GCSE assessment just got tougher.
Will your students have the skills?

The specimen questions are quite scary. Our students will find extended writing very challenging.

Gethyn Jones,
Phoenix School.

Crucial, the new pack from upd8, teaches the skills systematically, and fits into your existing GCSE course:

Tools lessons break assessed skills into their components, and help you teach, support and integrate them.

Applications lessons bring alive the content that's new in the specification, and give targeted skills practice.

Assessments with every Tool/Application consolidate understanding, with mark schemes for clear feedback.

CRUCIAL
upd8

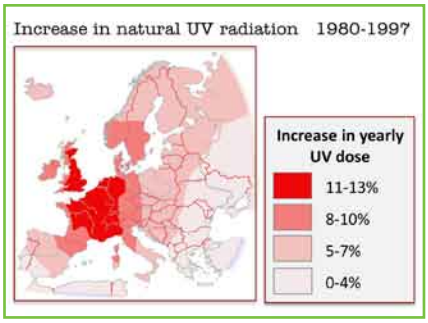
fill the **skills** gap, raise results.

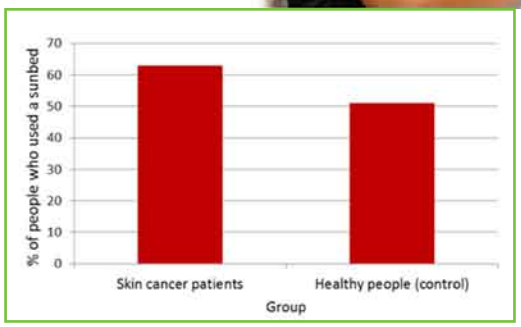
Get it now at upd8.org.uk

15 **'Tools'** teach assessed skills systematically

Crucial is founded on research-based methods. Take 'Reasoner', which is about judging how well evidence supports a claim – an important skill for both controlled assessments and written exams.

In the lesson, students work on a consumer TV show, examining the claim: *have sunbeds caused a rise in skin cancer?* The challenge facing students is how to interpret multiple pieces of evidence...

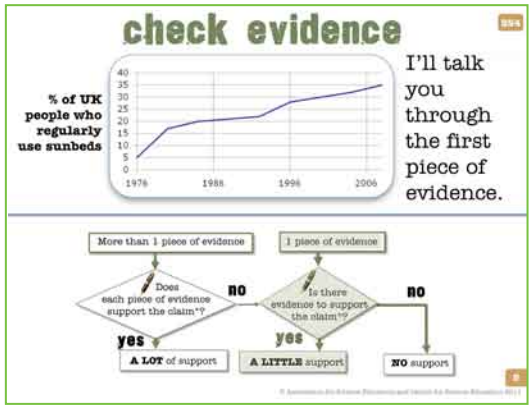


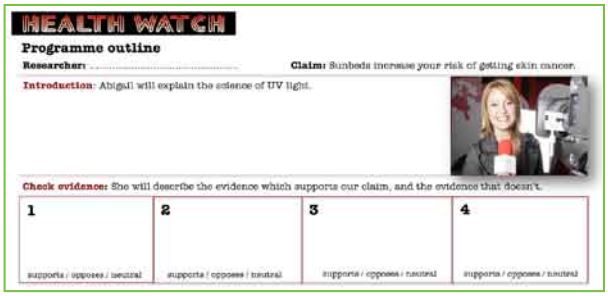


Lifelines show the steps in the thinking, visually...

The thinking process is unpacked and visualised in a 3-stage flowchart.

The Presentation slides help you model the skill, step-by-step, with an example.

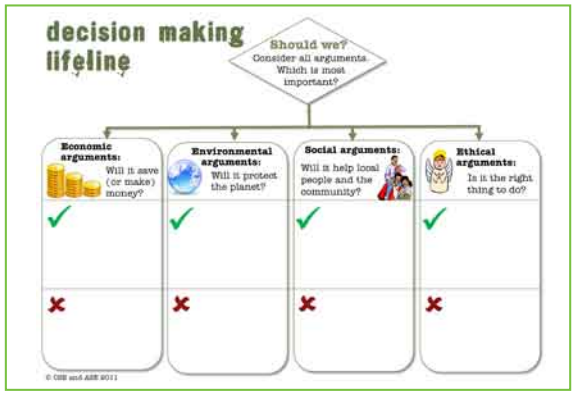




Then students use the Lifeline as support while they create an outline for the TV show.

