old dog new tricks!

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A whole lot of Chemistry goin’ on!

K. Kitzmann/ChemEd2013/kakitzmann@mhsmi.org
1. On-line homework
2. iPad use
3. Flipped classroom
4. Microscale revisited
5. Guided inquiry

What is left to learn?

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-- OWL (Online web-based learning) for General Chemistry
-- developed at the University of Massachusetts by Roberta Day and Beatrice Botch in the 1980’s
-- supports mastery learning
-- numerical, chemical and contextual parameterization
-- simulations, tutorials, visualizations, end-of-chapter problems

On-line homework
www.cengage.com/owl

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Mercy H.S. has been a tablet school for many years.

Fall of 2012: All freshmen required to have iPads

Chem/AP Chem: a mix of iPads and tablet computers!

Technology changes: Tablets → iPads

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1. Note-taking: Evernote, iAnnotate, CloudOn

2. Teacher: Dropbox, ShowMe, Explain Everything

3. Chemistry: EMD PTE (Periodic Table), Mild EleMints, Nova Elements, Molecules, Gas Laws HDLite, ChemApp Lite, Lewis Dots, Graphical Analysis

**iPads: Apps**

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At the beginning of the year we created a video on “use of lab equipment” using iMovie and linked it to YouTube http://www.youtube.com/watch?v=rkdXZfFiEtk&feature=yt
tube_gdata_player

Also, I made a “movie” of the Gases Mini Stations Lab for the students who missed the lab to watch.
http://www.youtube.com/watch?v=9ZFHa5BP7uw

iPads... other uses
• What?
• Why?
• When?
• How?

I used Explain Everything on the iPad to create the “flips”, then downloaded them to YouTube, and connected them to Moodle.

Students had a notes outline that they needed to complete as they watched each “flip”.

Flipped lessons

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<table>
<thead>
<tr>
<th>Activity</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Hints for Balancing Equations” notes.</td>
<td>Watch “FLIP: Reaction Types Part I” (on Moodle) and take notes. Do pp. 4-6 of equations packet.</td>
</tr>
<tr>
<td>Work on pp. 4-6 of equations packet.</td>
<td></td>
</tr>
<tr>
<td>Discuss Reaction Types Part I. Do p. 7: 1-4 on equations packet.</td>
<td>Read pp. 262-269. Watch “FLIP: Reaction Types Part II” (on Moodle) and take notes.</td>
</tr>
<tr>
<td>Do p. 7 #5 and pp. 9-10 of equations packet.</td>
<td>Read pp. 270-276. Watch “FLIP: Reaction Types Part III” (on Moodle) and take notes.</td>
</tr>
<tr>
<td>Do p. 8 #6-8 and pp. 11-12 of equations packet.</td>
<td>Finish equations packet. Complete packet is due on Day H.</td>
</tr>
</tbody>
</table>
“Flips” on **Reaction Types**: required of all students
   Reaction Types Part I: combustion, synthesis, decomposition
   Reaction Types Part II: single replacement
   Reaction Types Part III: double replacement

http://www.youtube.com/watch?v=zV1RCpPq9Dc

**Stoichiometry** notes: available to all; primarily intended for those who missed class or needed reinforcement of the concepts
Gas Laws: required of all students
  Flip 1: Boyle’s, Charles’
  Flip 2: Gay-Lussac’s, Combined Gas Law
  Flip 3: Dalton’s Law of Partial Pressures

http://www.youtube.com/watch?v=6hxu1Nq37VA

Solutions: primarily for those students who missed class
  Flip 1: Molarity
  Flip 2: Solution Stoichiometry

Flipped lessons (cont.)

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• Why? Looking for new AP labs to do
• Purchased *An Inquiry and Forensic Approach Towards Chemical Experimentation* by Jesse Bernstein, Jeffrey Bracken, and Paul Price
• Tried: #11 The Peroxide Problem, #13 Equilibrium Constant Determination, and #16 How Fast Do You Want the Reaction to Go
• Also: Microscale Titration of Vinegar and $K_{sp}$ of Ca(OH)$_2$

Microscale revisited

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Jason Neil, chemistry teacher in Michigan
http://www.chemistryinquiry.com/index.htm
Ex: ChemQuest 36: Gases and the Mole

Target Inquiry, Grand Valley State University
http://www.gvsu.edu/targetinquiry/
Ex: My Acid Can Beat Up Your Acid

AP Chemistry curriculum & lab changes for 2013-2014 and on…
AP Chemistry Guided-Inquiry Experiments: Applying the Science Practices (College Board)
And there will be more, I’m sure...
Slide 1:  http://celiasue.files.wordpress.com/2010/10/1496949592_9dc327ae77.jpg
Slide 3:  http://images.huggintonpost.com/2809-09-03-JonesSkateboards.jpg
Slide 14:  http://missallottasclassroom.blogspot.com/
Other photos: K. Kitzmann

Image sources

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“Teaching is humbling. The more I teach, the more I have to learn. Life is humbling. The more I live, the more I have to learn.”

Phua Geok Kuan

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