



The First Year Chemistry Raft of Resources

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School of Chemistry

Introduction

What we do

Does it work?

Conclusion



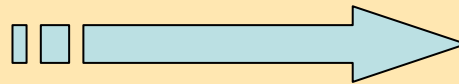
Time of Change

Content delivery – lectures, tutorials, labs



Face-to-face

- Interviews
- Duty tutor
- Stu vac



ICT mediated

- E-mail
- On-line





Issues relating to ICT

University

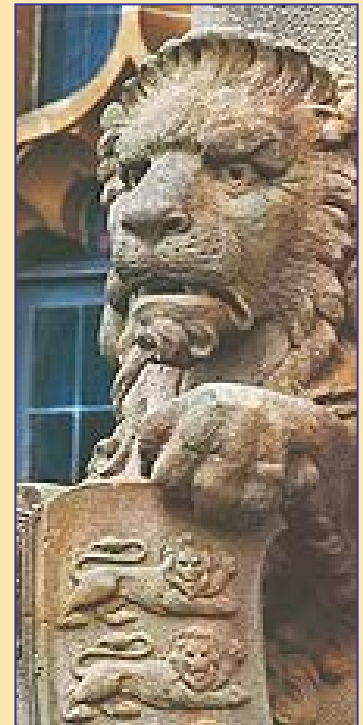
- Integration
- How to review progress

Department

- Cost and efficiency
- Does it work?

Student

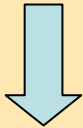
- Time management





Advantages of integrating ICT

Flexible learning and enhanced learning



- Less time on campus (jobs)
- Self paced learning
- Access 24-7

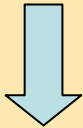


- Multi layered program possible
- Comfortable environment
- Feedback at time of work



Disadvantages of integrating ICT

Staff related and education related



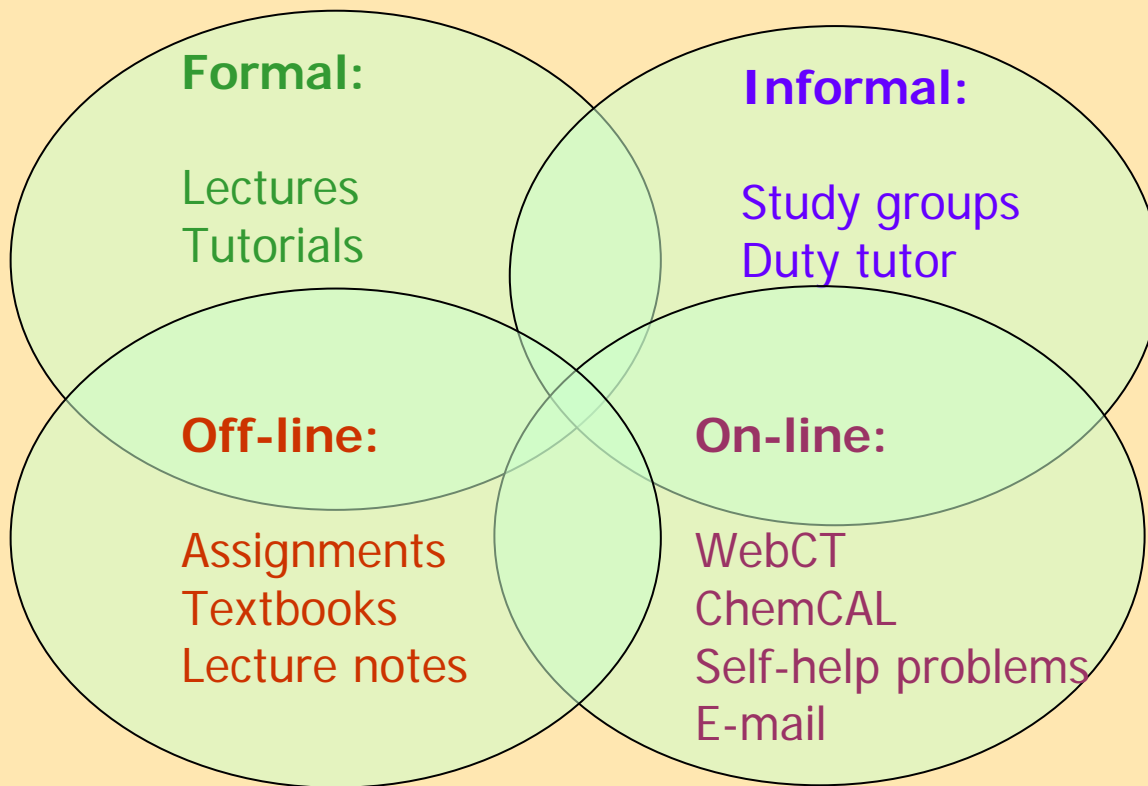
- Large time commitment
- Staff input not often acknowledged
- One-off grants for funding



- Support for on-going development
- Changing environment
- Does it work?

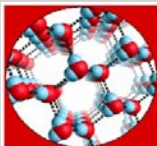


How we do it – Raft of Resources





Resource page



Syllabus and Resources for CHEM1001 (Fundamentals of Chemistry 1A)

The order of topics presented here is essentially the order of presentation in the lecture course, although individual lecturers may make some variations from this. Some topics span more than one week.

Resources:

- Links to worked answers for assignments will become available after completion of the assignment by all students.
- Textbook references are to *Chemistry: The Molecular Nature of Matter and Change*, Martin Silberberg, McGraw Hill, 3rd Edition.
- ChemCAL is an on-line suite of modules with information, explanations, animations and questions on most topics. To access, click [ChemCAL](#) and log on using *username 1001* *password helium*.
- The self-help problems are a series of topic related questions of varying difficulty, with links to full worked answers.
- The lecture notes and assignments may be downloaded in Adobe Acrobat format (PDF files). If you do not have Acrobat Reader [click here](#).

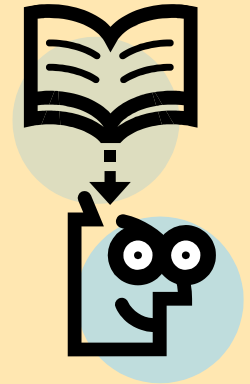
Week	Topics covered	Lecture Notes and Assignments	References	ChemCAL	Self help problems
1	Introduction <ul style="list-style-type: none">- admin. matters- overview of course Elements and Atoms <ul style="list-style-type: none">- elements, compounds and mixtures- physical and chemical change- chemical symbols- allotropes	Assignments 1-12 (these are the same as the ones in the yellow unit booklet handed out at the first lecture) Lecture notes on elements and atoms	Silberberg 2.2-2.4 Silberberg pp 54-55 Silberberg 24.1-24.2 Silberberg pp 1074-5 Radioactive Dating of the Shroud of Turin	Note you may have to configure your computer to run ChemCAL correctly. See "Setting up ChemCAL on-line" to do this.	
2	Elements and Atoms (continued) <ul style="list-style-type: none">- atomic structure<ul style="list-style-type: none">- protons- electrons- neutrons- atomic number- isotopes- shell structure Molecules and Ions <ul style="list-style-type: none">- formation of ions- ionic compounds: formation, formulas, naming- covalent bonding, valence, bonding/nonbonding pairs	Lecture notes on molecules and ions Answers to Assignment 1	Silberberg 24.3-24.5 Silberberg 8.1 & 8.4 Silberberg 2.6-2.7 Silberberg pp 267-268 National Center for Neutron Research Radiation Safety Training Software (SMB self-expanding file) Atomic Absorbance and Emission Spectra of the Elements	Atoms, Electrons and Orbitals Electronic Structure of Atoms and Ions	Atomic Structure



Evaluation – Does it work?

Method

- Request for on-line feedback
- Computer usage data
- Student surveys
- Word of mouth

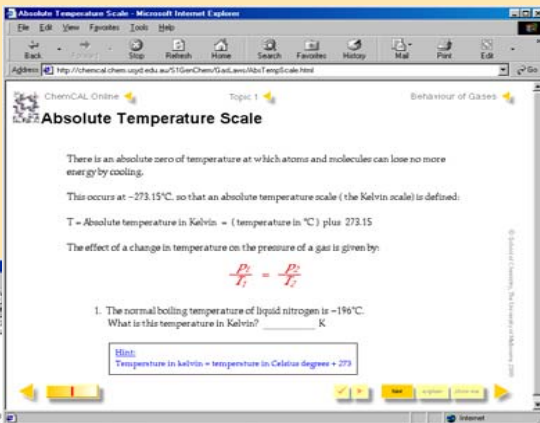
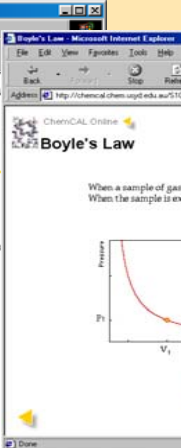
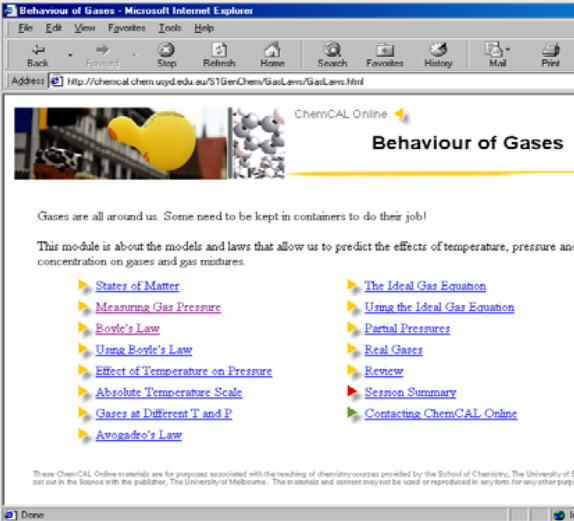
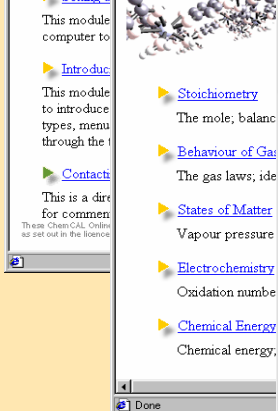
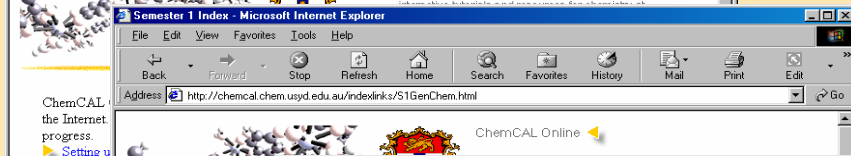
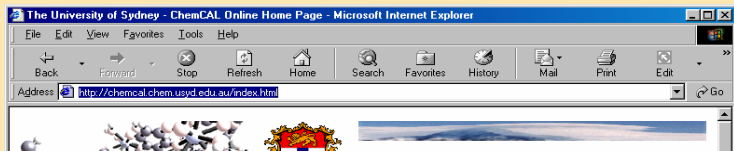


Purpose

- Ensure educational benefit
- Improve programs/applications
- Justify current and future resources



One Example – ChemCAL





Quantitative and Qualitative data

Student use

- Log data indicates most students use ChemCAL at least a little
 - Use is a mixture of 'as you go' and revision
 - Those that did not use ChemCAL were asked why
 - Those that did use ChemCAL were asked what they found useful about it, what not and why (focus of delivery not content)
-



The good the bad and the reason

Aids learning and tests understanding
Questions
Visual impact
24/7 accessibility

Immediate feedback
Drag & drop presentation
Better than textbook
Work at own pace

Technical difficulties/download times
Nothing
Pages with no interaction
Explanations/hints too brief

Difficultly with shockwave

Slabs of text boring
Prefer tutor interaction



How students use ChemCAL

Examine Log data in detail

{[0][0]ES}{[0]ES}{[1]}{[1]}{[1]}{[1]}{!}



ChemCAL Online Chemistry 610-141 Stoichiometry

Reduction of Iron(III) Oxide

The metal iron can be produced by the reaction of iron oxide with carbon monoxide.

