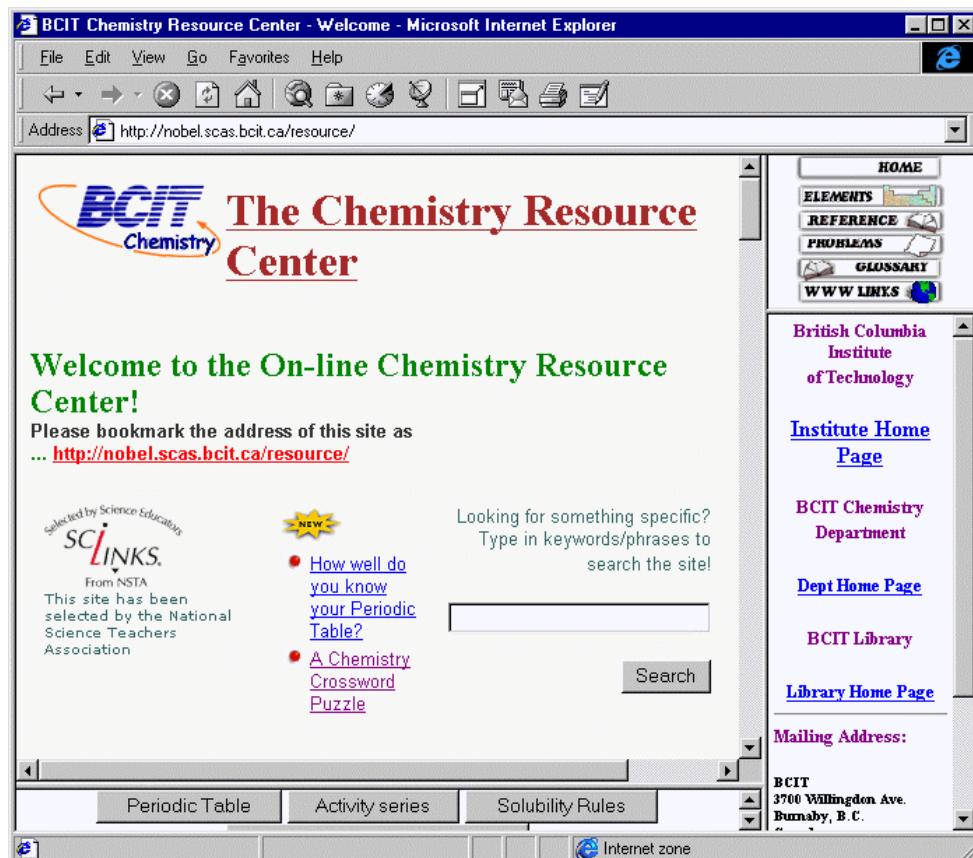


# The BCIT Online Chemistry Resource Center

<http://nobel.scas.bcit.ca/resource>

- Introduction
- Web site design
- Web site features
- Student Response
- Other Applications
- Conclusion
- Acknowledgements



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# The Chemistry Resource Center

<http://nobel.scas.bcit.ca/resource>

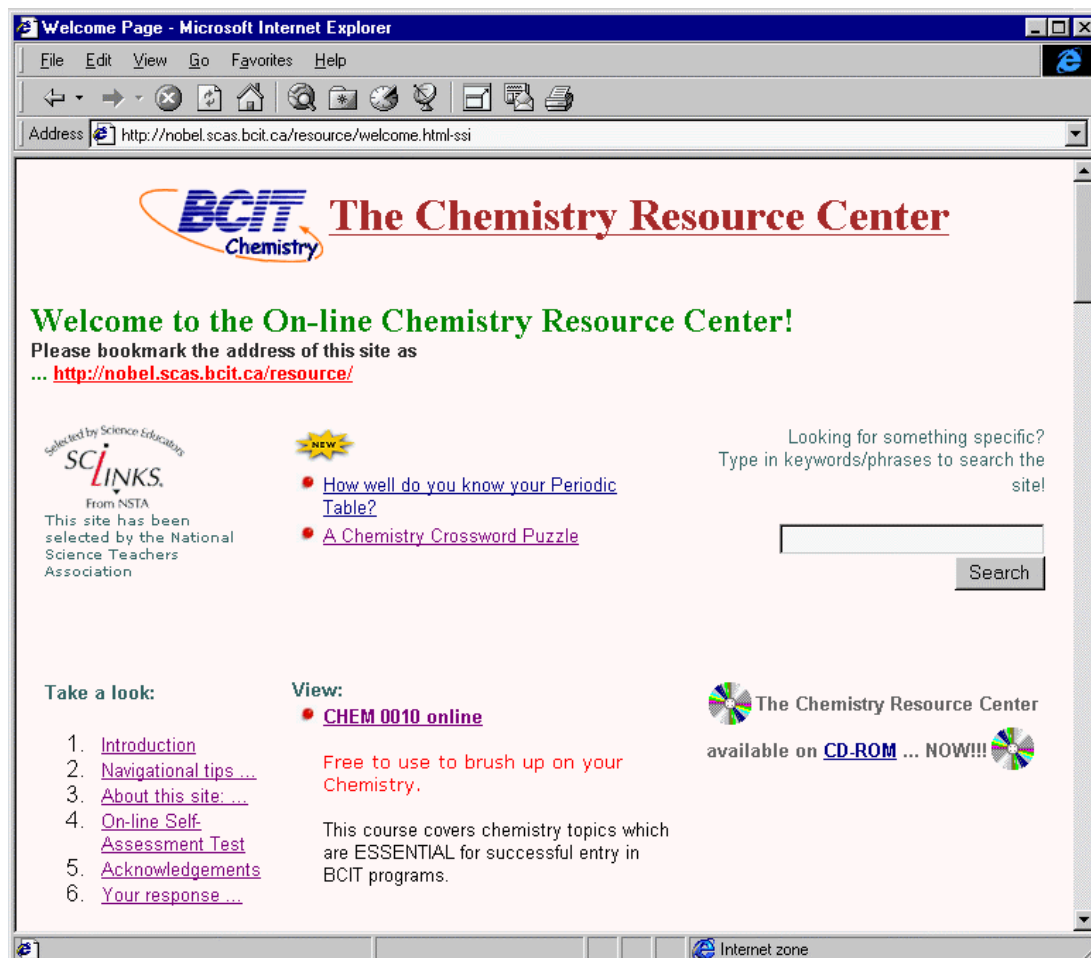
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[Student Response](#) | [Other Applications](#) | [Conclusion](#) | [Acknowledgements](#)

## INTRODUCTION

This web site is designed to be a resource for anyone who is interested in Chemistry.

It was prepared in response to students' enthusiasm towards using the the concept of hypermedia and the World-Wide Web (WWW) as a learning tool.

