4.4 How Do We Balance Chemical Equations?

Example 4

When the following chemical equation is balanced, the coefficient in front of the oxygen is:

a) 1
b) 2
c) 3 ✓
d) 4
e) 5

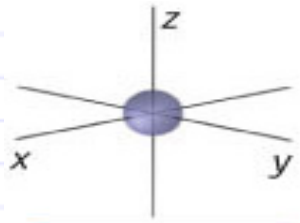
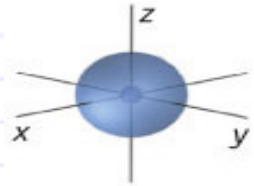
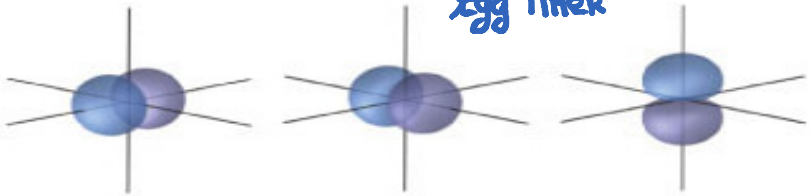
$$\_\_\ C_2H_4(g) + \underline{3\ ?}\ O_2(g) = \underline{2}\ CO_2(g) + \underline{2}\ H_2O(g)$$

C	2	2	2	2
H	4	4	4	4
O	2	2	2	6

C	1	2	2	2
H	2	2	4	4
O	3	5	6	6

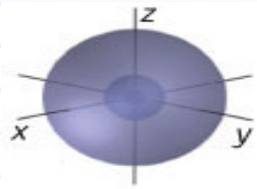
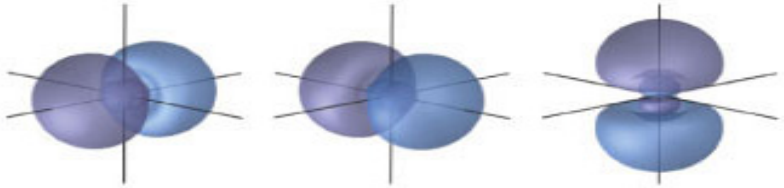
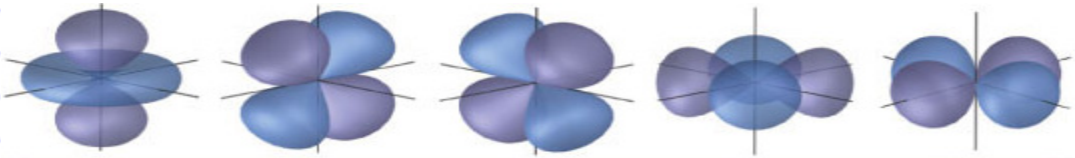
2.6 How Are the Electrons in an Atom Arranged?

A Orbital Shapes

n	Orbitals		#	Label
1	1	 Sphere	1	1s
2	4	 Sphere (larger)	1	2s
		'Egg timer' 	3	2p

