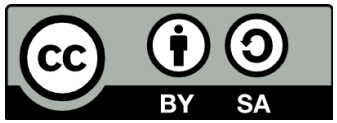
open.michigan

Author(s): Brenda Gunderson, Nancy Kerner



Attribution Key

for more information see: http://open.umich.edu/wiki/AttributionPolicy

Use + Share + Adapt

{ Content the copyright holder, author, or law permits you to use, share and adapt. }

PD-GOV **Public Domain – Government**: Works that are produced by the U.S. Government. (17 USC § 105)

PD-EXP **Public Domain – Expired**: Works that are no longer protected due to an expired copyright term.

PD-SELF **Public Domain – Self Dedicated**: Works that a copyright holder has dedicated to the public domain.

CC ZERO **Creative Commons – Zero Waiver**

CC BY **Creative Commons – Attribution License**

CC BY-SA **Creative Commons – Attribution Share Alike License**

CC BY-NC **Creative Commons – Attribution Noncommercial License**

CC BY-NC-SA **Creative Commons – Attribution Noncommercial Share Alike License**

GNU-FDL **GNU – Free Documentation License**

Make Your Own Assessment

{ Content Open.Michigan believes can be used, shared, and adapted because it is ineligible for copyright. }

PD-INEL **Public Domain – Ineligible**: Works that are ineligible for copyright protection in the U.S. (17 USC § 102(b)) *laws in your jurisdiction may differ

{ Content Open.Michigan has used under a Fair Use determination. }

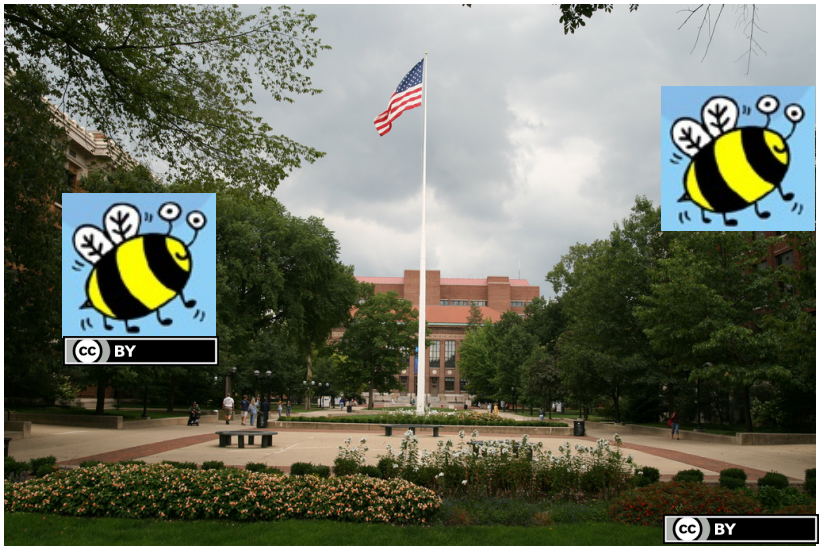
© FAIR USE **Fair Use**: Use of works that is determined to be Fair consistent with the U.S. Copyright Act. (17 USC § 107) *laws in your jurisdiction may differ

Our determination **DOES NOT** mean that all uses of this 3rd-party content are Fair Uses and we **DO NOT** guarantee that your use of the content is Fair.

To use this content you should **do your own independent analysis** to determine whether or not your use will be Fair.

SLOAN-C 5th ANNUAL INTERNATIONAL SYMPOSIUM
Emerging Technologies for Online Learning
JULY 25-27, 2012 • THE VENETIAN AND PALAZZO RESORT, LAS VEGAS, NV
A JOINT SYMPOSIUM OF THE SLOAN CONSORTIUM AND MERLOT

Integration of Technology Into Undergraduate Education via Cross-Disciplinary Pollination



Nancy Kerner, Brenda Gunderson and Emily Bonem,
Adena Rottenstein, Gracie Winschel and Others,
University of Michigan at Ann Arbor

Project Goal

To **improve education** by **integrating quality** cross-discipline and course-specific **Learning Objects** (**LOs**) into undergraduate courses

Learning Resources
Any web-based teaching tool (tutorial, collection, ….)

Learning Objects (LOs)
Interactive web resources that lead students to learning goals via informed pedagogy

Academic Gateway Courses

UNIVERSITY OF MICHIGAN

Initial Perceived Barriers
to using technology in teaching or learning

Low Barrier ⟷ High Barrier

Don't know how to implement

Extra work, little connection

Takes too much time

I spend too much time on it

Students don't know how to use it

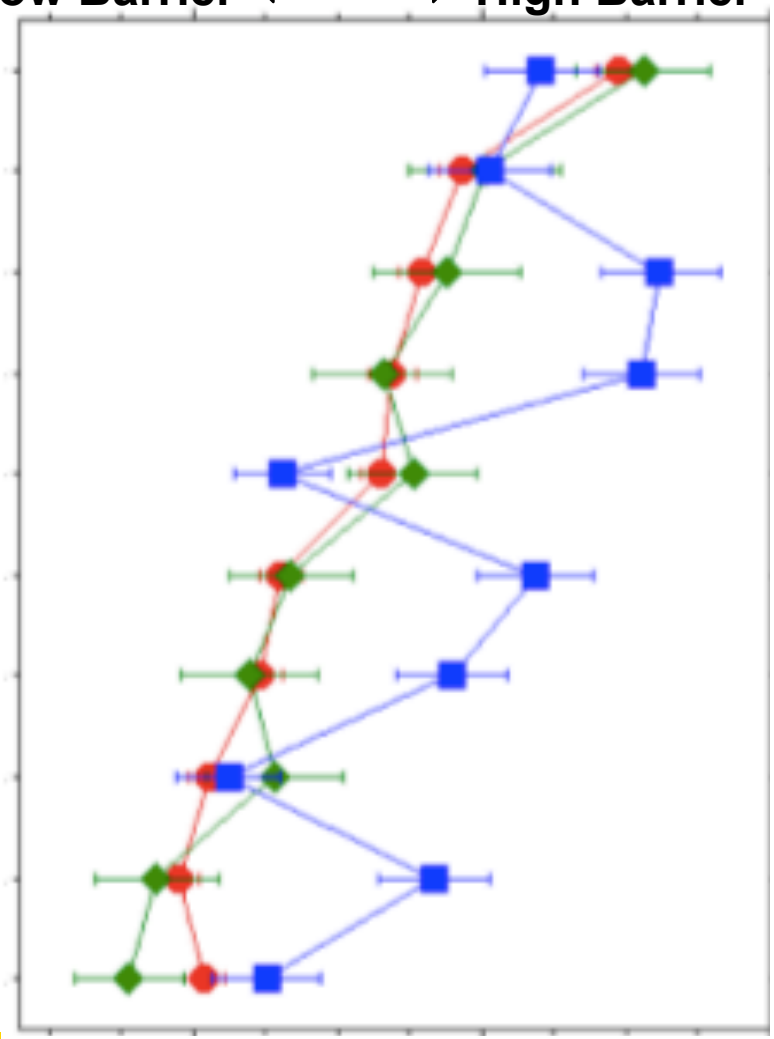
Don't have tech support

Too complicated

Too expensive

I don't have the skills

Doesn't work on my computer



Faculty Students Students who teach

carat.umich.edu/carat/itsurs/2005_survey

The Proposed Solution
Train (Graduate) Students

- **Educate (graduate) students** across disciplines to access, evaluate, design LOs; and to create quality course-specific and cross-discipline LO collections.
- (**Graduate**) **students disseminate LOs** to relevant faculty for integration into undergraduate courses

The trainee becomes the trainer

See "Bottom Up Faculty Development" at conference.merlot.org/2009/Sat_Program.html

The Proposed Solution
Unique Collaborative Approach

Project Faculty Mentors

- Coordinators/instructors of large gateway courses.
- Guidance on best practices to enhance teaching/learning

Other Faculty

- Provide schedule of topics and concepts
- Provide insight on muddy points and desirable LOs

Graduate Student Instructors

- Interest in tech + pedagogy
- Train to find, evaluate, package, author online LOs