Balance the equation:

$$\text{Fe}_2\text{O}_3 + 3 \text{CO} \rightarrow 2 \text{Fe} + 3 \text{CO}_2$$

Given 1.00 kg of iron oxide:

- a) How many mole of Fe can be formed? 12.5 ✓ mol
- b) What mass of Fe can be formed? 698 ✓ grams
- c) How many mole of CO₂ can be formed? 18.8 ✓ mol
- d) What mass of CO₂ can be formed? 827 ✓ grams

2 / 9

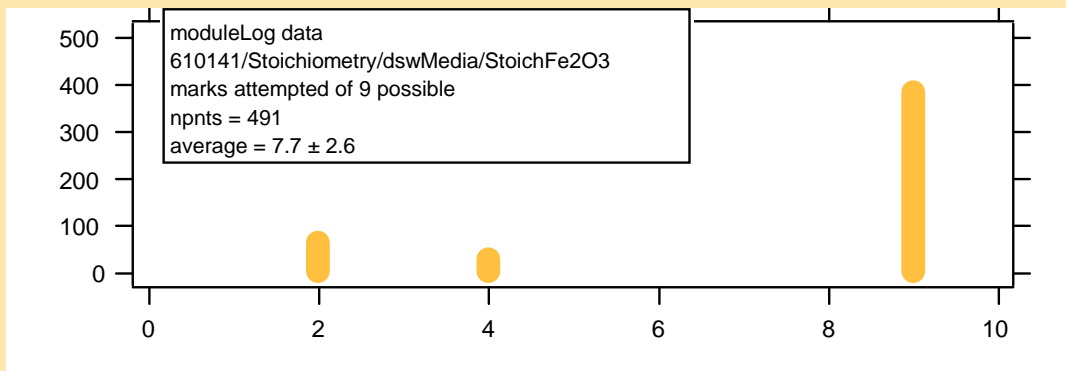
atomic masses... 0 / 2 hint explain show me

School of Chemistry, The University of Melbourne, 2003

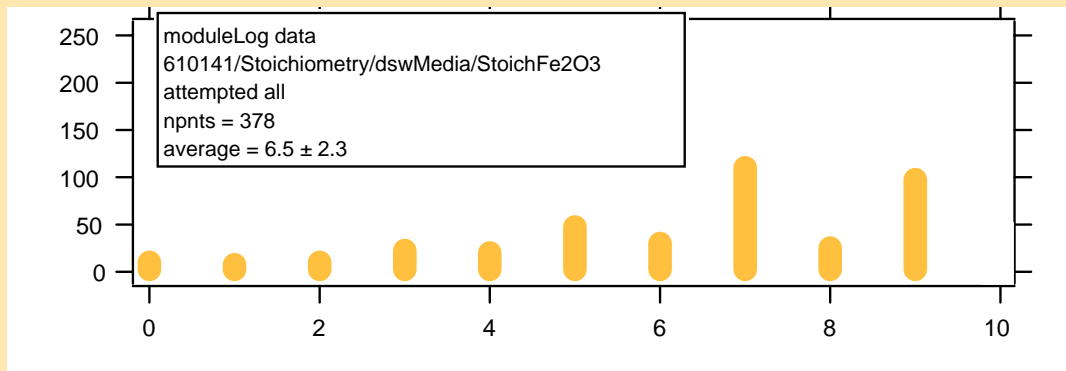


Student Engagement

How many marks do students attempt?



For students that attempted 9 marks, what was their score?

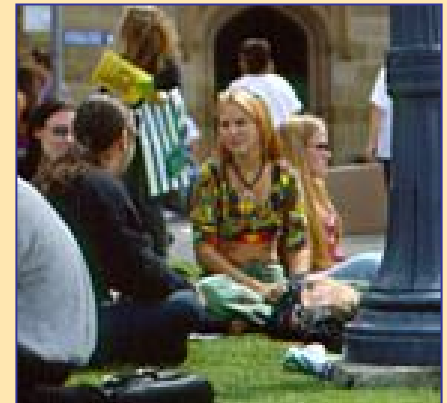




Summary of Evaluations

Does it work?

- Students do use this ICT resource & feel they benefit from it
- All or nothing approach but generally high level of engagement





Conclusion – looking ahead

University

- Ongoing support for ICT developments supported by one-off grants
- Workload issues for academics involved

Department

- Can we help students use their own ICT for self-learning networks

Student

- Social and technical issues with students studying at home

