Electron Configuration – an "address" for the electrons in an atom

An Orbital is:

How do we describe orbitals?

1.
2.
3.
4.

Different orbitals are in different energy levels	**Different orbitals have different shapes**	**Different orbitals have different orientations**	**Each orbital is only allowed to have two e^-s**

Where do e- live? What is the address for one?

State ----------> Energy level ⬚

City ----------> Type/shape of orbital ⬚

Street ----------> Orientation or orbital ⬚

House # ----------> Spin up or spin down of electron ⬚

Electron configuration for an electron in the second energy level, inside a p shaped orbital that is lined up on the x axis and is a spin up electron:

They can get REALLY long

$1s_{+½}$, $1s_{-½}$, $2s_{+½}$, $2s_{-½}$

$2p_{x\ +½}$, $2p_{x\ -½}$, $2p_{y\ +½}$

$2p_{y\ -½}$, $2p_{z\ +½}$, $2p_{z\ -½}$

Want to describe where ALL the e- in an atom were? Shrink it down and only list:

1.
2.
3.

Example:

Steps to finding all the electrons

1. Pick an _____
2. Find the number of _____
3. Start putting electrons into the _____ Use an _____
4. List which _____ you used and _____ electrons in each one

Rules for putting electrons in an orbital diagram:

1. <u>Aufbau Principle</u>

An electron occupies the lowest energy orbital that it can.

Means:

2. <u>Pauli Exclusion Principle</u>

No two e^-s in the same atom can have the same set of 4 quantum numbers

Means:

3. <u>Hunds Rule</u>

Orbitals of equal energy are each occupied by one e^- before any orbital is occupied by a second e^-.

Means: