

Review guide for final unit test (see school website for days/times)

The student can expect the usual 'Clark test' with roughly 20-30 multiple choice questions, a handful of 'essay' questions and several 'math' questions.. (heat transfer, density, concentration, etc.) This test will be roughly 1/3 of the student's 'test grades' which represent 40% of the overall grade. (i.e., about 13% total of the student grade). That being said, this is the student's last chance to impress Clark as he continuously 'look for reasons' to raise a student's grade above formula. *Extra credit (up to five points) for students who bring 'home made treats' to the test (points placed in the classwork category).*

Article: The sad fate of the ancient, well-shelled mariners. When were the Cambrian and Devonian Periods? What role does Phosphorus play in DNA and in 'powering' cell's functions? What led to the statement; Phosphorus was stolen by the bony fishes? What is a phosphorene? When was phosphorus discovered? What was the primary source of the phosphorus that was discovered? What does the word Phosphorus mean in Greek? What is 'phossy jaw'? To what degree does pure phosphorus exist in nature? What are the most common forms of phosphorus? How much phosphorus does your body process every day? How does the phosphate molecule compare to the carbonate molecule? What would have happened in life had evolved to use carbonate to 'stitch together DNA' rather than phosphate? How did the phosphorus content of the early oceans compare to the phosphorus content today? Why? What substance in the human body still contains large amount of phosphorus to make hard substances?

Video: Kiss the ground: What percent of the exudates that plants produce ends up going directly into the ground? How does tilling disrupt the storage of carbon? How can soils sequester carbon? Why does soil that has been tilled not absorb as much water during rainstorms as soil that has been left intact? Why does tilling release carbon into the atmosphere? Why is the temperature of the air above 'living soils' cooler than soil above soils that have been tilled and sprayed with herbicides and insecticides? Why does tilling soils lead to soil loss during rainstorms and windstorms? What percent of the Earth's top-soils have been lost as a result of tilling the land? What is the concept of 'soil armor? What is the potential to store carbon if farmers began to use these 'no till' techniques?

General chemistry;

How does the Carbonate ion differ from the bi-carbonate ion? What are ions? What ions are elements on the left-most side of the table likely to form as compared to elements on the right-most side of the table? Why? How can you tell from the table what charge the ions might have once they become charged? Given examples of elements from Table of elements, be able to predict the degree of reactivity and the degree of electrical conductivity they might have. (i.e., the lab we did with mystery elements).

The periodic table of elements. By this point in the semester, the student should recognize the chemical symbols for the following elements. (all elements with atomic number 1-20; Iron, Nickel, Copper, Zinc Silver, Tin, Gold, Mercury and Lead).

Be able to determine the percent mass of an element given a molecular formula. Be able to determine the percent mass and total mass of an element in a sample of materials (such as Calcium in a sample of Calcium Carbonate in which the mass is known).

Lab practical: Given a solution of alcohol and water, be able to determine the density of the solution and, based on the temperature of the mixture, the percent concentration of alcohol given a table of values (as we did in lab).

Orbital Structure? How many electrons are the S-orbitals able to hold? How many electrons are P-orbitals able to hold? What are 'valence' electrons? What is the 'octet rule' and how does that rule determine how many electrons can be gained or lost in a bonding transaction? Given a sample element, be able to determine how many electrons each 'shell' contains.

Coulombs Law.. given information about the charge and separation of two 'charged items' be able to determine how the force changes if the distances are changed (decreased or increased by some fraction) or if the charge on one or both items changes.

Trends in the periodic table of elements: Given samples of elements on the Periodic Table of Elements, the student should be able to describe the level of electrical conductivity, reactivity, the relative size of elements (compared to other elements on the table), electronegativity and Ionization energy. And.. be able to describe why (i.e., the number of electrons in the valence shells, where the electrons are, the relative sizes, etc.).

Flame test: Why do we see different colors of flame when different elements are 'put into the fire'? How does where the element's placement on 'the table' affect the color of the light of the flame test?

Video: Chasing Ice: What data did the ice-cores give us? How far back in time does the ice core data go? Where were the greatest number of cameras set up? What were the major obstacles that the Extreme Ice group faced? What is a Moulin on a glacier? Roughly how much water is coming off the Greenland Ice sheet today? What is the Atlantic Thermo-haline cycle and how does it work? Why is it important for Europe? What factors could lead to the cycle potentially stopping and what effect would that have on Europe?

Heat of fusion lab: How does the Heat of fusion compare to the concept of Specific Heat Capacity? What are the four 'states of matter'? How do the different temperatures that substances have for melting, boiling, freezing, etc.. relate to the inter-molecular forces within those substances? Given a sample data set, be able to determine how much heat is transferred either in melting ice or in warming or cooling water.

Distillation lab: Be able to describe the basic process of distillation including the fundamental principals which allow the process to work in the first place. Given a diagram of a distiller, be able to describe what the function of each component is. Given a sample of mixed alcohol and water, be able to determine the concentration of alcohol through measurements of density and volume. Be able to describe why different substances have different 'boiling points' (and melting points and freezing points, etc.).