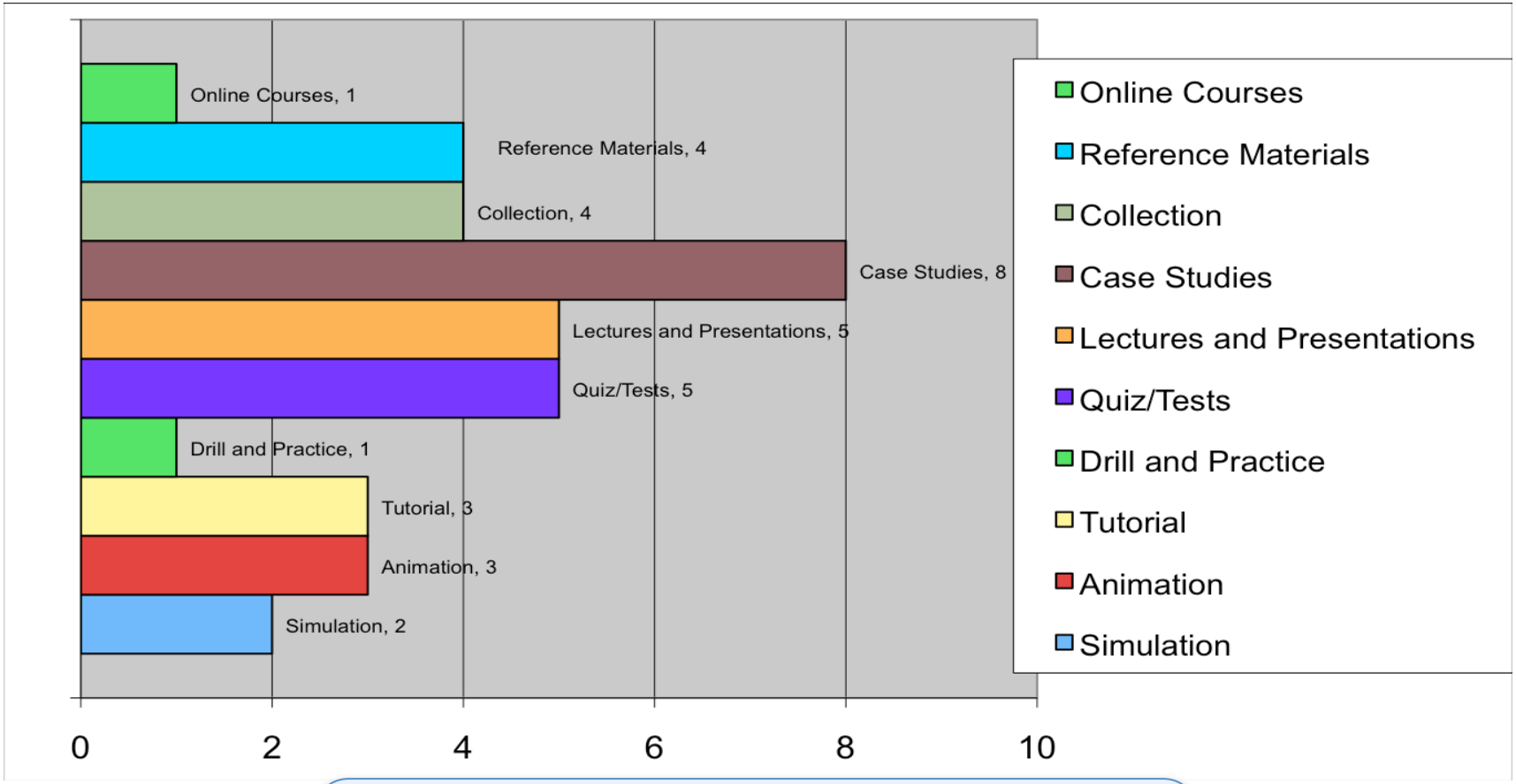
Staff

- Provide basic grant support
- Some technology support

Initial year = General Chemistry, Psychology, Statistics with promise to add additional disciplines.

The Proposed Solution

Determine Faculty Needs/Preferences



- What are the difficult concepts?
- Syllabus topics?
- Type of LO preferences?

The Funded Project!

- Enhancing Undergraduate Education Through the Deployment of Quality Learning Objects (2008-2010)

↓

- Infusing Curricula with Adaptable Learning Objects to Improve Student Engagement and Learning (2011-2013)

MELOs

Funding

NINI Grant (New Initiatives/New Infrastructure) from UM LSA-ITC (Instructional Tech Committee)

MELO3Ds

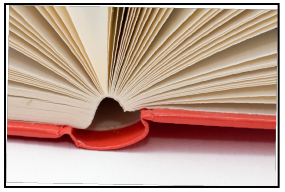
Michigan Education Through Learning Objects

General Chemistry, Psychology, Statistics, Physics, Physical Chemistry, Math, Writing, Spanish, Organic Chemistry, History (Disciplines Years 1-3)

Initial Outcomes

- **LO course collection**
  - Selection based on course needs and goals
  - Located in MERLOT as Personal Collection
  - Provided within syllabus or on website

- **LOs tagged for course integration**
  - Choice based on **needs vs type** of LO
  - Choice focused on LOs that address **difficult concepts or skills**



Example Initial Outcome

Integration of LOs into Pre-labs (Chem)

Periodic Table Scavenger Hunt

TEAM #: _____ NAMES: _____

I. Electronic Structure of Elements

Procedure
You are to use the Internet Web site http://www.dayah.com/periodic/ to determine structural properties of elements. At this site, you will find an interactive Periodic Table that will be helpful as you answer the following questions. You may have to click on various tabs to locate the correct information. Explore the site a bit before starting.

Periodic Table Information
- *Family* = column of elements
- *Period* = row of elements

1. Record the symbol of the element with an electron configuration of $1s^2 2s^2 2p^1$? _____

   What is the symbol of the element that has one additional valence electron in the outer electron energy level? _____

2. What is the family number with elements having a full valence s subshell and only 1 electron in the p subshell? _____

   The symbol and electron configuration for the element in Period 2 of this family = _____

3. Circle the energy level (1 2 3 4) that elements in Period 2 are adding valence electrons to.

4. K, Ca, Ga, and Br are members of the same (family period) = number _____ where electrons are being added to energy level (1 2 3 4).

5. F, Cl, Br, and I are members of the same (family period) = number _____ where each element has (1 2) electrons in the (s p) shell

Psych MELO Summary

Kira

Alicia

Adena

Jay

NEW Initial Outcome

Unique LO Collection Building (Psychology)

Students in a single section recommend many quality LOs **previously overlooked or undiscovered**

Examples

Pavlov's Dog- A classical conditioning simulation
Cataloged in: Science&Technology/Biology/Zoology

Mouse Party- A simulation for examining the effect of common illicit drugs at the synaptic level
Cataloged in:
Science&Technology/Chemistry/Biochemistry

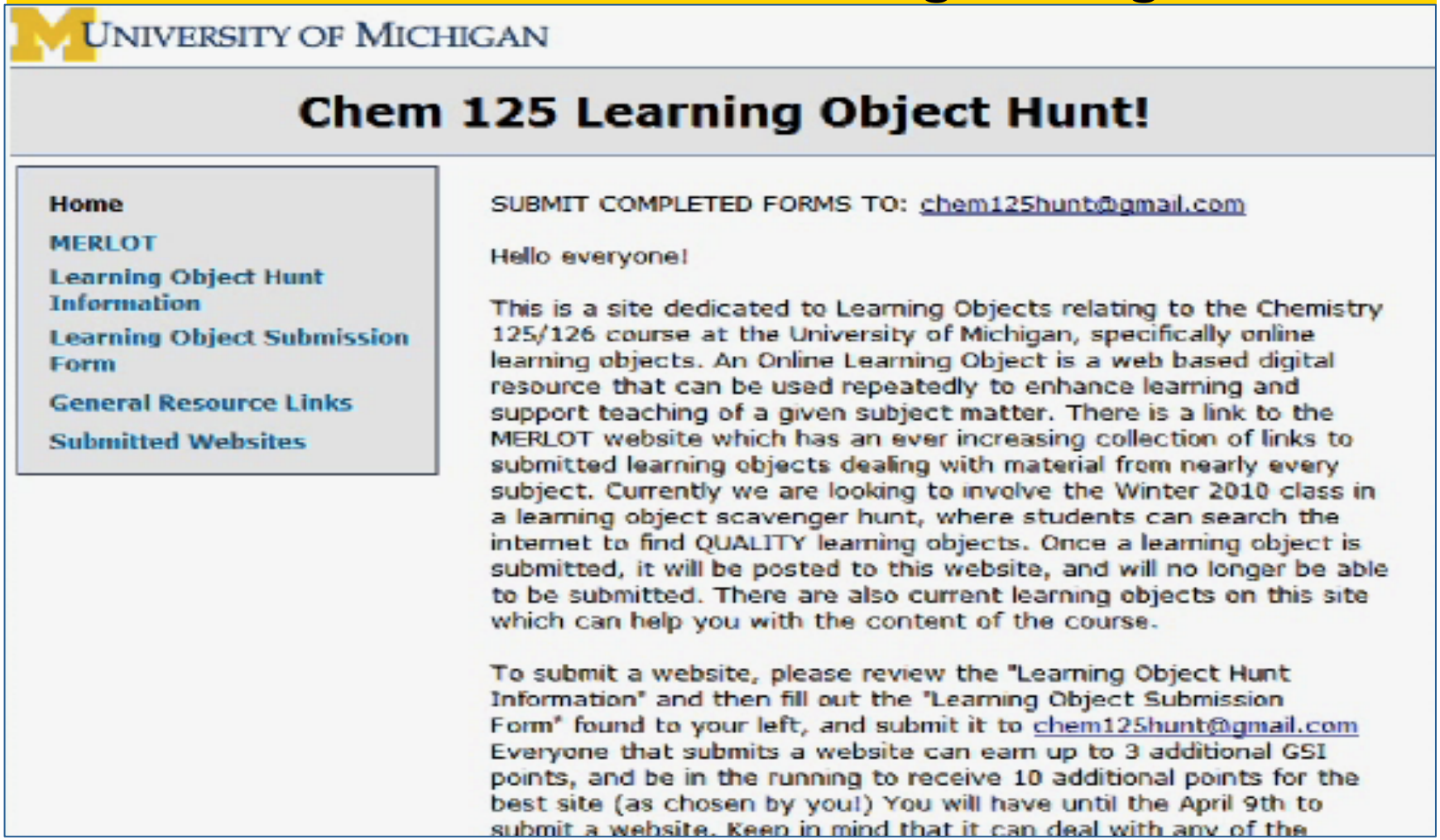
Initial Cross-Disciplinary Pollination

Psychology

Show and Tell

Pollination **Outcome**

Innovative LO Collection Building in Large Course



UNIVERSITY OF MICHIGAN

Chem 125 Learning Object Hunt!

- Home
- MERLOT
- Learning Object Hunt Information
- Learning Object Submission Form
- General Resource Links
- Submitted Websites

SUBMIT COMPLETED FORMS TO: chem125hunt@gmail.com

Hello everyone!

This is a site dedicated to Learning Objects relating to the Chemistry 125/126 course at the University of Michigan, specifically online learning objects. An Online Learning Object is a web based digital resource that can be used repeatedly to enhance learning and support teaching of a given subject matter. There is a link to the MERLOT website which has an ever increasing collection of links to submitted learning objects dealing with material from nearly every subject. Currently we are looking to involve the Winter 2010 class in a learning object scavenger hunt, where students can search the internet to find QUALITY learning objects. Once a learning object is submitted, it will be posted to this website, and will no longer be able to be submitted. There are also current learning objects on this site which can help you with the content of the course.

To submit a website, please review the "Learning Object Hunt Information" and then fill out the "Learning Object Submission Form" found to your left, and submit it to chem125hunt@gmail.com Everyone that submits a website can earn up to 3 additional GSI points, and be in the running to receive 10 additional points for the best site (as chosen by you!) You will have until the April 9th to submit a website. Keep in mind that it can deal with any of the

http://www.screencast.com/t/MTE1MG14MTgt

UNIVERSITY OF MICHIGAN

Chem 125 Learning Object Hunt!

Home

MERLOT

Learning Object Hunt Information

Learning Object Submission Form

General Resource Links

Submitted Websites

SUBMIT COMPLETED FORMS TO: chem125hunt@gmail.com

Hello everyone!

This is a site dedicated to Learning Objects relating to the Chemistry 125/126 course at the University of Michigan, specifically online learning objects. An Online Learning Object is a web based digital resource that can be used repeatedly to enhance learning and support teaching of a given subject matter. There is a link to the MERLOT website which has an ever increasing collection of links to submitted learning objects dealing with material from nearly every subject. Currently we are looking to involve the Winter 2010 class in a learning object scavenger hunt, where students can search the internet to find QUALITY learning objects. Once a learning object is submitted, it will be posted to this website, and will no longer be able to be submitted. There are also current learning objects on this site which can help you with the content of the course.

To submit a website, please review the "Learning Object Hunt Information" and then fill out the "Learning Object Submission Form" found to your left, and submit it to chem125hunt@gmail.com Everyone that submits a website can earn up to 3 additional GSI points, and be in the running to receive 10 additional points for the best site (as chosen by you!) You will have until the April 9th to submit a website. Keep in mind that it can deal with any of the

Cross-Disciplinary Idea Pollination

New Model For Technology Integration?

Move from a model where students
are not only learners but also co-teachers?

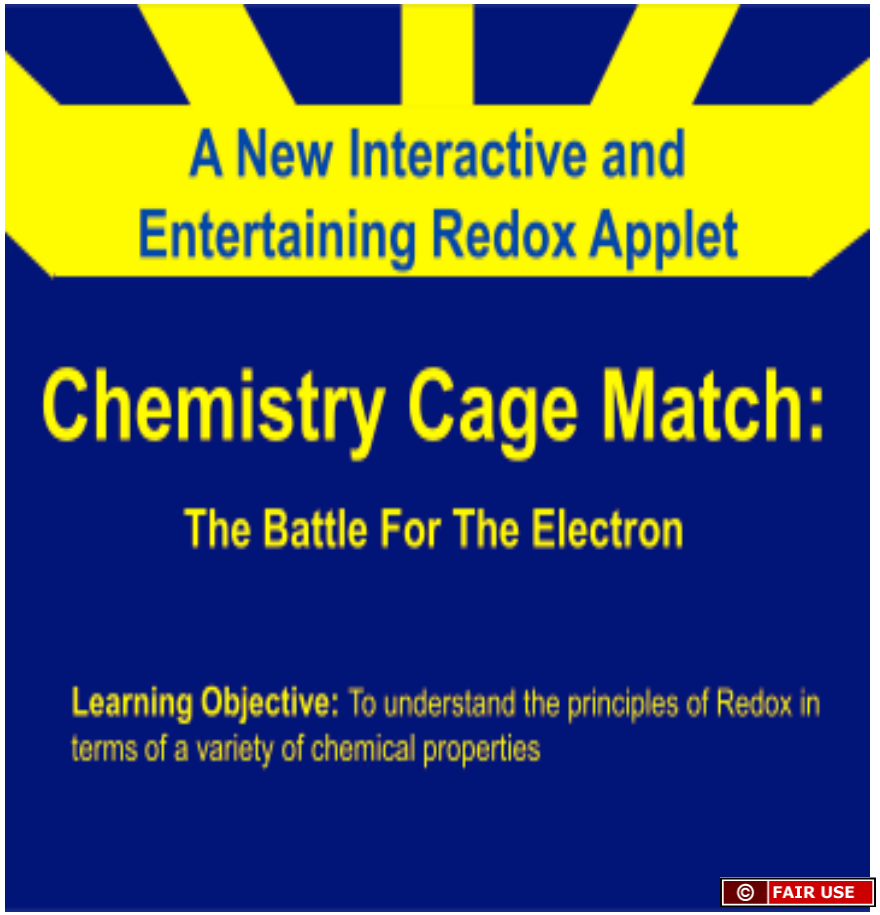
Perceived Barriers Alter!

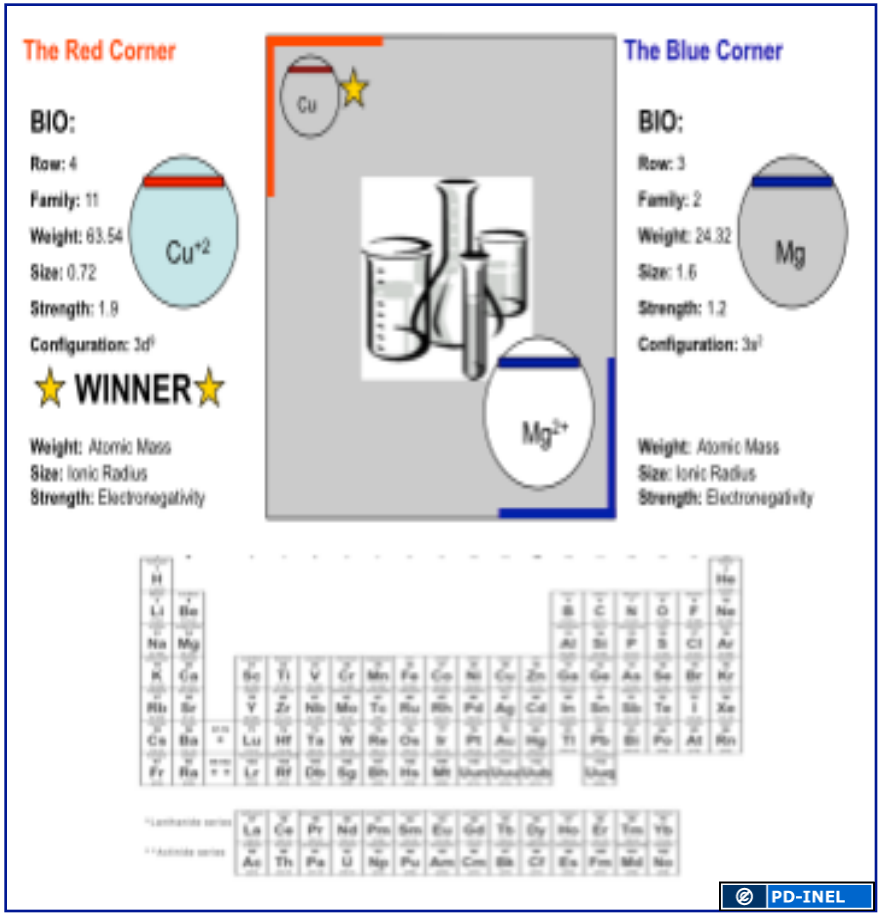
to using technology in teaching or learning

Quality online learning objects that **address key course concepts do NOT exist!**

Example Outcome

Innovative LO Designs





Example Outcome

Authored LO (Statistics)

Name That Scenario

This site gives you a chance to practice recognizing the appropriate situations in which to apply various statistical procedures. You will be presented with a series of ten real world statistics scenarios. Your task is to select the most appropriate statistical procedure for each scenario.

DIRECTIONS

1. Select at least two of the following Procedures.

2. Choose "First Scenario" to begin.

One Proportion

Two Proportions

One Mean

Paired

Independent T-test

ANOVA

Regression

Chi-sq Goodness of Fit

Chi-sq Homogeneity

Chi-sq Independence

First Scenario

Clear selection

Example Outcome

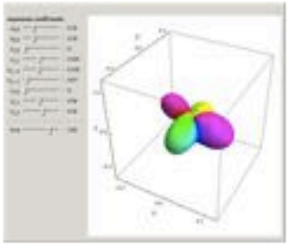
Authored LOs (Physical Chemistry)

Porscha McRobbie

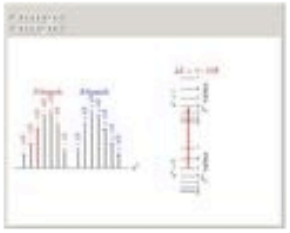
DEMONSTRATIONS

Demonstrations 1 - 20 of 25

Subscribe to RSS feed

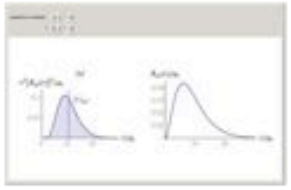


Time-Dependent Superposition of Rigid Rotor Eigenstates

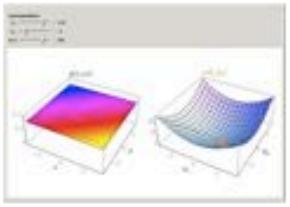


Rotational-Vibrational Spectrum of a Diatomic Molecule

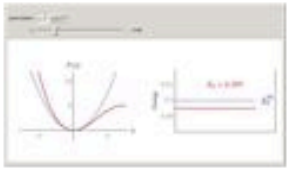
Temperature-Dependent Rotational Energy Spectrum



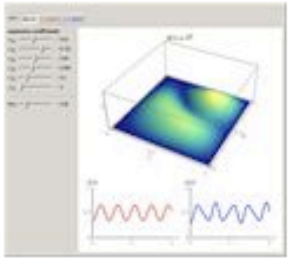
Hydrogen Atom Radial Functions



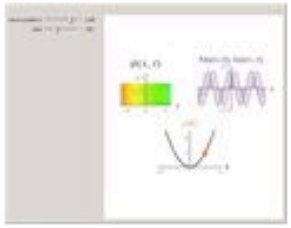
Time Evolution of a Quantum Free Particle in 2D



