1. Each of the organic molecules below belongs to a different functional group.

There is a carboxylic acid, an alcohol, an alkene and an alkane but they are muddled up.

A

\[ \text{H} - \text{C} - \text{C} - \text{O} - \text{H} \]

B

\[ \text{H} - \text{C} - \text{C} - \text{H} \]

C

\[ \text{H} - \text{C} - \text{C} - \text{O} \]

D

\[ \text{H} = \text{C} - \text{C} - \text{H} \]

Complete the table by writing each letter (A–D) into the correct box.

<table>
<thead>
<tr>
<th>Carboxylic acid</th>
<th>Alcohol</th>
<th>Alkene</th>
<th>Alkane</th>
</tr>
</thead>
</table>

2. George is asked by his teacher to draw out the structure of ethanoic acid.

He gives four possible structures, but only one is correct.

Which one is correct?

A

\[ \text{H} - \text{C} - \text{C} - \text{O} - \text{H} \]

B

\[ \text{H} - \text{C} - \text{C} - \text{H} \]

C

\[ \text{H} - \text{C} - \text{C} - \text{O} \]

D

\[ \text{H} - \text{C} - \text{C} - \text{H} \]
3. **This question is about naming carboxylic acids.**

A student has named the carboxylic acids below, but he has made some mistakes. How many correct answers can you see? Give him a mark out of 5 – one mark for each correct answer. For any incorrect answers, add the correct names.

<table>
<thead>
<tr>
<th>Structure</th>
<th>Correct Name</th>
</tr>
</thead>
</table>
| \[
\begin{array}{c}
\text{H} \\
\text{H} \\
\text{C=O} \\
\text{O-H}
\end{array}
\] | Methanol... |
| \[
\begin{array}{c}
\text{H} \\
\text{H} \\
\text{H} \\
\text{H} \\
\text{C=O} \\
\text{O-H}
\end{array}
\] | Pentanoic acid... |
| \[
\begin{array}{c}
\text{H} \\
\text{H} \\
\text{H} \\
\text{H} \\
\text{H} \\
\text{C=O} \\
\text{O-H}
\end{array}
\] | Propanoic acid... |
| \[
\begin{array}{c}
\text{H} \\
\text{C} \\
\text{C} \\
\text{C} \\
\text{C} \\
\text{C}=\text{O} \\
\text{O-H}
\end{array}
\] | Ethanoic acid... |
| \[
\begin{array}{c}
\text{H} \\
\text{H} \\
\text{H} \\
\text{C=O} \\
\text{O-H}
\end{array}
\] | Butanoic acid... |
4. **Sarah and Dean carry out an experiment with ethanoic acid solution.**

They add the substances in the left-hand boxes, and test any gas formed. Draw straight lines to link together the substance added with the correct observation.

<table>
<thead>
<tr>
<th>Substance being added</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium</td>
<td>Gas formed that turns limewater milky</td>
</tr>
<tr>
<td>Sodium hydroxide solution – an alkali</td>
<td>Gas formed that gives a squeaky pop</td>
</tr>
<tr>
<td>Chalk – calcium carbonate</td>
<td>No gas formed</td>
</tr>
</tbody>
</table>