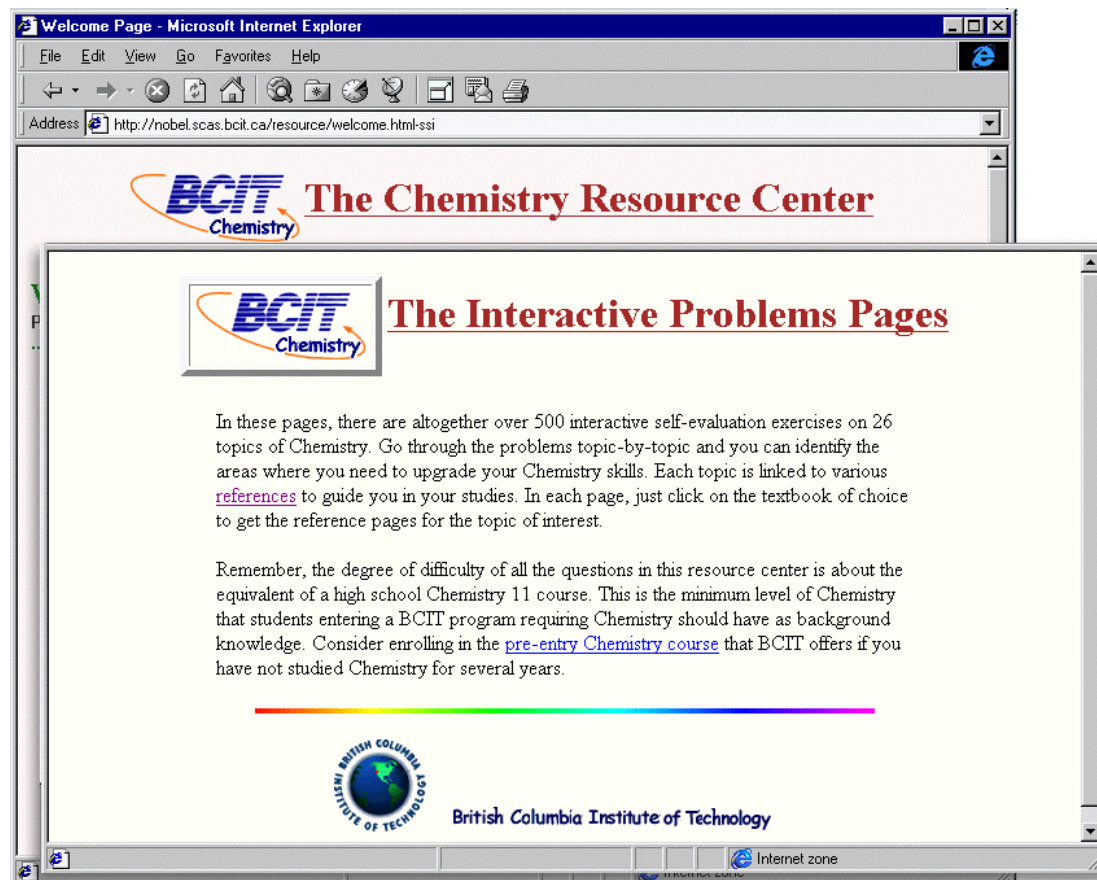


May 3, 2003

## INTRODUCTION

My objectives:

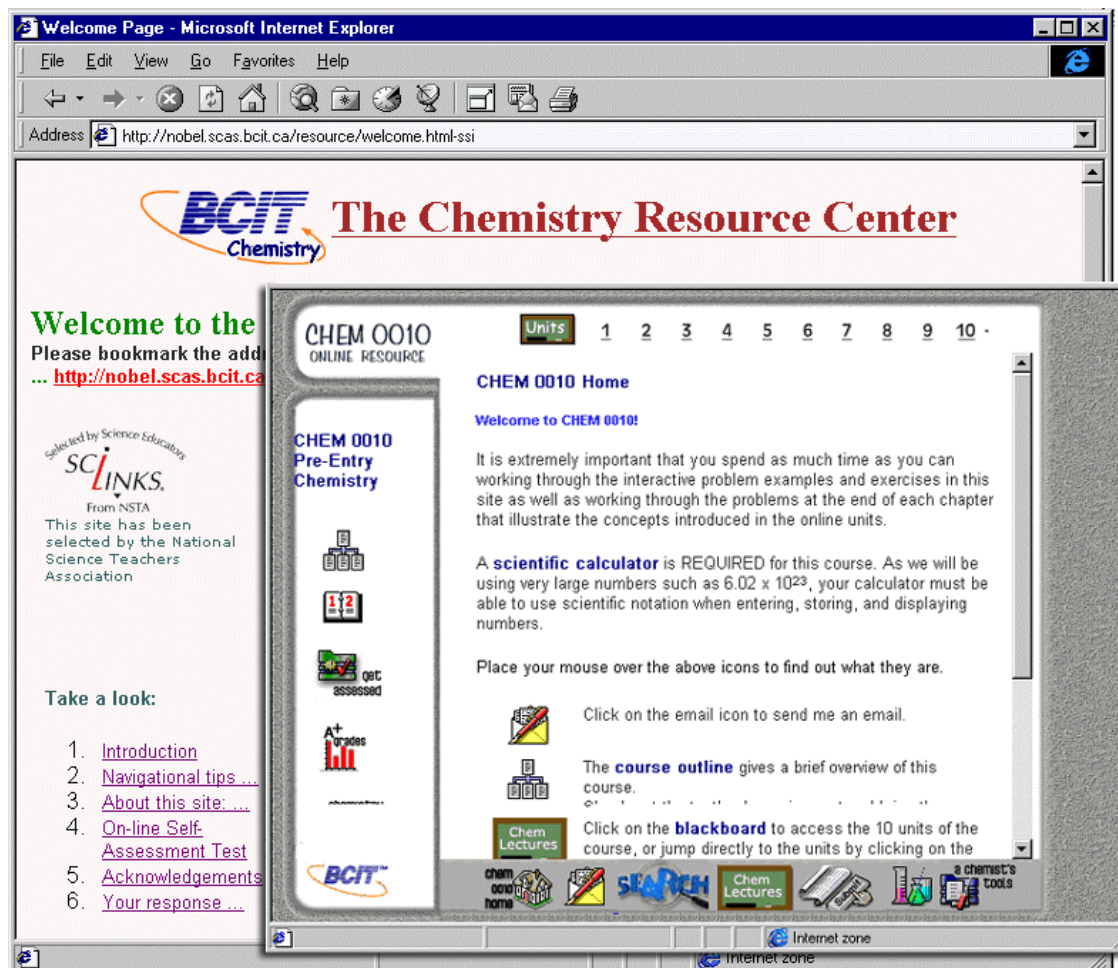
- have a 24-hour on-line tutoring service to improve student study habit through user-initiated learning
- conduct on-going informal self-assessment of chemistry skills, and identify the specific problem areas.



