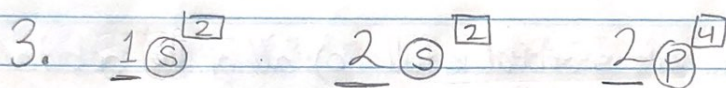


POGIL: Electron Configuration

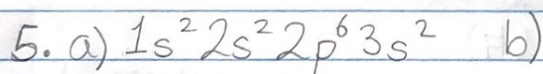
Model 1 - The Boarding House

1. a) • = Boarder
 b) H = Bunkbed for boarders
 c) $1s^2 2s^2 2p^6 3s^1$ = Manager's code for the number of boarders and their room assignments

2. a) there were 8 boarders at 5:00pm
 b) I just counted the number of spots that occupied a spot on a bunk bed



4. a) 1^{s+} (first)
 b) all bottom bunks are occupied
 c) all of the bunks
 d) all of the bunks in the sunny room on that floor are occupied



Model 2 - Ground State Orbital Diagrams and E.C.

6. a) \square = atomic orbital
 b) \uparrow = single electron
 c) $\uparrow\downarrow$ = pair of electrons with opposite spin
 d) $\square\square\square$ = sublevel
 e) $1s^2 2s^2 2p^4$ = electron configuration

7. a) 8 electrons

b) the atomic number of oxygen is 8



9. The 's-orbital' is filled with electrons before the 'p-orbital' because it requires less energy to be filled. This is also proven by the fact that the s-orbital is lower on the page than the p-orbital

10. a) 1s b) the previous s-orbital is full c) all of the orbitals

11. opposite spins

12. a) all orbitals in the same sublevel have one electron
b) they all have the same spin

13. a)	<div><div>□</div><div>□ □</div><div>↑</div><div>↑ ↓</div></div>	bunk bed (H)
		different rooms (sun rooms and pink rooms)
		single boarder (H)
		double boarder (H)
	$1s^2 2s^2 2p^4$	managers code

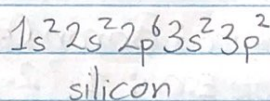
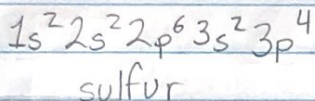
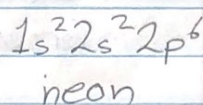
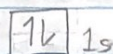
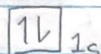
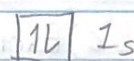
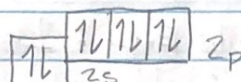
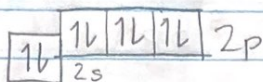
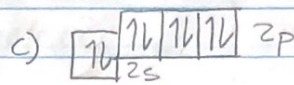
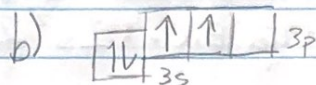
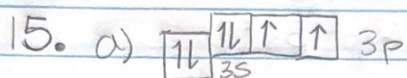
b) the spin of the electron is not accurately described

c) the pink room should be placed a little bit higher to indicate the higher energy

14. a) Wrong: the 2p orbital needs to be filled first before moving on to the next energy level

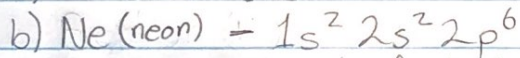
b) Correct

c) Wrong: all orbitals in a energy level must have at least one electron before being paired up

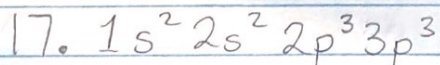


Model 3 - Orbital Diagram for an Atom of Element X

16. a) 10 electrons



c) The arrangement of electrons in Model 3's orbital diagram has higher total potential energy than the ground state electron configuration of Element X. This is because there is an electron in the 3s orbital that should be in the 2p orbital. The electron would need more energy in order to skip an orbital.



18. a) Excited state E.C.: $1s^2 2s^1 2p^3 3s^1$

Element: nitrogen (N)

Ground state E.C.: $1s^2 2s^2 2p^3$

b) Excited state E.C.: $1s^2 2s^2 2p^6 3s^1 3p^1$

Element: magnesium (Mg)

Ground state E.C.: $1s^2 2s^2 2p^6 3s^2$

c) Excited State E.C.: $1s^2 2s^2 2p^3 3p^6$

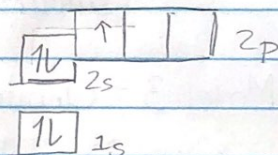
Element: aluminum (Al)

Ground State E.C.: $1s^2 2s^2 2p^6 3s^2 3p^1$

19. a) Element Name: Boron (B)

Ground State E.C.: $1s^2 2s^2 2p^1$

Orbital Diagram:



b) Element Name: Fluorine (F)

Ground State E.C.: $1s^2 2s^2 2p^5$

Orbital Diagram:

