Cambridge TECHNICALS

RESOURCES LINK

LEVEL 2 UNIT 10

VERSION 1 JANUARY 2014

SCIENCE

Level 2 and Level 3

OCR
Oxford Cambridge and RSA

WELCOME

Resources Link is an e-resource, provided by OCR, for teachers of OCR qualifications. It provides descriptions of, and links to, a variety of independent teaching and learning resources that you may find helpful.

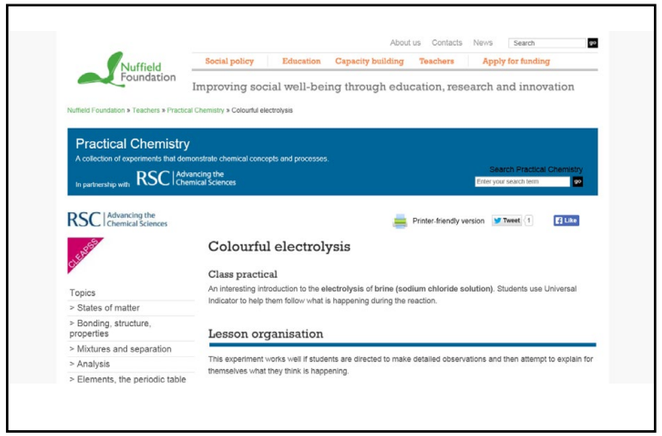
In Resources Link you will find details of independent resources, many of which are free: where this is the case this has been indicated.

If you know of other resources you would like to see included here, or discover broken links, please let us know. We would also like to hear from you if have any feedback about your use of these, or other, OCR resources. Please contact us at resourcesfeedback@ocr.org.uk.

We leave it to you, as a professional educator, to decide if any of these resources are right for you and your students, and how best to use them.

To give us feedback on, or ideas about the OCR resources you have used, email resourcesfeedback@ocr.org.uk

Colourful electrolysis



An interesting introduction to the electrolysis of brine (sodium chloride solution). Students use Universal Indicator to help them follow what is happening during the reaction.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO1 'Be able to describe why a chemical process and its location are chosen'
Cost:	Free
Format:	Web-page with download

http://www.nuffieldfoundation.org/practical-chemistry/colourful-electrolysis

If you know of any resources that you think should appear here, or if you identify broken links please let us know. We would also like to hear from you with your feedback about your use of any of the resources listed here. Please contact us at

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Bulk and fine chemicals

Two videos about the bulk and fine chemical production.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO1 'Be able to describe why a chemical process and its location are chosen'
Cost:	Free
Format:	Video's

http://media.rsc.org/alchemy/videos/sa.mpg

http://media.rsc.org/alchemy/videos/mm.mpg

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Virtual tour – Ethanol production

A virtual tour - includes short video clips of every stage in the production of ethanol.

Supports: OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO1 'Be able to describe why a chemical process and its location are chosen'

Cost: Free

Format: Web-page with interactive videos

http://english.unica.com.br/virtual-mill/video-new/virtual-mill.htm

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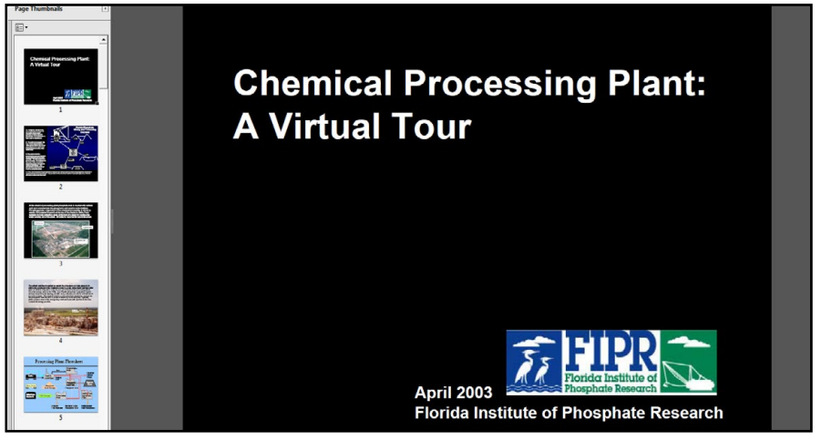
Chemical Processing Plant: A Virtual Tour



This is a pdf/PowerPoint presentation with detailed instructions as to how chemicals are produced on an industrial scale.

