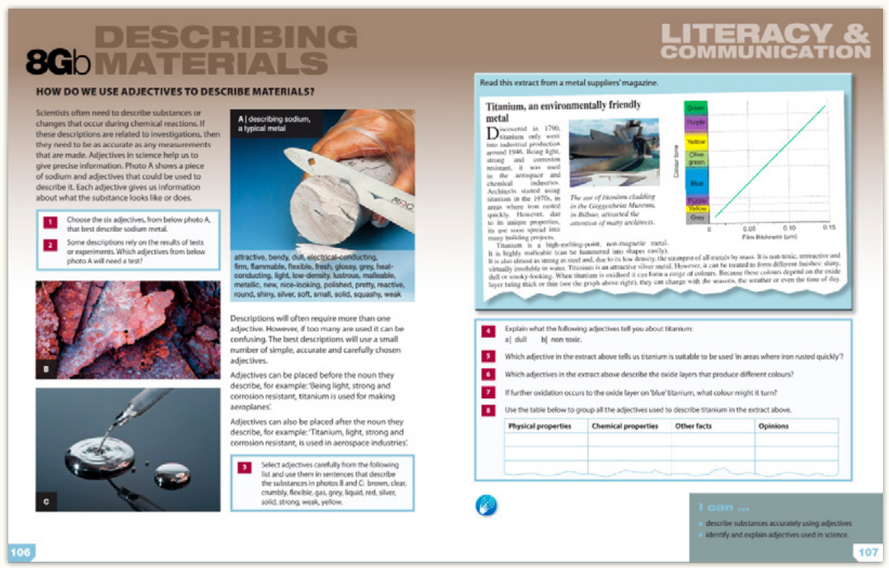
> *Planning for progression takes account of what is taught in other subjects. For example, the science curriculum should be coherent with what is taught in mathematics. Where there are differences, these are made explicit to pupils and teachers.*
>
> Ofsted (April 2021) ***Research review series: science***, page 13.

Literacy & Communication

> *There is strong correlational evidence to show that reading achievement is associated with science achievement generally.*
>
> Ofsted (April 2021) ***Research review series: science***, page 21

Exploring Science incorporates literacy and numeracy into its core teaching strategy. To meet the combined challenges of the extended writing questions in the GCSEs and the fact that many schools face challenges with students who have English as a second language, key English language and communication skills are also highlighted. Each unit contains one section devoted to a specific skill. These sections also provide links and cross-curricular teaching opportunities with English.

Literacy & Communication cover a variety of skills, including taking and making notes, summarising information, presenting ideas, title writing, persuasive writing and arguments. We have worked with Helen Lines, from the University of Exeter, throughout the development of the Literacy & Communication strand, ensuring that the terms and methodology match those that students will meet in English.



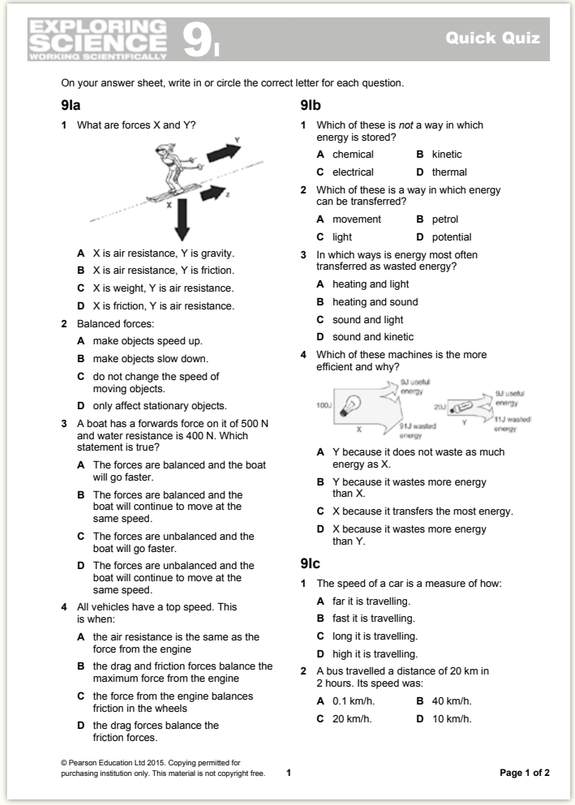
Example of a Literacy & Communication section from *Exploring Science Year 8 student book*

Assessment

There are three types of assessment in *Exploring Science: Working Scientifically*:

- **Baseline** – assessing what students know/are able to do before a learning session
- **Formative** – assessing how students are progressing during a learning session
- **Summative** – assessing what students have learnt and are now able to do after a learning session.