2.6 How Are the Electrons in an Atom Arranged?

A Orbital Shapes

n	Orbitals		#	Label
		 Sphere	1	3s
3	9	'Egg Liner' 	3	3p
		 4 leafed clover	5	3d

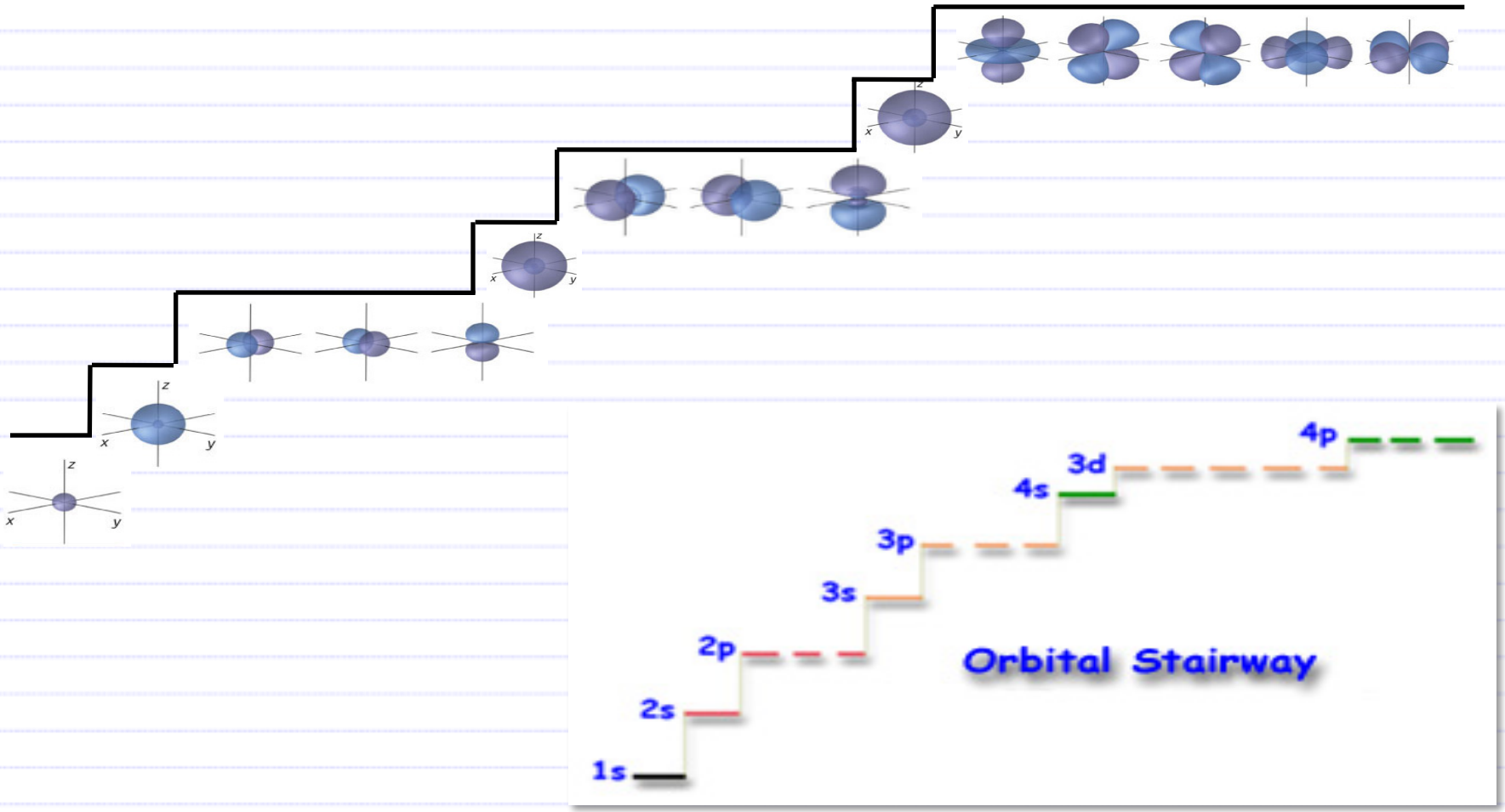
2.6 How Are the Electrons in an Atom Arranged?

A Summary

n	Total	Type	Number
1	1	1s	1
2	4	2s	1
		2p	3
3	9	3s	1
		3p	3
		3d	5
4	16	4s	1
		4p	3
		4d	5
		4f	7

2.6 How Are the Electrons in an Atom Arranged?

A Orbital Stairway



2.6 How Are the Electrons in an Atom Arranged?

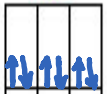
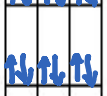
Electron Configurations Worksheet.

