You should be able to answer the following questions, solve problems involving the following concepts, or understand the following concepts so that you can describe them and answer questions about them.

- Periodic trends regarding atomic and ionic radii.
- What is meant by valence electrons?
- What is ionization energy?
- What is the octet rule?
- What are ions? How do they relate to the octet rule?
- How is charge balance related to writing formulas of ionic compounds?
- Write dot formulas for atoms, and show how they interact with each other to form ionic compounds and molecular covalent compounds.
- Be able to write formulas for ionic and covalent compounds if given the names.
- Be able to write names for ionic and covalent compounds if given the formulas.
- What is unique about most transition metals?
- Know the names and formulas for polyatomic ions, and the naming of ionic compounds of polyatomic ions.
- Be able to draw electron dot formulas for covalent compounds, be able to identify the central atom in the molecule.
- You should be able to use a periodic table to determine which, of a list of elements, has the highest or lowest electronegativity.
- What does it mean to say that a bond is polar?
- What is the difference between polar and nonpolar covalent bonds?
- You should be able to indicate the polarity of a bond using the arrow or delta symbols.
- What is the difference between molecular mass and formula mass?
- You should be able to use the periodic table and a chemical formula to calculate the molecular mass or the formula mass of any compound or element.
- You need to memorize Avogadro’s number.
- What is a mole?
- You should be able to use Avogadro’s number to convert between moles of a substance and numbers of molecules (or atoms or ions).
- What is molar mass? What is the difference between molar mass and molecular mass?
- What are the units of molar mass?
- You should be able to use molar mass to convert between moles of a substance and grams of a substance.
- What do the subscripts in a chemical formula represent? You should be able to use these subscripts to convert between numbers of moles of a molecule and number of moles of a particular atom in a compound.
- You should be able to calculate the percent composition for a compound given its formula.
- You should be able to determine the empirical formula for a compound given its percent composition or the mass for each element in the compound.
- You should be able to determine the molecular formula for a compound from its molecular mass and empirical formula.