> *[…] teachers need to frequently check pupils' understanding to identify 'gaps' and misconceptions. This must be coupled with subject-specific feedback, so pupils know how to make progress in learning the science content.*
>
> Ofsted (April 2021) ***Research review series: science***, page 22



EXPLORING SCIENCE WORKING SCIENTIFICALLY 9I Quick Quiz

On your answer sheet, write in or circle the correct letter for each question.

9Ia

1 What are forces X and Y?

A X is air resistance, Y is gravity.
B X is air resistance, Y is friction.
C X is weight, Y is air resistance.
D X is friction, Y is air resistance.

2 Balanced forces:
A make objects speed up.
B make objects slow down.
C do not change the speed of moving objects.
D only affect stationary objects.

3 A boat has a forwards force on it of 500 N and water resistance is 400 N. Which statement is true?
A The forces are balanced and the boat will go faster.
B The forces are balanced and the boat will continue to move at the same speed.
C The forces are unbalanced and the boat will go faster.
D The forces are unbalanced and the boat will continue to move at the same speed.

4 All vehicles have a top speed. This is when:
A the air resistance is the same as the force from the engine
B the drag and friction forces balance the maximum force from the engine
C the force from the engine balances friction in the wheels
D the drag forces balance the friction forces.

9Ib

1 Which of these is *not* a way in which energy is stored?
A chemical **B** kinetic
C electrical **D** thermal

2 Which of these is a way in which energy can be transferred?
A movement **B** petrol
C light **D** potential

3 In which ways is energy most often transferred as wasted energy?
A heating and light
B heating and sound
C sound and light
D sound and kinetic

4 Which of these machines is the more efficient and why?

A Y because it does not waste as much energy as X.
B Y because it wastes more energy than X.
C X because it transfers the most energy.
D X because it wastes more energy than Y.

9Ic

1 The speed of a car is a measure of how:
A far it is travelling.
B fast it is travelling.
C long it is travelling.
D high it is travelling.

2 A bus travelled a distance of 20 km in 2 hours. Its speed was:
A 0.1 km/h. **B** 40 km/h.
C 20 km/h. **D** 10 km/h.

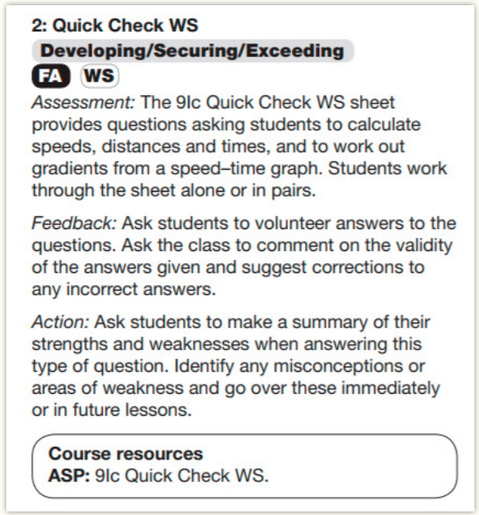
Example of a Quick Quiz which can be used for baseline assessment. Each one comes with a Quick Quiz answer sheet.

Formative assessment

Exploring Science helps you to deliver effective formative assessment throughout the whole course.

Formative assessment is embedded within the lesson sequence. Each topic includes suggestions for activities that encourage students to reflect on what they already know and what they have learned, and to check their learning progress.

The Assessment, Feedback and Action are all crucial for the formative assessment to be effective. The 'Feedback' allows us to spot where the intervention is needed and the 'Action' is the intervention. Research[1] suggests that giving students written or verbal feedback without marks is much more effective than giving marks.



