



# Lesmahagow High School

## National 5 Chemistry: Unit 2

### Key Area – Kitchen Cupboard Chemistry



Learning Statement		Red	Amber	Green																		
Alcohols are a homologous series containing the hydroxyl functional group, -OH.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																		
Alcohols can be made by the hydration of alkenes.  Ethene + Water → Ethanol $C_2H_4 + H_2O \rightarrow C_2H_5OH$		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																		
Alcohol can also be made by the fermentation of glucose which is catalysed by the enzymes found in yeast.  glucose $\xrightarrow{\text{Yeast}}$ ethanol (alcohol) + carbon dioxide		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																		
<b>Alcohols</b> <ul style="list-style-type: none"><li>Are a homologous series of compounds containing the hydroxyl functional group, -OH.</li><li>The names of the first eight members are:</li></ul> <table border="1"><thead><tr><th>No. C's</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th></tr></thead><tbody><tr><td>Name</td><td>methanol</td><td>ethanol</td><td>propanol*</td><td>butanol*</td><td>pentanol*</td><td>hexanol*</td><td>heptanol*</td><td>octanol*</td></tr></tbody></table> <p>*names will also have a number in them telling you the position of the -OH group.</p> <ul style="list-style-type: none"><li>You need to be able to name and draw the above alcohols. </li><li>The name of an alcohol ends in ...OL.</li><li>The general formula for the alcohols is <math>C_nH_{2n+1}OH</math></li></ul>		No. C's	1	2	3	4	5	6	7	8	Name	methanol	ethanol	propanol*	butanol*	pentanol*	hexanol*	heptanol*	octanol*	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No. C's	1	2	3	4	5	6	7	8														
Name	methanol	ethanol	propanol*	butanol*	pentanol*	hexanol*	heptanol*	octanol*														
In alcohols with more than 3 carbons in their chain, the -OH group can be in different positions on the chain. To show where the -OH group is, we can place a number in the name of the alcohol. For example: 		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																		
Propan-1-ol and propan-2-ol are <b>isomers</b> , as they have the same molecular formula but a different structural formula.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																		
Small alcohols such as methanol, ethanol and propanol are soluble in water. Longer carbon chained alcohols are not soluble in water.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																		
Alcohols are useful as solvents. They are found in a variety of skincare products as some alcohols are able to dissolve the oils present in skin.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																		
Alcohols are highly flammable, which means they make good fuels.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																		
Alcohols make good fuels as they burn with a much cleaner flame than hydrocarbon fuels.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																		

Ethanol, which can be made by fermentation, is becoming more widely used as a fuel for vehicles.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>												
Alcohols can be converted into another type of chemical, called a <b>carboxylic acid</b> .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>												
<b>Carboxylic acids</b> are a homologous series of compounds which contain the <b>carboxyl functional group</b> . The carboxyl functional group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>												
<b>Carboxylic Acids</b> <ul style="list-style-type: none"> <li>Are a homologous series of compounds contain the carboxyl functional group (COOH)</li> <li>The names of the first five members are:</li> </ul> <table border="1"> <thead> <tr> <th>No. C's</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> </tr> </thead> <tbody> <tr> <td>Name</td> <td>methanoic acid</td> <td>ethanoic acid</td> <td>propanoic acid</td> <td>butanoic acid</td> <td>pentanoic acid</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>You need to be able to name and draw carboxylic acids</li> </ul> <ul style="list-style-type: none"> <li>Their names all end in .....<b>ANOIC ACID</b>.</li> <li>They have the general formula <math>C_nH_{2n+1}COOH</math>.</li> </ul>	No. C's	1	2	3	4	5	Name	methanoic acid	ethanoic acid	propanoic acid	butanoic acid	pentanoic acid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No. C's	1	2	3	4	5										
Name	methanoic acid	ethanoic acid	propanoic acid	butanoic acid	pentanoic acid										
Ethanoic acid is more commonly known as vinegar.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>												
Carboxylic acids can have a variety of uses: <ul style="list-style-type: none"> <li>as preservatives</li> <li>as cleaning products as they are weak acids</li> <li>in the food industry.</li> </ul>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>												
Carboxylic acids tend to have an unpleasant smell, e.g. butanoic acid. This acid is formed when butter becomes rancid.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>												
Carboxylic acids can react with alcohols to form a compound called an <b>ester</b> . $\text{Alcohol} + \text{Carboxylic Acid} \rightleftharpoons \text{Ester} + \text{Water}$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>												
When an ester is made, water is also formed. This type of reaction is called a condensation reaction.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>												
<b>Esters</b> are compounds which contain an ester functional group. An ester functional group has the following structure. The ester functional group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>												
You need to be able to identify this functional group if you are given the structural formula of a substance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>												
Esters have <b>sweet smells</b> . They are found in many everyday products.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>												
Esters have a variety of uses: <ul style="list-style-type: none"> <li>as fragrance compounds</li> <li>as flavourings in foods</li> <li>as cleaning agents</li> <li>as solvents, e.g. nail varnish remover.</li> </ul>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>												
Esters are found in fats and oils.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>												