

# Teacher Notes



## How to use this resource

Teachers may consider the *Experiments at school* and the *Activities at Scienceworks* as part of a broader theme which could be developed into a unit of work. Some suggestions for themed units of work are:

- Science in the home
- Science in the kitchen
- Cooking and chemical processes
- How appliances work
- Inventions

The *Resource List* (page 10) contains books and websites useful for developing these themes.

The filmed experiments have been designed to provide visual and aural stimulus for students and teachers. Accompanying the filmed experiments are listening activities that students may complete during or after the viewing of the experiment. Having the narration in Italian and English provides opportunities for the Italian teacher to present the Italian narration in the LOTE classroom whilst the English narration can be used by the classroom teacher or Science teacher to reinforce the scientific concepts.

The filmed experiments also provide teachers and students with demonstrations of techniques to be used when students attempt the same experiments for themselves in the classroom.

Teachers should note that there are no listening activities for the English videos, however, they could be used for classroom discussion prior to performing the experiments in the classroom.

### Acknowledgments

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## Essential preparation

- Read the education kit and, ideally, visit Scienceworks to familiarise yourself with the exhibition. Become a MVteacher to receive free entry at [mvteachers@museum.vic.gov.au](mailto:mvteachers@museum.vic.gov.au)
- Research has shown that setting objectives for a museum visit is extremely important for students. Teachers should provide clear and precise objectives; this in turn will assist students in focussing and cooperating during the visit.
- Teachers should create interest in the subject. The *Resource List* contains suggestions that you may choose to investigate prior to the visit.
- Determine which Pathway is most appropriate for your students. Teachers should consider all of the activities carefully (activities in Pathway A designed for beginners whilst Pathway B is for intermediate level).
- Bookings are essential; phone Scienceworks 03 9392 4819 between 8.30am and 4.30pm weekdays.
- Print-out and photocopy pathways for students to bring on the day of their visit, with the appropriate writing materials.

## Aims of this resource

- To develop student knowledge and understanding of the scientific concepts within an integrated unit of Italian.
- To enable cooperative learning within groups to occur through practical, hands - on science activities.
- To explore the science of the home using familiar Italian vocabulary applied to a new situation.
- To support students' Italian language acquisition and proficiency.
- *House Secrets* includes a range of experiences where everyday Italian vocabulary can be practised outside of the classroom or at home.

## Curriculum relevance

It is suggested that the Italian LOTE teacher plans and liaises with the classroom teacher or Science teacher to complement cross curricular opportunities for science themes being dealt with in both Italian and English. This approach should make the visit to Scienceworks a more meaningful learning experience for students.

### Italian LOTE themes

#### Year 3 - Year 4

Themes included in museum activities: i numeri, i colori, l'ora, il cibo, gli oggetti nella casa, gli elettrodomestici, le stanze nella casa, gli animaletti e i verbi.

#### Year 5 - Year 9

Themes included in museum activities: gli elettrodomestici, le stanze nella casa, le fonte d'energia, gli ideatori, i verbi, i numeri, il cibo, le macchine semplici e i materiali.

# Victorian Essential Learning Standards (VELS)

<http://vels.vcaa.vic.edu.au>



Scopri i segreti della casa

Per gli insegnanti

| LOTE Dimensions   | Related school based activities   |
|---|---|
| <p><b><i>Communicating in a language other than English</i></b><br/> <b>Level 4 Pathway 1</b></p> <p>Participate effectively in very simple interpreting and translating routines.</p>  | <p>Listening &amp; Reading tasks that accompany the kitchen chemistry experiments.</p>                              |
| <p><b><i>Intercultural knowledge and language awareness</i></b><br/> <b>Level 4</b></p> <p>Explore a topic of interest through the language.</p>  | <p>Combining the theme of Italian and Science through the kitchen chemistry experiments and Scienceworks visit.</p> |
| <p><b><i>Communicating in a language other than English</i></b><br/> <b>Level 5 Pathway 1</b></p> <p>Students recall most of the main ideas, objects and details presented with a topic in the language. They use a range of strategies to assist in listening comprehension.</p> | <p>Listening, reading and written tasks that accompany the kitchen chemistry experiments.</p>                       |
| <p><b>Level 5 Pathway 2</b></p> <p>Students identify the names of visible objects and items from aural cues. They show awareness of the language requirements of a range of specific situations related to a given topic.</p>   | <p>Listening, reading and written tasks that accompany the kitchen chemistry experiments.</p>                       |
| <p><b><i>Communicating in a language other than English</i></b><br/> <b>Level 6 Pathway 2</b></p> <p>Students recall most of the main ideas, objects and details presented with a topic in the language.</p>  | <p>Listening, reading and written tasks that accompany the kitchen chemistry experiments.</p>                       |



## Scopri i segreti della casa

Per gli insegnanti

| Science Dimensions  | Related school based activities   |
|---|---|
| <p><b>Level 3 Science knowledge and understanding</b></p> <p>Understanding concepts related to matter its properties and uses, and how different, substances are created through chemical change.</p> | <p>Experiment 1: Fizzical reactions<br/>Experiment 3: Bubble mix<br/>Experiment 4: Dancing currants</p> |
| <p><b>Level 3 Science at work</b></p> <p>Learning about mixing, dissolving, melting, boiling and evaporating.</p>   | <p>Experiment 3: Bubble mix</p>   |
| <p><b>Level 4 Science knowledge and understanding</b></p> <p>Its properties and uses, and how different substances are created through chemical change.</p>   | <p>Experiment 2: Cabbage indicator</p>  |
| <p><b>Level 5 Science knowledge and understanding</b></p> <p>Understanding concepts related to matter, its properties and uses, and how different substances are created through chemical change.</p> | <p>Experiment 1: Fizzical reactions<br/>Experiment 3: Bubble mix<br/>Experiment 4: Dancing currants</p> |
| <p><b>Level 5 Science at work</b></p> <p>Testing and the control of variables.</p>  | <p>Experiment 2: Cabbage indicator</p>  |
| <p><b>Level 6 Science knowledge and understanding</b></p> <p>Understanding concepts related to matter, its properties and uses, and how different substances are created through chemical change.</p> | <p>Experiment 1: Fizzical reactions<br/>Experiment 3: Bubble mix<br/>Experiment 4: Dancing currants</p> |
| <p><b>Level 6 Science at work</b></p> <p>Testing and the control of variables.</p>  | <p>Experiment 2: Cabbage indicator</p>  |



|  |   |
|--|---|
| <b>Domain: Interpersonal development</b>   | <b>Related school based activities</b>  |
| <b>Level 3 - Level 6 Dimension:</b><br><b><i>Working in teams</i></b>  | Students use the group model to set up practical experiments in the classroom. Students join in the concluding class discussions whilst working cooperatively in small groups.  |
| <b>Domain: ICT</b>   | <b>Related school based activities</b>  |
| <b>Level 3 - Level 6 Dimension:</b><br><b><i>ICT for communicating and creating</i></b>  | ICT written task with images used to reflect on the excursion by presenting a product that uses editing and manipulation of images.   |
| <b>Domain: Thinking</b>  | <b>Related school based activities</b>  |
| <b>Level 3 - Level 6 Dimension:</b><br><b><i>Reasoning, processing &amp; inquiry</i></b><br><b><i>Creativity</i></b><br><b><i>Reflection, evaluation and metacognition</i></b> | <p>Learning through interacting with objects, text and technology within House Secrets exhibition.</p> <p>Enhancing the scientific literacy through text types that include exposition, procedure, recount, description and explanation.</p> <p>Making predictions and investigating hypothesis.</p> <p>To acquire strategies for thinking related to enquiry, processing information, reasoning, problem solving, evaluation and reflection.</p> <p>Learning through the independence and interdependence environment of Scienceworks.</p> |



## Preparing students for the experiments

Teachers may decide to watch the filmed chemistry experiments in this resource. Students could watch the experiments as a whole class or in small groups. The Italian audiovisuals also have listening activities that students can complete.

The teacher should present the written/reading tasks to students when they are ready to undertake the experiment in the classroom. If the teacher chooses to use the experiments written in Italian then it would be appropriate that some modification be made to suit particular students. The teacher can assist by focussing the students on one particular difficulty at a time. E.g. use of verbs or key scientific words or the language used to give instructions.

## Setting up the experiments in the classroom

Teachers could consider using the following model as a way of organising classroom kitchen chemistry experiments in the LOTE Italian or Science classroom.

### 'Group work' model

Using a group work model ensures that students are given clear and real responsibilities during practical work and it ensures that the students take ownership of their own learning. The teachers role is that of facilitator and any problems that are encountered are solved within the group or the Communication Officer would ask assistance of another Communication Officer from another group before the teacher is called upon.

The students will be allowed to experience the different roles and therefore gain experience in different skills and tasks undertaken during the activities.

## Job Descriptions

**Equipment Manager:** Collects and returns clean materials and equipment from the equipment area/storage.

**Lab supervisor:** reads all instructions carefully and ensures each group member understands the process. They ensure that each part of the investigation is completed in the correct order.

**Communication Officer:** The only group member allowed to move around the room. They can ask teacher or other communication officers for assistance if group experiences difficulties.

**Data Officer:** (one or more per group)

They keep careful, clear and accurate records of the experiment. These records shall be referred to regularly during class discussions.

## Cooperation and class discussions

Each member of the group should have the opportunity to observe and contribute to each activity and join in the concluding class discussions. Working cooperatively in small groups with lively discussion is the key to successful hands-on science lessons.

## Safety Information



Things to remember:

- Try identifying potential hazard at the beginning of each session and remembering safe practices which will minimise the hazard.
- Remember that some hazards are invisible, such as clear liquids and hot liquids.
- Reactions that produce gases should not be done in tightly sealed containers.
- Never use our sense of taste (except when cooking).
- Measure only the required quantities for each activity. Students have a natural curiosity about making it bigger and 'better'.
- Dilute liquids as much as possible (for example 50/50 vinegar and water works as well as pure vinegar for most activities).
- All of the chemicals used in these activities are not dangerous if used properly. Similarly, to a certain extent all the chemicals used in these activities could potentially be hazardous if used incorrectly. For example, vinegar is an acid and can sting eyes and soap is a base and can sting your eyes.
- Some experiments require the wearing of safety glasses. Teachers must ensure that they are worn during these experiments. If any chemicals enter the eye, flush the eye with water only.
- Seek medical advice if eye is still irritated after flushing.
- Students must always wash hands after experiment work.

## Background information

Teachers can find some background information below for each kitchen chemistry experiment. Teachers should also note that the filmed kitchen chemistry demonstrations also give explanations of results of experiments in both Italian and English.

### Esperimento 1: Reazioni veloci

The 'volcano' erupts in this activity because the baking soda (sodium bicarbonate) and vinegar (acetic acid) react and produce a gas called carbon dioxide. In the activity, the bubbles of carbon dioxide are released, making the 'lava' residue flow.

### Esperimento 1B: Reazioni veloci

To blow up a balloon we can use our breath which contains carbon dioxide. This same common gas can also be produced using vinegar and baking soda. In this chemical reaction the gas produced (carbon dioxide) expands the balloon and the balloon swells up.



## Esperimento 2: Cavolo indicatore

Liquids and solids used in our homes can be tested to find out if they are acids or bases. We can do this using a liquid indicator that turns red in acids and blue or green in bases. Red cabbages can be used to make one of these indicators. However, if the liquid or solid is neutral (neither acid nor base) then there will be no colour change.

## Esperimento 3: La miscela di sapone

Water molecules have strong cohesive forces and tend to cling together. Because of this it is impossible to stretch water across a frame to form bubbles. However, when you add detergent to water, the detergent weakens the force between the water molecules and this allows it to stretch across a bubble frame, and to make bubbles. The soapy film of a bubble is very elastic and can expand without breaking. This elasticity is due to a reduction of the surface tension. The spherical shape of bubbles is due to a balance between the air inside the bubble pushing out and the film's tendency to reduce its surface area pushing in. For a given volume, a sphere is the shape with the least surface area.

## Esperimento 3B: Il latte e la miscela di sapone

From the previous experiment it was discovered that soap reduces surface tension. When soap touches the milk, the surface tension at that point is reduced, but it is as strong as ever in the rest of the bowl. That's why the milk (and the colours) spreads towards the side of the dish.

## Esperimento 4: L'uvetta danzante

The surface of the sultanas is naturally hydrophobic/water repelling, or 'water hating'. The sultanas 'want' to get away from water. Gas bubbles from the soda water surrounds them so that their surface is less exposed to the water. When enough gas bubbles are attached they float to the surface. At the surface, the bubbles burst and the sultanas fall down. The cycle is repeated and the sultanas continue dancing around. If you add detergent to the mixture, it alters the surface reaction of the sultanas. They no longer repel the water and the bubbles no longer stick to their surface.

## La mappa di House Secrets



**Scopri i segreti della casa**

Per gli insegnanti

- 1 l'entrata
- 2 la cucina
- 3 la dispensa
- 4 le sedie
- 5 la stanza pazza
- 6 il soggiorno
- 7 l'aspirapolvere
- 8 la camera da letto
- 9 il bagno
- 10 la lavanderia
- 11 il cortile



## Resource List (Risorce)



The following publications are available for loan from Co.As.It Resource Centre, Level 1, 189 Faraday St, Carlton VIC 3053. Membership and other details available at: <http://www.coasit.com.au>, in the Education Section.

### Kits

Italiano italiano: Stage B Unit 5-8 (kit based on theme of the house) Queensland Department of Education.

Dov'è Lingua: An interactive multimedia resource for students of Italian in the Middle Years. DE&T, Vic 2003.

### Teacher/ student resources

Gralla Preston, *La città*, Jackson Libri, Bergamo 1997

Walpole Brenda, *Divertiamoci con la Scienza- Movimento*, DeAgostini Ragazzi, Novara 1993

Cash Terry & Parker Steve, *Divertiamoci con la Scienza 2*, DeAgostini Ragazzi, Novara 1993

Bonafede R, *come nasce...quarta serie completa*, Malipiero spa Editore. Italy

### Reference books

*La mia casa*, Edibimbi, Gruppo Editoriale, Milano Italy

Dami Elisabetta & Sirena Adriana *Invenzioni e grandi scoperte*, Dami Editore, Milano 1994

Clima Gabriele, *La mia prima Enciclopedia*, Il Mosaico editoriale, Novara 1998

Pigozzi Paolo, *Bambini e bambine oggi cucino io*, Demetra s.r.l., Colognola ai Colli (VR) 1996

Wolf Tony, *il libro della terra*, Giunti Editore s.p.a, Firenze-Milano 2002

Jensen Kiersten, *There's a possum in the house- c'è un possum nella casa*.



## Story books

Giacomin Marina, *Bambù, I suoi amici e...la pioggia*, Crealibri Gruppo Editoriale, Milano 2004

Panini Allegra, *Il segreto dei colori- primo sguardo alla natura della luce*, Mondadori, Milano 2001

Picozzi Laura, *I miei primi libri – la natura*, Edibimbi, Milano 2004

Panini Allegra, *Giochiamo con la scienza - Ecologia*, Mondadori Editore s.p.a. Milano 2004

## Video/Film

Wilkes Angela, *Il mio primo libro di cucina*, Gruppo Editoriale Fabbri, Milano 1992

## Songs and Poems

Endrigo Sergio, *Quando la musica è poesia*, Warner Fonit Music 1999

## Internet sites

**Inventors** <http://www.inventors.about.com/mbody.htm>

Site includes the A to Z for famous inventions and inventors. Find a lesson plan for teaching about invention and inventors. Young inventors' universe, featuring sites and fun experiments all about inventing.

**Exploratorium: the Science of cooking**

<http://www.exploratorium.edu/cooking/index.html>

Discover how a pinch of curiosity can improve the cooking! Explore recipes, activities, and webcasts that will enhance your understanding of the science behind food and cooking.

**A Science Odyssey -You try it!** <http://www.pbs.org/wgbh/aso/tryit>

Provides a range of animations for secondary students the includes 'Technology at Home'.

**How Stuff Works** <http://www.howstuffworks.com>

There is information on chemical reactions- bread and chocolate making.

**Kids Cooking Corner** <http://www.kidscookingcorner.com>

**Miami Museum of Science- the pH factor** <http://www.miamisci.org/ph>

**Double Helix Club** <http://www.csiro.au/helix>

This is the home page for CSIRO's Double Helix Club for students. It has some great kitchen chemistry listed under Cool Science.