Activate
Question • Progress • Succeed

Supporting your students on their journey through KS3 to KS4 success
Activate is a brand new Key Stage 3 science course designed to spark your students’ interest in science and support them on their journey through KS3 to KS4 success. It’s tailored to the 2014 curriculum, with a comprehensive and flexible solution for effective differentiation and assessment.

Engage your students
Engaging and inquisitive, packed full of fun activities, practicals, quizzes and questions to spark your students’ interest in science.

Choose your route through
Pick between separate or combined sciences, and two or three-year routes.

Build key skills
Maths, literacy and working scientifically skills are embedded throughout, with progression of skills carefully planned, and supported by tasks and assessments to help monitor progress.

Assessment you can trust
Activate’s assessment has been designed and quality assured for the new curriculum by our assessment expert, Dr Andrew Chandler-Grevatt.

Prepare for the new (9–1) GCSEs
Summary and exam-style questions with GCSE command words, as well as extended writing tasks and maths and practical skills are incorporated throughout, to help your students build confidence as they approach the new (9–1) GCSEs.

Support and extend
Support and extension is provided for every lesson, with differentiated questions, support sheets, and extension tasks. End-of-chapter checkpoints provide further support and extension.

“Expertly written and clearly offers magnificent support for the new curriculum.”
Teach Secondary magazine

Evaluate Activate free for 90 days
The Activate Evaluation Pack contains a copy of the Activate 1 Student Book, samples from the Activate 1 Teacher Handbook and Activate 3 Student Book, plus a guide to Kerboodle.
Activate Evaluation Pack
978 019 839254 5
Email schools.orders.uk@oup.com to request your pack.

Find out more online
Find more information and sample material from Activate at www.oxfordsecondary.co.uk/activate.

Turn to page 11 to see how Activate delivers the changes for the new curriculum
Choose your route

Activate provides **two flexible routes through KS3** so you can choose the best option for your school. Teach combined science with *Activate 1, 2 and 3*, or separate sciences with *Activate Biology, Chemistry and Physics*. Both routes work for a **two-year or a three-year KS3**.

### Combined Science Route

<table>
<thead>
<tr>
<th>Activate 1</th>
<th>Activate 2</th>
<th>Activate 3</th>
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Books 1 and 2 cover the new programme of study in full. Book 3 takes a contextual approach, consolidating KS3 topics and providing further valuable preparation for KS4.

### Separate Sciences Route

<table>
<thead>
<tr>
<th>Activate Biology</th>
<th>Activate Chemistry</th>
<th>Activate Physics</th>
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Each book contains 2 units to cover the programme of study, and 1 contextual unit to consolidate KS3 learning and skills whilst continuing to prepare for KS4 success.

### Reliable five-year assessment for seamless transition and progress

**KS3 and KS4 assessment**

Our expert Assessment Editor Dr Andrew Chandler-Grevatt has devised a **flexible five-year assessment** package you can use for the new KS3 curriculum and GCSE. Track your students’ progress seamlessly through KS3 and KS4 to ensure GCSE success.

The Activate KS3 bands, *Developing*, *Secure* and *Extending*, allow you to monitor progress against what’s required by the KS3 programme of study. They’re matched to previous national curriculum levels and Bloom’s Taxonomy, so you can choose what works for you. They are also **matched to the new GCSE grading system (9-1)**, to ensure seamless transition to KS4.

### Assessment for learning with our Checkpoint system

The checkpoint assessment system assesses students at the end of each chapter, helping to ensure that all students achieve their full potential. **Follow-up lessons are provided, with support and extension tasks** designed to allow everyone to reach the required level of understanding. Use the checkpoint system to ensure all your students make progress and are ready for the challenges of the curriculum ahead.
Physics 2

You already know
- lots of things are made of electricity
- some metals, like silver, are good conductors of electricity
- you can change the brightness of a bulb by adjusting the number of cells
- switches can control lamps and buzzers
- magnets have two poles and attract or repel, depending on whether the poles face each other
- some metals are magnetic - the Earth is a giant magnet

BIG Questions

What happens in an electric circuit? Why do magnets attract? What happens in a power station?

Learning objectives
After this topic you will be able to:
- describe solutions using key words and phrases
- explain dissolving to primary-school children. Draw diagrams to show what you will do, and write notes to remind you what to say.
- give examples and pictures of different types of plant cell
- discuss the arrangement of particles in a solution
- explain how the arrangement of particles in a solution is affected by the size of the solvent.

Do you like coffee? When you add water to coffee, you make a solution. A solution is a mixture of a liquid and another substance. Most solutions are what we call solids or liquids. All parts of the mixture are the same.

When salt dissolves in water, a new substance called a solution forms. In the solution, salt is the solute and water is the solvent. Salt is soluble in water. Water is the solvent for many substances. Water is able to dissolve many different substances.

Can gases dissolve?

Many gases dissolve in solvents. Carbon dioxide gas makes drinks fizzy. In the bottle, there is a solution. Carbon dioxide gas is dissolved in water. When you open the bottle, gas escapes. Carbon dioxide gas is a gas. When you open a soda bottle, gas escapes.

Summary Questions

1. In KS2 Science, what is a solution?
2. What happens when salt dissolves in water?
3. Can gases dissolve?
4. What do you need to do to make a solution?
5. What is a solid?

To make a solution, you need a solid and a liquid and they have to mix together. When you add water to coffee, you make a solution. A solution is a mixture of a liquid and another substance. Most solutions are what we call solids or liquids. All parts of the mixture are the same.

Is water the only solvent?

No. There are other solvents as well. Some common ones are oil and water. Oil and water do not mix together. Oil is a liquid, but it does not dissolve in water. Oil is a non-polar liquid. Water is a polar liquid. Polar liquids are made up of molecules that have a positive and a negative end.

Key Words
- solution
- solvent
- solute
- gaseous
- dissolved

Activate Chemistry Student Book

Online versions of the Student Books are available as Kerboodle Books. You can display Kerboodle Books on your whiteboard, and purchase access for students at home.
## B1 Chapter 2 Summary

### Key Points
- **Respiratory System**: Takes in oxygen and expels carbon dioxide.
- **Digestive System**: Transports nutrients around the body.
- **Circulatory System**: Resides in the heart.

### End-of-chapter questions
1. State the function of the respiratory system.
2. Name the type of cell shown in the diagram above.
3. Name the bones that protect the lungs.

### Key Words
- **Bone**
- **Skeleton**
- **Support**
- **Protect**
- **Cartilage**
- **Joint**
- **Ligament**
- **Tendon**

### Big Write

1. Describe how the body is organised in levels:
   - **Organism**
   - **Organ**
   - **Tissue**
   - **Cell**

2. Name the bones that protect the lungs.

3. Explain why the student should repeat the experiment.

### End-of-chapter activities
- **Big Write**
- **Maths Challenge** to build literacy and maths skills.

### Differentiated End-of-chapter questions
1. State the function of this cell. (1 mark)
2. Compare the main differences in... (1 mark)
3. Explain why the student should repeat the experiment. (1 mark)
4. Name the bones that protect the lungs. (1 mark)
5. Name the type of cell shown in the diagram above. (1 mark)

### Auto-marked end-of-chapter tests and progress tasks
- Available on Kerboodle: Lessons, Resources and Assessment.

### Teacher Handbooks
- The Teacher Handbooks provide a page-by-page match to the Student Books, with support for your teaching including lesson plans, differentiation suggestions and assessment guidance.

### Chemistry 1
- Unit opener spreads provide KS2 catch-up, national curriculum links for KS3, links to KS4 and index of maths and literacy skills covered.
- Checkpoint lessons follow on from Checkpoint assessments on Kerboodle. Use these spreads to support and extend your students at the end of each chapter.

### Kerboodle
- Teacher Handbooks now also available on Kerboodle – see back page for details.

- Customizable lesson presentations and practicals are available on Kerboodle: Lessons, Resources and Assessment.

### Activate 1
- Student Book
- Kerboodle
- Teacher Handbook
Activate is accompanied by Kerboodle, an online bank of teaching material for running creative and effective lessons, with a flexible, fully integrated assessment model and solution for KS3 assessment without levels. It’s intuitive to use, customizable and can be accessed online anytime, anywhere. Kerboodle provides three purchasing options for each level in the course: Lessons, Resources and Assessment, Kerboodle Book and Kerboodle Teacher Handbook.

Assessment

Auto-marked assessment

Auto-marked assessments with confidence selectors and targeted feedback help assess:

- Content from the chapter
- Maths skills
- Literacy skills (including spelling)
- Working scientifically skills
- KS2 knowledge

You can assign assessments to students at home and track their progress in the Kerboodle markbook.

After having looked at all the schemes available for the new KS3 National Curriculum, Activate has by far the best thought out assessment package.