2: Quick Check WS

Developing/Securing/Exceeding

FA **WS**

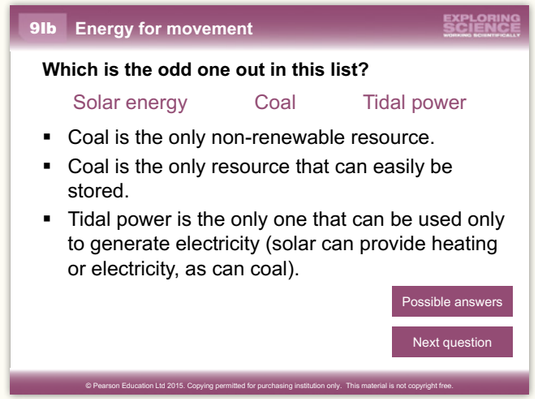
Assessment: The 9Ic Quick Check WS sheet provides questions asking students to calculate speeds, distances and times, and to work out gradients from a speed–time graph. Students work through the sheet alone or in pairs.

Feedback: Ask students to volunteer answers to the questions. Ask the class to comment on the validity of the answers given and suggest corrections to any incorrect answers.

Action: Ask students to make a summary of their strengths and weaknesses when answering this type of question. Identify any misconceptions or areas of weakness and go over these immediately or in future lessons.

Course resources
ASP: 9Ic Quick Check WS.

Example of a formative assessment activity from *Exploring Science Year 9 Teacher and Technician Planning Pack*



9Ib Energy for movement

Which is the odd one out in this list?

Solar energy Coal Tidal power

- Coal is the only non-renewable resource.
- Coal is the only resource that can easily be stored.
- Tidal power is the only one that can be used only to generate electricity (solar can provide heating or electricity, as can coal).

Possible answers

Next question

Example of a Thinking skills activity from *Exploring Science Year 9 ActiveTeach*

Together with learning skills, students also need to develop their thinking skills. Too often in science, students want to know what 'the correct answer' is and are happy to leave it at that. Thinking skills strategies help students to become more analytical and see how answers can be considered and worked out rather than just 'learnt'. And thinking skills strategies come into their own when students start to encounter situations in which they have to apply their knowledge to unfamiliar contexts. So, early introduction of these strategies helps students to engage with more difficult exam-type questions.

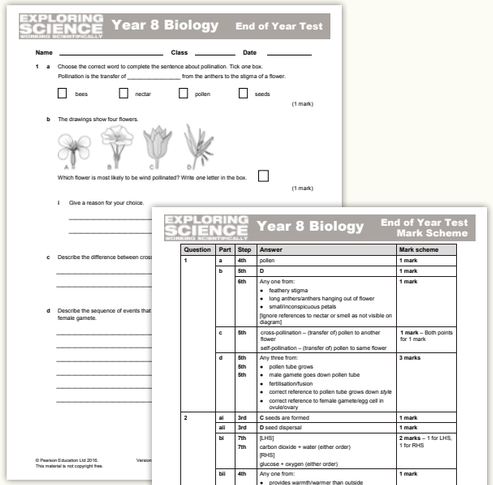
There is at least one 'thinking skills' activity in each topic, but various thinking skills are integrated throughout the course.

[1] Butler, R. (1988). Enhancing and undermining intrinsic motivation; the effects of task-involving and ego-involving evaluation on interest and performance. British Journal of Educational Psychology, 58, 1–14.

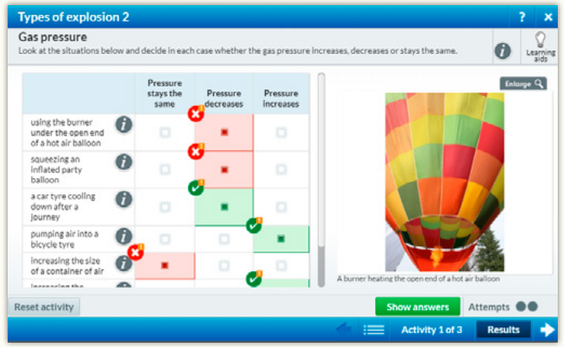
> *One study found that formative assessment in science is most effective for pupils when it is embedded within a lesson sequence, occurring at the same time as new knowledge is taught.*
>
> Ofsted (April 2021) ***Research review series: science***, page 23

Exploring Science has a wealth of assessment support, for example:

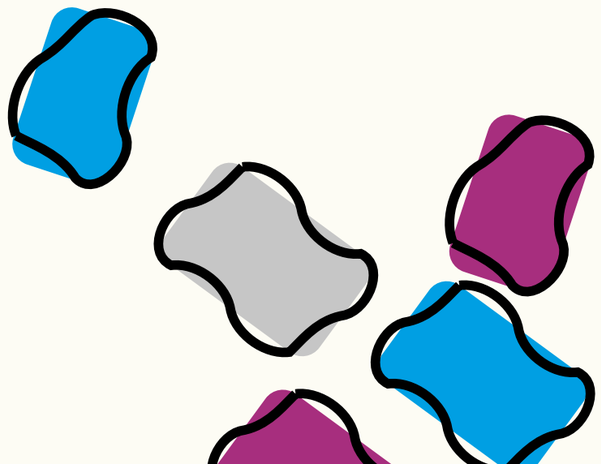
- The Quick Quiz has been designed as simple, quick and easy to administer. The marking may be done by students in class, helping them to focus on their own areas of weakness. It is primarily for baseline assessment.
- Quick Check sheets are formative assessments available for every topic. This is a worksheet task that allows quick assessment of the progress students have made through the topic. They have been designed to embed the principles of formative assessment through exercises that involve students actively considering how they learn.
- Self-marking quizzes provide students with instant results and feedback. As a teacher, you can view your students' results and feed back to them using the Reports section of your ActiveLearn account.



Example of an end of year test and mark scheme from *Exploring Science Year 8 Progress & Assess*



Example of self-marking quiz from *Exploring Science Year 9 ActiveLearn*

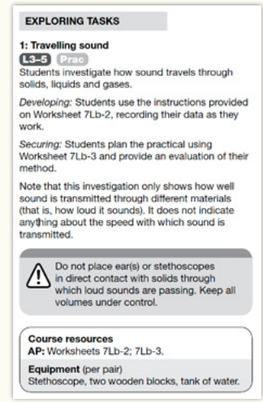


High-quality practical work

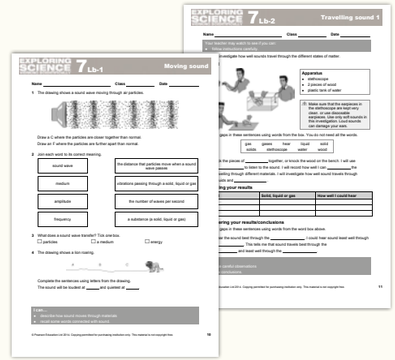
> *Evidence suggests that high-quality practical work has a clear purpose, forms part of a wider instructional sequence and takes place only when pupils have enough prior knowledge to learn from the activity. High-quality practical work is therefore dependent on a well-sequenced curriculum that specifies what pupils are learning and builds on what came before.*
>
> Ofsted (April 2021) ***Research review series: science***, page 17.

There are **over 150 optional practicals** integrated into the Exploring Science curriculum.

Here is an example of how **practical work is integrated** into the Exploring Science curriculum as part of the **coherently planned curriculum** and supported by additional resources to reinforce student's knowledge.



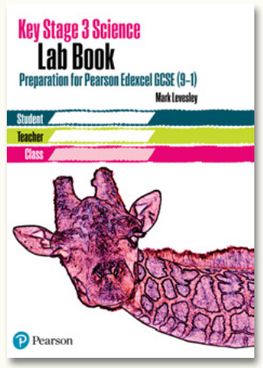
The optional, integrated practicals are fully supported by differentiated worksheets (and ideas for differentiation), notes on safety, and lists of resources.



Exploring Science has a comprehensive range of activities, with many different options provided to illustrate the same teaching point. This allows individual teachers to use the course in a way that is most suited to their own style of teaching, and the needs of their students.

To further support high-quality practical work the **Key Stage 3 Science Lab Book** (available for both Pearson Edexcel and AQA) helps to embed practical skills and terminology in a fun and inspiring way.

Each of the 12 practicals starts with a checklist of skills that are going to be developed in the practical, alongside a list of prior knowledge to assess and consolidate previous learning. Each practical starts with Writing frames and guidance support students as they build their confidence in key skills, such as experimental design, recording and presentation of results, evaluation of methods and data. Links to Exploring Science show how these key practicals can be embedded in the teaching scheme.



How can *Exploring Science* help to deliver a high-quality science education?

> *Evidence suggests that quality textbooks, when used well, have a particularly important role to play in creating a coherent learning progression. They can also free up teachers' time.*
>
> Ofsted (April 2021) ***Research review series: science***, page 15

Exploring Science has been designed by an expert team of science teachers and authors.

