



## Physics

1. All kinematics equations and manipulating them for vertical and horizontal motion (acceleration, displacement, velocity, time)
2. Finding forces, net forces, friction forces, normal forces and knowing how net force = mass times acceleration works
3. Understanding series and parallel circuits and how current, voltage and resistance work in each case
4. Kinetic energy and potential energy equations and going from one to the other
5. The relationship between Impulse, Force, Time and Momentum
6. Understand how Power and Work are calculated and their relationship.
7. Understand how to use  $q=m*c*\Delta t$
8. Understand longitudinal and transverse waves and the equation  $c=\lambda*f$  and how period relates.
9. Understand the difference between reflection, refraction, and diffraction and how to use Snell's law.
10. Understand the differences between concave and convex lens and mirrors, the types of images they produce, and how to calculate the size and location of the image.
11. Understand harmonics for strings, open, and closed-end pipes and how to find the wavelength and frequency given the harmonic.
12. Understand the difference between color addition and subtraction.

[This](#) site has some good practice and answers! So does [this](#) one.

## Chemistry

1. Naming and writing ionic compounds, covalent compounds, and acids and bases.
2. Stoichiometry - converting between grams and moles and molecules
3.  $MV=MV$  and molarity and molality equations
4. Balancing equations and knowing types of equations
5. Limiting reactant problems (based off of stoichiometry)
6. Acids/Bases, pH, concentration of  $H_3O^+$ , pOH
7.  $PV=nRT$  and sub equations of that (ie.  $PV=PV$ )
8. Knowing how to write electron configuration.
9. Alpha, beta, and gamma decay
10. Fusion vs Fission
11. Understanding the relationship between atomic number, mass number, #protons, #neutrons, #electrons
12. Trends in the periodic table

13. Lewis dot structure and basic molecular geometry

14. Understand how to use significant figures/digits

[Here](#) is a good website with practice for chemistry. Khan academy on each of these items is also a good resource. [This](#) site has some more good ones!

## Biology

1. Photosynthesis and all phases
2. Cellular respiration
3. Mitosis
4. Meiosis
5. Understand protein synthesis and all details surrounding transcription and translation
6. Parts of a cell, what they look like and what they do
7. Eukaryotic/prokaryotic cell
8. Basic differences between kingdoms
9. Active and Passive Transportation
10. Genetics/Punnett Squares. Know all about how to do all types of crosses: dominance, incomplete dominance, dihybrid, multiple alleles, epistasis, etc. Also know how to calculate phenotypic and genotypic ratios and what they mean.
11. Monomers and Polymers in DNA, proteins, carbohydrates and lipids.

[This](#) site offers a great review of the Biology you need to know