Supports: OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO1 'Be able to describe why a chemical process and its location are chosen'

Cost: Free

Format: Web-page

http://www.fipr.state.fl.us/pondwatercd/chemical_processing_tour.pdf

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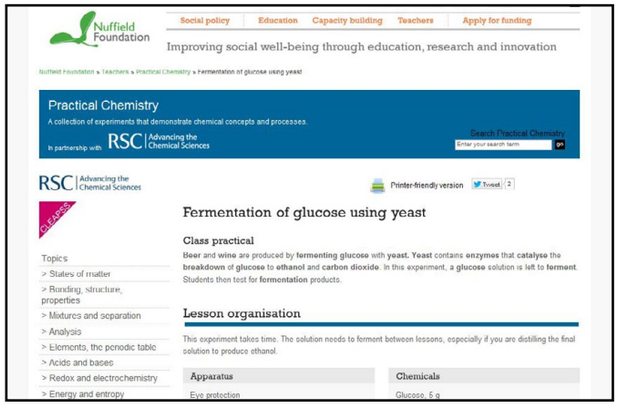
Fermentation of glucose using yeast



This is a detailed practical investigation into the fermentation of glucose using yeast.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO1 'Be able to describe why a chemical process and its location are chosen'
Cost:	Free
Format:	Web-page with download

http://www.nuffieldfoundation.org/practical-chemistry/fermentation-glucose-using-yeast

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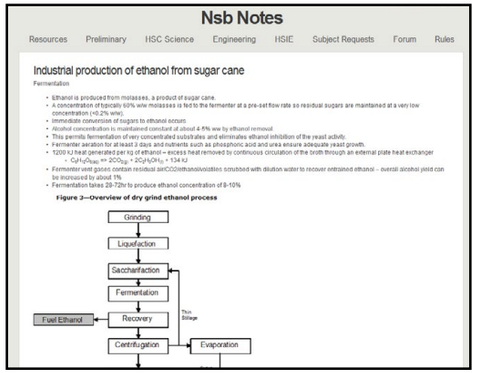
Industrial production of ethanol from sugar cane



This page provides detailed information about the conditions required for the reaction to occur, processes/ stages of production of ethanol and scientific theory.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO1 'Be able to describe why a chemical process and its location are chosen'
Cost:	Free
Format:	Web-page with download

http://nsb.wikidot.com/c-9-2-3-12

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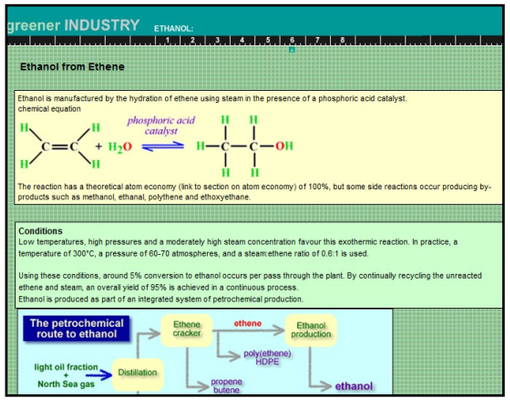
Production of ethanol from ethene



This page provides detailed information about the conditions required for the reaction to occur, processes/ stages of production of ethanol and scientific theory.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO1 'Be able to describe why a chemical process and its location are chosen'
Cost:	Free
Format:	Web-page with download

http://www.greener-industry.org.uk/pages/ethanol/ethanol6PM1.htm

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Video of fermentation

Howstuffworks video, explaining the uses of fermentation to create a wide range of products.

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Cost:	Free
Format:	Web-page with download

http://videos.howstuffworks.com/discovery/34874-howstuffworks-show-episode-5-fermentation-video.htm

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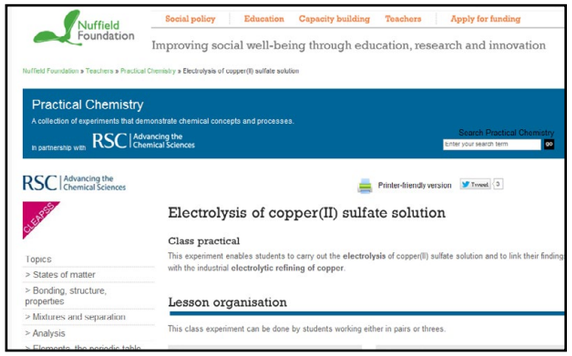
Electrolysis of copper(II) sulfate solution



