

	<u>Protons</u>	<u>Neutrons</u>	<u>Electrons</u>
Atom A	7	8	7
Atom B	8	8	8
Atom C	8	9	10
Atom D	9	9	10
Atom E	9	8	9
Atom F	9	8	10
Atom G	10	10	10
Atom H	10	11	10
Atom I	11	11	10

**Directions:** Refer to the atoms described above in answering the following questions. List all the correct responses. You may refer to the Periodic Table if needed

- Which of these atoms satisfy the Rule of the Octet? According to the information provided in chart, atoms C, D, F, G, H and I all have a filled second shell (total of 10 electrons: 2 in first shell, 8 in second)
- What is the chemical symbol of Atom E? Atom E has nine protons; therefore, it has an atomic number of 9. According to the periodic table, the only element with an atomic number of 9 is fluorine and its symbol is F.
- What is the atomic mass of Atom I? 22 (remember that the atomic mass = # protons + # neutrons)
- Which of these are neutral atoms? To be neutral an atom must have the same number of protons (with positive charge) as electrons (with negative charge). According to the chart, atoms A, B, E, G and H are neutral.
- Which atoms are positively charged? To be positively charged an atom must have more positive charges (protons) than negative (electrons). The only atom for which that is true is Atom I; it has 11 protons and 10 electrons and therefore would carry a charge of +1.

6. Which are atoms of the same element? What defines an element is its proton number. Atoms B and C both have 8 protons so they are both atoms of the same element (in this case, oxygen). Atom D, E and F all have 9 protons so they are atoms of the same element (fluorine) and Atoms G and H are both atoms of neon since both have an atomic number of 10.
7. Which atoms have the same atomic mass? Atoms C, E and F all have a mass of 17 (protons + neutrons). Atom C happens to a different element than E or F so they have different properties; nevertheless, they happen to have the same mass.
8. Which atoms are ions? Remember that ions are charged atoms. They have unequal numbers of protons and electrons. This statement applies to atoms C, D, F and I.
9. Which atoms are negatively charged? To be negatively charged an atom must have fewer positive charges (protons) than negative (electrons). This applies to atoms C, D and F. Atom C has 8 protons (+) and 10 electrons (-) and therefore would carry a charge of  $-2$ ; atoms D and F have 9 protons (+) and 10 electrons (-) and an overall charge of  $-1$ .
10. Which of the atoms on the list must have received electrons from another atom? C, D and F. These atoms have more electrons than protons. Since the atom originally carried no charge, the only way they acquire extra electrons is by a transfer from another atom(s). Notice that each of these atoms also has a full outer shell as a result of that transfer.