## INTRODUCTION

### Web site Goals:

- give students a user-initiated interactive learning environment

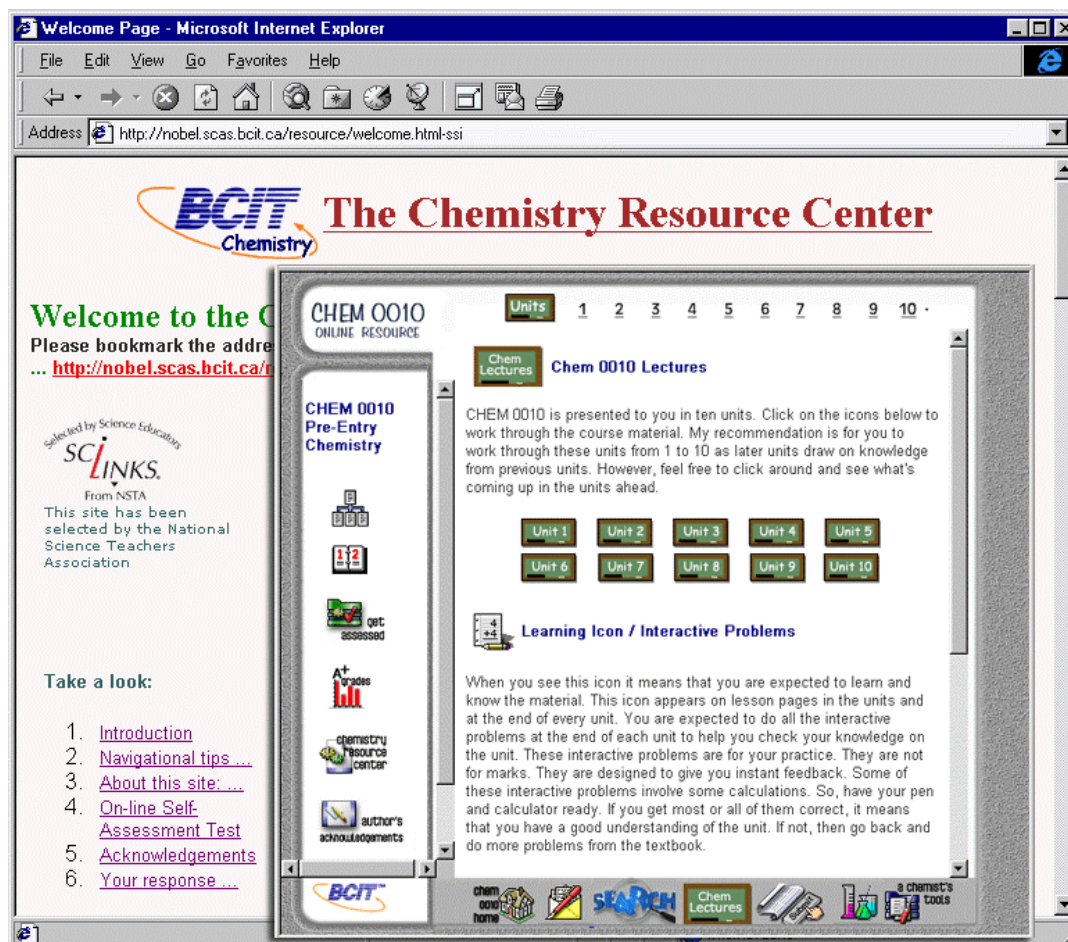




## WEB SITE DESIGN

### Web site Goals:

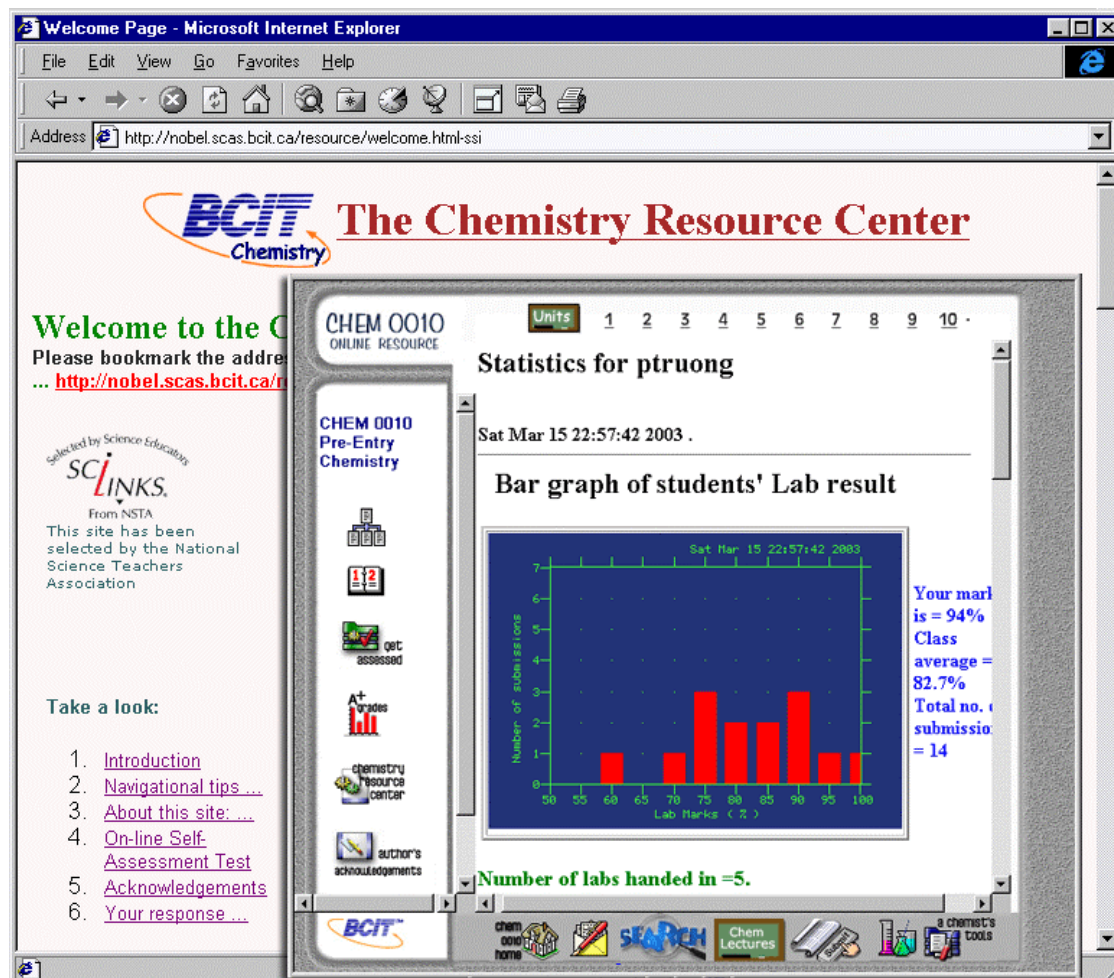
- give students easy navigation to find chemistry content quickly



## WEB SITE DESIGN

### Web site Goals:

- provide a content-rich which serves to entice students to return to the resource center





# The Chemistry Resource Center

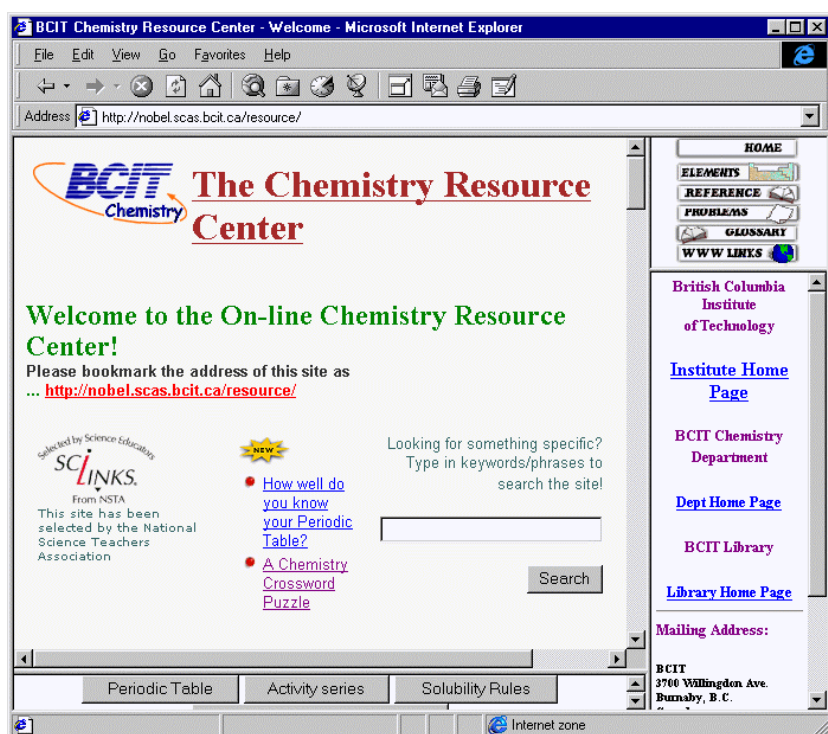
<http://nobel.scas.bcit.ca/resource>

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[Student Response](#) | [Other Applications](#) | [Conclusion](#) | [Acknowledgements](#)