Perturbation Theory Applied to the Quantum Harmonic Oscillator



Time-Dependent Superposition of 2D Particle-in-a-Box Eigenstates



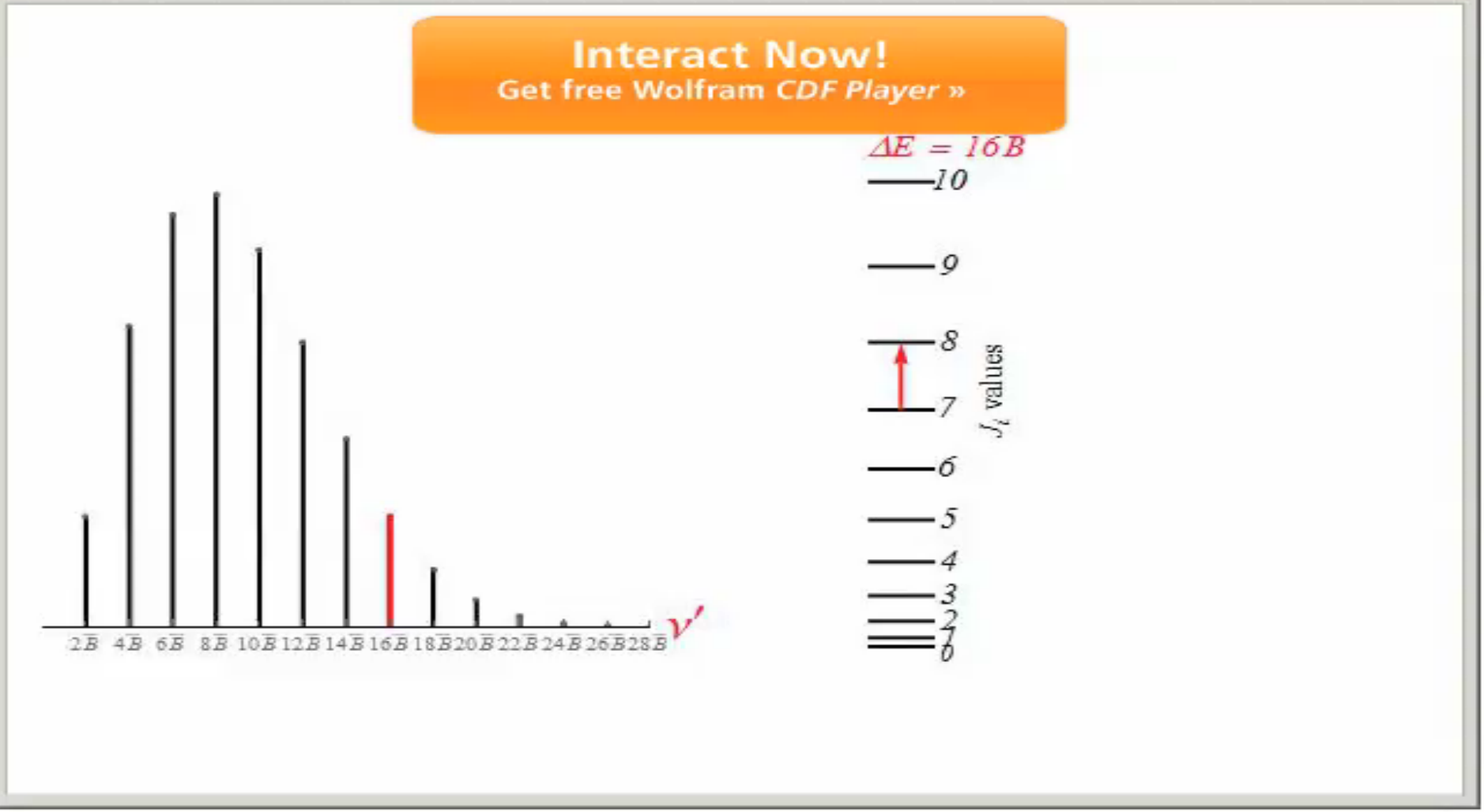
Time Evolution of a Quantum Free Particle in 1D

demonstrations.wolfram.com/author.html?author=Porscha+McRobbie

Replay »

$k_B T/hc\bar{B}$ 20.7

J_i 0 1 2 3 4 5 6 7 8 9



This Demonstration studies the pure rotational spectrum of the quantum rigid rotor problem (neglecting centrifugal distortion), described by the Hamiltonian $\hat{H} = \frac{\hat{J}^2}{2I}$, where $\hat{J}$ is the angular momentum operator and I is the moment of

Example Outcome

Authored LO (Psychology)

- Demonstrates the Frustration-Aggression Hypothesis
- Adena Rottenstein (graduate student) authored with an undergraduate student
- Winner of the Cengage Psychology ‘Get Psyched’ Video Contest

Hosted at: http://youtu.be/oe8PJ8rVV0M

Initial Perceived Barriers Alter!

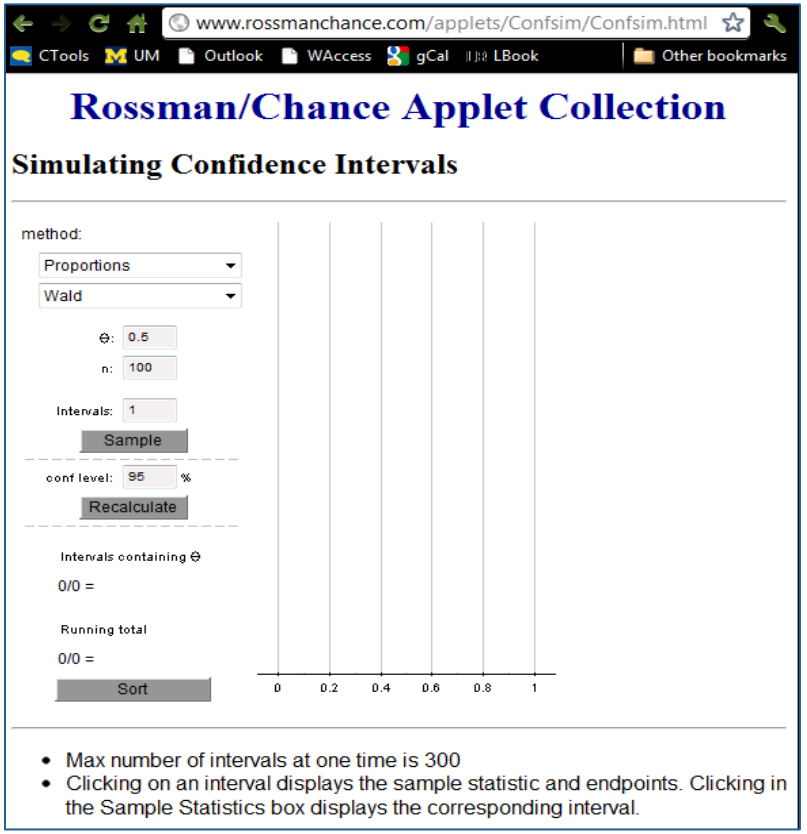
to using technology in teaching or learning

- Many useful online learning resources exist, **but most must be adapted** to become a useful match to a given course/curricula!

Example Barrier

Imperfect LO!

- Simulating Confidence Intervals
- Authors: Beth Chance, Allan Rossman (CP)



http://www.rossmanchance.com/applets/Confsim/Confsim.html

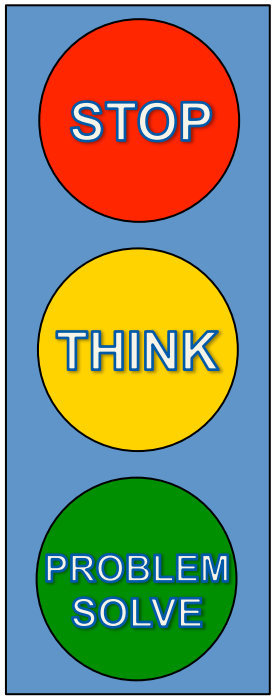
Disadvantages of LO?

- Learning Objectives?
- Directions?
- Terminology/Notation unknown to our students

Advantages of LO?

- Addresses fundamental concept.
- Provides excellent visual demonstration.
- User can adjust controls.

Initial Perceived Barriers Alter
to using technology in teaching or learning



and calm down.

of a plan.

wisely.

