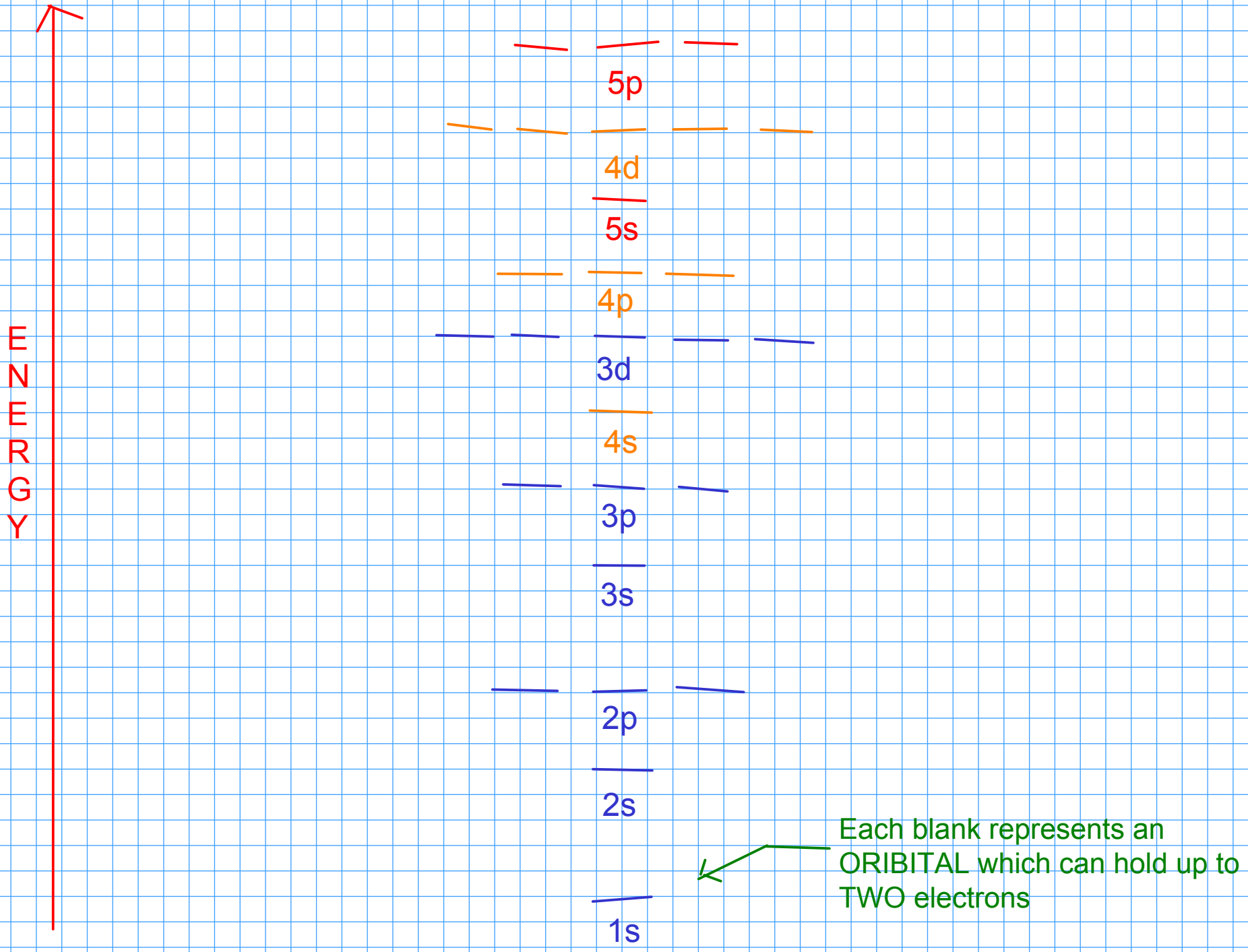
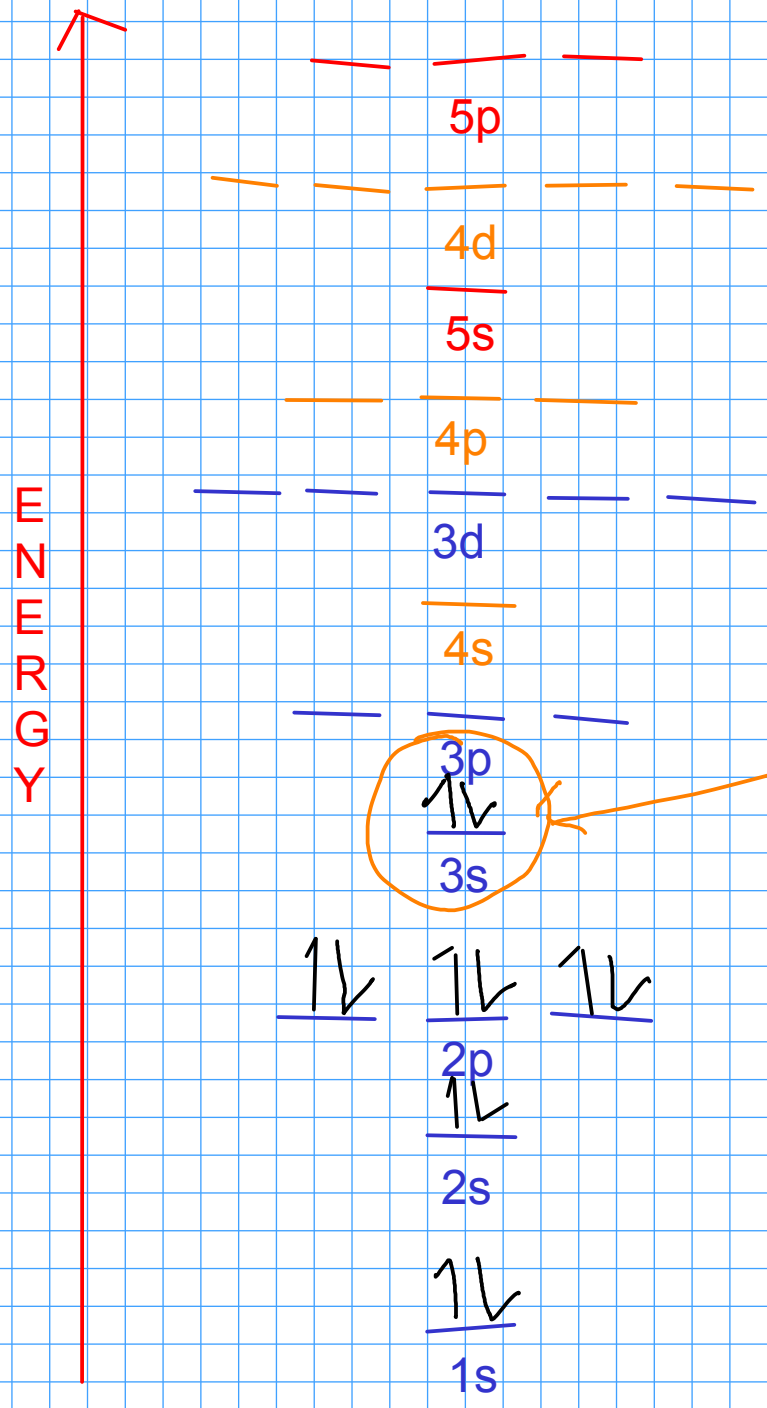
ENERGY DIAGRAM

- We can map out electrons around an atom using an energy diagram:



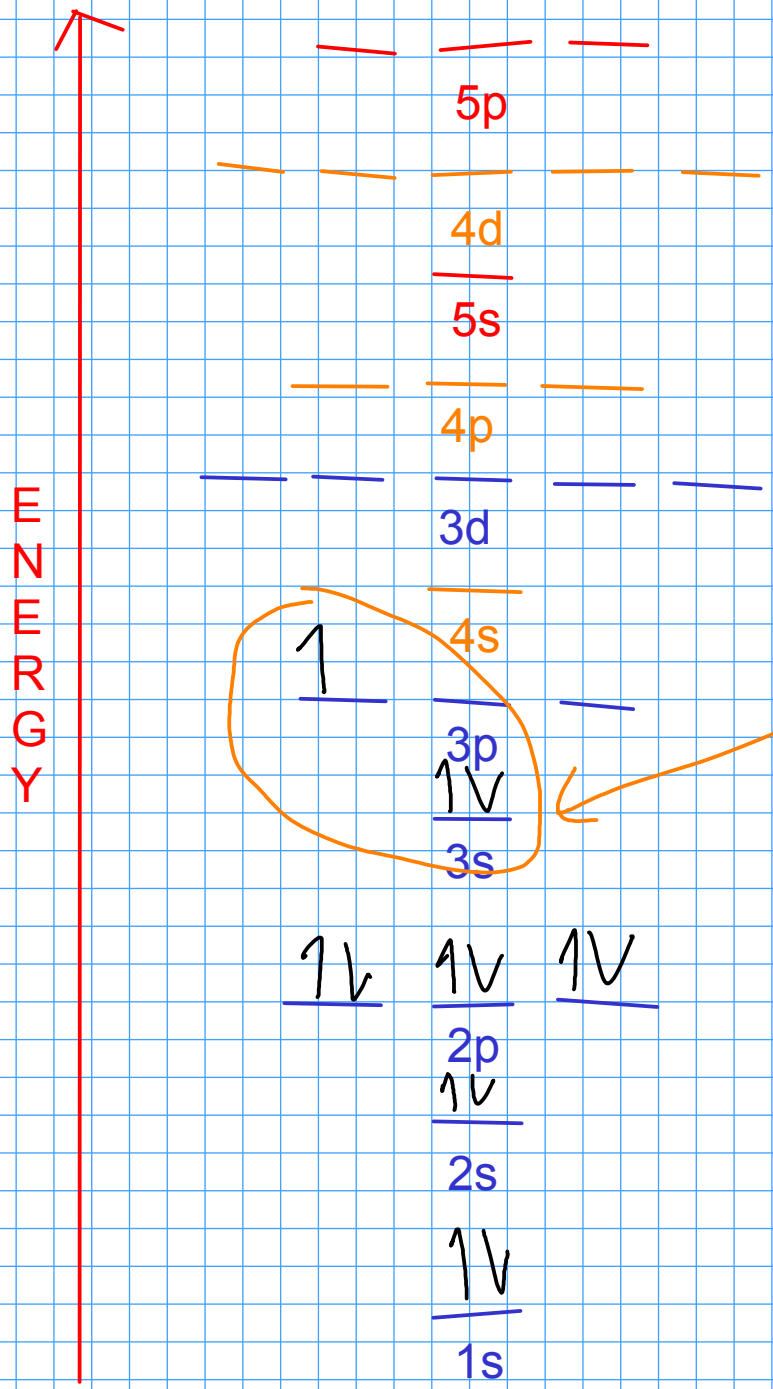
Let's look at some example atoms:

Magnesium: Z=12 , 12 electrons



Outermost electrons of magnesium "valence electrons". These electrons are involved in chemical bonding!

Aluminum: Z = 13

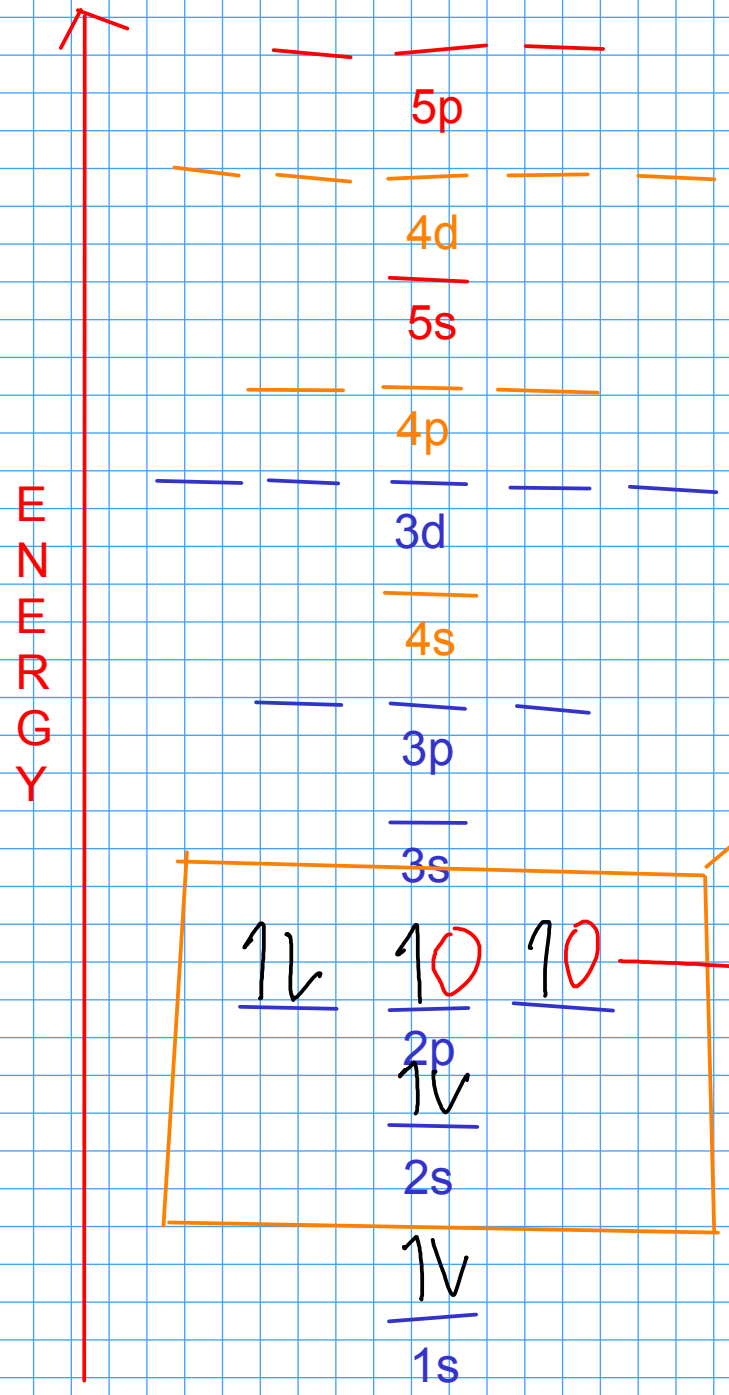


Aluminum has THREE valence electrons! (All electrons in the outer shell are valence electrons!)

Atoms tend to form ions or chemical bonds in order to end up with filled "s" and "p" subshells.

This is called the "octet" rule. (Not all chemical bonds follow this - it's a RULE OF THUMB, not a scientific law!)

Example: Oxygen, Z = 8



Valence electrons for oxygen. (6 electrons)

Oxygen needs two more electrons to complete its outer "p" subshell!

In ionic compounds, oxygen has gained two electrons to become the oxide ion (2- charge). In molecular compounds, oxygen shares electrons with other atoms so that it has a share in eight electrons in its outer shell!