

Name: \_\_\_\_\_

## Chemistry A Level Transition

We are delighted that you will be joining us in September and are looking forward to helping you become amazing Chemists. Chemistry is brilliant when you get it and, just like most things, 'getting it' comes with practice. We have identified three areas that make Chemistry easy (well easier!) once you have a good understanding of them. Use the Periodic Table at the end of this document to help you and bring this with you to your first lesson. Good luck 😊

### 1. Writing Chemical Equations

One of the most important aspects of Chemistry is being able to write balanced chemical equations. To do that, you need to be able to write the formulae of compounds correctly and this is only possible if you know the formula of some important ions. The following section will take you through each of these areas.

#### a) Ions

As you know a ion is a charged particle. Complete this table

Name of ion	Formula of ion (including charge)
1.	$\text{Cl}^-$
2. Oxide	
3. Magnesium	
4.	$\text{CO}_3^{2-}$
5. Sulphate	
6. Nitrate	
7.	$\text{NH}_4^+$
8. Hydroxide	

## b) Compounds

A compound is a substance made from two or more different elements. The compounds in the table below are ionic. Use your knowledge of ions to help you write their formula.

Compound	Formula
1.	NaCl
2. Strontium bromide	
3. Rubidium oxide	
4. Gallium sulphide	
5.	MgCO <sub>3</sub>
6. Magnesium nitrate	
7.	NH <sub>4</sub> NO <sub>3</sub>
8. Calcium hydroxide	
9. Sodium sulphate	
10. Ammonium sulphate	

## c) Reactions

Sometimes it is important to know which substances you would react together to make a certain product and this, in turn, relies on you knowing what type of chemicals belong to which families.

1. What acid and alkali would you react together to form calcium sulfate?

Acid :

Alkali :

2. What acid and base would you react together to form magnesium nitrate?

Acid :

Base :

It is really important that you know your general equations (such as MASH etc) and you are able to apply them when given compounds to react. Write a balanced chemical equation for the following reactions.

3. Sodium reacting with water

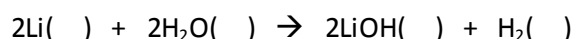
4. Barium reacting with nitric acid

5. Hydrochloric acid reacting with sodium hydroxide
6. Sulfuric acid reacting with sodium oxide
7. Hydrochloric acid reacting with sodium carbonate
8. Nitric acid reacting with ammonia

## **2. Chemical Calculations**

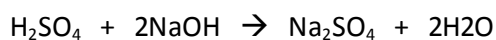
Another important area is chemical calculations, which always come down to moles. Work through the following questions to refresh your 'moley skills'.

1. 2g of the metal lithium reacted with 50cm<sup>3</sup> of water to produce a solution of lithium hydroxide and hydrogen gas. The equation for the reaction is:



- a) Insert state symbols to the equation
- b) Calculate the amount, in moles, of lithium that reacted  
(Tip: you know the mass of lithium, can you remember how to get from mass to moles?)
- c) Calculate the concentration, in mol/dm<sup>3</sup>, of the resulting solution of lithium hydroxide  
(Tip: now you know the moles of lithium, you can work out the moles of lithium hydroxide by looking at the chemical equation. You also know the volume of the solution. Can you remember how to work out concentration when you know moles and volume?)
- d) Calculate the volume, in cm<sup>3</sup>, of hydrogen gas produced  
(Tip: you know the moles of lithium, you can work out the moles of hydrogen by looking at the chemical equation. Can you remember how to work out gas volume when you know moles? Don't forget to look at the units that the question is asking for though!)

2. During a titration reaction, 25.0 cm<sup>3</sup> of sodium hydroxide was neutralised by 18.3cm<sup>3</sup> of 0.1 mol/dm<sup>3</sup> sulphuric acid. The equation for the reaction is:



Calculate the concentration of the sodium hydroxide.

(Tip: You need to know the moles of sodium hydroxide and its volume. You can work out the moles by calculating the moles of sulfuric acid and then looking at the chemical equation. The volume is given in the question)

### 3. Organic Chemistry

Organic Chemistry is a very important part of A Level. You have already met three functional groups at GCSE (alkanes, alkenes and alcohols, which will be explored more at A Level) and there are a few others that you will meet in your first few weeks back. Use the internet to help you find the functional group of each of the homologous series below (the first has been done for you).