...to use throughout GCSE

There's a Lifeline for every assessed skill, like this organiser for 'Decision making'. Get maximum value from the Lifelines by using them to build fluency whenever students meet the skills – in Core, Additional and Triple Science.

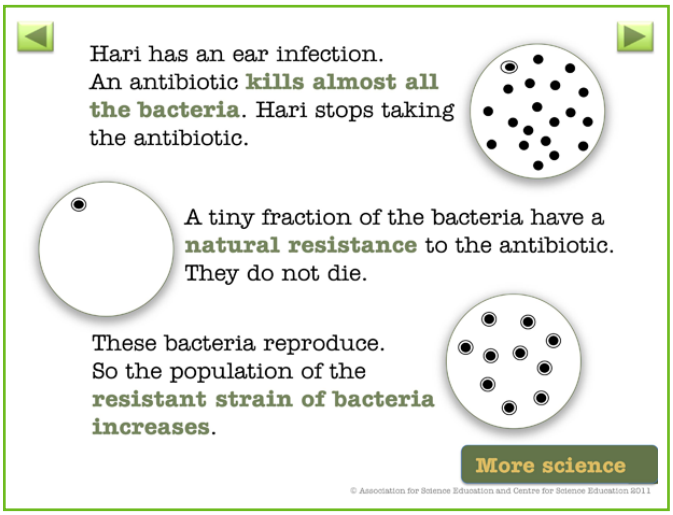


15 ‘Applications’ bring new content alive

About 10% of the content at GCSE has changed. New Antibiotics (AQA) covers new statements on ‘superbugs’, in a highly engaging upd8 style.

A scenario give students a ‘need to know’, and solving the problem makes students grapple with the required scientific knowledge.

To cater for different learning styles, there is a variety of teaching strategies, like discussions, experiments, data analysis and case studies.

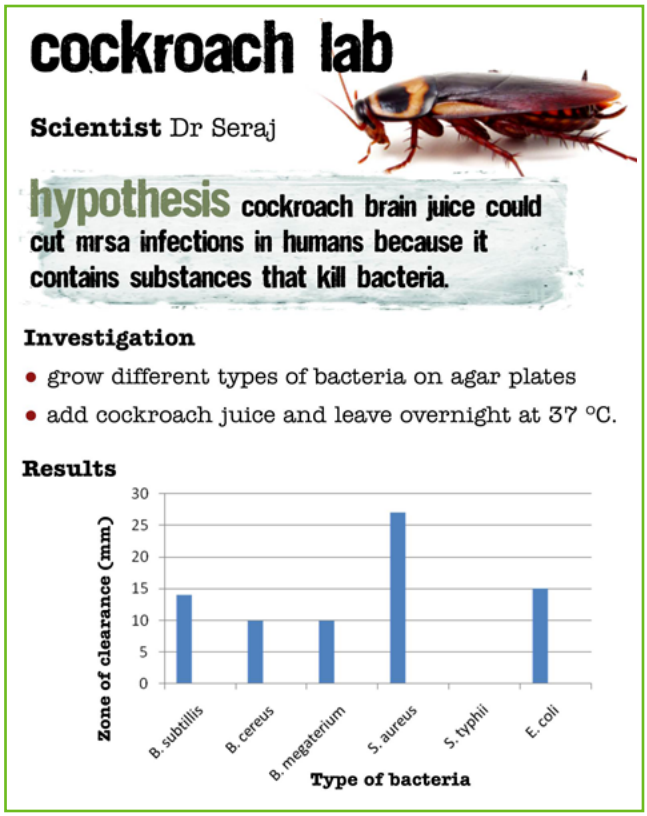


They make the science clear and accessible...

A set of ‘more science’ slides helps to make the concepts easy and visual for students to absorb, and complements the active learning with direct teaching.

...and build skill fluency

The second part of New Antibiotics gives targeted practice in using the ‘Reasoner’ skill to examine real scientific data on new drug developments.