Together with the rigorous progression planning, ***Exploring Science*** is full of quirky facts, engaging photos, clear illustrations and real-world contexts that bring modern science to life.

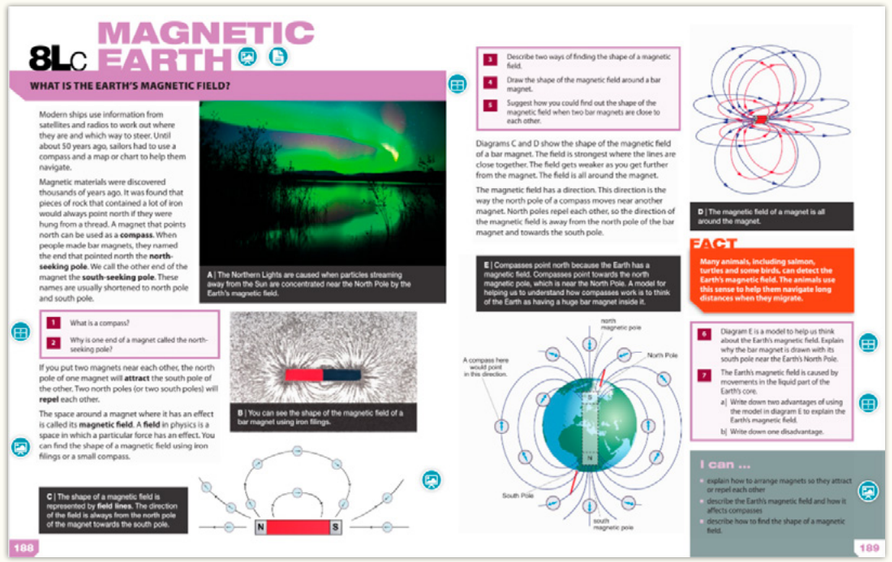
You can trust that the content and activities have been **coherently planned and sequenced**, that the illustrations and photos are **engaging** and clear and that it is full of fascinating facts and examples of **real-life situations** to inspire the scientists of the future.

We have adopted an engaging and flexible layout for the student books, one that is more magazine style than a traditional textbook. Each page has a unique design that responds to its subject matter and promotes enquiry.

Each unit has been given a loose theme, on which to hang opportunities to look at real-world impacts and to debate and discuss issues. The themes are purposefully very loose, and we have been careful not to pursue a thematic approach to which the science has to be fitted.

The first page introduces the theme, and reminds students of prior learning. There are then seven double-page spreads, one of which concentrates on the development of 'Working Scientifically' skills and another of which concentrates on 'Literacy & Communication' skills. The last page provides a summary of some of the main points of the unit together with the setting for a debate on an issue raised by the unit.

There are numbered questions throughout. The questions generally increase in difficulty as students progress through the page. The last question is usually the hardest. 'I can...' boxes are a summary of the main learning points (Learning outcomes) from the topic.



Exploring Science includes three student books (available as print and ActiveBook versions), as well as ActiveLearn, which provides interactive activities, videos and animations, worksheets and presentations. Our resources provide support for planning, delivery and assessment. All practicals have been reviewed by CLEAPSS for safety.

Exploring Science is suitable for all awarding organisations, and for both 2- and 3-year Key Stage 3 delivery.

> *[…]high-quality science textbooks fulfil several valuable roles in supporting pupils' learning. For example, they can give clear delineation of content with a precise focus on key concepts and knowledge. They also provide a coherent learning progression within the subject.*
>
> Ofsted (April 2021) ***Research review series: science***, page 16

