REVIEW FOR NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

UNIT ONE EXAM DATE\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_PERIOD\_\_\_\_\_\_\_\_\_\_

Complete all activities and answer all questions to begin preparation for the Unit 1 Exam. You should **also know your notes and the lab.**

1. Understand the contributions of Dalton, Thompson, Rutherford and Bohr to our understanding of atomic structure, including the experiments that helped them to their conclusions.
2. What is the difference between qualitative and quantitative observations?
3. What are the five indicators of a chemical change?
4. Mark each of the following as to whether it is a physical or chemical change:
   1. \_\_\_\_\_\_ Dry ice (CO2) sublimes (changes from a solid to a gas).
   2. \_\_\_\_\_\_ Two colorless liquids are mixed and a white precipitate forms
   3. \_\_\_\_\_\_ Steam condenses on a bathroom mirror
   4. \_\_\_\_\_\_ A candle burning
   5. \_\_\_\_\_\_ Melting of ice
   6. \_\_\_\_\_\_ Formation of clouds in the air
5. What is the mass of a proton, neutron and electron in amu?
6. What is the charge on an electron? A proton? A neutron?
7. What parts of the atom are found in the nucleus?
8. Where are the electrons found in the atom?
9. What does the atomic number of an element tell you?
10. What is the mass number of an atom?
11. Define or describe an ion.
12. Define or describe “isotope”.
13. Specifically, what subatomic particle causes the differences in mass between 235U (uranium 235) and 239U (uranium 239)?
14. If atomic masses are always whole numbers, why is the mass of potassium listed on your periodic table as 39.10 amu?
15. What is the atomic number for iodine? For zinc? For calcium?
16. What is the atomic mass of neon? Of copper? Of tin?
17. What is the chemical symbol for gold? For tungsten? For silver?
18. How many protons does chlorine have? How many does cobalt have? Boron?
19. If a sodium atom has 10 electrons what is the charge on the atom?
20. How many significant figures in the following?
    1. 5000.05 g
    2. 65.42 g
    3. 5612 kg
    4. 0.047 cm3
    5. 58,900,000 ft
21. Round off the following to the indicated sig figs.
    1. .0165 L to 3 sig figs
    2. 24 km to 1 sig fig
    3. 0.4851 to 2 sig figs
    4. 268 g to 2 sig figs
    5. 47.374 ml to 2 sig figs
    6. 8.34987 ml to 3 sig figs
22. Perform the following calculations using the appropriate number of sig figs:
    1. 9.47 \* 220
    2. 812.000 \* 0.0050
    3. 82.250 / 12
    4. 18 / 515
    5. 58 + 8.2
    6. 0.05 + .100
    7. 100 + 78
    8. 74.3 - 0.2113
23. Perform the following conversions:
    1. 3.85 cm to m
    2. 7.5 L to mL
    3. 90.25 g to kg
    4. 13 mL to L
    5. 45 mL to cm3
    6. 22 °C to Kelvin
    7. 32 ft to cm
    8. 30 miles to Km
    9. 160 Km to miles
24. A 25 lb. anchor is made of pure iron. It displaces 1.62 quarts of water when used. What is the density of the iron in g/cm3?
25. What is the density of a 4.085 g steel ball that has a 5.5 mm radius? (volume of a sphere is 4/3πr3)
26. The density of liquid water at 22 ºC is 1g/ml. The density of solid water is .917 g/ml. What is the volume of 145 ml of liquid water after it freezes? What was the gain in volume due to solidification?
27. What mass of methanol (density = .791 g/ml) occupies the same volume as 15.0 kg of gasoline (density = .690 g/ml)?
28. A box with square base measuring .8 m per side has a height of 1.2 m. It is filled with 3.2 kg of expanded polystyrene packing material. What is the bulk density of the packing material, in g/cm3?
29. Which of the following would most difficult to lift into the back of a pickup truck? (I) a 100 lb bag of potatoes (II) a 15 gallon plastic bottle filled with water or (III) a 3.0 L flask filled with mercury (density of water = 1g/ml; density of Hg = 13.534 g/ml)
30. How many protons are there in nitrogen 14 (14N)?
31. How many neutrons are there in potassium 40 (40K)?
32. If a calcium atom is neutral, how many electrons does it have?
33. How many protons are there in plutonium 244?
34. How many neutrons are there in plutonium 244?
35. What is the average atomic mass of tungsten? Tin? Tellurium?
36. Carbon 12 occurs in nature 98.89% of the time, and carbon 13 occurs 1.11% of the time. What is the average atomic mass of carbon?

12C = 12.0000 amu 13C = 13.0034 amu

1. Lithium 6 has a relative abundance of 7.42% and lithium 7 a relative abundance of 92.58%. What is the average atomic mass of lithium?

6L = 6.0151 amu 7L = 7.0160 amu

1. The fractional abundance of nitrogen 14 is 99.63% and for nitrogen 15 is 0.37%. What is the average atomic mass?

14N = 14.0031 amu 15N = 15.0001 amu

1. Chlorine 35 has a relative abundance of 75.53% and chlorine 37, 24.47%. What is the average atomic mass?

35Cl = 34.9689 amu 37Cl = 36.9659 amu

1. Uranium 235 occurs 0.72% of the time and uranium 238 occurs the other 99.27%. What is the average atomic mass?

235U = 235.0439 amu 238U = 238.0508 amu