Practical instructions to enable learners to carry out the electrolysis of copper(II) sulfate solution and to link their findings with the industrial electrolytic refining of copper.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO1 'Be able to describe why a chemical process and its location are chosen'
Cost:	Free
Format:	Web-page

http://www.nuffieldfoundation.org/practical-chemistry/electrolysis-copperii-sulfate-solution

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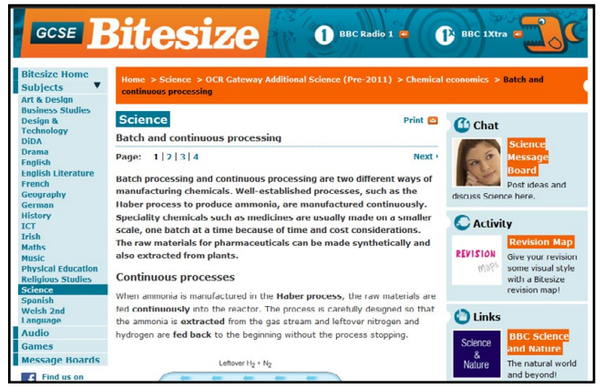
Batch and continuous processing



Explanation of Batch and continuous processing.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO1 'Be able to describe why a chemical process and its location are chosen'
Cost:	Free
Format:	Web-page

http://www.bbc.co.uk/schools/gcsebitesize/science/add_gateway_pre_2011/chemical/batchcontinuousrev1.shtml

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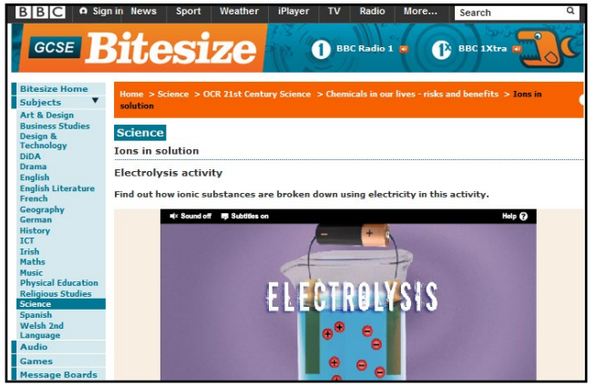
Ions in solution – Electrolysis activity



BBC Bitesize activity based on electrolysis. Useful for student only use or as an interactive tool within lesson.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO1 'Be able to describe why a chemical process and its location are chosen'
Cost:	Free
Format:	Animation/activity

http://www.bbc.co.uk/schools/gcsebitesize/science/21c/chemicals_in_our_lives/manufacture_chemicalsact.shtml

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Investigating the Effect of Concentration on the Rate of a Chemical Reaction

Practical details to investigate the effect of concentration on the reaction.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO2 'Be able to describe the factors that govern the rate and yield of a chemical process'
Cost:	Free
Format:	Web-page with download

http://www.nationalstemcentre.org.uk/elibrary/resource/9578/investigating-the-effect-of-concentration-on-the-rate-of-a-chemical-reaction

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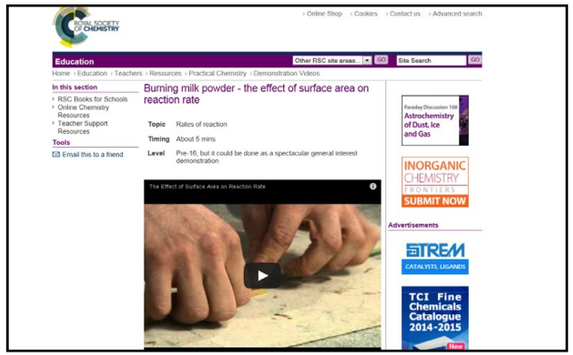
Burning milk powder - the effect of surface area on reaction rate



Short video clip 'Burning milk powder, accompanied with teacher notes.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO2 'Be able to describe the factors that govern the rate and yield of a chemical process'
Cost:	Free
Format:	Web-page with download

http://www.rsc.org/Education/Teachers/Resources/Practical-Chemistry/Videos/surface-area-on-reaction-rate.asp