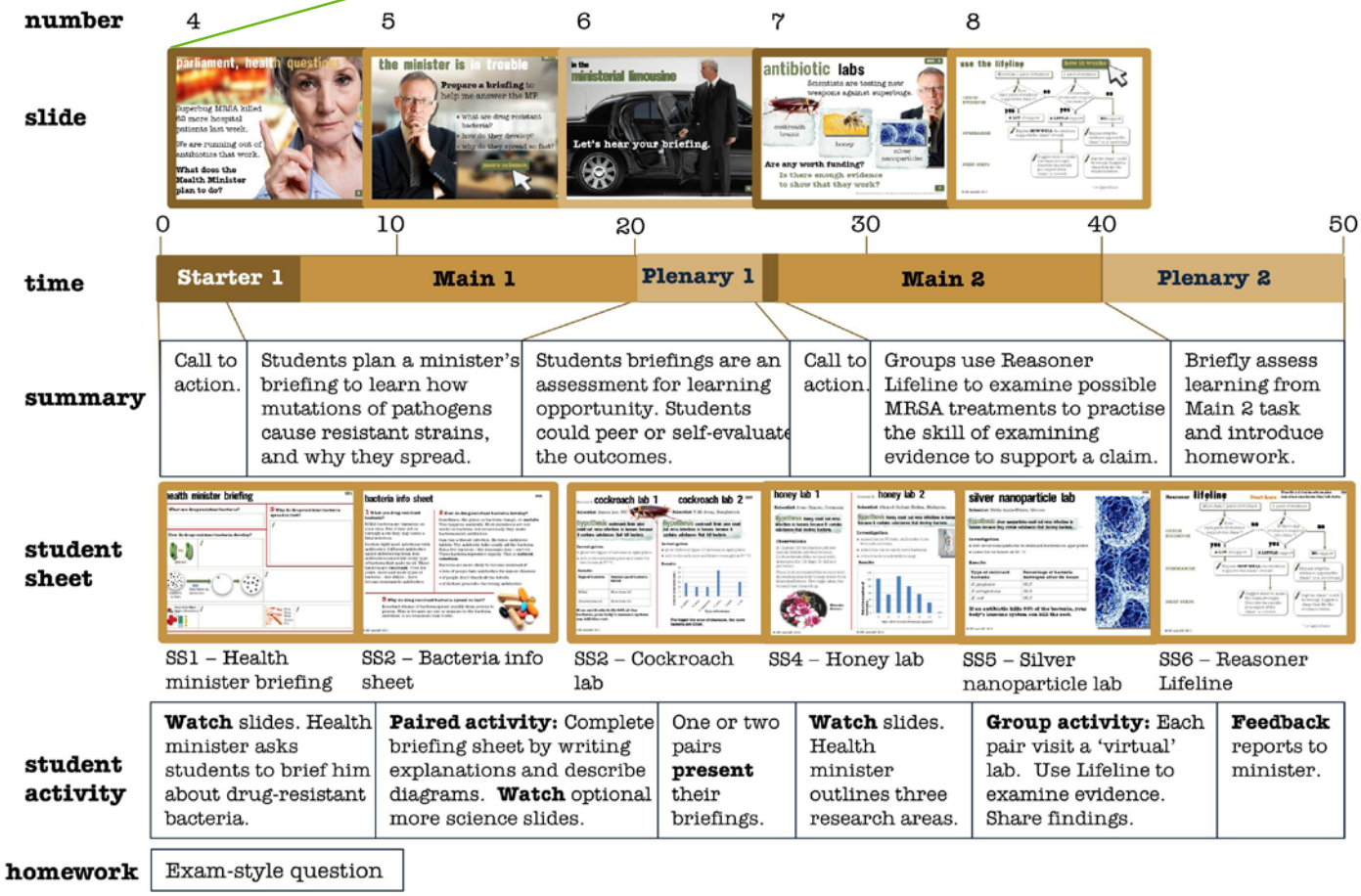


I thoroughly enjoyed **upd8** *at 11–14 and I’ll be buying Crucial to support GCSE.*

Hazel Vaughandick, Voyager School.

Easy to use, quality materials – for **outstanding lessons**

Crucial lessons are thoroughly tested to be effective out of the box. They come with upd8's popular 'visual guide' format to help you plan lessons at a glance, and see when to use slides and student sheets.



The teachers' guide gives full specification information and a clear 1 page commentary.

STAGE/PURPOSE	RUNNING NOTES
Starter 1 (5min) Call to action.	An MP points out the dangers of superbugs such as MRSA (3, 4). The health minister asks students, in role as his scientific advisers, to brief him about drug-resistant bacteria (5).