Alcohol	- OH	Alkene	
Carboxylic acid		Ketone	
Aldehyde		Haloalkanes	

# The Periodic Table of the Elements

(1)	(2)											(3)	(4)	(5)	(6)	(7)	(0)
<b>1</b>		<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> <p><b>Key</b>                      atomic number  <b>Symbol</b>                      name                      relative atomic mass</p> </div>														<b>18</b>	
<b>1</b> <b>H</b> hydrogen 1.0												<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>2</b> <b>He</b> helium 4.0
<b>3</b> <b>Li</b> lithium 6.9	<b>4</b> <b>Be</b> beryllium 9.0											<b>5</b> <b>B</b> boron 10.8	<b>6</b> <b>C</b> carbon 12.0	<b>7</b> <b>N</b> nitrogen 14.0	<b>8</b> <b>O</b> oxygen 16.0	<b>9</b> <b>F</b> fluorine 19.0	<b>10</b> <b>Ne</b> neon 20.2
<b>11</b> <b>Na</b> sodium 23.0	<b>12</b> <b>Mg</b> magnesium 24.3											<b>13</b> <b>Al</b> aluminium 27.0	<b>14</b> <b>Si</b> silicon 28.1	<b>15</b> <b>P</b> phosphorus 31.0	<b>16</b> <b>S</b> sulfur 32.1	<b>17</b> <b>Cl</b> chlorine 35.5	<b>18</b> <b>Ar</b> argon 39.9
<b>19</b> <b>K</b> potassium 39.1	<b>20</b> <b>Ca</b> calcium 40.1	<b>21</b> <b>Sc</b> scandium 45.0	<b>22</b> <b>Ti</b> titanium 47.9	<b>23</b> <b>V</b> vanadium 50.9	<b>24</b> <b>Cr</b> chromium 52.0	<b>25</b> <b>Mn</b> manganese 54.9	<b>26</b> <b>Fe</b> iron 55.8	<b>27</b> <b>Co</b> cobalt 58.9	<b>28</b> <b>Ni</b> nickel 58.7	<b>29</b> <b>Cu</b> copper 63.5	<b>30</b> <b>Zn</b> zinc 65.4	<b>31</b> <b>Ga</b> gallium 69.7	<b>32</b> <b>Ge</b> germanium 72.6	<b>33</b> <b>As</b> arsenic 74.9	<b>34</b> <b>Se</b> selenium 79.0	<b>35</b> <b>Br</b> bromine 79.9	<b>36</b> <b>Kr</b> krypton 83.8
<b>37</b> <b>Rb</b> rubidium 85.5	<b>38</b> <b>Sr</b> strontium 87.6	<b>39</b> <b>Y</b> yttrium 88.9	<b>40</b> <b>Zr</b> zirconium 91.2	<b>41</b> <b>Nb</b> niobium 92.9	<b>42</b> <b>Mo</b> molybdenum 95.9	<b>43</b> <b>Tc</b> technetium	<b>44</b> <b>Ru</b> ruthenium 101.1	<b>45</b> <b>Rh</b> rhodium 102.9	<b>46</b> <b>Pd</b> palladium 106.4	<b>47</b> <b>Ag</b> silver 107.9	<b>48</b> <b>Cd</b> cadmium 112.4	<b>49</b> <b>In</b> indium 114.8	<b>50</b> <b>Sn</b> tin 118.7	<b>51</b> <b>Sb</b> antimony 121.8	<b>52</b> <b>Te</b> tellurium 127.6	<b>53</b> <b>I</b> iodine 126.9	<b>54</b> <b>Xe</b> xenon 131.3
<b>55</b> <b>Cs</b> caesium 132.9	<b>56</b> <b>Ba</b> barium 137.3	• 57–71 lanthanoids	<b>72</b> <b>Hf</b> hafnium 178.5	<b>73</b> <b>Ta</b> tantalum 180.9	<b>74</b> <b>W</b> tungsten 183.8	<b>75</b> <b>Re</b> rhenium 186.2	<b>76</b> <b>Os</b> osmium 190.2	<b>77</b> <b>Ir</b> iridium 192.2	<b>78</b> <b>Pt</b> platinum 195.1	<b>79</b> <b>Au</b> gold 197.0	<b>80</b> <b>Hg</b> mercury 200.6	<b>81</b> <b>Tl</b> thallium 204.4	<b>82</b> <b>Pb</b> lead 207.2	<b>83</b> <b>Bi</b> bismuth 209.0	<b>84</b> <b>Po</b> polonium	<b>85</b> <b>At</b> astatine	<b>86</b> <b>Rn</b> radon
<b>87</b> <b>Fr</b> francium	<b>88</b> <b>Ra</b> radium	• 89–103 actinoids	<b>104</b> <b>Rf</b> rutherfordium	<b>105</b> <b>Db</b> dubnium	<b>106</b> <b>Sg</b> seaborgium	<b>107</b> <b>Bh</b> bohrium	<b>108</b> <b>Hs</b> hassium	<b>109</b> <b>Mt</b> meitnerium	<b>110</b> <b>Ds</b> darmstadtium	<b>111</b> <b>Rg</b> roentgenium	<b>112</b> <b>Cn</b> copernicium		<b>114</b> <b>Fl</b> flerovium		<b>116</b> <b>Lv</b> livermorium		

<b>57</b> <b>La</b> lanthanum 138.9	<b>58</b> <b>Ce</b> cerium 140.1	<b>59</b> <b>Pr</b> praseodymium 140.9	<b>60</b> <b>Nd</b> neodymium 144.2	<b>61</b> <b>Pm</b> promethium 144.9	<b>62</b> <b>Sm</b> samarium 150.4	<b>63</b> <b>Eu</b> europium 152.0	<b>64</b> <b>Gd</b> gadolinium 157.2	<b>65</b> <b>Tb</b> terbium 158.9	<b>66</b> <b>Dy</b> dysprosium 162.5	<b>67</b> <b>Ho</b> holmium 164.9	<b>68</b> <b>Er</b> erbium 167.3	<b>69</b> <b>Tm</b> thulium 168.9	<b>70</b> <b>Yb</b> ytterbium 173.0	<b>71</b> <b>Lu</b> lutetium 175.0
<b>89</b> <b>Ac</b> actinium	<b>90</b> <b>Th</b> thorium 232.0	<b>91</b> <b>Pa</b> protactinium	<b>92</b> <b>U</b> uranium 238.1	<b>93</b> <b>Np</b> neptunium	<b>94</b> <b>Pu</b> plutonium	<b>95</b> <b>Am</b> americium	<b>96</b> <b>Cm</b> curium	<b>97</b> <b>Bk</b> berkelium	<b>98</b> <b>Cf</b> californium	<b>99</b> <b>Es</b> einsteinium	<b>100</b> <b>Fm</b> fermium	<b>101</b> <b>Md</b> mendelevium	<b>102</b> <b>No</b> nobelium	<b>103</b> <b>Lr</b> lawrencium