## WEB SITE FEATURES

### BCIT Chemistry Resource Center



### CHEM 0010 - Pre-Entry Chemistry

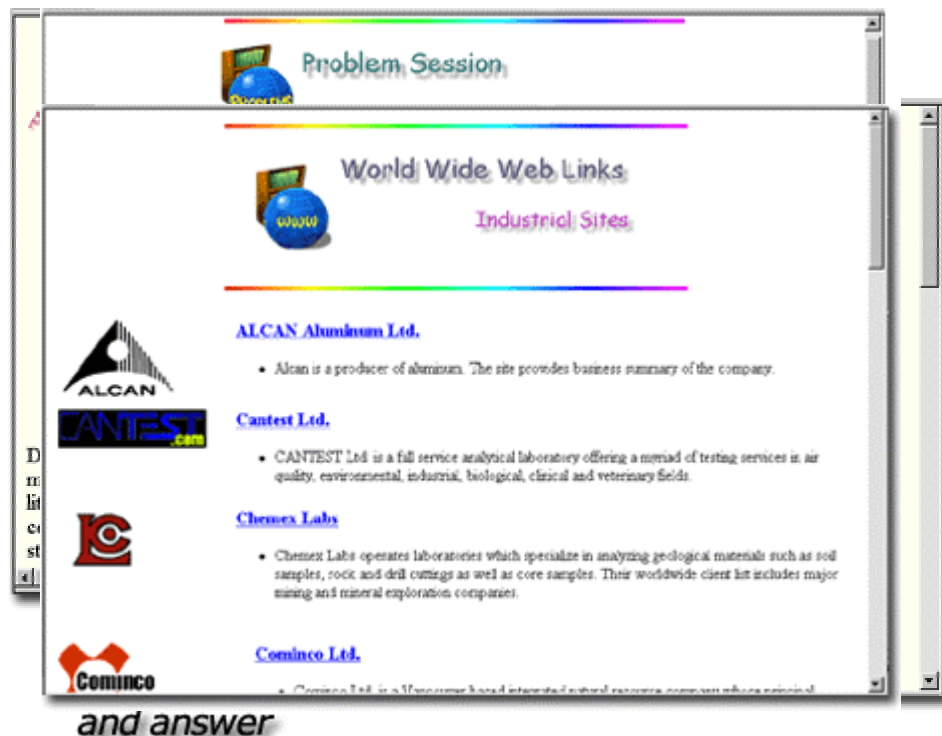
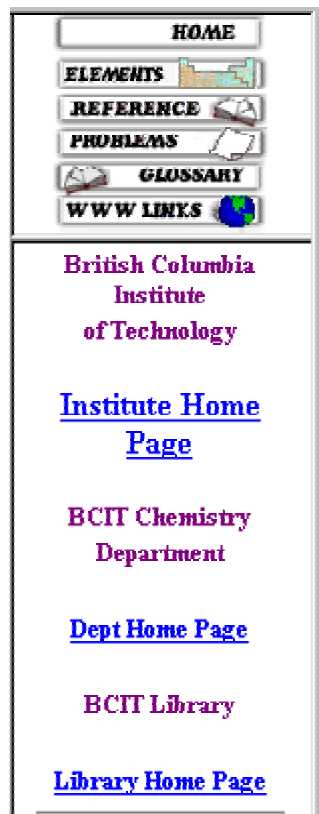




## WEB SITE FEATURES

Chemistry Resource Center:

- Pictures of the Periodic Table of Elements
- Interactive Problems
- Glossary
- Reference Textbooks
- WWW links







# The Chemistry Resource Center

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## WEB SITE FEATURES

### CHEM 0010 - Pre-Entry Chemistry

- CHEM 0010 is one of the courses in the [Technology Entry \(TE\) Program](#) at BCIT.
- This course is now recognized by the [Ministry of Education of B.C.](#) to meet all the requirements of the [ABE Advanced Level Chemistry curriculum \(Grade 11 chemistry\)](#).
- It meets the Chemistry 11 entrance requirement of BCIT programs and also serves to provide upgrading/refreshing for those whose chemistry background is weak or not recent.

A 14-week course:

- 3 - 50-minute lectures / week
- 1 - 2-hour lab / week
- 1 - 50-minute tutorial / week



# The Chemistry Resource Center

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## WEB SITE FEATURES

CHEM 0010 - Pre-Entry Chemistry

### **Student profile:**

- the recent high school graduate (within 5 years)
- the high school graduate from more than 20 years ago to everything in between
- the one who seeks a career change
- the one who has suffered from a job-related injury and is on a Worker's Compensation vocational rehabilitation program



# The Chemistry Resource Center

<http://nobel.scas.bcit.ca/resource>

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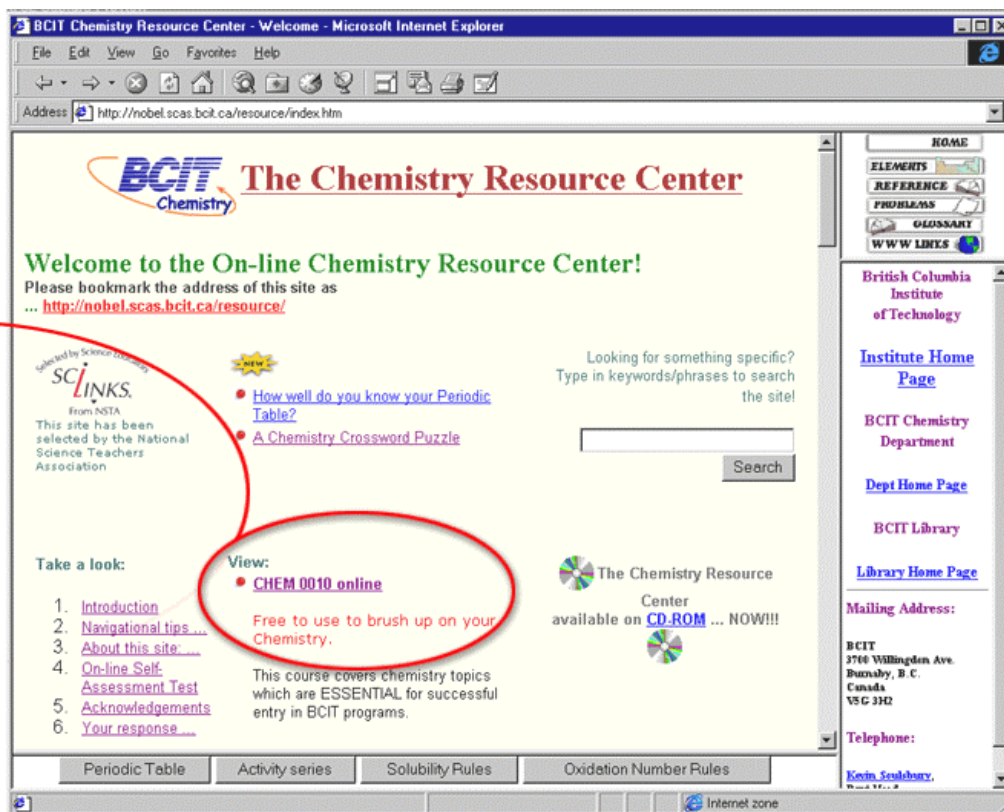
[Student Response](#) | [Other Applications](#) | [Conclusion](#) | [Acknowledgements](#)

## WEB SITE FEATURES

### CHEM 0010 - Pre-Entry Chemistry

<http://nobel.scas.bcit.ca/chem0010>

CHEM 0010  
web site  
is accessed  
from the  
Chemistry  
Resource  
Center



May 3, 2003

## WEB SITE FEATURES

### CHEM 0010 - Pre-Entry Chemistry

- 10 units of lectures



Unit 1 - Measurement  
Unit 2 - Matter & Energy  
Unit 3 - Atomic Structure  
Unit 4 - The Periodic Table  
Unit 5 - Compounds

Unit 6 - Naming Compounds  
Unit 7 - Calculations Based on Formulae  
Unit 8 - Chemical Reactions  
Unit 9 - Solutions  
Unit 10 - Acids & Bases and Ionic Equations

- 11 laboratories











## WEB SITE FEATURES

### CHEM 0010 - Pre-Entry Chemistry



Chemists need to rely on reference materials. Click on this icon and you will see the Periodic Table of Elements, Glossary, Names of common polyatomic ions, Activity Series, Solubility Rules, and Rules for Assigning Oxidation Numbers.

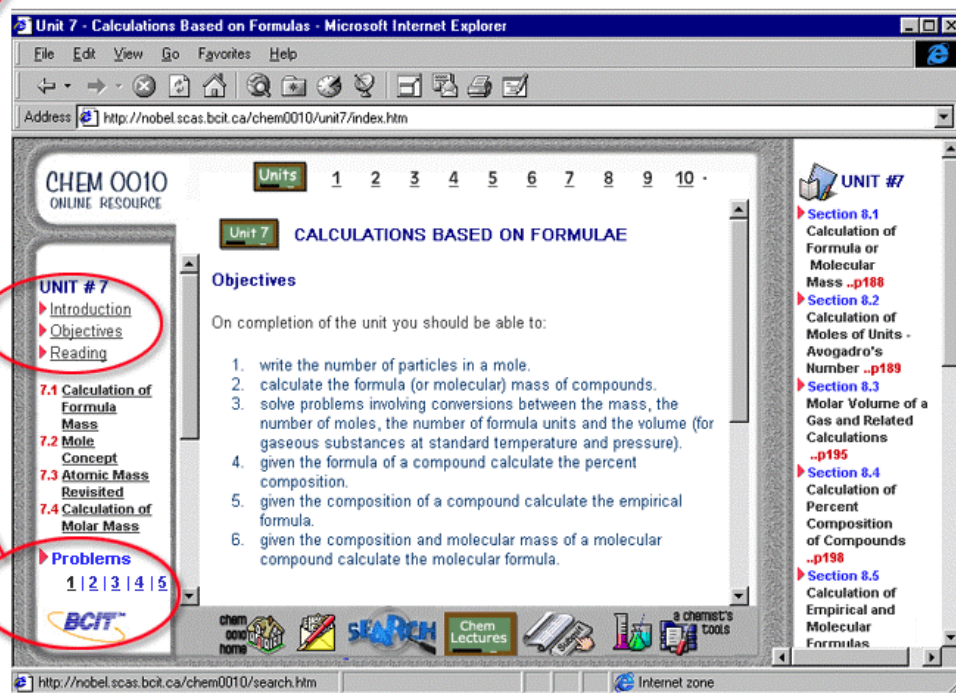
Clickable Periodic Table			Rules to assign oxidation numbers
Glossary			Activity Series
Ions to Learn			Solubility Rules

## WEB SITE FEATURES

### CHEM 0010 - Pre-Entry Chemistry

Each unit clearly identifies:

1. learning objectives
2. a reading list
3. Interactive Problems



Unit 7 - Calculations Based on Formulas - Microsoft Internet Explorer

Address: <http://nobel.scas.bcit.ca/chem0010/unit7/index.htm>

CHEM 0010  
ONLINE RESOURCE

Units: 1 2 3 4 5 6 7 8 9 10

Unit 7 CALCULATIONS BASED ON FORMULAE

Objectives

On completion of the unit you should be able to:

1. write the number of particles in a mole.
2. calculate the formula (or molecular) mass of compounds.
3. solve problems involving conversions between the mass, the number of moles, the number of formula units and the volume (for gaseous substances at standard temperature and pressure).
4. given the formula of a compound calculate the percent composition.
5. given the composition of a compound calculate the empirical formula.
6. given the composition and molecular mass of a molecular compound calculate the molecular formula.

UNIT #7

- Section 8.1 Calculation of Formula or Molecular Mass ..p188
- Section 8.2 Calculation of Moles of Units - Avogadro's Number ..p189
- Section 8.3 Molar Volume of a Gas and Related Calculations ..p195
- Section 8.4 Calculation of Percent Composition of Compounds ..p198
- Section 8.5 Calculation of Empirical and Molecular Formulas

UNIT #7

- Introduction
- Objectives
- Reading
- Problems

7.1 Calculation of Formula Mass

7.2 Mole Concept

7.3 Atomic Mass Revisited

7.4 Calculation of Molar Mass

1 2 3 4 5

BCIT

chem 0010 home SEARCH Chem Lectures a chemist's tools

<http://nobel.scas.bcit.ca/chem0010/search.htm>

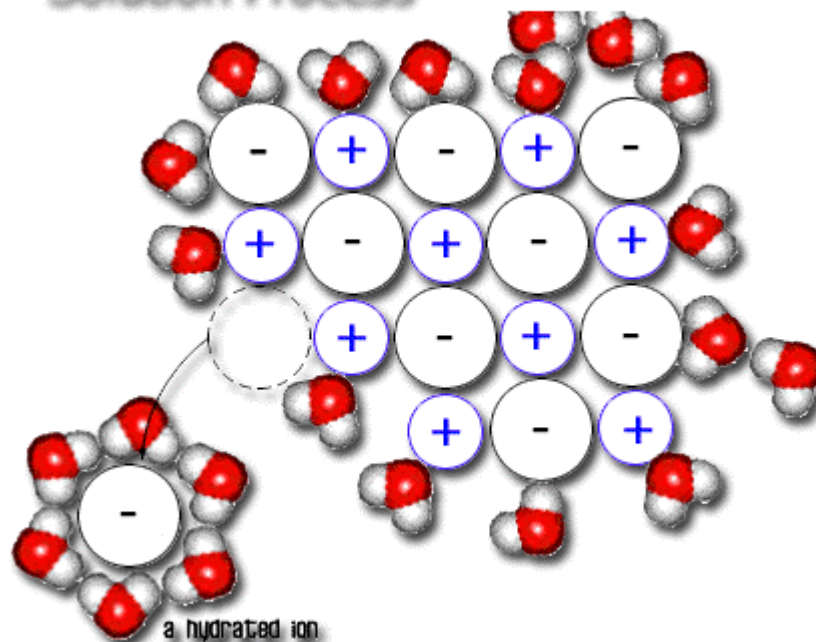
Internet zone

## WEB SITE FEATURES

CHEM 0010 - Pre-Entry Chemistry

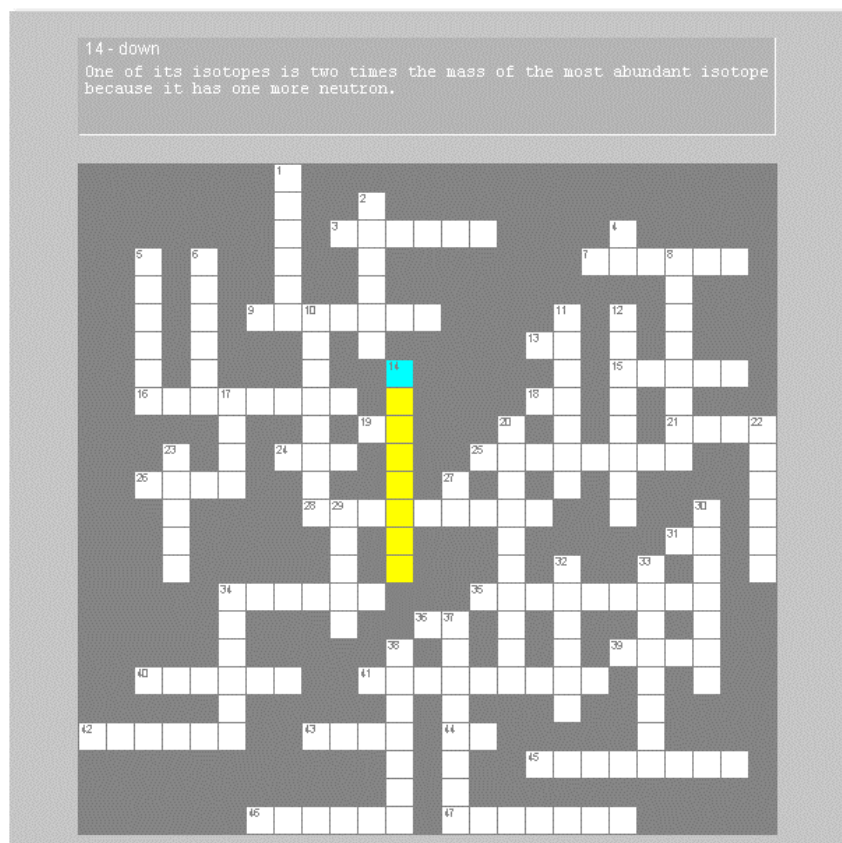
**Web medium is suitable for  
multimedia presentation  
and animation.**

### Solution Process



## WEB SITE FEATURES

### CHEM 0010 - Pre-Entry Chemistry



**Web medium is suitable for multimedia presentation and animation.**

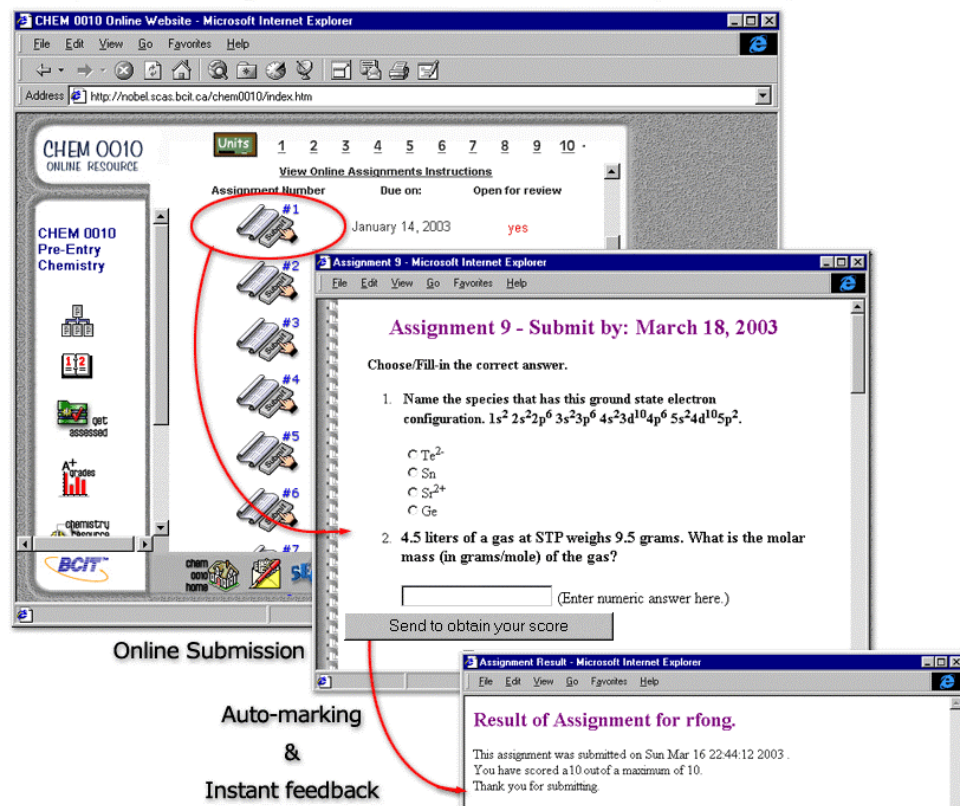
An interactive crossword puzzle to familiarize students with the Periodic Table.



## WEB SITE FEATURES

### CHEM 0010 - Pre-Entry Chemistry

Weekly Online Assignments - combination of multiple choice, fill-in-the-blank



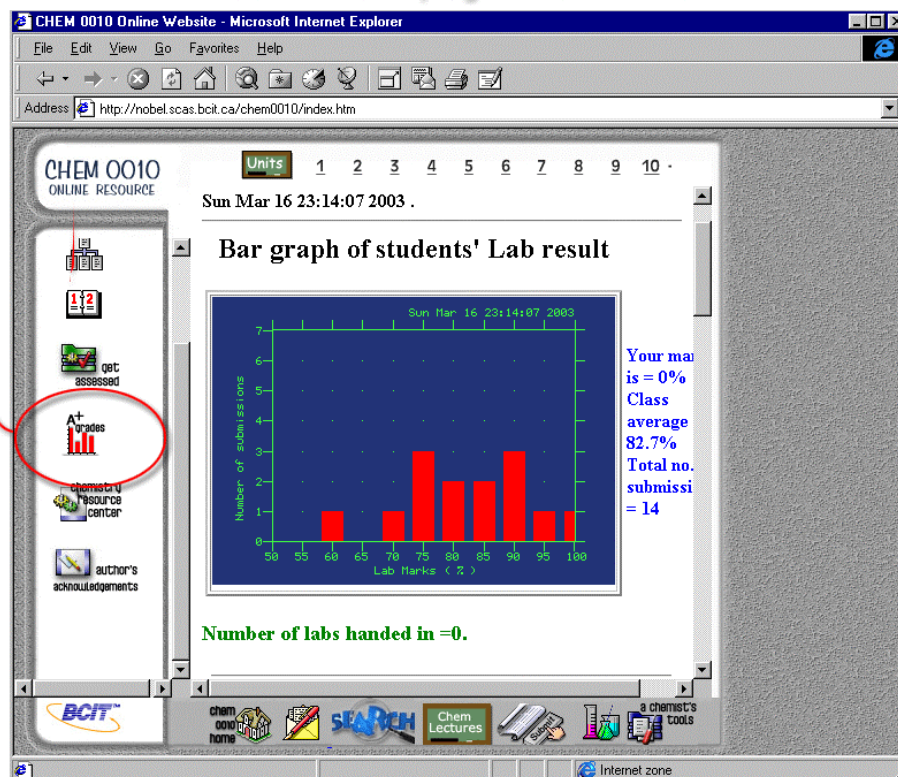
The screenshot displays the CHEM 0010 Online Resource website in a Microsoft Internet Explorer browser. The website has a navigation bar with units 1 through 10. A sidebar on the left contains links for 'CHEM 0010 Pre-Entry Chemistry', 'get assessed', 'AT+grades', and 'chemistry Resource'. The main content area shows a table of assignments with columns for 'Assignment Number', 'Due on:', and 'Open for review'. Assignment #1 is highlighted with a red circle. A red arrow points from this circle to a second browser window titled 'Assignment 9 - Microsoft Internet Explorer'. This window shows the details for 'Assignment 9 - Submit by: March 18, 2003' and contains two questions: '1. Name the species that has this ground state electron configuration.  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^2$ .' and '2. 4.5 liters of a gas at STP weighs 9.5 grams. What is the molar mass (in grams/mole) of the gas?'. Below the questions is a text input field and a 'Send to obtain your score' button. A third browser window titled 'Assignment Result - Microsoft Internet Explorer' is shown at the bottom, displaying the 'Result of Assignment for rfong.' and stating: 'This assignment was submitted on Sun Mar 16 22:44:12 2003. You have scored a 10 out of a maximum of 10. Thank you for submitting.' Red arrows indicate the flow from the assignment list to the submission page and then to the results page. Labels 'Online Submission', 'Auto-marking & Instant feedback' are placed near the arrows.