To save time and photocopying, Student Sheets are categorised: reusable, consumable or shared.

contents

Sheet number	Title	Notes
SS1	Health minister briefing	Consumable – 1 per pair
SS2	Bacteria info sheet	Reusable – 1 per pair
SS3	Cockroach lab	Reusable - 6 per class of 30
SS4	Honey lab	Reusable – 6 per class of 30
SS5	Silver nanoparticle lab	Reusable – 6 per class of 30
SS6	Reasoner lifeline	Reusable – 1 per pair

What the OCR B (Gateway) version contains

Applications

Heart disease How diet, smoking and lifestyle cause disease. (B1a) 	**Insulin** Causes of diabetes, and control of types 1/2. (B1f)	**Extremophiles** Specialists, generalists, and adaptations to extremes. (B2e)
Problems with oil Its finite nature and environmental problems. (C1a/C1b)	**Warming Earth** Reasons for climate change and difficulties of measuring it. (P2c)	**Natural selection** Theories to explain evolution and acceptance of Darwin. (B2f)
Thermograms Temperature and energy, and representing by colours. (P1a)	**Climate evidence** For and against man-made warming, and consensus. (P2c)	**Sea chemistry** How sodium chloride is obtained and extraction issues. (C2h)
Mobile phones Dealing with evidence from studies of radiation effects. (P1e)	**Ozone** The story of the 'hole' and society's response. (P1h)	**Electrolysis of brine** Oxidation and reduction reactions and uses. (C2h)
Sankey diagrams How to interpret and create, to show energy conservation. (P1b)	**UV dangers** How risks are communicated to improve public health. (P1h)	**Modelling the Universe** How models have changed over time, and why. (P2h)

Essentials Edition		Plus, in Pro/VLE Edition
Batch 1*	**Batch 2**	**Batch 3**

Tools

Reasoner Draw a justified conclusion from different sources of evidence.	**Evidence checker 1** Evaluate accuracy and repeatability.	**Evidence checker 2** Evaluate the validity of conclusions.
Technology Evaluate the impact by considering pros and cons.	**Communicator 1** Quality of written communication.	**Models** Give an explanation that applies a scientific model.
Analyser 1 Describe and compare relationships between variables.	**Analyser 2** Display data in tables, charts and graphs.	**Safe experimenter** Identify hazards and minimise risks.
Interrogator Be critical of reports, evidence, opinion, sources and bias.	**Planner** Consider variables, controls, sample size and replicates.	**Hypothesiser** Research methods to test hypotheses.
Decision maker Consider environmental, economic, social and ethical arguments.	**Communicator 2** Write balanced arguments, with evidence.	**Theories** Weigh up evidence for and against, and how they develop.

*Crucial is published in 3 batches: **1:** July '11, **2:** Oct '11, **3:** Jan '12

What the AQA A version contains

New antibiotics Superbugs and how scientists are fighting back.

Applications

 Resistant bacteria, and new drugs (1.1.2e)	**Plant hormones** Growth hormones in agriculture and horticulture. (1.2.3)	**Recycling waste** Evaluate the effectiveness of recycling organic waste. (1.6.1)
Plant sensitivity Sensitivity to light, moisture and gravity, and hormone control. (1.2.3)	**Performance drugs** Drugs in sport and ethical implications. (1.3.1)	**Biofuels** Fermentation, and issues of using the fuels. (1.4.3/1.5.3)
Phytomining New ways of extracting copper. (1.3.1)	**Environmental change** Relating changes in indicators to distribution of organisms. (1.4.2)	**Waves for communication** Comparing different wavelengths and risks. (1.5.1)
Energy and design How devices are designed for better energy transfer. (1.1.3)	**Biodegradable plastics** Using starch to make these polymers. (1.5.2)	**Microwave background** How it supports Big Bang theory. (1.5.4)
U Values Measures of insulating ability, for home heating. (1.1.4)	**Energy supply and demand** Evaluate small-scale electricity production like solar cells. (1.4)	**Origin of life** The uncertainty and the 'primordial soup' theory. (1.7.2)

Essentials Edition		Plus, in Pro/VLE Edition
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Tools

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Analyser 1 Describe the relationships between variables shown on graphs.	**Analyser 2** Display data in tables, charts and graphs.	**Safe experimenter** Identify hazards and minimise risks.
Interrogator Evaluate how trustworthy a report is.	**Planner** Consider variables, controls, sample size and replicates.	**Hypothesiser** Research methods to test hypotheses.
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*Crucial is published in 3 batches: **1:** July '11, **2:** Oct '11, **3:** Jan '12

What the Edexcel version contains

Limestone

Students battle with 'sinkholes', and silence campaigners' objections to a quarry.