Mat Power, Head of Science, Holy Cross Catholic High School

Andy Chandler-Grevatt explains the assessment model in detail at www.oxfordsecondary.co.uk/activate.
Check your students’ knowledge of KS2

- Downloadable paper-based tests assess your Year 7 students’ knowledge and understanding of KS2

Make progress with key skills

- Progress tasks for the end of each chapter help monitor progress and set targets in key skill areas
- Progress trackers help students track progress and record areas for improvement
- Interactive investigations and progress quizzes provide auto-marked assessment of skills for each chapter
- Paper-based end-of-chapter tests are easily downloadable to help assess students’ progress at the end of every chapter

Prepare for the new Science GCSEs

- Maths and practical skills are embedded throughout to help prepare students for GCSE
- Exam-style question papers build confidence in GCSE-style questions and provide accurate summative marks for the end of each unit and year

Follow assessment with learning

Activate includes a Checkpoint assessment system.
1. Use the auto-marked Checkpoint assessment at the end of each chapter to determine next steps
2. Use the Checkpoint lesson and resources to support and extend your students as needed
Kerboodle

Lessons

Ready-to-play lesson presentations are provided to complement every double page spread in the Student Book. Each lesson presentation is fully customizable, meaning you can edit, add, or delete screens to suit your needs.

Resources

WebQuests build literacy and research skills, and can be used as homework tasks. Interactive screens are provided for every lesson for use on your whiteboard.
**Properties of solids, liquids, and gases**

<table>
<thead>
<tr>
<th>Substance being observed</th>
<th>Is it a fixed shape?</th>
<th>Can it be compressed (crushed)?</th>
<th>Does it take the shape of its container?</th>
<th>Does it (or could it) vaporise out and fill any space it is in?</th>
<th>Can it be poured?</th>
<th>Solid, liquid, or gas?</th>
</tr>
</thead>
<tbody>
<tr>
<td>wooden block</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>solid</td>
</tr>
</tbody>
</table>

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**Chemistry**

You already know

Can you tell what this zoomed-in picture is?

Clue: It's a cold and frosty morning.

In C1 you will learn about atoms and molecules and what happens when chemicals react.

In B1 you will learn about diffusion and how particles move between substances.

In P2 you will learn about energy transfer and energy conservation.

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**3 BIG Questions**

1. What are materials like inside and why do they behave as they do?
2. What are atoms and elements?
3. How do scientists make new materials?

**Who can make the biggest crystals?**

**Setting the scene**

Create a lab to find out if crystals can be made larger than expected. The size of the crystals that bars depend on how quickly and how long the crystals grow.

**Aims**

In this practical you will:

- complete a survey with other students in your class to see who can obtain the biggest metal or salt crystals
- decide the best way to control evaporation to obtain the biggest crystals possible
- use a control sample to decide how effective your technique was.

You will be working scientifically to:

- ask questions and develop a line of inquiry
- use appropriate techniques and apparatus during laboratory work
- present reasoned explanations.

**Safety**

- wear eye protection.
- copper sulphate is harmful and is also an irritant; avoid contact with skin.
- set up chemical spills using a dry paper towel.
- wash your hands after handling chemicals.
- discuss any potential hazards and risk assessment.

**Equipment and materials**

- copper sulphate solution
- two test tubes
- 1 cm³ measuring cylinder
- plastic spatulas

**Making connections**

Can you solve this Picture Puzzler?

The first letter of each of these images spells out a science word that you will come across in this book.

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**Activate Kerboodle: Lessons, Resources and Assessment**

**Kerboodle Books**

Kerboodle Books are digital versions of the Activate Student Books, which can be accessed on a range of devices and tablets including iPad. Teacher access to each Kerboodle Book is automatically included in the relevant Lessons, Resources and Assessment package, and you can also choose to buy access for all your students so they can log on and use a digital version of their Student Book from home.
About the Assessment Editor

Dr Andrew Chandler-Grevatt
Assessment Editor

Dr Andrew Chandler-Grevatt has a PhD in school assessment, and a real passion for science teaching and learning. Having worked as a science teacher for ten years, of which five were spent as an AST, Andy has a real understanding of the pressures and joys of teaching in the classroom. Alongside his national and international research in school assessment, Andy is a teaching fellow on the PGCE course at the University of Sussex, and is a successful published assessment author. Find out more about Andy and the Activate assessment model at www.oxfordschools.co.uk/activate.