MERLOT International Conference 2008

The Outcome
LO Video Capture

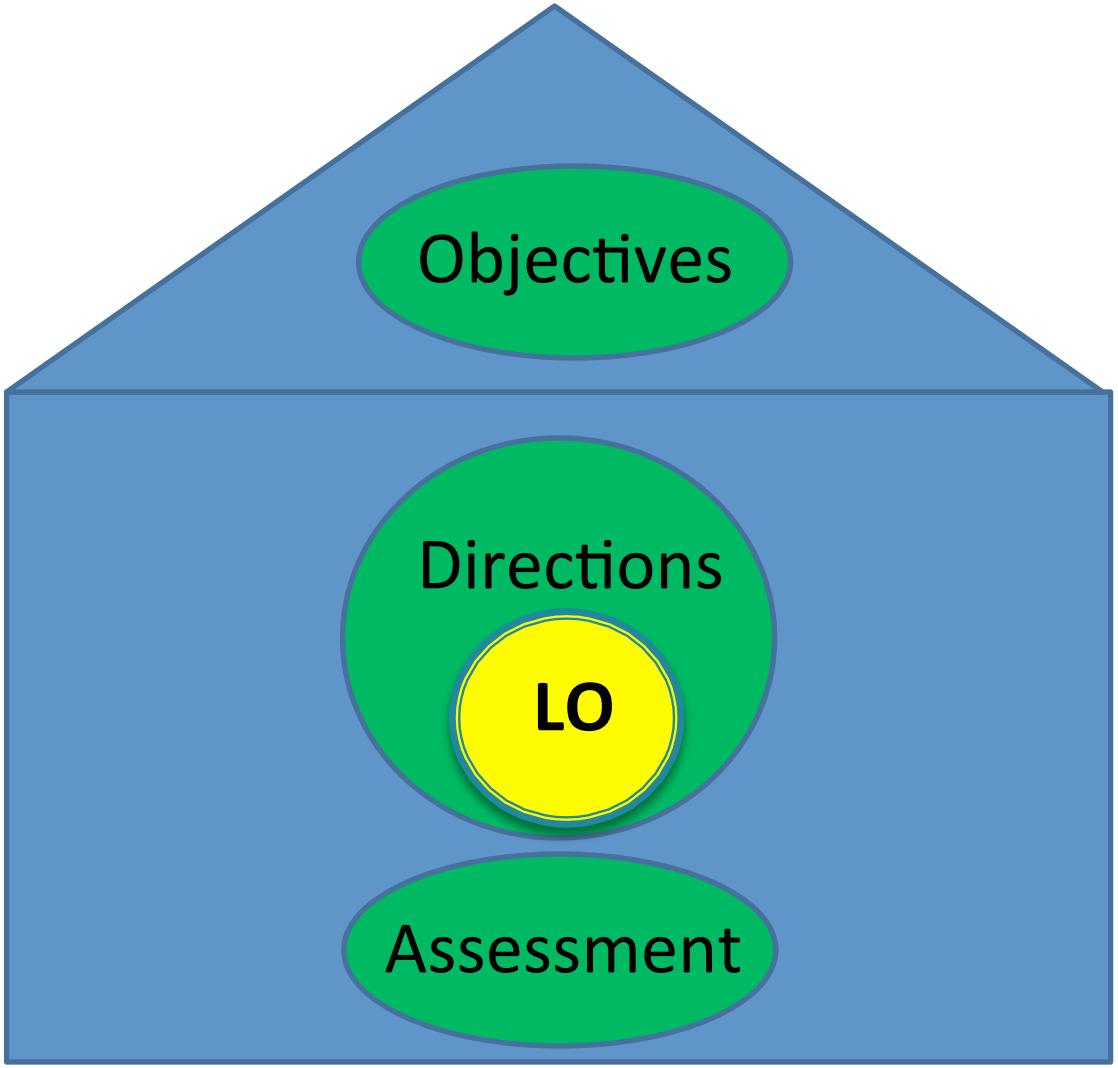
Video Capture the LO to:

- Introduce the LO *and/or*
- State or clarify learning objectives *and/or*
- Explain inconsistency in notation, *and/or*
- Shows how it works

CamStudio

Instead of:

Students will see:



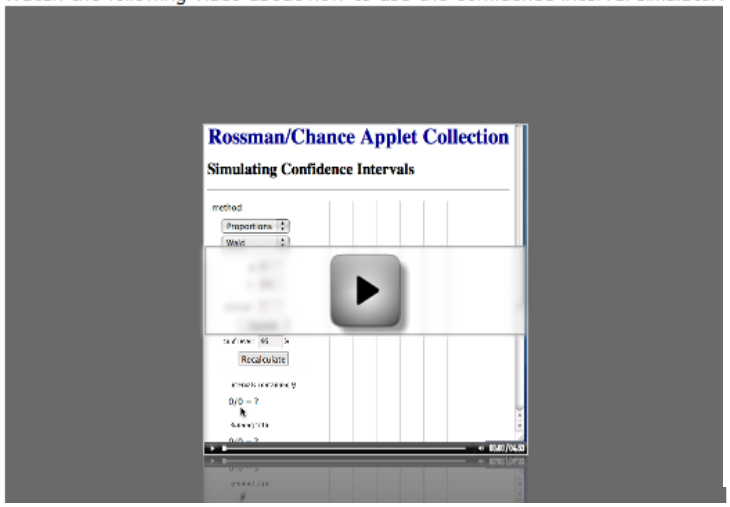
The Fully Wrapped LO PreLab 03

Lesson03:

In this lesson, you will generate confidence intervals for estimating a population proportion. You will be able to set the value of the (usually unknown) population proportion, the sample size, and the confidence level. You also are able to decide how many samples will be generated and a confidence interval based on each sample will be computed and displayed. The applet graphs the intervals and those which did contain the true proportion are shown in green, while the intervals that did not contain the true proportion are in red. The true proportion is shown by a blue line on the graph. Trying different settings will allow you to make comparisons and draw some important conclusions about how confidence intervals work.

Lesson:

Watch the following video about how to use the confidence interval simulator.



Simulation Link:

The simulation may be found here.

Assignment:

Check Ctools for due date and submission details.

For each of the questions below, use the applet to help you address the question. **Submit your 1-2 sentence summary for each question directly inline to your GSI Ctools site Assignment for prelab3 (or as instructed on your class Ctools site).**

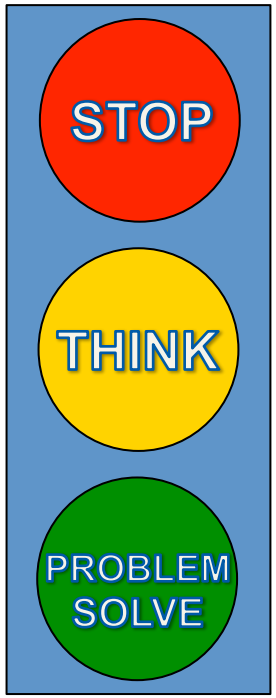
1 - Set the confidence level to 99% and the sample size to 100.
(a) What is the long run proportion of confidence intervals that contain the population proportion?
(b) Does this long run proportion depend on the sample size *n*? (Try some other sample sizes keeping the confidence level at 99%)

2 - What happens to the length of the confidence intervals as the confidence level increases? Compare some intervals at the 90%, the 95%, the 99% confidence levels (keeping the population proportion and the sample size *n* the same).

3 - What happens to the length of the confidence intervals as the sample size increases? Compare some intervals made using samples sizes of $n = 30$, $n = 50$, and $n = 100$ (keeping the population proportion and the confidence level the same).

Collect Quality Learning Objects

Perceived Barriers Alter!
to using technology in teaching or learning



and calm down.

of a plan.

wisely.

Many useful online learning objects exist **but …**

Which LOs may be freely adapted for course infusion - i.e. which are OER?

Proposed Solution Changes

Project Faculty Mentors

- Coordinators/instructors of large gateway courses.
- Guidance on best practices to enhance teaching/learning

Other Faculty

- Provide schedule of topics and concepts
- Provide insight on muddy points and desirable LOs

Graduate Student Instructors

- Interest in tech + pedagogy
- Train to find, evaluate, package, author online LOs