Applications

 Uses, and issues of quarrying. (2.12-2.18)	**Diabetes** The role of insulin and its control. (2.8-2.13)	**Fighting bacteria** How pathogens spread and bacteria resistance. (3.9-3.15)
Accepting Darwin's ideas Modern evidence and the scientific community. (1.18-1.19)	**Plant hormones** How hormones control cell growth, and uses. (2.14-2.18)	**Interdependency** How survival depend on the presence of other species. (3.19)
Classification How scientists place organisms into groups. (1.2-1.6)	**Electrolysis** How compounds breaks down compounds and uses. (3.6-3.13)	**Polymer disposal** Problems and how they can be overcome. (5.37)
Understand the Universe Using data to build ideas. (1.1-1.4/3.7)	**Controlling CO_2** Human activity and the atmosphere. (5.15)	**Induction** Generation of a.c./d.c. and what influences its size. (5.6-5.10)
Telescopes How they use properties of lenses. (1.5-1.9)	**Earthquakes** Why they happen and seismic monitoring seismic. (4.6-4.13)	**National Grid** Transformers and transmission of electricity. (5.11-5.15)

Essentials Edition		Plus, in Pro/VLE Edition
Batch 1*	**Batch 2**	**Batch 3**

Tools

Reasoner Draw a justified conclusion from different sources of evidence.	**Evidence checker 1** Evaluate accuracy and repeatability.	**Evidence checker 2** Evaluate the validity of conclusions.
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Decision maker Consider environmental, economic, social and ethical arguments.	**Technology** Evaluate its impact by considering pros and cons.	**Theories** Weigh up evidence for and against, and how they develop.

*Crucial is published in 3 batches: **1:** July '11, **2:** Oct '11, **3:** Jan '12

What the OCR A (Twenty First Century) version contains

15 Tools to teach the assessed skills

This compact version is designed specifically for Twenty First Century Science. It teaches the underlying skills for the written papers and controlled assessments, both case studies and practical data analysis.

Each Tool is set within a subject context from the new Core Science specification. The exam questions and marking guidance are based on OCR criteria.

Essentials Edition

Batch 1*	Batch 2	Batch 3
 **Reasoner** Judge how well data supports an explanation. The subject context is UV/sunbeds. (P2.2)	**Evidence checker 1** Consider accuracy, repeatability and reproducibility in primary data and deal with outliers.	**Evidence checker 2** Consider the validity of conclusions, and identify possible cause-effect relationships.
Communicator 1 Quality of written communication The subject context is oil. (C2.2)	**Technology** Evaluate its impact by considering pros and cons.	**Models** Give an explanation that applies a scientific model.
Analyser 1 Compare categoric variables and describe the relationships between variables shown on graphs. The subject context is infectious diseases. (B2.2)	**Analyser 2** Display data in tables, charts and graphs.	**Safe experimenter** Identify hazards and minimise risks.
Interrogator Evaluate how trustworthy a report is. The subject context is nuclear fuel. (P3.2)	**Planner** Consider variables, controls, sample size and replicates.	**Hypothesiser** Research methods to test hypotheses.
Decision maker Consider economic, social and ethical arguments, risks, and benefits/costs to groups affected by a decision about science or technology. The subject context is slimming pill issues. (B2.2)	**Communicator 2** Write balanced arguments, with evidence.	**Theories** Weigh up evidence for explanations, and how the scientific community validates claims.

*Crucial is published in 3 batches: **1:** Aug '11, **2:** Oct '11, **3:** Jan '12

15 Tools to teach the assessed skills

As WJEC recommend, Crucial for WJEC A "develops the skills for all controlled assessment tasks as an integral part of the delivery of subject content". It covers all 3 exercises: research skills, practical work, and experimental techniques.

Crucial also teaches the underlying skills for the written exam. Each Tool is set within a subject context from the new Science A specification. Exam questions and marking guidance are based on WJEC criteria.

