Unit Three Studyguide

Give a short history of how the concept of the atom developed.
Describe the contributions of Democritus and Dalton to the atomic theory.
Summarize Dalton's atomic theory (5 postulates) and explain its historical development.
State the law of definite proportions.
State the law of multiple proportions.

Explain the observations that led to Thomson's discovery of the electron.
Describe Thomson's plum-pudding model of the atom.
Describe Rutherford's gold foil experiment and explain how this experiment disproved the plum-pudding model.
Draw a diagram of the Rutherford model of the atom and label the nucleus and the electron cloud.

Explain Millikan's oil drop experiment and its significance to atomic theory.

Identify the three major subatomic particles and their charges, masses, and location in the atom.
Briefly describe the discovery of the neutron.
Define atomic number.
Describe the size of the nucleus in relation to the size of the atom.
Explain what is meant by the atomic mass of an element and describe how atomic masses are related to carbon-12.
Define mass number.
Explain what isotopes are and how isotopes affect an element's atomic mass.
Determine the number of protons, neutrons, and electrons in an atom.
Calculate the atomic mass of an element from the masses and relative percentages of the isotopes of the element.
Perform calculations involving the relationship between the wavelength and frequency of electromagnetic radiation, $v = l f$.
Perform calculations involving the relationship between the energy and the frequency of electromagnetic radiation, $E = h f$.
State the velocity of electromagnetic radiation in a vacuum.
Name at least three different areas of the electromagnetic spectrum.
When given two comparative colors or areas in the electromagnetic spectrum, identify which area has the higher wavelength, the higher frequency, and the higher energy.
Describe the appearance of an atomic emission spectrum.
Explain why an element can be identified by its emission spectrum.
Explain how an atomic emission spectrum is produced.
Explain how an atomic emission spectrum is related to the atomic absorption spectrum of the same element.
Describe how the Bohr model of the atom explains the existence of atomic spectra.
Explain the limitations of the Bohr model and why it had to be replaced.