May 3, 2003

## WEB SITE FEATURES

### CHEM 0010 - Pre-Entry Chemistry

A+ Grade icon - For monitoring the class's marks distribution and student's own progress in the course



## STUDENT RESPONSE

### In 1997:

#### Campus computers

486/66 MHz or Pentium/75 MHz  
8/16 MB RAM  
Windows 3.1/95; Floppy/CD

#### Student home computers

486 computers /Windows 3.1  
Pentium / Win95

#### Home Internet Access

50% has home Internet access  
28.8 kbps dial-up modem

### In 2003:

#### Campus computers

Pentium III / 996 MHz  
384 MB RAM  
Windows XP; Floppy/CD/DVD/ZIP drives

#### Student home computers

Pentium II / III  
Windows 98/ME/XP

#### Home Internet Access

10 students:  
7 with cable access  
2 with modem access  
1 no access



# The Chemistry Resource Center

<http://nobel.scas.bcit.ca/resource>

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## STUDENT RESPONSE

From this past term, Jan - Apr 2003:

- helpful resource; easy tool to use for all with varying computer skills
- most use the site between 2-3 times and 4-5 times a week
- at school; 6-9 pm; 9-11 pm; after 11 pm; weekends
- one online assignment a week is about right
- reliable accessibility to the web site
- would like to see more of this type of web site used in conjunction with other courses
- ranked the web site as a very effective computer-aided learning tool in CHEM 0010





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## STUDENT RESPONSE

From this past term, Jan - Apr 2003:

### **Features that are most liked:**

- online assignments; the step-by-step explanation of the problems
- A+ grades and comparison with the class average
- Lecture notes; lots to read
- Chemist's tools
- organized, easy to find



## STUDENT RESPONSE

From this past term, Jan - Apr 2003:

### **Features that are most disliked:**

- keep having to close the pop-up windows
- wanted marks updated more frequently
- the Periodic Table should have all the atomic masses shown instead of clicking on the square
- search engine giving better results

## STUDENT RESPONSE

Student Comments : (Jan - Apr 2003)

### **Additional Comments for me to consider:**

- "found it stressful when the class did not go at the same pace that was scheduled on the web."
- "easier to follow if the units were in the order that they were covered. Why not just change the numbers for the units so that they are numbered in the order we cover them."
- "more games to make it more fun."
- "The web site was very good. I hardly used my textbook because the notes were very easy to understand."



# The Chemistry Resource Center

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## OTHER APPLICATIONS

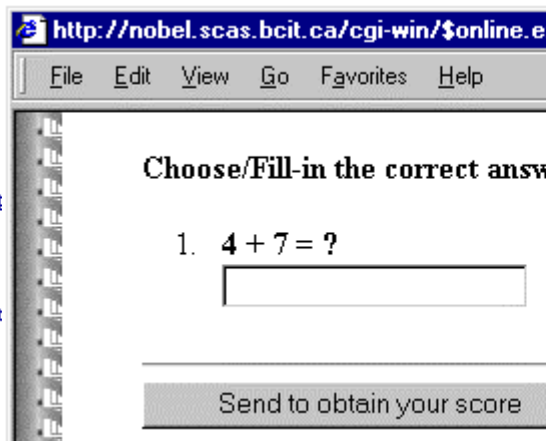
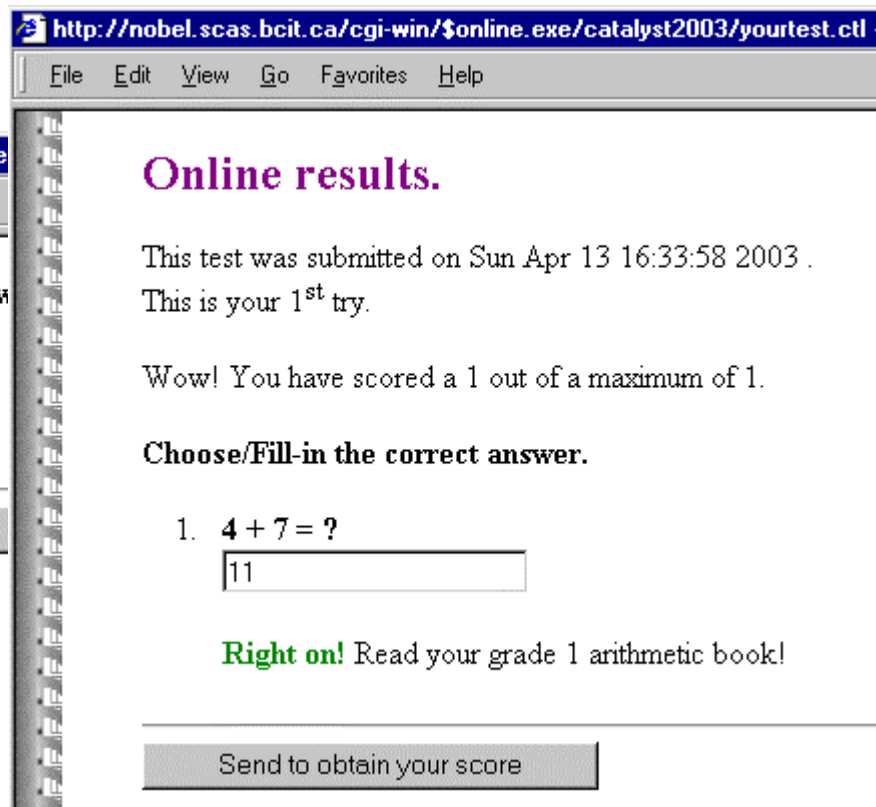
- not restrictive to only Chemistry
- apply web tool to other subjects: Math, Biology, Physics etc ...
- applied web tool to any levels: elementary, high school, college, university
- online assignments for other subjects



## OTHER APPLICATIONS

```
<problem>
<question>
  <li><strong>
    4 + 7 = <input type="text"/>
  </strong>
</question>
<answer> 11 </answer>
</problem>
```