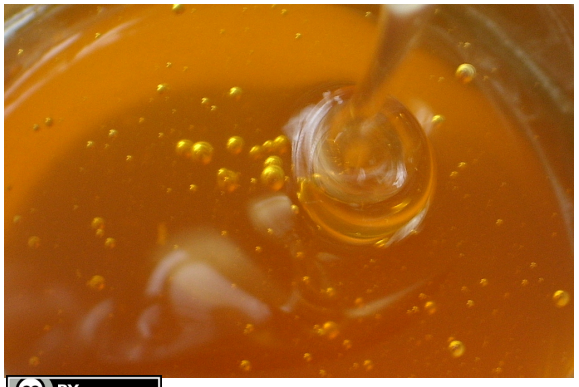
Add Staff

- Provide basic grant support
- Some technology support
- OER support

Initial Cross-Disciplinary Pollination

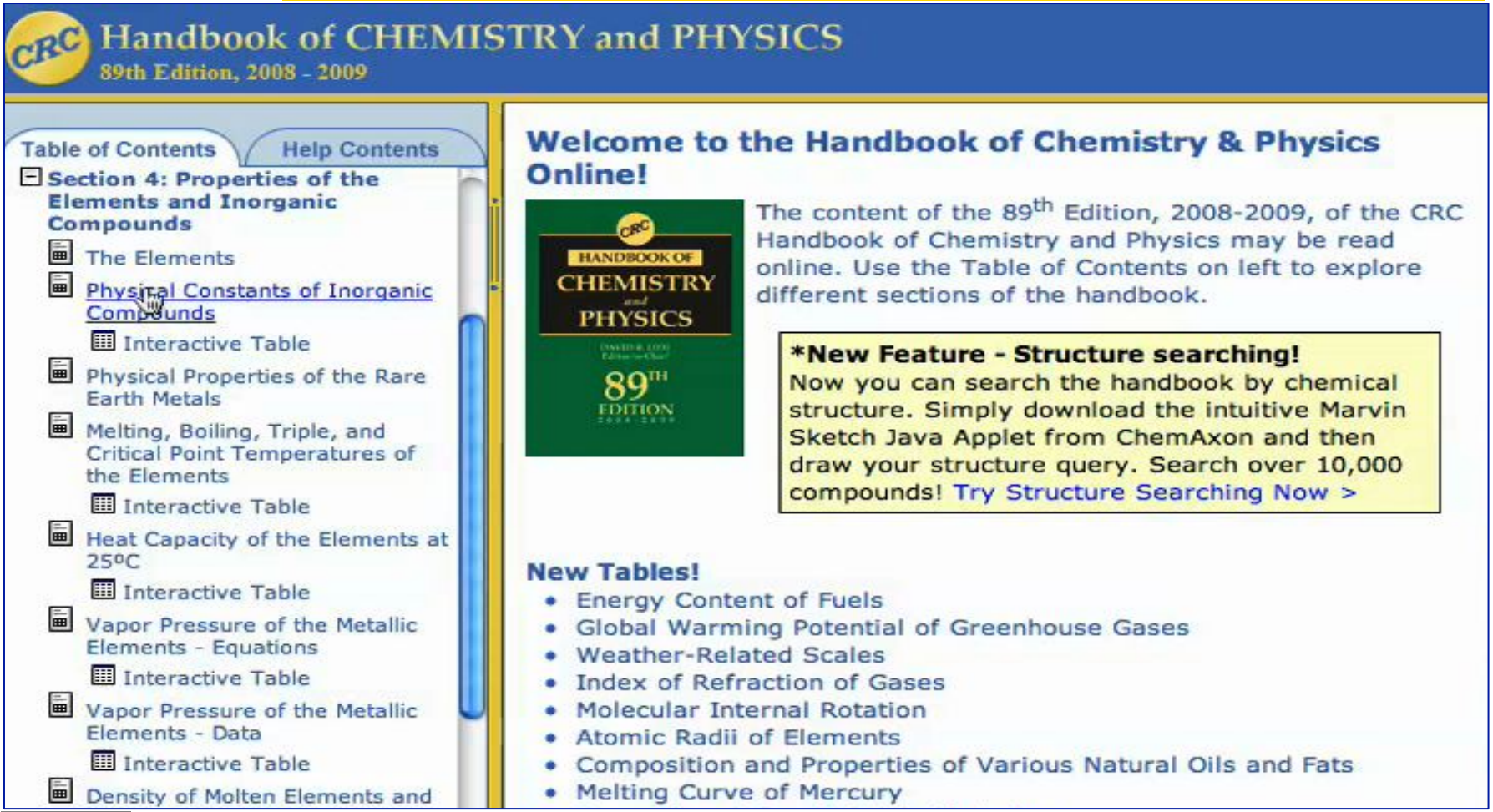
Statistics

Show and Tell



Example Tool Pollination

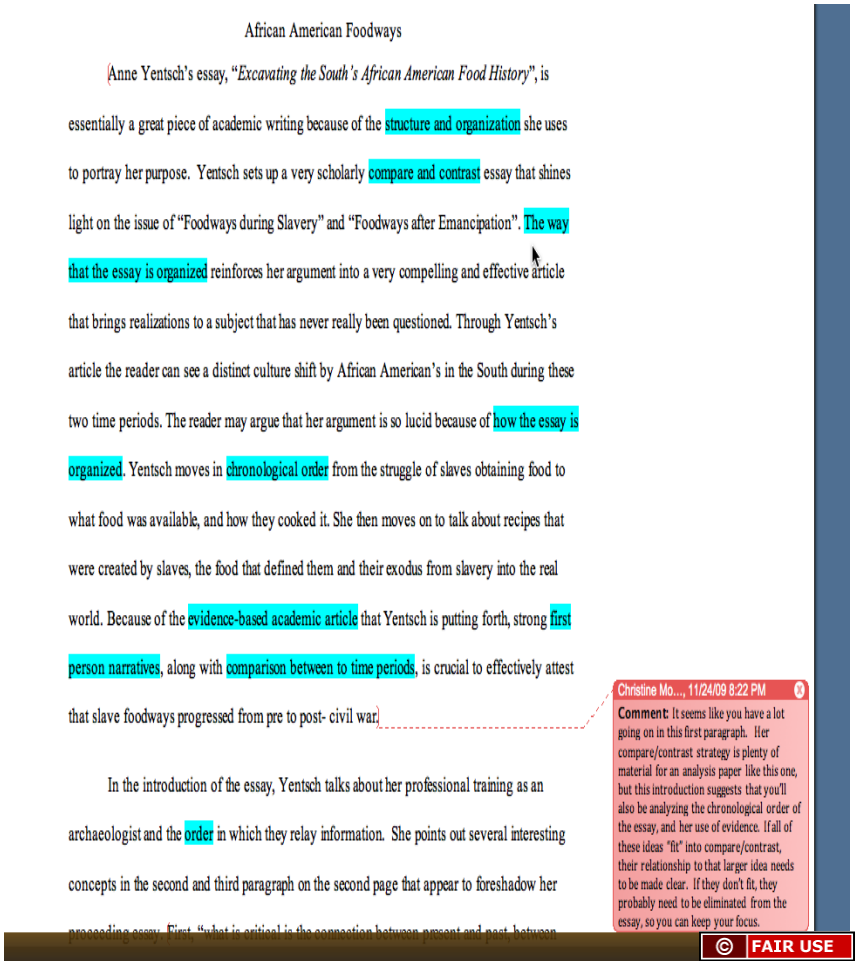
Video tutorials (Chemistry)



How do I look up properties of compounds in the *CRC Handbook*?

Example Tool Pollination

Personalized Video Feedback (Writing)



- **Video captured feedback**
  - personalized feedback on student papers.

- **Screen captured tutorials**
  - e.g., how to construct a concept map for writing

http://www.screencast.com/users/cmodey/folders/Jing/media/8bd96754-d693-4b5e-ba59-952afb2f2e4d

Example Tool Pollination

Grammar Videos/Podcasts(Spanish)

- What is the difference between imperfect and preterit?
- What is…?

Inicio Unidad 1 Unidad 2 Unidad 3 Unidad 4 Quiénes somos

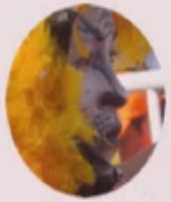
Grammar Podcasts for Spanish 103

Tejedora en Chinchero, Cusco, Perú. Fotografía: Tatiana Calixto

This site contains podcasts with grammar explanations for Spanish 103 Intensive Review. Enjoy!

Unidad 1

Unidad 2



Unidad 3

Unidad 4

Grammar Podcasts for Spanish 103
4108 Modern Languages Building | 812 East Washington Street | Ann Arbor, Michigan 48109-1275 | USA | Fax: (734) 764-8163
Contact: tcalixto@umich.edu
2011 - 2012

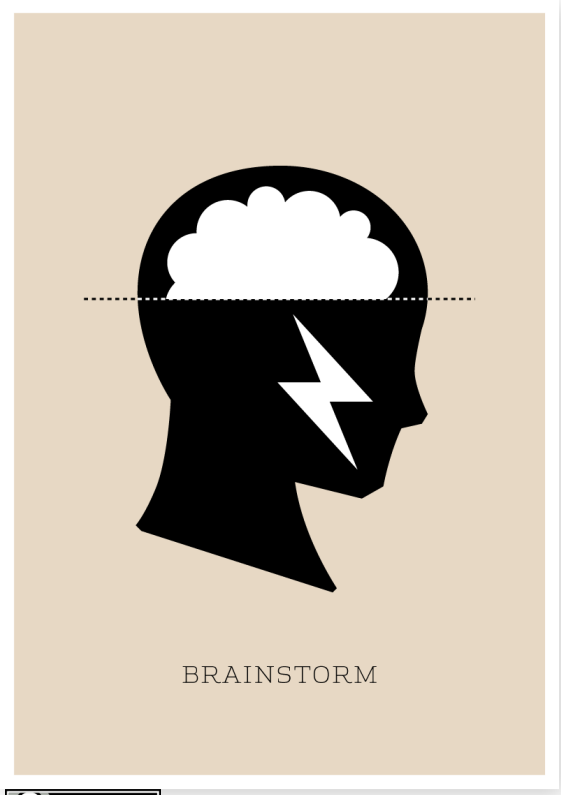
Perceived Barriers Alter!
to using technology in teaching or learning

- Quality online learning objects exist,
  but some do not use an appropriate or best pedagogical approach/technology tool
  to enhance learning and teaching

Cross-Disciplinary Outcome

Social Media Tech

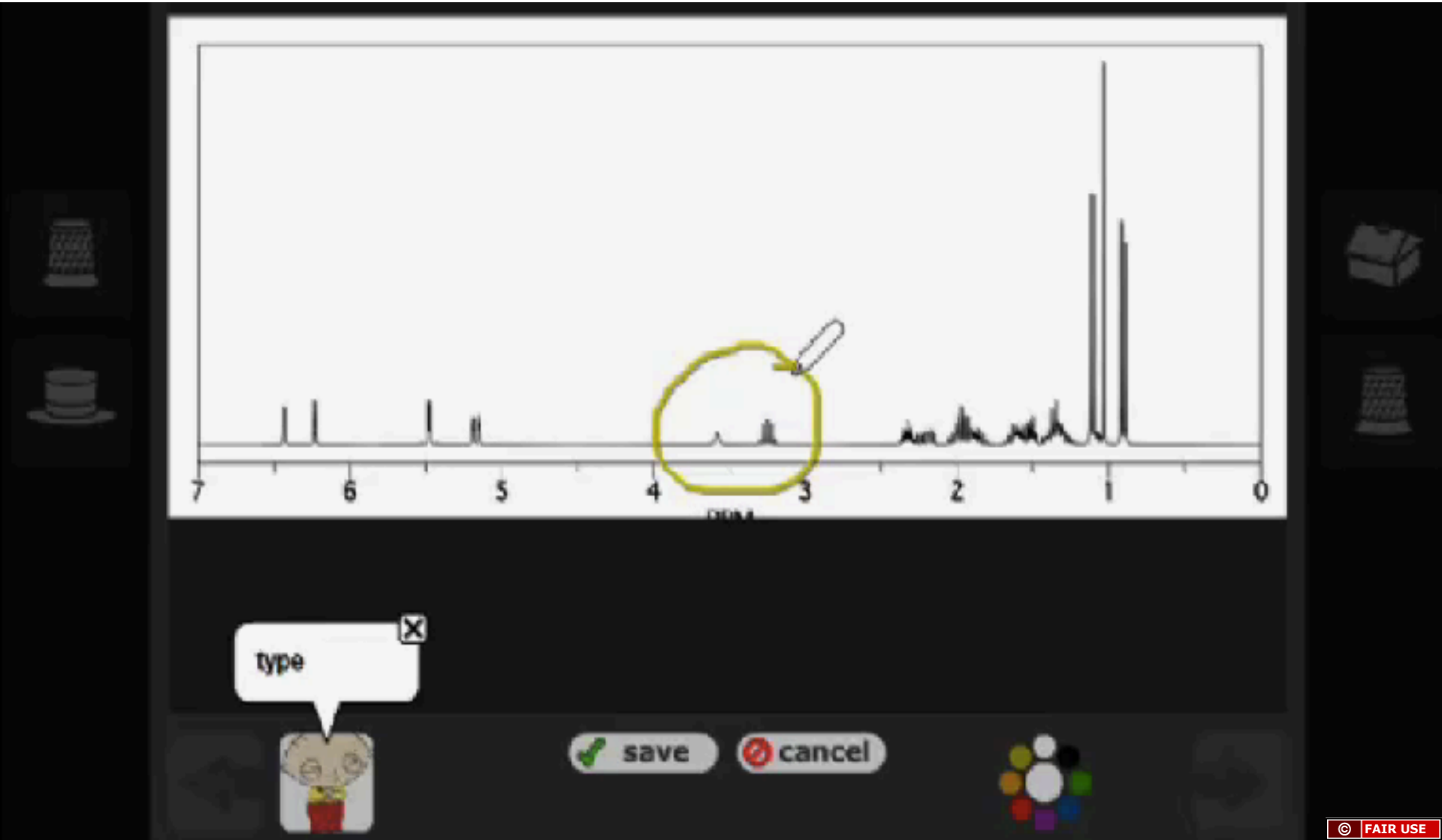
Students as co-teachers

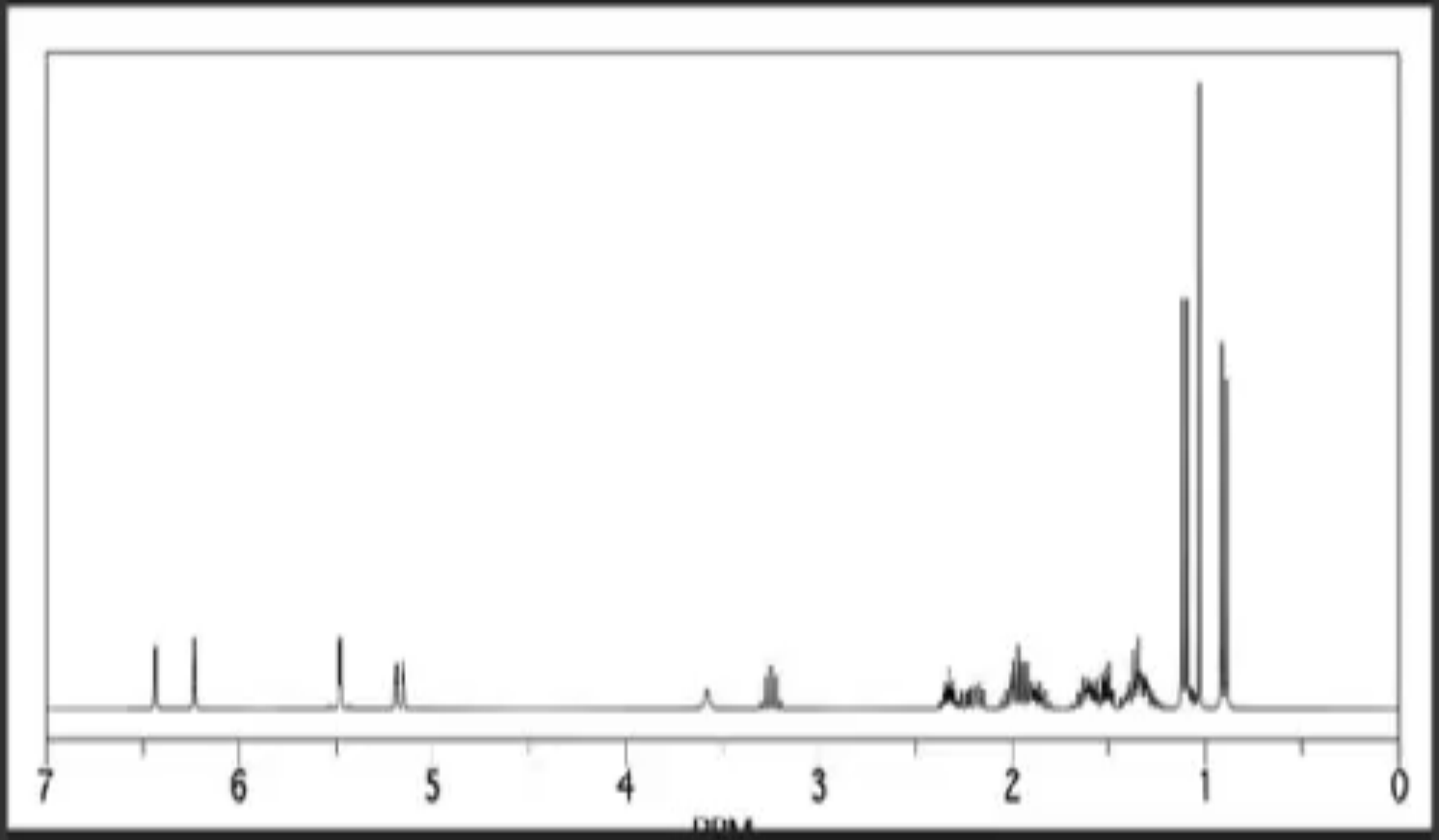


Move from a model where students are not only learners but also co-teachers

Example Outcome

Online LO Pre-Labs with VoiceThread (Org chem)





record type

Example Outcome

Facebook as a Discussion Board (Psychology)

Students use Facebook in a variety of ways for discussion:

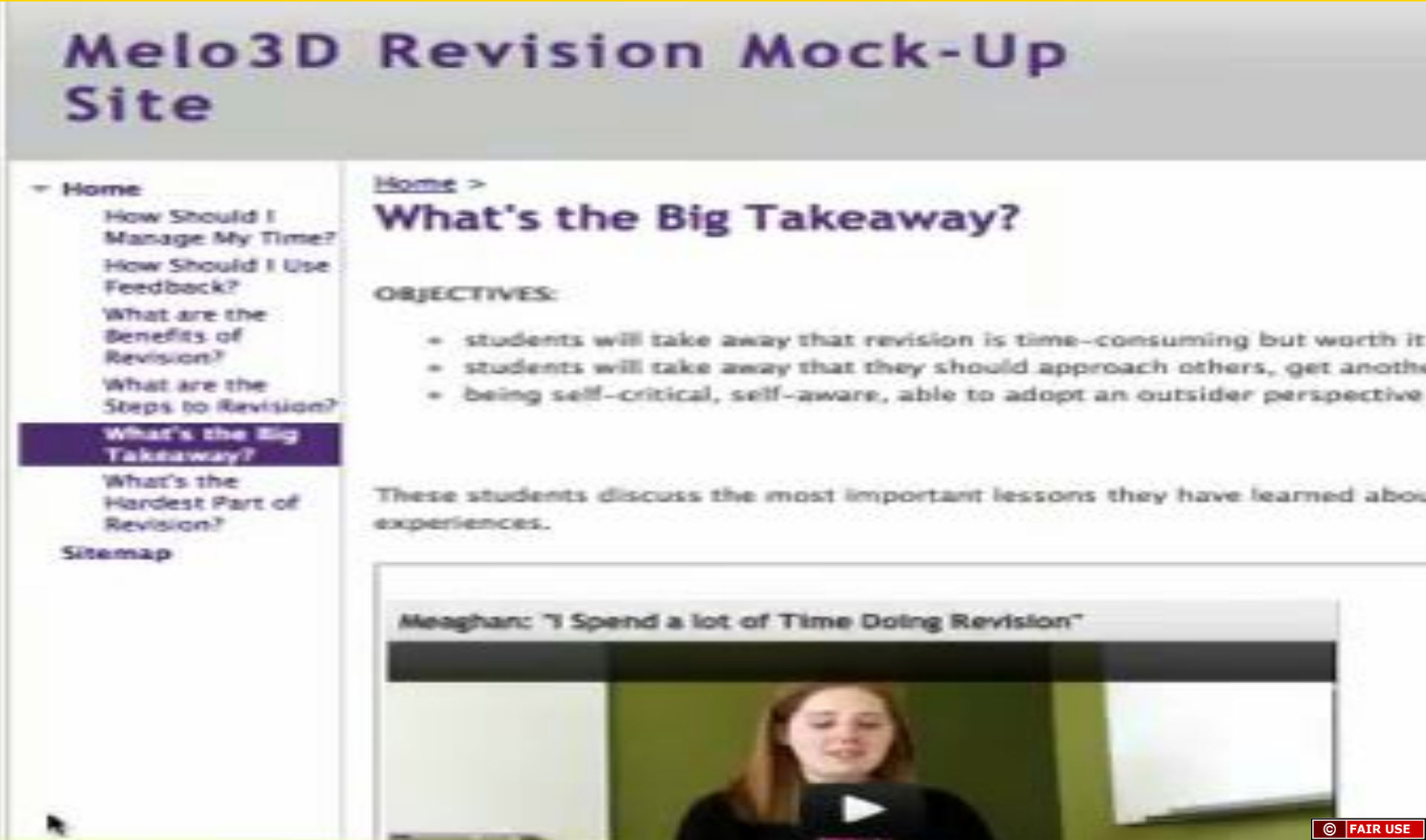
-Post links to videos, news articles

-Comment on each others posts

Adena Rottenstein

Example Outcome

Reflective Writing Video Collection (Writing)



Melo3D Revision Mock-Up Site

https://sites.google.com/site/melo3drevisionmockupsite/home

Google

Melo3D Revision Mock-Up Site | Choreography of Words | WRITING 100 Visual Rhetoric Qui... | Visual Rhetoric in the Writing 100...

Melo3D Revision Mock-Up Site

Search this site

Home

Welcome to our site, "Exploring Revision." We have designed this site to help you think about your own revision process, consider new ways to approach and think about revision, and to ease your fears about revision. Revision is often the most frustrating part of the writing process, and we hope that listening to students like yourself talk about how they approach and think about revision, you will find new ways to make the revision process productive and rewarding.

