

TEACHER RESOURCE

L I F E A R T M I N D



Science

Mathematics

KITCHEN CHEMISTRY

Permanent programme

Year 3 - Year 8

Explore the chemistry behind everyday household activities.

Supported by the Ministry of Education

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INTRODUCTION

Why Do Chemistry?

Chemistry forms the basis of much of our lives and the reactions that go on within and outside our bodies which enable us to function. Chemical reactions underlie cooking, cleaning, transport, industry, and many other activities that we do every day. Using household materials enables students to make connections between everyday life and the world at the molecular level.

ABOUT THE EDUCATION PROGRAMME

This programme is suitable for Year 3 – Year 8 students and takes 1 ½ hours, which may be shortened for younger students.

Using standard household products students explore chemical reactions through a series of interactive experiments. They practise science skills of observation and analysis, and mathematical skills of measurement and estimation. By working together in pairs and in small groups they use social and co-operative skills. Communication skills will be utilised particularly in the discussion of results.

Three popular programmes are: Fizzing and Foaming, Density, and Cosmetic Chemistry.

Some activities are better suited for a particular age group so the programme will be adjusted to the level of the students.

Activities may include:

- production of gases and their properties (Fizzing and Foaming)
- comparison of a range of “ingredients”
- physical and chemical change
- characteristics of water
- use of scientific method and fair testing
- introduction to science principles and language e.g. reactions, density, change of state

Special Requirements:

Some prior knowledge of students' level of understanding within this subject area would be appreciated, and can be provided by filling out our pre-visit questionnaire or by contacting a Science Educator via email:

Barbara Arnold barbara.arnold@temanawa.co.nz

Mary Sheridan mary.sheridan@temanawa.co.nz

This will mean that your students' specific learning needs will be better catered for.

Please indicate your section of interest when you make a booking so that the programme can be constructed to reflect this.
Students will be working in pairs and so you may want to allocate partners before arrival.

CURRICULUM LINKS

Science

Nature of Science Level 1 - 4

Understanding about science

Investigating in science

Communicating in science

Participating and contributing

Material World Level 1 - 4

Properties and changes of matter

Observe, describe, and compare physical and chemical properties of common materials and changes that occur when materials are mixed, heated or cooled. (Level 1 – 2)

Group materials in different ways, based on the observations and measurements of the characteristic chemical and physical properties of a range of different materials. (Level 3 – 4)

Chemistry and society

Find out about the uses of common materials and relate these to their observed properties. (Level 1 – 2)

Relate the observed, characteristic chemical and physical properties of a range of different materials to technological uses and natural processes. (Level 3 – 4)

Mathematics and Statistics Level 1 – 4

Geometry and measurement

Use appropriate units and devices to measure volume, temperature, and time.

Statistics

Conduct investigations using the statistical enquiry cycle:

- posing and answering questions
- gathering and sorting data
- identifying patterns and trends
- communicating findings

Key Competencies

Using language, symbols and texts

Students will learn and become familiar with the specialist language, including symbols and text, associated with chemistry.

Thinking

Students will use creative, critical, metacognitive, and reflective processes to make sense of and question information, experiences and ideas about chemistry.

LEARNING OUTCOMES

We are learning to:

- make observations
- make accurate measurements
- recognise patterns and trends

We know we have achieved this when:

- we can describe what our senses tell us
- we can carry out an experiment following the instructions
- we can describe similarities and differences between experiments

PRE AND POST VISIT ACTIVITIES

- Collect packaging from household products and compare the ingredients
- Investigate the different raising agents used in cooking
- Explore what a chemical is, where chemicals are found and how they are used
- Find out the chemical symbols for common substances such as water
- Make a poster to illustrate the different uses of carbon dioxide
- Find out the links between carbon dioxide and energy
- Find out how carbon dioxide affects our atmosphere and why this might be a problem
- Investigate how plants use carbon dioxide
- Find out about the gases that make up the air we breathe
- Design a poster to show the common and chemical names of ingredients commonly found in household products such as toothpaste, baking powder, bleach, glass cleaner

- Investigate safety with chemicals

RESOURCES

BOOKS:

Horrible Science Chemical Chaos

N. Arnold

Scholastic U.K, 1997

Kitchen Chemistry

T. Lister & H. Blumenthal

The Royal Society of Chemistry, 2006

Check out the Palmerston North City Library catalogue online at www.citylibrary.pncc.govt.nz.

WEBSITES:

<http://www.fizzicseducation.com.au/experiments/Kitchen%20Chemistry/chemistry.html>

Lots of fun experiments, clear instructions and explanations

<http://www.kidspot.co.nz/activity-finder-kidspot.acp>

Science experiments for different age groups

http://www.chatham.edu/pti/Kitchen_Chem/abstract_page.htm

This is the website of the Pittsburgh Teachers Institute. Lots of ideas and easy to follow instructions for experiments

<http://www.axel-and-alice.com/proj/chem/chem0001.html>

Simple experiments students will love to carry out!

<http://home.ntelos.net/~rollinso/SciFood.html>

An interesting collection of experiments with links to other websites

http://en.wikipedia.org/wiki/Kitchen_chemistry

For a list of commonly available chemicals including their chemical name, chemical formula, source and description plus safety information

NATIONAL LIBRARY SCHOOLS' SERVICE

For books, videos and CD ROMS:

Website: <http://www.natlib.govt.nz/>

Telephone: 0800 171717 Fax: 0800 907000

Palmerston North

Monday - Friday 8.30am - 5.00pm

Thursday 8.30am - 6.00pm (during term)

Online request form: <http://www.natlib.govt.nz/cis-online-request>