

You should be successful on this exam, if you can do the following:

(Note any changes announced in lecture or on the web bulletin board.). Reading is listed by the objective.

MATTER AND BASIC MEASUREMENT	UNIT. SECTION
	<u>Unit 1. 1, 2</u>

1. Use evidence to distinguish between mixture/pure and states of matter
2. Use evidence to distinguish between element/compound or atom/molecule
3. I.D. chemical and physical properties
4. I.D. chemical and physical changes

5. Know basic units and prefixes (to convert metric to metric)
6. Define accuracy and precision
7. Read & express measurements in sig. figs
8. Carry out math operations in sig. Figs (add, sub, multiply, divide)
9. Express numbers in scientific notation
10. Carry out math operations in sci. notation
11. Convert units using the Dimensional Analysis (factor-label) method
12. Define the 3 temperature scales & convert between them
13. Define density. Given 2 of the 3 (volume, mass, or density), calculate the 3rd

Unit 1. 3, 4

ATOMS	UNIT. SECTION
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1. Describe and Evaluate Dalton's Atomic Theory
2. Write symbols of elements given the name (v.v.) (1-36 +Ag, Pt, Au, Hg, Sn, Pb, I, Rn, U)
3. Describe the evidence for the nature of the atom from Dalton, Thompson, & Rutherford
4. Describe the composition of the atom in terms of p, e, and n
5. Determine the number of p, n, & e, given ^AX. (vv)
6. Determine atomic number and mass number of two or more isotopes
7. Explain and calculate atomic mass using % of isotopes (vv)
8. Describe the composition of an ion in terms of p, e, and n

9. ID metals, metalloids, families, groups, and periods in the Periodic Chart, including states of matter and diatomics.

10. ID trends in reactivity with water
11. ID trends in atomic radius and ionic radius
12. ID trends in Ionization Energy

13. ID E.M. radiation. (give types & relative wavelengths)
14. Calculate energy, wavelength, or frequency of light.
15. Describe evidence for quantified nature of energy (in electrons)
16. Describe the Bohr model of the atom
17. Give the Bohr electron configuration for elements 1-20.
18. Calculate the energy required to raise an electron to a higher energy level. (vv)

Unit 2. 1-3

Unit 2. 4

Unit 3. 1-3

ATOMS PART 2	UNIT. SECTION
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1. ID trends in electron affinity & electronegativity
2. Explain probability, electron density, & orbital
3. Calculate wavelength, mass or velocity given 2 of the 3.
4. Give the shape and number of each type of orbitals
5. Describe the wave mechanical model of atom and explain trends with it

Unit 3. 4

Unit 4. 2

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| 6. Predict similarity of properties by location in the periodic chart. | |
| 7. Write the ground state electron configurations for atoms & ions | <u>Unit 4.3</u> |
| 8. Write orbital diagrams for atoms & ions; ID paramagnetic and diamagnetic | <u>Unit 4.1b</u> |
| 9. Explain the meaning of each Quantum Number | <u>Unit 3.5, Unit 4.1a, 4.1M</u> |
| 10. Write the Quantum numbers for an electron | <u>Unit 4.4</u> |

MOLECULES

UNIT.SECTION

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| 1. Identify the kinds & numbers of atoms in a formula (v.v.) | |
| 2. Write formulas from ions given names (v.v.) | <u>Unit 5.1</u> |
| 3. Write the Lewis symbols for elements | |
| 4. Predict what ions are formed from given elements, using their place in the chart. | |
| 5. Write formulas for compounds, given their name (vv) | <u>Unit 5.2-5.3</u> |
| •metal-nonmetal | |
| •variable valence metal-nonmetal | |
| •polyatomic compounds | |
| •Write the symbols and charge for polyatomic ions given their name (vv) | |
| •nonmetal-nonmetal | |
| •oxyanion compounds | |
| •acids | |
| 6. Define and use average atomic mass & amu | |
| 7. Define and use molecular mass & formula mass (weight) | |
| 8. Define and use the mole, Avogadro's number, & Molar Mass | <u>Unit 2.5</u> |
| 9. Convert between moles, grams, & # of particles for elements or compounds | |
| 10. Calculate the mass or mass percent of an element or ion in a compound | |
| 11. Calculate empirical formulas given mass or % of elements | <u>Unit 8.1</u> |
| 12. Calculate molecular formulas from the empirical given molar mass | |
| 13. Convert between moles, grams, & # of particles for hydrates | |