Click on the links below to view videos and answer questions on the following topics:

Alternative text:

Great pieces of college writing are made in the process of revision.

One true thing about revision is this: it's an awful lot of work. In fact, it's so much work that many writers, especially new writers, often avoid it.

Revision requires the ability to look at your own work objectively, to assess its strengths and weaknesses, to shrewdly identify where the piece has gone wrong and what you must do to fix it, to consider and incorporate the feedback of others without allowing it to overwhelm your own sense of purpose.

Above all, effective revision requires taking ownership of your writing and rewriting it, not so much to fit a rubric or to please a teacher but to fulfill your own vision for the essay.

This series of videos will help you to see the process of revision in all of its challenge, excitement, frustration, and satisfaction through the eyes of undergraduates at the University of Michigan. These clips address some of the most frequently asked questions about the revision process, including

- How do I make a revision plan?
- How can I best manage my time in the revision process?
- How do I incorporate feedback from others?
- How do I deal with frustration in the revision process?

Pause 2:41 / 5:00

New Outcomes (Gen Chem)

Shift of lecture class format

Transforming A Large Lecture To An Interactive Personalized Online Format

Transforming Lecture

Stepping Stones to the Multimedia Online Format

- Online Learning Resources

- Video Capture of demonstrations

- Podcasts

- Software

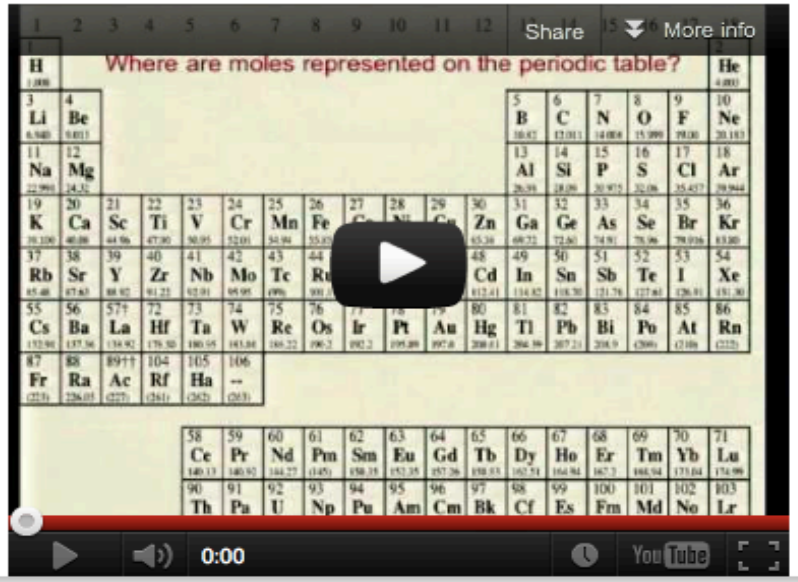
http://www.umich.edu/~chem125/softchalk/Exp2_Final

Preparing a solution of known concentration

What is a mole?

The first thing you will need to understand when making a solution is the concept of a mole. A mole is a number 6.02×10^{23} to be exact. All chemistry calculations are calculated in moles. The concept of a mole is just like the concept of a dozen. There are 12 objects in a dozen, just like there are 6.02×10^{23} objects in a mole. When working with different elements, they all have different **atomic weights.**

The atomic weight is how many grams of that element will make up one mole (or 6.02×10^{23} atoms) When this is applied to a ionic or molecular compound, the **molecular or formula weight** of the compound is determined by combining the atomic weight of all the atoms in the compound. The atomic weights for each atom can be found on any periodic table.



New Outcomes

Shift lecture class format

History of the American West: History 373

- Transition from lecture to interactive meetings
- Interactive syllabus
- Technology tools for “real – time historical inquiries
- Move from content-based pedagogy to integrating transferable skills such as analysis of primary resources

https://amwest.pbworks.com/w/page/43768438/Syllabus

Week One: The First American West

September 6: Course Introduction

No required reading for today.

September 8: The Ohio Territory and Indian Country

Readings
* Andrew Cayton, "Noble Actors Upon the Theatre of Honour: Power and Civility in the Treaty of Greenville" (Ctools)
* Treaty of Greenville (1795)
* Declaration of Independence
* Letter to Governor William H. Harrison, February 27, 1803

From The Philadelphia Aurora (A Philadelphia Newspaper):
* "The Savage Tomahawk," November 24, 1812 (reprinted in *The Columbian*)
* "The Savage Allies of England," August 3, 1812 (reprinted in *The Independent Chronicle)*
* "The War," September 19, 1812 (reprinted in *The American Mercury*)
* David Thompson, History of the Late War Between Great Britain and the United States (1832)

Note: to scroll to the bottom of the newspaper articles, click and scroll at the same time.

Study Questions

a. Describe the civilizing mission of the United States and explain how this concept related to Thomas Jefferson's Indian Policy.

b. How did Americans in the early 19th century understand their relationship to Native peoples? Was there a place in the republic for Indian peoples? Base your answers on public policy and popular discourse in the early republic.

Overall “IDEAS” Outcome

Move from a model where students are not only engaged learners but also co-teachers

Technology Integration via cross-disciplinary pollination is a successful model

Moyan Brenn Berkut83@hotmail.it

Current Goals

Shift in focus from technology development and integration of online learning objects to:

- Assessment of technology infusion impact on learning
- Web accessibility concerns

Go to the MELO presentation:

"Online learning Objects: Affecting Change through Cross-Disciplinary Practices and Open Technologies"

Emily Puckett Rodgers, Steve Lonn and others

Thursday July 26, 10:10 am, Marco Polo 706-707


THANK
YOU
GRACIAS
BOLZÏN
MERCI
BÏYAN
DANKSCHEEN
SHUKRIA
TINGKI
YAQHANYELAY
TASHAKKUR ATU
SUKSAMA
EKHMET
ARIGATO
SHUKURIA
GOZAIMASHITA
EFCHARISTO
JUSPAXAR
GRAZIE
MEHRBANI
KOMAPSUMNIDA
MAAKE
PALDIES
SPASSIBO
SNACHALHUYA
NUHUN
CHALTU
YUSPAGARÀTAM
WABEEJA
MAITEKA
HUI
DHANYABAAD
ANIHA
ATTO
MERSI
SPASIBO
DENKAUJA
NENACHALHYA
UNALCHÉESH
GUI
HATUR
EKOJU
SIKOMO
MAKETAI
MINMONCHAR
SANCO
MERASTAWHY
GAEJTHO
LAH
TAVTAPUCH
MEDAWAGSE
AGUYJE
FAKAAUE
BAIKA

Additional Source Information

Slide 3: (cc) BY Image courtesy of Bernt Rostad, "University of Michigan," http://www.flickr.com/photos/brostad/2902469588/

(cc) BY Image courtesy of jelene, "bees wallpaper," http://www.flickr.com/photos/jelene/3399436299/

Slide 3: (cc) BY Image courtesy of Bernt Rostad, "Angell Hall," http://www.flickr.com/photos/brostad/2901638071/in/photostream/

Slide 7: (cc) BY-SA Image courtesy of dvanzuijlekom, "Philips Lightbulb," http://www.flickr.com/photos/dvanzuijlekom/7324829530/

Slide 8: (cc) BY-NC Image courtesy of lumaxart, "Working Together Teamwork Puzzle Concept," http://www.flickr.com/photos/lumaxart/2137737248/

Slide 10: (cc) BY-SA Image courtesy of DaveLevy, "Green Light," http://www.flickr.com/photos/davelevy/7190079438/

Slide 12: (cc) BY Image courtesy of muppetspanker, http://www.flickr.com/photos/muppetspanker/748894499/

Slide 12: (cc) BY Image courtesy of Horia Varlan, "Hardcover book gutter and pages," http://www.flickr.com/photos/horiavarlan/4268896468/

Slide 16: (cc) BY Image courtesy of Siona Karen, "Honey," http://www.flickr.com/photos/sionakaren/3870732249/

Slide 16: (cc) BY Image courtesy of Muffet, "confetti 'n' keys," http://www.flickr.com/photos/calliope/4322693088/

Slide 20: (cc) BY Image courtesy of wlodi, "Red Lights," http://www.flickr.com/photos/wlodi/2532289914/

Slide 29: (cc) BY-SA Image courtesy of dvanzuijlekom, "Philips Lightbulb," http://www.flickr.com/photos/dvanzuijlekom/7324829530/

Slide 36: (cc) BY Image courtesy of lumaxart, "Working Together Teamwork Puzzle Concept," http://www.flickr.com/photos/lumaxart/2137737248/

Slide 43: (cc) BY Image courtesy of andymangold, "brainstorm," http://www.flickr.com/photos/andymangold/4455910733/

Slide 46: (cc) BY Image courtesy of mujitra, "Facebook." http://www.flickr.com/photos/mujitra/4039942772/

Slide 49: (cc) BY Image courtesy of University of Michigan MSIS, "Class-Lecture-Hall-Abrams-2," http://www.flickr.com/photos/umich-msis/6550333283/in/photostream/

Slide 50: (cc) BY-NC Image courtesy of s_falkow, http://www.flickr.com/photos/safari_vacation/5842069535/in/photostream

Slide 50: (cc) BY-NC Image courtesy of Rob Pearce, "Laptop and working lunch. An outside table with a silver laptop, coffee and a sandwich on it", http://www.flickr.com/photos/54268887@N00/5056901103/in/photostream/

Slide 50: (cc) BY-NC Image courtesy of derrickkwa, "podcast_subscribe," http://www.flickr.com/photos/15319336@N07/2060971197/in/photostream/

Slide 54: (cc) BY Image courtesy of Moyann Brenn, "thank you note for every language" http://www.flickr.com/photos/aigle_dore/5849712695/in/photostream/