

1. Match the following scientists with their contribution to modern chemistry.

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|-----------------------|---------------------|
| a) Earnest Rutherford | f) Dmitri Mendeleev |
| b) Neils Bohr | g) Eugene Goldstein |
| c) Lord Kelvin | h) John Dalton |
| d) J. J. Thomson | i) James Chadwick |
| e) Robert Boyle | j) Galileo Galilei |

- (i) The scientist to first arrange the elements into a "periodic table" _____
- (ii) The modern scientist that re-introduced the concept of the "atom" _____
- (iii) The scientist to first propose the "plum pudding" model of the atom _____
- (iv) The scientist to first propose the "nuclear atom" _____
- (v) The scientist to first propose the "orbital" model of the hydrogen atom _____
- (vi) The scientist to first discover the neutron _____
- (vii) The scientist to first discover the electron _____
- (viii) The scientist to first discover the proton _____
- (ix) A unit of temperature is named after this scientist _____.
- (x) The scientist credited with inventing the scientific method _____.

2. Mass ratios in chemical reactions: {go over lecture examples & Ch 3 worksheet}

3. The Periodic Table:

- | | |
|----------------------|---|
| (i) its structure | (iii) metals, nonmetals, metalloids |
| (ii) its main groups | (iv) relationship between structure and electron orbitals |

4. Atoms, Molecules, Isotopes and Ions

- (i) chemical symbols and chemical formulas
- (ii) isotope & ion notations

5. Atomic Mass, Atomic Number (A), and Mass Number (Z):

- (i) how do you determine the number of neutrons in an atom's nucleus?
- (ii) difference between atomic mass and mass number

6. Light & electromagnetic radiation

- (i) relationship between wavelength & energy of a photon
- (ii) relationship between frequency & energy of a photon

7. The Bohr Atom

- (i) how are electrons arranged around the nucleus in the Bohr model of the atom?
- (ii) what happens when an "excited" electron "relaxes" to a lower energy level
- (iii) what is the relationship between electron energy levels and the energy of an emitted photon

8. Effective Nuclear Charge & Trends in the Periodic Table

Determine the number of inner electrons and the effective nuclear charge for the following elements:

a) helium

d) lithium

b) chlorine

e) oxygen

c) magnesium

f) boron

9. Total and outer electron configurations (i.e. the orbital model)

Determine the total and outer electron configurations for the following elements:

a) helium

d) lithium

b) chlorine

e) oxygen

c) magnesium

f) boron