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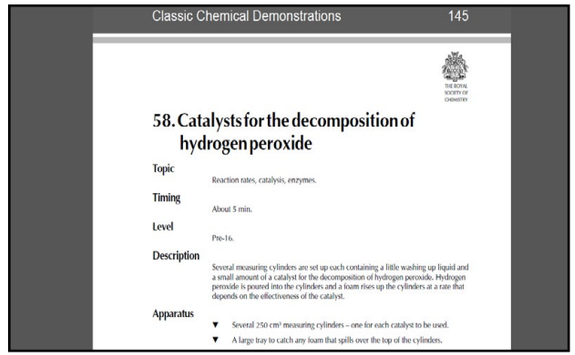
Catalysts for the decomposition of hydrogen peroxide



Practical details about the decomposition of hydrogen peroxide.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO2 'Be able to describe the factors that govern the rate and yield of a chemical process'
Cost:	Free
Format:	Web-page with download

http://www.rsc.org/images/catalysts_tcm18-188821.pdf

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Sulfuric acid and the Contact process

Video clip describing the manufacture of sulfuric acid using the Contact process.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO2 'Be able to describe the factors that govern the rate and yield of a chemical process'
Cost:	Free
Format:	Web-page with download

http://www.youtube.com/watch?v=_zj3bMjFclA

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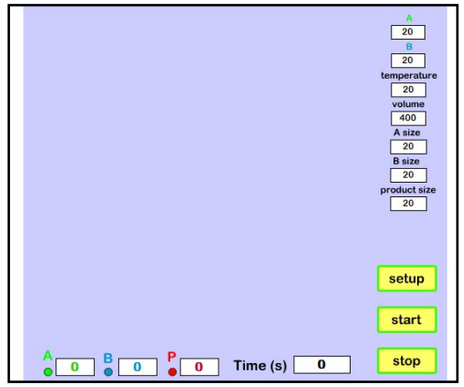
Collision Theory



This web-page provides an easy to manipulate animation of collision theory.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO2 'Be able to describe the factors that govern the rate and yield of a chemical process'
Cost:	Free
Format:	Web-page

http://www.kscience.co.uk/animations/collision.htm

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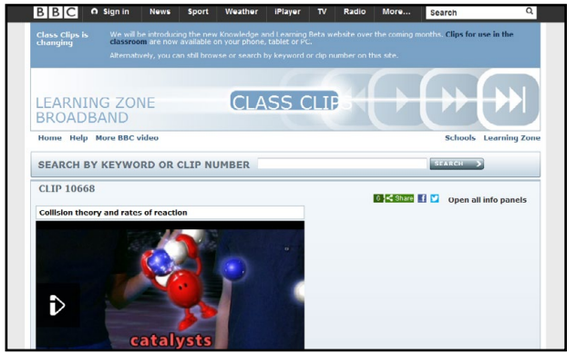
Collision theory and rates of reaction



An animated video designed to describe collision theory and what factors affect rates of reaction

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO2 'Be able to describe the factors that govern the rate and yield of a chemical process'
Cost:	Free from the BBC
Format:	Video clip/animated film

http://www.bbc.co.uk/learningzone/clips/collision-theory-and-rates-of-reaction/10668.html

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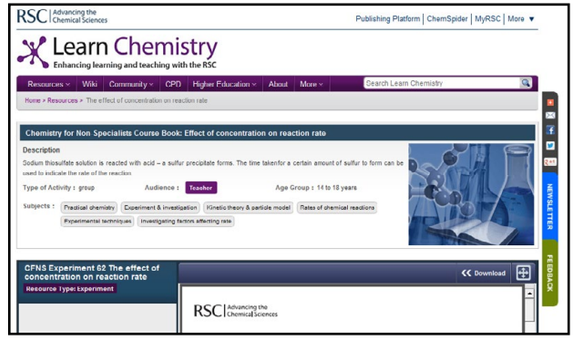
Rate of reaction - the effects of concentration on reaction rate



RSC practical investigation into the effect of concentration on rate of reaction. List of equipment/chemicals required, method to follow, health and safety issues and teacher notes to aid in the delivery of this task.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO2 'Be able to describe the factors that govern the rate and yield of a chemical process'
Cost:	Free
Format:	Web-page

http://www.rsc.org/learn-chemistry/resource/res00000743/the-effect-of-concentration-on-reaction-rate?cmpid=CMP00000821

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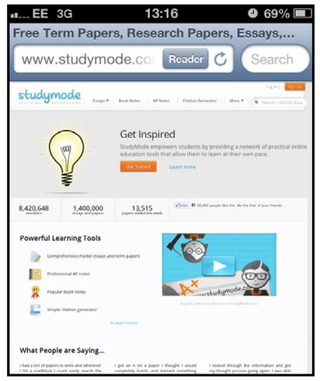
Investigating the Rate of Reaction Between Marble Chips (Calcium Carbonate) and Hydrochloric Acid