Question in  
XML Format

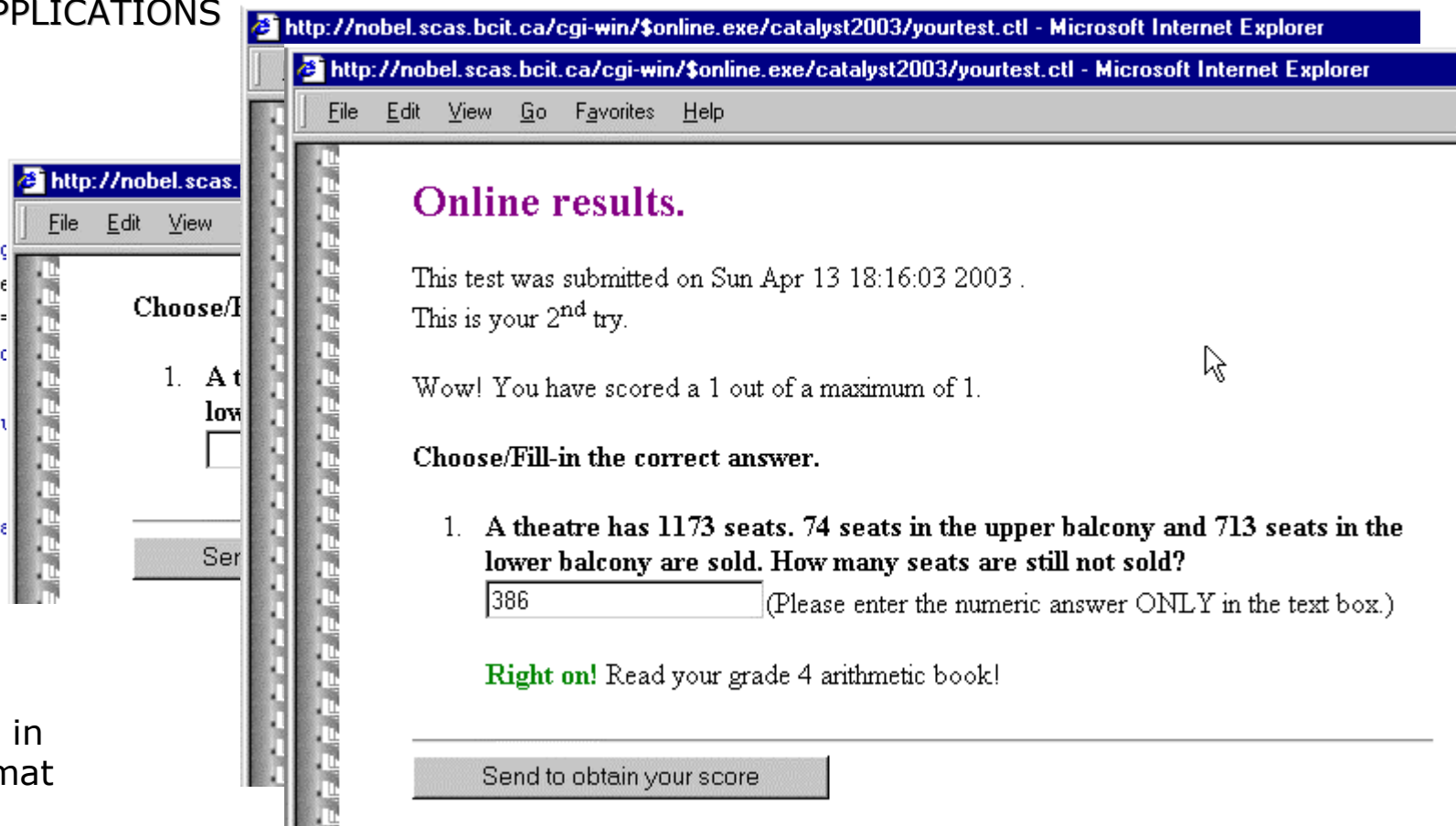



Output as a web page accessible online.

## OTHER APPLICATIONS

```
<problem>
<question>
<li><strong>
A theatre
<calc> y=
and <calc>
How many
<br><input type="text" value="386" />
</strong>
</question>
<answer> <calc>
</problem>
```

Question in  
XML Format



Output as a web page accessible online.



# The Chemistry Resource Center

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## CONCLUSION

- a resource center for all who seek information about Chemistry
- presently my web sites are mainly used in North America by teachers and students:
  - elementary school students starting from Grade 3
  - middle school students
  - high school students
- judging from the students' response, the Chemistry Resource Center and CHEM 0010 web sites are good teaching tools.
- from my own experience, creating a companion web site for my course enables me to have more time for personal interaction with students in the long run.

## CONCLUSION

**It's been 7 years on the World wide web, we are on the major search engines:**



**altavista** Web Image MP3/Audio Video Directory News

beryllium

SEARCH: ☒ Worldwide ☐ Canada

Refine your search with AltaVista P

[Beryllium Compounds >>](#)  
[Beryllium Copper >>](#)  
[Beryllium Disease >>](#)

**Beryllium**  
 Beryllium, which occurs in the mine is complicated, the metal is obtained from beryl. [nobel.scas.bcit.ca/resource/ptable/b](http://nobel.scas.bcit.ca/resource/ptable/b)  
[More pages from nobel.scas.bcit.ca](#)

**Chronic Beryllium Disease and other Beryllium-related diseases**  
 Describes Beryllium-related diseases and berylliosis.  
[www.chronicberylliumdisease.com/n](http://www.chronicberylliumdisease.com/n)

**Sponsored Site About**  
**The Beryllium Legal Resource**  
 Employees and others exposed to beryllium may develop serious respiratory disease or berylliosis.  
[www.injuryboard.com](http://www.injuryboard.com)

**Extend Your Search About**  
 Search the Yellow Pages for [beryllium](#) with SMARTpages.com

**Result Pages:** [[<< Prev](#)] [1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#) [10](#) [[Next >>](#)]

**Google** Advanced Search Preferences

beryllium

Search: ☒ the web ☐ pages fr

**LYCOS** beryllium

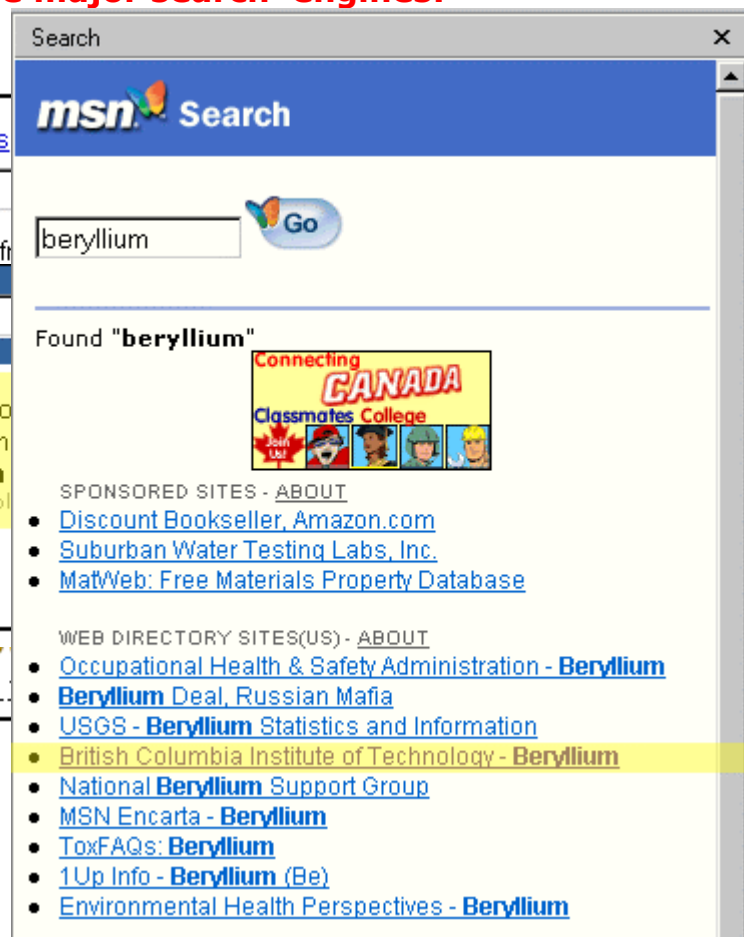
Searched the web for

**Beryllium**  
 Beryllium, which occurs in the mine, was found in 1798. ...  
 Description: About the metal beryllium.  
 Category: Science > (Chemistry)  
[nobel.scas.bcit.ca/resource/ptable/b](http://nobel.scas.bcit.ca/resource/ptable/b)

17. **Beryllium** - Beryllium, which occurs in the mine, was found in 1798. ...  
 the extraction of beryllium from beryl. <http://nobel.scas.bcit.ca/resource/ptable/b>

[« Previous](#) [Next »](#)

Result Page: [Previous](#) [1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#) [10](#) [11](#)



Search

**msn Search**

beryllium

Go

Found "beryllium"

**Connecting CANADA**  
 Classmates College

**SPONSORED SITES - ABOUT**

- [Discount Bookseller, Amazon.com](#)
- [Suburban Water Testing Labs, Inc.](#)
- [MatWeb: Free Materials Property Database](#)

**WEB DIRECTORY SITES(US) - ABOUT**

- [Occupational Health & Safety Administration - Beryllium](#)
- [Beryllium Deal, Russian Mafia](#)
- [USGS - Beryllium Statistics and Information](#)
- [British Columbia Institute of Technology - Beryllium](#)
- [National Beryllium Support Group](#)
- [MSN Encarta - Beryllium](#)
- [ToxFAQs: Beryllium](#)
- [1Up Info - Beryllium \(Be\)](#)
- [Environmental Health Perspectives - Beryllium](#)



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## CONCLUSION

### Useful URL:

BCIT Chemistry Resource Center

<http://nobel.scas.bcit.ca/resource/>

CHEM 0010 - ABE equivalent to Chemistry 11

<http://nobel.scas.bcit.ca/chem0010/>

This Catalyst 2003 presentation can be viewed at

<http://nobel.scas.bcit.ca/catalyst2003/>



## ACKNOWLEDGEMENTS

### BCIT Institute Financial Support:

- BCIT Instructional Enhancement Grant (1997)
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- BCIT Learning Enhancement Grant (1999)
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- Kent Yakel - BCIT, Associate Dean of School of Computing and Academic Studies
- Chemistry Department
- Dr. Griff Richards - BCIT, Coordinator of On-line Learning (1997/1998)

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