1. Crude oil is made of many hydrocarbons.
   a) Complete the sentence:
      Hydrocarbons contain two elements only.
      They are called **hydrogen** and **carbon**.
   
   b) **Which of these molecules are hydrocarbons?**
      Tick the boxes.
      
      ![](image)
      
      **Answer:** ✔  **Answer:** ✔

2. One family of hydrocarbons found in crude oil is called the alkanes.
   Here are the first four members of the alkane homologous series (family):

   ![](image)

   a) **Name each of these alkanes.**
      Write your answers in the table.

   b) **What is the molecular formula for each of these alkanes.**
      Write your answers in the table.
c) What is the molecular formula of the next alkane in the family?

**Answer:** C₅H₁₂.

3. The alkanes have a general formula.
   The letter n is the number of carbon atoms in an alkane molecule.
   
   a) How many hydrogen atoms would there be in an alkane?
   You may wish to use the information in the table in question 2 to help you.

   **Answer:** (2n + 2) hydrogen atoms.

   b) Complete the general formula for the alkanes:
   General formula for the alkanes = CₙH₂ₙ₊₂
c) Use the names, formulae or structures to work out which of the molecules are hydrocarbons and which are alkanes.

Place a tick or cross in the box.

<table>
<thead>
<tr>
<th>Hydrocarbon</th>
<th>Alkane</th>
</tr>
</thead>
<tbody>
<tr>
<td>H₂O</td>
<td>x</td>
</tr>
<tr>
<td>C₅H₁₂</td>
<td>✓</td>
</tr>
<tr>
<td>C₄H₆</td>
<td>✓</td>
</tr>
<tr>
<td>C₂H₅OH</td>
<td>x</td>
</tr>
<tr>
<td>Pentane</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>

4. Alkanes are saturated hydrocarbons.

a) What is meant by saturated?

Answer: A hydrocarbon made of carbon single bonds only.

b) Which molecules in the table in question 3 are saturated hydrocarbons?

Answer: Molecules 2, 5 and 6 are saturated hydrocarbons.