Practical investigation into the rate of reaction between marble chips and hydrochloric acid.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO2 'Be able to describe the factors that govern the rate and yield of a chemical process'
Cost:	Free
Format:	Web-page

http://www.studymode.com/essays/Investigating-The-Rate-Of-Reaction-Between-1115998.html

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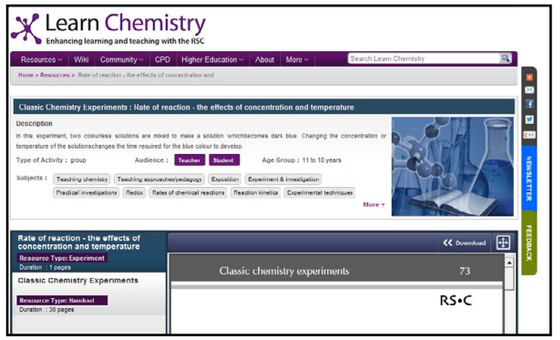
Rate of reaction – the effects of concentration and temperature



RSC practical investigation into the effect of concentration and temperature on rate of reaction.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO2 'Be able to describe the factors that govern the rate and yield of a chemical process'
Cost:	Free
Format:	Web-page

http://www.rsc.org/learn-chemistry/resource/res00000413/rate-of-reaction-the-effects-of-concentration-and-temperature?cmpid=CMP00000483

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BBC Bitesize - Ammonia and the Haber process

Details the stages in the production of ammonia.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO2 'Be able to describe the factors that govern the rate and yield of a chemical process'
Cost:	Free
Format:	Web-page

http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa_pre_2011/chemreac/energychangesrev3.shtml

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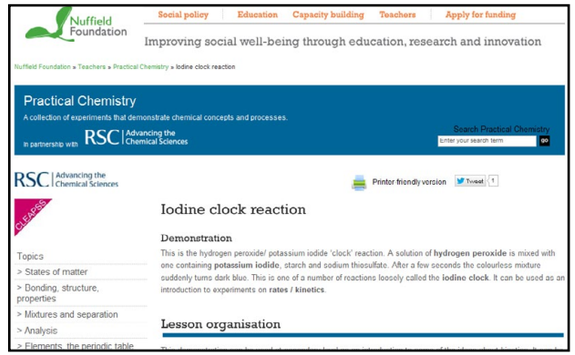
Iodine clock reaction



RSC practical investigation into the effect of catalysts on the rate of reaction.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO2 'Be able to describe the factors that govern the rate and yield of a chemical process'
Cost:	Free
Format:	Web-page

http://www.nuffieldfoundation.org/practical-chemistry/iodine-clock-reaction

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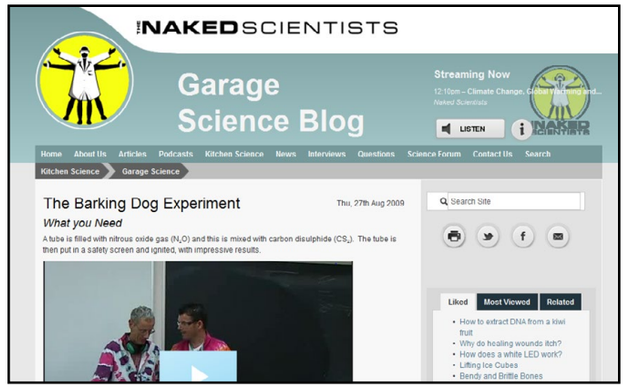
The Barking Dog Experiment



This web page contains a video that could be used to introduce the effect of pressure on the rate of reaction.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO2 'Be able to describe the factors that govern the rate and yield of a chemical process'
Cost:	Free
Format:	Web-page

http://www.thenakedscientists.com/HTML/content/kitchenscience/garage-science/exp/the-barking-dog-experiment/

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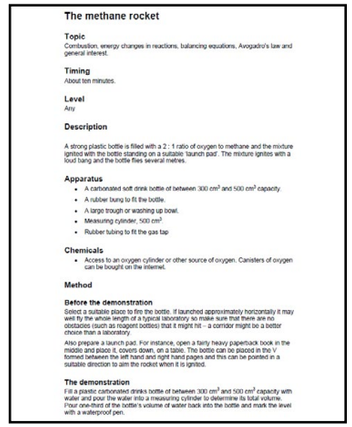
The methane rocket


The methane rocket

Topic
Combustion; energy changes in reactions, balancing equations, Avogadro's law and general interest.

