

# Class Copy Please do not write on

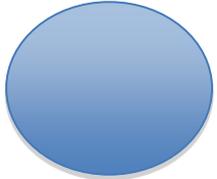
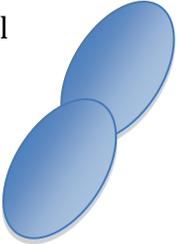
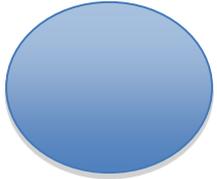
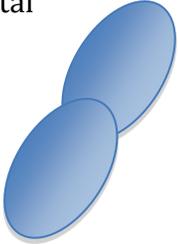
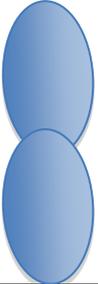
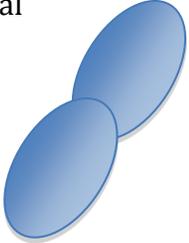
## Apartment House Analogy

One way to approach the very abstract task of filling electron orbitals is to use an analogy to make it a bit more concrete. Imagine you are the landlord of a very strange apartment building. Your job is to fill the apartments in the building in the most efficient way possible. You are required by the owner of the building to fill the rooms in a certain way. The rules you have to follow are as strange as the building because quantum mechanics is not like anything you might have expected. The rules are summarized in the table below.

In the building the different floors are like the different energy levels (or shells) in an atom. The energy levels are numbered starting from one, just like the floors in an apartment house. Each room corresponds to one orbital. The rooms have a capacity of two electrons (two people) each. In each room only a man and a woman may be paired together. In the strange world of quantum mechanics there are no same-gender room mates.

Apartment House Rules	Electron Rules
<b>From the Bottom Up:</b> Rooms must be filled from the ground floor up. Fill the one room on the first floor before starting to put new tenants on the second floor. The s room must be filled before you can start filling the p rooms	<b>Aufbau Principle:</b> the electrons fill the lowest energy level and orbitals first.
<b>Singles First:</b> All p orbital rooms must be occupied by a single tenant before you can double up.	<b>Hund's Rule:</b> The electrons do not pair together until each orbital has one electron.
<b>Opposite Genders:</b> Rooms can only be occupied by tenants of the opposite gender. No same gender tenants in the same room	<b>Pauli Exclusion Principle:</b> Electrons must have an opposite spin in order to occupy the same orbital.

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4 <sup>th</sup> Energy Level	S Orbital 	Px Orbital 	Py Orbital 	Pz Orbital 
3 <sup>rd</sup> Energy Level	S Orbital 	Px Orbital 	Py Orbital 	Pz Orbital 
2 <sup>nd</sup> Energy Level	S Orbital 	Px Orbital 	Py Orbital 	Pz Orbital 
1 <sup>st</sup> Energy Level	S Orbital 			