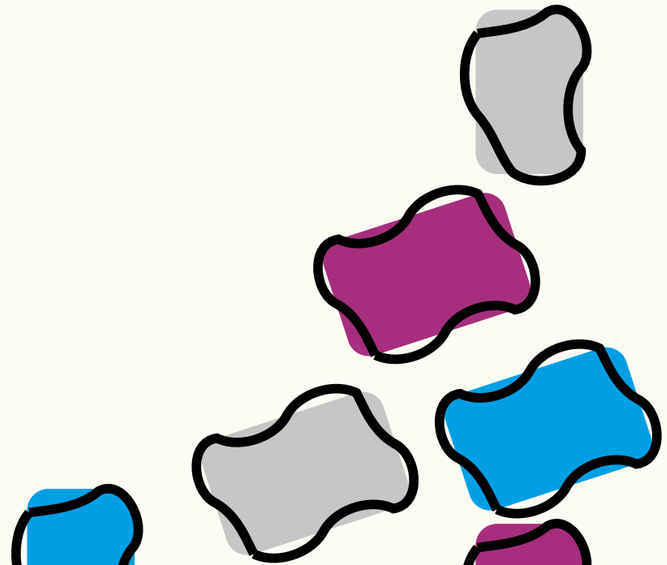
Planning and guidance

Exploring Science has an extensive range of **easy-to-use teacher planning materials** with fully editable, shareable lessons and schemes of work allowing you to build your own lessons, add your own resources and personalise learning based on what works best for your own class.

The Teacher and Technician Planning Pack includes vast amounts of support for the course including:

- an overview of the whole unit, showing what material is covered and in which topic. It also shows some of the concepts that students may have already met
- lists of the National Curriculum, Working Scientifically, Maths and Literacy & Communication statements
- opportunities for cross-curricular and cross-disciplinary work
- background information including information on common areas of misunderstanding, words that students are likely to encounter in independent research, details on the context running through the unit and helpful guides to scientific terminology.
- Objectives, topic notes and answers
- Over 1500 differentiated worksheets across all three years of Key Stage 3 aligned with the curriculum.

> *High-quality textbooks can also free teachers up to spend more time planning and adapting what they are going to teach. They can also be a valuable source of subject knowledge for inexperienced teachers or those teaching outside of their subject area.*
>
> Ofsted (April 2021) ***Research review series: science***, page 16.



Interactive Scheme of Work (iSoW)

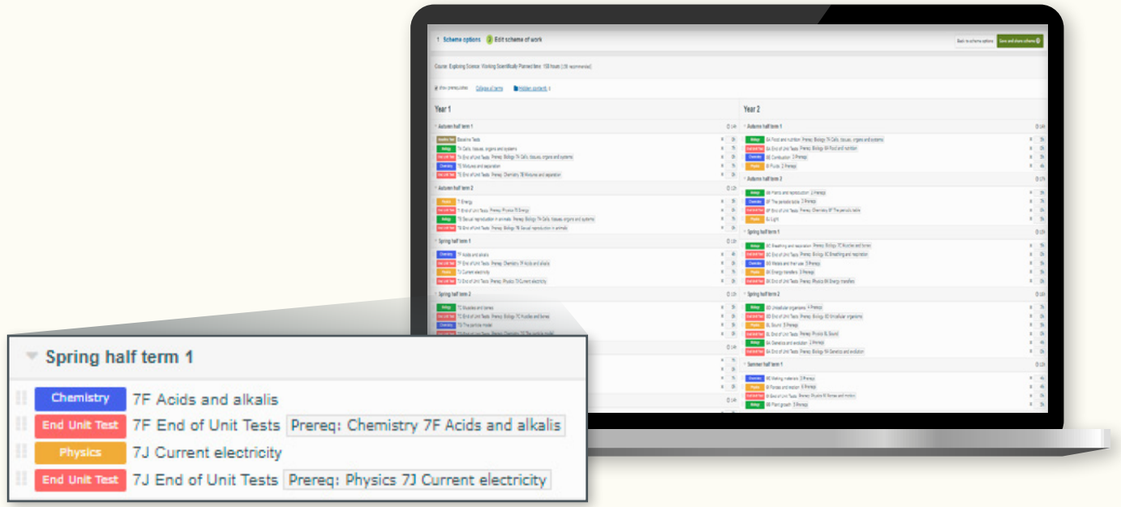
The Interactive Scheme of Work is a fantastic online planning tool for a seamless 11-16 science learning pathway (KS3 and GCSE 9–1). The Interactive Scheme of Work uses technology to support planning and you can start using the iSoW straight away for free!

What is it?

Like a traditional scheme of work, our digital iSoW helps you cover the full curriculum and qualification requirements over 5 years. You can choose a 2 or 3-year Key Stage 3.

You can teach the topics in the order you choose; the iSoW will automatically highlight any prerequisite topics first.

The iSoW works seamlessly with your existing ActiveLearn resources; they will be integrated into your personalised iSoW.



The role of technology

> *Technology can play an important role in helping pupils to learn abstract scientific concepts. This can be through animations, simulations and videos when used as part of teachers' lessons.*
>
> Ofsted (April 2021) ***Research review series: science***, page 20.