Timing
About ten minutes.

Level
Any

Description

A strong plastic bottle is filled with a 2 : 1 ratio of oxygen to methane and the mixture ignited with the bottle standing on a suitable 'launch pad'. The mixture ignites with a loud bang and the bottle flies several metres.

Apparatus
- A carbonated soft drink bottle of between 300 cm^3 and 500 cm^3 capacity.
- A rubber bung to fit the bottle.
- A large trough or washing up bowl.
- Measuring cylinder, 500 cm^3
- Rubber tubing to fit the gas tap

Chemicals
- Access to an oxygen cylinder or other source of oxygen. Canisters of oxygen can be bought on the internet.

Method

Before the demonstration
Select a suitable place to fire the bottle. If launched approximately horizontally it may well fly the whole length of a typical laboratory so make sure that there are no obstacles (such as reagent bottles) that it might hit – a corridor might be a better choice than a laboratory.

Also prepare a launch pad. For instance, open a fairly heavy paperback book in the middle and place it, covers down, on a table. The bottle can be placed in the V formed between the left hand and right hand pages and this can be pointed in a suitable direction to aim the rocket when it is ignited.

The demonstration
Fill a plastic carbonated drinks bottle of between 300 cm^3 and 500 cm^3 capacity with water and pour the water into a measuring cylinder to determine its total volume. Pour one-third of the bottle's volume of water back into the bottle and mark the level with a waterproof pen.

Practical task to test the effect of pressure using a variety of different ratios of gases to see which one creates the most pressure and allows the rocket to travel the furthest distance.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO2 'Be able to describe the factors that govern the rate and yield of a chemical process'
Cost:	Free
Format:	PDF

http://www.rsc.org/images/methanerocket_tcm18-188848.pdf

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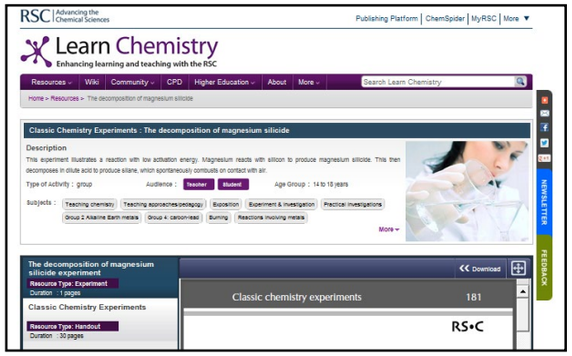
The decomposition of magnesium silicide



An experiment to illustrate a reaction with low activation energy.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' LO2 'Be able to describe the factors that govern the rate and yield of a chemical process'
Cost:	Free
Format:	Web-page

http://www.rsc.org/learn-chemistry/resource/res00000456/the-decomposition-of-magnesium-silicide

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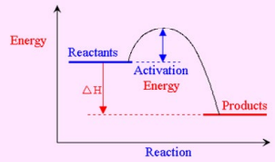
Rates of reaction - Activation energy

The change in energy can be plotted against the progress of a reaction, as the reactants turn into products.



Going from reactants to the top of the curve, you are going up the energy scale. Energy (heat) is being put in to break bonds in the reactants.

At the top of the curve, the bonds in the reactants have been broken. The amount of energy put in to break these bonds is called the activation energy.

Explanation of activation energy.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO2 'Be able to describe the factors that govern the rate and yield of a chemical process'
Cost:	Free
Format:	Web-page

http://www.gcsescience.com/rc24-energy-level-diagram.htm

If you know of any resources that you think should appear here, or if you identify broken links please let us know. We would also like to hear from you with your feedback about your use of any of the resources listed here. Please contact us at

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The Case of the Sulphuric Acid Plant

Video clip about the contact process.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' LO3 'Know how waste treatment methods can be used to minimise the environmental impact of a chemical process'
Cost:	Free
Format:	Video

http://www.youtube.com/watch?v=r7XdRMNXVgM

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Ammonia video

You tube video created by the RSC – detailing the production of ammonia by the Haber process. Explanation of the stages of production, chemicals involved, uses of the products created in the reaction.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO3 'Know how waste treatment methods can be used to minimise the environmental impact of a chemical process'
Cost:	Free
Format:	Web-page

http://www.youtube.com/watch?v=wiwl4eoHbig

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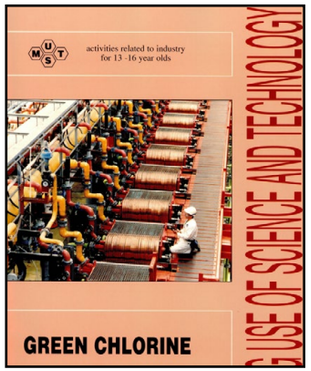
Green chlorine – Electrolysis of brine



This pdf document includes practical work that will enable students to carry out electrolysis within a laboratory setting. There are clear instructions for three methods that link to industry and the key scientific information that both the student and teacher will require in order to fully understand the processes.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO3 'Know how waste treatment methods can be used to minimise the environmental impact of a chemical process'
Cost:	Free
Format:	Web-page based PDF document

http://www.ciec.org.uk/2%20Topic%20Bank/texts/GreenChlorine.pdf

If you know of any resources that you think should appear here, or if you identify broken links please let us know. We would also like to hear from you with your feedback about your use of any of the resources listed here. Please contact us at

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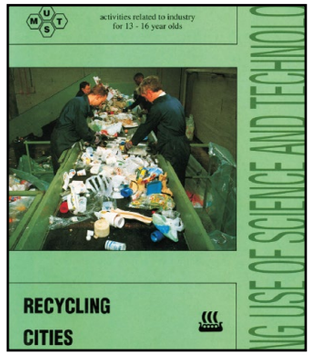
Recycling Cities – The production and management of waste for polymers



This pdf document contains information about practical tasks related to the production and management of waster for polymers. Technicians notes are provided and teacher delivery notes to enable the successful delivery of each task.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO3 'Know how waste treatment methods can be used to minimise the environmental impact of a chemical process'
Cost:	Free
Format:	Web-page with PDF downloads

http://www.ciec.org.uk/2%20Topic%20Bank/texts/RecyclingCities.pdf

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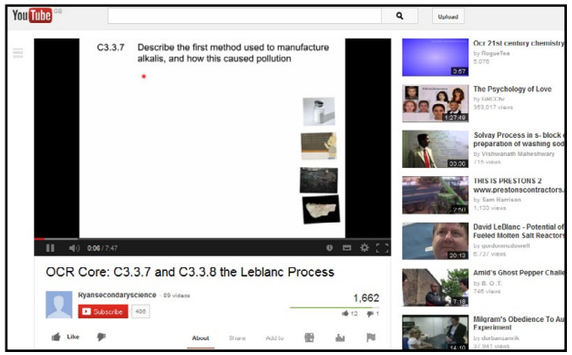
Leblanc Process



Short video clip detailing the reactants, products, waste, pollution produced from the Leblanc process – which is the method used to produce alkali's in industry.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO3 'Know how waste treatment methods can be used to minimise the environmental impact of a chemical process'
Cost:	Free
Format:	Video

http://www.youtube.com/watch?v=6XJ1ywiuj6U

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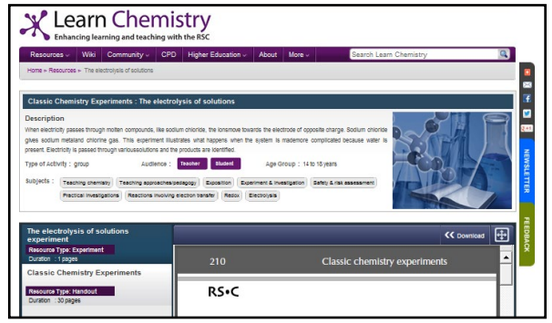
The electrolysis of solutions



RSC practical investigation of the electrolysis of solutions.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO3 'Know how waste treatment methods can be used to minimise the environmental impact of a chemical process'
Cost:	Free
Format:	Web-page

http://www.rsc.org/learn-chemistry/resource/res00000466/the-electrolysis-of-solutions?cmpid=CMP00000536

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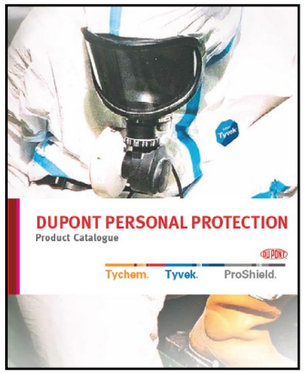
Du pont safety clothing



This is a product catalogue for safety clothing. The clothing is clearly labelled with benefits and coding system that identifies which chemicals/substances it is suitable to wear when handling.

