CH131 – Spring 2023

***Chemistry for the Community*: WMS Comes to SJC!!**

**Overview**

Most of you participated in CFTC in the Fall in CH130 by teaching and inspiring WMS 8th graders at WMS. The process will be similar to last semester.

You will work together as a group in your lab section to design and execute hands-on learning activities for Ms. Pam Mallard’s Windham Middle School 8th grade classes. You will be assigned to a group based on similar schedules.

We are looking for you to really step up the complexity and tackle some college level topics with the kids. The biggest challenge is taking a college level topic (your favorites, kinetics and equilibrium!) and present it in a way they can understand. In the process, your understanding grows.

Keep in mind this project is worth 120 points or 30% of your lab grade. Lab is 30% of you overall grade so this project is over 9% of your overall grade. So it can help you quite a bit! Only the final is worth more.

**Objective and Expectations**

Working in a group can be enormously beneficial for learning, but it also introduces the stresses of interacting with – and relying on – other people.  It’s incredibly important to COMMUNICATE, work together, stick to deadlines, use class time wisely, and support each other.  The first thing groups will do today is discuss expectations and make a group contract.

We’re also working with a community partner – they are relying on US and need our energy and ideas! We need to give them our best work.  I am hopeful almost all of the preparation can be done IN LAB – 6 hours is a long time. But there could be a need to work on this outside of class. If so, communication and follow through is extremely important given the short turnaround.

Here is the overview of **dates and** **deadlines**, organized by week. Deliverables, or things that need to be submitted are **bolded** and highlighted **yellow** for an individual taskor **green** for a group task:

Week 1 – Lab 3/16 (all tasks **completed IN LAB**)

* Complete the quick **Google form on CBL Professional Guidelines**: <https://docs.google.com/forms/d/e/1FAIpQLSfHCZGbvELoaJB_8wU3HnDMtJ2OlP7NKAtSqp4ch8CRb7Noiw/viewform>
* Initial Work Session. Goals:
  + get to know each other if you don’t
  + decide on the experiment and the primary kinetics/equilibrium concept you want to emphasize – think big picture, what are the biggest takeways the students should leave with?
  + gather supplies
  + test experiment and think about how you will modify it and how you will instruct the students on how to complete it SAFELY. They can use “real” chemicals but it is imperative that safety is above everthing else.
  + create outline of the lesson – start big picture, not about how many minutes each little part will take.
  + identify science content, real world application, and assessment activities
* **Begin the outline draft.** One group member should download the template from Brightspace, convert to a Google Doc, and share with teammates, Dr. Lesher and Ms. Hu.
* Last thing you do before leaving: **Complete reflection 1**: <https://forms.gle/kbdv8QqTwQVC535a7>

Week 2 – Lab 3/23

* Reconvene and assess. Fine tune plans. Work on any materials you will share with the students.
* Informal run-throughs.
* **Finalized outlines due.**

***In lab on 3/30 – you will be working on Lab 5 (not CBL). Lab 5 is a two week lab, the second week will take place on 4/20.***

In between Week 2 and 3 – if there are things that need to happen in between, be sure everyone is on the same page regarding who, what and when. Rehearse! Do a practice dress rehearsal, or a few.

Week 3 – 4/6

* Dress rehearsal
* **Reflection 2** due by end of lab: <https://forms.gle/Ui6BSn78hV2V14jX8>

Week 4 – 4/13 (For L2, 11:45-2:45) OR 4/27 (For L1, 8:15-11:15), L3 will do their CBL during L1 or L2

* Give the lesson!!! ☺
* **Reflection 3** due in lab the day of your presentation, completed after the session with the kids (you should have time in your lab period): <https://forms.gle/HFnpskx71DpTuuym7>

**Lesson Structure**

1. The lesson should be somewhere between 50-60 minutes! This is longer than the fall!
2. There must be some sort of introduction or ice breaker. Try to learn their names and we’ll also have name tags.
3. We are really looking for you to dig in deep to kinetics and equilibrium and explain an aspect of these related topics in terms 8th graders can understand. You should NOT do any math on rate laws, activation energy, or equilibrium constants, but you should bring in at least one of the concepts below. Probably only one because they are pretty heavy!:
   * Most reactions happen when molecules collide. Collisions need to be “effective” and this depends on energy (among other things). The speed of the reaction is related to temperature because higher energy allows for more effective collisions.
   * Concentration of reactants affects the speed of a reaction because more molecules in close proximity means more collisions per second.
   * In equilibrium systems, reactions are occurring in the forward and reverse directions. Equilibrium can be disturbed and the system responds to reestablish equilibrium. This is accomplished by changes in the rates of the forward and reverse reactions.

We would like to see you utilize the Kinetics Simulation (<https://phet.colorado.edu/sims/cheerpj/reactions-and-rates/latest/reactions-and-rates.html?simulation=reactions-and-rates>) to provide an animated visual, which will really help them develop a deep understanding. You will need to think about how it can be used effectively. Do you want to develop a worksheet for them to take notes on? How many computers will you need (let us know if you need loners)? How many WMS kids will share a computer? Or will they take turns? Or will you demonstrate the simulation? (If the students are not using the simulation themselves, there must be a lot of involvement of the WMS students)

We recommend the students develop their understanding with the simulation and then move onto the experiment. You can start with questions from the simulation we did in class, but it must be simplified and streamlined to support your learning outcomes as effectively as possible.

1. The lesson must have students doing a hands-on kinetics or equilibrium experiment. There should be the ability for each student to do at least part of the experiment. You will be provided with a limited number of experiment ideas to choose from, and your group will also need to **modify the experiment to have an element of experimental design or hypothesis development.**  And it must be closely tied to your concepts above.
2. There must be a component of the students actively making/writing/drawing something to assess what they have learned. I would encourage you to think about using the whiteboards, giant post its, or something similar, and focusing on having them represent the chemistry using pictures or models. The plastic atom/molecule models are also an options!
3. The group must make an effort to have the students participate. You can and should use strategies such as calling on them by name, simple thumbs up/thumbs down to assess understanding.
4. You may NOT use Powerpoint, or online games like Kahoot. We’re going old fashioned this time ☺
5. You need to bring your energy to this project!