Active Learn provides a broad range of resources for teachers and students. This includes interactive activities, videos and animations, worksheets and presentations that boost engagement and inspire.

What's in Exploring Science *Active*Learn?

- 1000s of teaching and learning resources
- Access for all teachers and students in your school

Teaching resources

- 3 front-of-class Student Books
- 200+ world-class videos and animations
- 300+ interactive activities
- 650+ PowerPoint presentations
- 1000+ activity worksheets

Planning

- interactive Scheme of Work
- Differentiated routes
- 150+ lesson plans
- 150+ technician notes

*Active*Learn

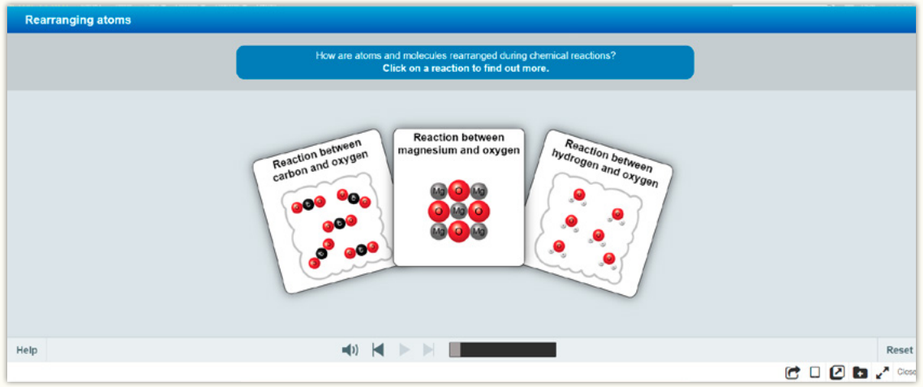
Student resources

- 800+ auto-marked homework activities
- Summary Sheets, Word Sheets and Quick Quizzes for every unit

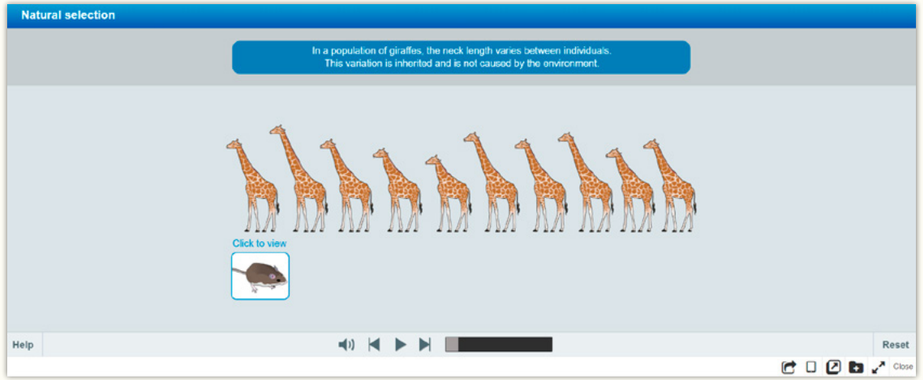
Progress & Assess

- Baseline tests for KS3 and KS4
- End-of-unit and end-of-year tests
- Online Markbooks
- Assessment Builder

Teaching resources contain interactive assets and animations developed for front-of-class use, with world-class videos using stunning BBC and Sky News clips, integrated throughout for a high-impact learning experience.



Example of an animation from Exploring Science Year 8 ActiveTeach



Example of an animation from Exploring Science Year 9 ActiveTeach

ActiveLearn has over 800 online homework activities for students with instant feedback and powerful reporting to aid motivation and progression. Auto-marked activities enable students to track their progress and get instant feedback on their work.

Track progression and develop your own assessments with **ActiveLearn Progress & Assess**, including online markbooks and our Assessment Builder tool.

ActiveLearn helps you build a foundation of essential skills, boost engagement and inspire your students.

EXPLORING SCIENCE
WORKING SCIENTIFICALLY

Next steps:

Request a free trial or buy online

It's easy to download samples, request a free trial, and personalise your order. You can also speak to a consultant online with our Live Chat service.

Visit: **www.pearsonschools.co.uk/KS3exploringscience**

If you would prefer to place your order over the phone, call 0161 855 7561.
We're open Monday to Friday 8.00am - 5.00pm.

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