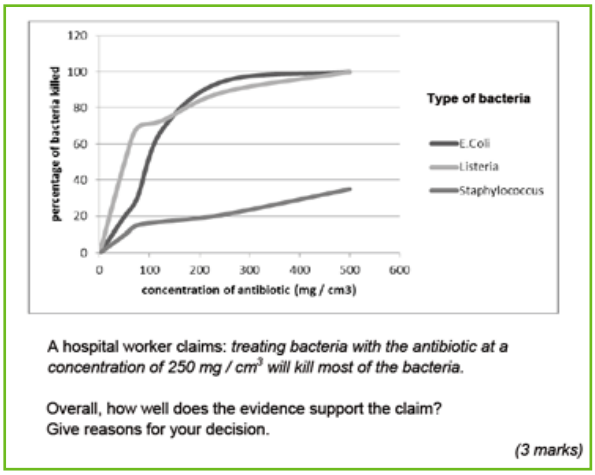
Essentials Edition

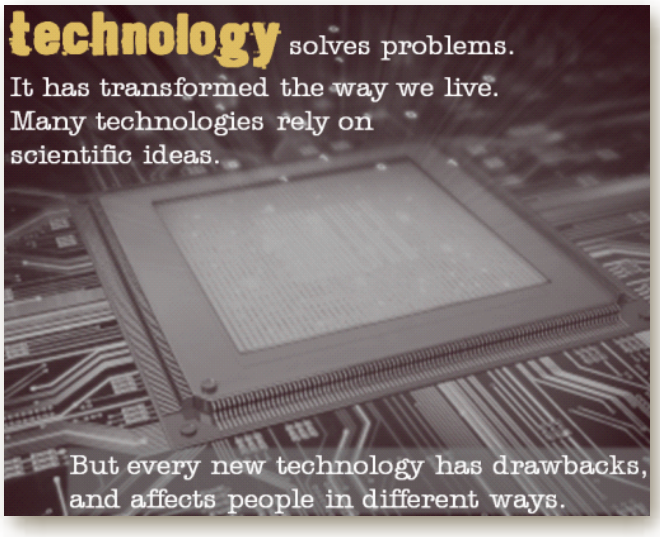
Batch 1*	Batch 2	Batch 3
 **Reasoner** Draw evidence-based conclusion from different sources of evidence. The subject context is UV/Sunbeds. (P1.6b)	**Evidence checker 1** Accuracy, repeatability in primary data.	**Evidence checker 2** Validity of secondary data, and cause-effect.
Communicator 1 Quality of written communication (accuracy, coherence, terminology) The subject context is Metals. (C1.3)	**Technology** Evaluate the impact by considering pros and cons.	**Models** Explain using a scientific model, and knowing limitations.
Analyser 1 Describe relationships in data, The subject context is balancing human needs with environment. (B1.2 a)	**Analyser 2** Choosing a representation, drawing tables and graphs.	**Safe experimenter** Analyse safety aspects of experimental work, and manage risks.
Interrogator Evaluate claims in reports: evidence, opinion, sources and bias. The subject context is Nuclear fuel. (P1.6)	**Planner** How to collect data: variables, controls, samples.	**Hypothesiser** Research using information sources to test hypotheses.
Decision maker Consider economic, social and ethical arguments, risks, and benefits/costs to groups affected. The subject context is Diet drug issues. (B1.7a/e)	**Communicator 2** Writing balanced arguments, with evidence.	**Theories** Weigh up evidence for and against, and the scientific community.

*Crucial is published in 3 batches: **1:** Aug '11, **2:** Oct '11, **3:** Jan '12

Assessments consolidate learning in every lesson

Simulated exam questions are provided as homeworks to test understanding. These come complete with marking guides to give student clear feedback to improve.





Crucial is designed for maximum impact

Curriculum materials rarely look this good. Yet motivating 14-16 students was a top priority for 90% of users we surveyed. Crucial's eye catching design will help to catch, and hold teenagers' attention.

Which edition is for you?

Essentials	Pro	VLE
Fundamental topics and skills: 10 Tools 10 Applications 20 Assessments	*Adds complete coverage:* 15 Tools 15 Applications 30 Assessments	*Adds VLE integration:* SCORM package 3 in 1 document player, for blended learning

5 reasons you'll like it

- ✔ Low-cost upgrade to fit your existing course
- ✔ Tailored to the changes in each specification
- ✔ Equips C/D students for tougher assessment
- ✔ Keeps 14-16 year olds motivated
- ✔ Easy to use, tried-and-tested lessons

*An **excellent resource** – easily the best yet. I urge other schools to look at it.*

Philippa Wallington,
LLanishen High School

Don't leave students' **skills** too late. Get **Crucial**!

From the Centre for Science Education & Association for Science Education

CRUCIAL upd8

Get it **now** at upd8.org.uk