About the authors

Philippa Gardom Hulme

Philippa Gardom Hulme has 15 years’ experience teaching secondary science and is now a science tutor on the PGCE course at Oxford University. Philippa also has experience examining for OCR and KS3 SATs, and is an experienced science textbook author for KS3, GCSE and IGCSE. Philippa has an honours degree in Chemistry, Resources and the Environment from York University, an MEd degree from Bristol University and a PGCE from the University of Oxford.

Jo Locke

Jo Locke has many years’ experience teaching secondary science, working on KS3 through to A-level and with experience as a Head of Science. She is an experienced examiner, and currently examines for International Baccalaureate and Edexcel A-levels. Jo is an author, and has written material for KS3, GCSE, BTEC, Entry Level Certificate and A-levels. Jo has a first class honours degree in Biology and a Science PGCE from the University of Bath.

Helen Reynolds

Helen Reynolds is an Institute of Physics Teaching and Learning Coach, and a former Head of Science. She is an experienced secondary science teacher, and has a MA in Physics and a PGCE from the University of Oxford. Helen’s authoring experience includes recent student and teacher materials for the Cambridge International KS3 equivalent (Secondary 1).

Simon Broadley

Simon Broadley has been teaching secondary science for 18 years, specialising in biology and applied science, and with responsibility for leading Biology and BTEC courses. Simon has a PhD and BSc in microbiology. Simon has been an OUP author for seven years, writing student and teacher resources for KS3 and GCSE.

Mark Matthews

Mark Matthews has been teaching secondary science for over 20 years, specialising in Biology and Applied Science, and with responsibility for leading biology and BTEC courses. Mark has a PhD in Developmental Biology and a BSc in Zoology. An experienced author, Mark has been writing for OUP for seven years, with published student and teacher materials for KS3 and GCSE.

Victoria Stutt

Victoria Stutt has been teaching since 2004, working across key stages and with experience of coordinating KS3. She is an experienced GCSE and A-Level author, and has written successful assessment titles for KS3. Victoria has an honours degree in Chemistry and a PGCE from the University of Sussex.

Nicky Thomas

Nicky Thomas is an experienced teacher of Physics and Science, as well as Institute of Physics Network Coordinator. As part of her work with the IoP, Nicky provides training and support for physics teachers, and mentors early career physics teachers. Nicky has a Physics degree from the University of Oxford, and is an experienced author, writing teacher and student materials across all secondary key stages.
**What’s changing in the curriculum?**

### NEW CONTENT
- New areas of content have been brought into KS3 from KS4, as well as changes in approach to some subject content
- **Activate** has been written specifically for the new curriculum, meaning you can be confident you are covering what you need to

### NO LEVELS
- Levels have been removed from the national curriculum
- Schools must devise their own assessment systems
- The **Activate** assessment model has been designed for the new curriculum
  - It uses a new banded system to assess each block of knowledge
  - Level references are still provided if you wish to use them

### MATHS
- KS3 and KS4 both contain more maths
- Students are expected to use equations and statistical techniques
- Mathematical progression is fully supported across all components
- Support activities and assessments are provided

### WORKING SCIENTIFICALLY
- ‘How Science Works’ has been replaced with ‘Working Scientifically’
- Working Scientifically is more demanding, with inclusion of terms and techniques previously introduced at KS4
- Working scientifically is integrated throughout
  - First chapter in Y7 focusses on working scientifically skills
  - Support activities and assessments are provided

### TOUGHER GCSEs
- GCSEs will be tougher in terms of both content and skills
- Students will need to be prepared leaving KS3
- Students will be assessed on their extended writing and mathematical skills
- Single science will no longer be available. Double and Triple science will be linear with terminal assessment
- Maths and literacy skills are built from Y7
- Extended writing skills are built from Y7, with questions and support provided for each chapter
- GCSE-style assessments and command words are included from Y7 to help build confidence
Course structure

<table>
<thead>
<tr>
<th>Course Structure</th>
<th>Student Books</th>
<th>Teacher Handbooks</th>
<th>Kerboodle: Lessons, Resources and Assessment</th>
<th>Kerboodle Book (one year licence)</th>
<th>Kerboodle Teacher Handbook (one year licence)</th>
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<tbody>
<tr>
<td>Combined Science Route</td>
<td>Student Book 978 019 839256 6</td>
<td>Teacher Handbook 978 019 8392590</td>
<td>Kerboodle: Lessons, Resources and Assessment 978 019 839262 0</td>
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**Kerboodle:**
- Lessons, Resources and Assessment (one year licence)
- Book (one year licence)
- Teacher Handbook (one year licence)