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

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 _____
4. Use an _____
5. List which _____ you used and _____ electrons in each one

Rules for putting electrons in an orbital diagram:

1. Aufbau Principle

An electron occupies the lowest energy orbital that it can.

Means:

2. Pauli Exclusion Principle

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

Means:

3. Hunds Rule

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

Means: