A Periodic Table Logic Problem

Purpose: In this activity you will use a set of clues to identify a set of unknown elements in a periodic table. The elements are the elements with atomic numbers 1-20 and 31-36. A letter of the alphabet is used to represent each unknown element. The letter designation is not related to an element's chemical symbol. Each clue refers to a property of an element or a relationship an element has to other elements in the periodic table. Along with logic and knowledge of properties, you will use the periodic trends to solve the puzzle.

Grade: Neatness and completeness count.
Procedure: Use the following trend clues to place the elements in their proper places on the provided periodic table. Try to identify the elements with direct clues first. For example, B is a direct clue because it identifies only one element.
Group 1 Group 2 Group 13 Group 14 Group 15 Group 16 Group 17 Group 18

Work copy

Group 1	Group 2		Group 13	Group 14	Group 15	Group 16	Group 17	Group 18

A – Has one of the highest electronegativities on the table.
B – Has one electron in a 3p orbital.
C – Has five electrons in the 4th energy level.
D – Forms the smallest 2+ ion.
E – Tends to gain one electron.
F – Electron configuration is 1s2 2s2 2p6 3s2 3p3
G – The most electronegative element.
H – An ion of this element with a 2+ charge has 18 electrons.
I – Its second ionization energy is large compared to its first ionization energy.

J – Its highest occupied energy level is full.
K – This nonmetal is likely to form an ion with a 3- charge.
L – Has the highest 1st ionization energy in the table.
M – Has the smallest atomic radius in the 3rd period.
N – Is the smallest atom in its family.
O – The first element with an electron in the 2nd energy level.
P – The only nonmetal in a group of highly reactive metals.
Q – Has eight fewer protons than its "groupmate" H.
R – The most likely element of the ones included to lose an electron.
S – A metalloid in period 4.
T – Its ionic radius is larger than its atomic radius.
U – The ion with a 2- charge that it forms has 18 electrons.
V – Atomic number is 34.
W – Metalloid that forms an anion with a 3+ charge.
X – Has characteristics of both a metal and a nonmetal.
Y – Has a lower 1st ionization energy than S.
Z – Has a 1st ionization energy that is higher than T but lower than M.

Ready to turn in?: Copy the clues with the corresponding answers and the filled in chart into your lab book..

Group 1	Group 2		Group 13	Group 14	Group 15	Group 16	Group 17	Group 18

Your partners:
1.
2.
3.