

Hello Future Fearless AP Chemists 2018!

AP Chem will probably be the harder than any class you have taken thus far. But you knew it was going to be a challenge when you signed up for it. I appreciate that about my students. They aren't in it for an easy grade. They are in it to push themselves to new limits, gain new knowledge. Really digging your teeth into something challenging can be a great experience. You are going to have so much FUN!

There are 3 things that create the challenge. One, the natural world –it's complex, more so than I let on in the intro class. Two, our desire to understand it. Humans have in them a natural desire to figure things out, to learn to predict and control nature. Curiosity is a hallmark of our species and of bright kids like you. (Everybody is born curious, the structure of schooling generally extinguishes that fire in kids who aren't successful at the school game). The third is the AP exam. I think the AP exam is a good test. I like working towards challenges. But I believe in being internally motivated. We shouldn't just be focused on rocking the AP chem exam, we should be focused on becoming totally awesome at chem! We should strive daily for mastery of the chem curriculum, for personal excellence. If we do that success on the exam is sure to follow.

Your summer reading is *Uncle Tungsten* by Oliver Sacks. I have a few copies left you can come in and get otherwise there should be other at the Public Library. People read him for fun. Robin Williams was in a movie based on one of his books (*Awakenings*). This book is good enough to be a New York Times best seller even though it's about chemistry. It really hits on that second motivation, being a curious kid, figuring out how stuff in your world works, what it is made of, but it will also help you towards the AP exam.

This book is aimed at the general public and as top students from my class you know more chemistry (and probably more European history) than "the general public" so this should go down pretty easy. Enjoy the story, the drama of the development of the science. Don't sweat it if there is a bit of science you get tripped up on, write it down as a point to ask about in class and move on. That's the only thing you should be taking notes on, the stuff you don't understand and want to ask about later. Don't feel obliged to take notes on the rest of it; just read it, digest it, enjoy it as background.

You can skip the following chapters: 3, 9, 15, 19, and 22. These are the more biographical ones (you could read for fun but we won't ever be discussing them in class). Answer the attached questions not because you have to but because you want to. You'll see that, like the book, they are not all about chemistry but also about history, about how much our world has changed in 50 years. Answer each in a typed grammatically decent sentence or two. You should be ready to hand this in on the second day of school.

Dave

- 1) How old was OW Sacks' grandpa when he got married? How about that?!
  - 2) How much would you guess his parents made (guess a yearly salary in today's \$)
  - 4) Write the formula for the reaction on page 41.
  - 5) The beginning illustration shows 4 light bulbs. How is the 4<sup>th</sup> better than the 3<sup>rd</sup>?
  - 6) Where is the land of stibnite?
  - 7, 8) This is obviously fun stuff, the place where many ideas for magic tricks come from. Pick from these chapters something you'd like to try.
  - 10) Who discovered oxygen?
  - 11) What was Davy ostensibly doing in Paris when he discovered Iodine?  
(I love their eccentricity, their passion for discovery)
  - 13) There is a quote about the development of science on the bottom of page 154. I want you to copy it down, take it to heart. It will sustain you next year.
  - 14) OWS makes a battery of 2 elements (Cu, Zn). We did a lab with those elements.  
Which one "wants" the electrons more? Which creates the battery's pull?
  - 16) This wonderful fulfilling, completing chapter tells us as much about OWS as it does about Mendeleev. What a complete, huge nerd he was! What are some factors that allowed OWS to develop in this way?
  - 17) What are the two types of mutually reinforcing (indeed matching) spectroscopy?  
Which one did we do in regular chemistry?
  - 18) The chapter illustration has an ingenious device that turns the wave energy of the sea into light for buoys to guide ships. Why don't we employ this system of lighting anymore?(clue: what element creates the light)
  - 20) What did they used to have in shoe stores? My dad remembers playing with them.
  - 21) What are some of the early "health inducing" effects of Radiation (in a footnote)
  - 24) This chapter corresponds to one of the conceptually most difficult chapters in the text (7 as it happens), yet OWS delivers it with all the wonderment it deserves. I hope you can pick up that spirit. Quantization is referred to for Bohr's work with the electrons. How and what does Mosely quantify?
- ∞) Which scientist do you think was Sacks' favorite? Give 1 or 2 quotes as to why.
- ∞ + 1) Which scientist was your favorite? Give 1 or 2 quotes as to why.