Supports: OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO4 'Know how the chemical industry maintains a good safety record in the manufacture and transport of chemicals'

Cost: Free

Format: PDF - Web-page

http://www2.dupont.com/Personal_Protection/en_GB/assets/PDF/LIT_EN_DPP_Catalogue.pdf

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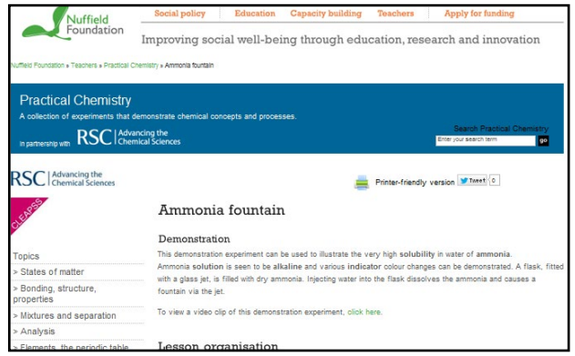
Ammonia fountain



Practical Investigation/demonstration – to engage students and show the uses/reactions that take place with ammonia.

Supports: OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO4 'Know how the chemical industry maintains a good safety record in the manufacture and transport of chemicals'

Cost: Free

Format: Web-page

http://www.nuffieldfoundation.org/practical-chemistry/ammonia-fountain

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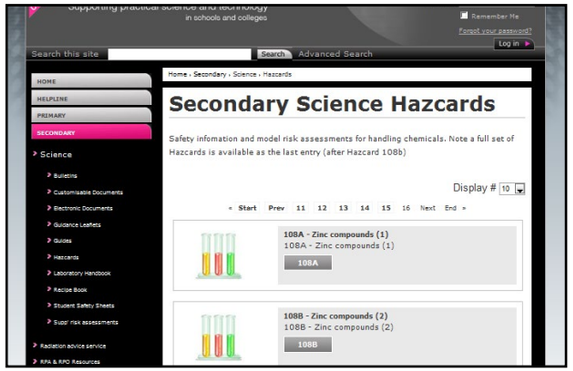
CLEAPPS Hazcards



Hazcards for all of the chemicals that are used in the school laboratory and in industrial production. Health and safety details, first aid treatment, appropriate storage and handling of the chemicals

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO4 'Know how the chemical industry maintains a good safety record in the manufacture and transport of chemicals'
Cost:	Free
Format:	Web-page

http://www.cleapss.org.uk/secondary/secondary-science/hazcards?start=150

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Laboratory spill response

Video clip detailing the correct procedures for handling chemical spillages in industry.

Supports:	OCR Level 2 Cambridge Technical Certificate/Extended Certificate/ Diploma in Science - Unit 10 'Chemistry of Production' - LO4 'Know how the chemical industry maintains a good safety record in the manufacture and transport of chemicals'
Cost:	Free
Format:	Video

http://www.youtube.com/watch?v=Dtp9vT15qIs

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LO1 - Be able to describe why a chemical process and its location are chosen

- Colourful Electrolysis
- Bulk and fine chemicals
- Virtual tour - Ethanol production
- Chemical Processing Plant - A Virtual Tour
- Fermentation of glucose using yeast
- Industrial production of ethanol from sugar cane
- Production of ethanol from ethene
- Video of fermentation
- Electrolysis of copper(II) sulfate solution
- Batch and continuous processing
- Ions in solution - Electrolysis activity

LO2 - Be able to describe the factors that govern the rate and yield of a chemical process

- Investigating the Effect of Concentration on the Rate of a Chemical Reaction
- Burning milk powder - the effect of surface area on reaction rate
- Catalysts for the decomposition of hydrogen peroxide
- Sulfuric acid and the Contact process
- Collision Theory
- Collision theory and rates of reaction
- Rate of reaction - the effects of concentration on reaction rate
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- Rate of reaction - The effects of concentration and temperature

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- Iodine clock reaction
- The Barking Dog Experiment
- The methane rocket
- The decomposition of magnesium silicide
- Rates of reaction - Activation energy

LO3 - Know how waste treatment methods can be used to minimise the environmental impact of a chemical process

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Cambridge TECHNICALS

SCIENCE

Level 2 and Level 3

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Oxford Cambridge and RSA