1. a) 2 b) 2 c) 3 d) 3 e) 3
2. a) 5.00 x 103 b) 5.05 x 10-3 c) 8.00 d) 7.00 x 10-3
3. a) 19 b) 14.5
4. a) 4 b) 190 c) 220
5. a) 6 b) 2 c) 4 d) 1 a is most certain; d is least
6. has volume and mass
7. substances, mixtures
8. homo, hetero
9. homo is uniform throughout
10. homo: anything dissolved, solutions, air hetero: soil, pizza, mud
11. elements and compounds
12. elements are made of one element; cannot be chemically broken down  
    compounds are made of 2 or more elements chemically combined;  
    they can be broken down by chemical rxns
13. Element: on periodic table Compound: water, sodium chloride, CO2
14. Smallest particle of an element
15. Smallest particle of a molecular compound
16. The ability of a substance to react and turn into another substance:  
    flammability, reactivity
17. A property that can be observed without changing the substance into a new substance:  
    melting point, density, mass, color
18. D=M/V
19. 19 mL
20. Property that is independent of the amount of matter: density, boiling point
21. Depends on the amount of matter you have: mass, volume
22. a) c b) i c) e d) I e) I f) e g) i h) i i) I j) I k) I l) c
23. quantitative has a number in it. EX 25 g
24. In chemical changes new substances with new formulas (and properties) are formed
25. Production of light or heat, bubbles, precipitate, color change
26. a) c b) p c) p d) c e) c f) p g) p h) p i) c j) c k) p l) c
27. matter is neither created nor destroyed; mass of products equals mass of reactants
28. Discovered electrons using cathode ray tube (CRT) experiments. Plum pudding model.
29. Discovered nucleus using gold foil experiment.
30. Complete the table below about the three basic subatomic particles.

|  |  |  |  |
| --- | --- | --- | --- |
| Subatomic particle | Relative atomic mass | Charge | Location within the atom |
| proton | 1 | +1 | nucleus |
| neutron | 1 | 0 | nucleus |
| electron | insignificant | -1 | Electron cloud |

1. From periodic table. Atomic number = number of protons.
2. Mass number = protons + neutrons
3. Charged atom
4. Gain or lose electrons
5. Cation: positive ion (atom lost electrons); Anion: negative ion (atom gained electrons)
6. Atoms of the same element that have a different mass (different # of neutrons)
7. 6 protons, 6 neutrons, 6 electrons
8. (Assume mass # is 16.) 8 protons, 10 electrons, 8 neutrons
9. E=hv
10. Wavelength x frequency = 3.0 x 108 m/s
11. 3.0 x 108 m/s
12. Excited electrons have absorbed energy and are in a higher energy level.  
    Electrons in the ground state are in the lowest energy levels possible.
13. s-sublevel: 1 orbital p-sublevel: 3 orbitals d-sublevel: 5 orbitals f-sublevel: 7 orbitals  
    2 electrons an go in a single orbital
14. electrons in the outer shell
15. a) 1 b) 6 c) 2 d) 5
16. It is impossible to know both the position and velocity of an electron at the same time.
17. a) +1 b) -3 c) -2 d) +2 e) -1 f) +3
18. Radius decreases left to right across a period and increases going down group.
19. C+4 < C < C-4
20. Group: vertical Period: horizontal