Orbital Box

Gp		#e	1s	2s	2p	3s	3p	Electronic Configuration	Noble Gas	Valence	Lewis Dot
1A	H	1	↑					$1s^1$			H
8A	He	2 ①	↑↓					$1s^2$			He
1A	Li	3	↑↓	↑				$1s^2\ 2s^1$			Li
2A	Be	4	↑↓	↑↓				$1s^2\ 2s^2$			Be
3A	B	5	↑↓	↑↓	↑			$1s^2\ 2s^2\ 2p^1$			B
4A	C	6 ②	↑↓	↑↓	↑ ↑			$1s^2\ 2s^2\ 2p^2$			C
5A	N	7	↑↓	↑↓	↑ ↑ ↑			$1s^2\ 2s^2\ 2p^3$			N
6A	O	8	↑↓	↑↓	↑↓ ↑ ↑			$1s^2\ 2s^2\ 2p^4$			O
7A	F	9	↑↓	↑↓	↑↓ ↑↓ ↑			$1s^2\ 2s^2\ 2p^5$			F
8A	Ne	10	↑↓	↑↓	↑↓ ↑↓ ↑↓			$1s^2\ 2s^2\ 2p^6$			Ne

2.6 How Are the Electrons in an Atom Arranged?

Electron Configurations Worksheet.

Gp		#e	1s	2s	2p	3s	3p	Electronic Configuration	Noble Gas	Valence	Lewis Dot
1A	Na	11						$1s^2 2s^2 2p^6 3s^1$			Na
2A	Mg	12						$1s^2 2s^2 2p^6 3s^2$			Mg
3A	Al	13						$1s^2 2s^2 2p^6 3s^2 3p^1$			Al
4A	Si	14						$1s^2 2s^2 2p^6 3s^2 3p^2$			Si
5A	P	15						$1s^2 2s^2 2p^6 3s^2 3p^3$			P
6A	S	16						$1s^2 2s^2 2p^6 3s^2 3p^4$			S
7A	Cl	17						$1s^2 2s^2 2p^6 3s^2 3p^5$			Cl
8A	Ar	18						$1s^2 2s^2 2p^6 3s^2 3p^6$			Ar

2.6 How Are the Electrons in an Atom Arranged?

Electron Configurations Worksheet.

Gp		#e	1s	2s	2p	3s	3p	Electronic Configuration	Noble Gas	Valence	Lewis Dot
1A	H	1	↑					$1s^1$	$1s^1$	1	H•
8A	He	2	↑↓					$1s^2$	$1s^2$	2	He:
1A	Li	3	↑↓	↑				$1s^2\ 2s^1$	$[He]\ 2s^1$	1	Li•
2A	Be	4	↑↓	↑↓				$1s^2\ 2s^2$	$[He]\ 2s^2$	2	Be:
3A	B	5	↑↓	↑↓	↑			$1s^2\ 2s^2 2p^1$	$[He]\ 2s^2 2p^1$	3	B:
4A	C	6	↑↓	↑↓	↑ ↑			$1s^2\ 2s^2 2p^2$	$[He]\ 2s^2 2p^2$	4	•C:
5A	N	7	↑↓	↑↓	↑ ↑ ↑			$1s^2\ 2s^2 2p^3$	$[He]\ 2s^2 2p^3$	5	•N:
6A	O	8	↑↓	↑↓	↑↓ ↑			$1s^2\ 2s^2 2p^4$	$[He]\ 2s^2 2p^4$	6	•O:
7A	F	9	↑↓	↑↓	↑↓ ↑↓ ↑			$1s^2\ 2s^2 2p^5$	$[He]\ 2s^2 2p^5$	7	:F:
8A	Ne	10	↑↓	↑↓	↑↓ ↑↓ ↑↓			$1s^2\ 2s^2 2p^6$	$[He]\ 2s^2 2p^6$	8	:Ne:

① ② ③ ④