Examples of skeletal structures for groups of compounds

**Linear Alkanes**: (Read more about alkanes)

**Ethane**
Molecular Formula: $C_2H_6$

Full Displayed Formula of Ethane:
```
H   H
H-C-C-H
H   H
```

Skeletal Formula of Ethane:
```
   |
```

So, a 'chain link' of two carbon atoms linked by a single covalent bond (together with the hydrogen atoms attached to them) is represented by a single line when drawn in the form of a skeletal formula.

Further examples:

**Propane**
Molecular Formula: $C_3H_8$

Full Displayed Formula of Propane:
```
H   H   H
H-C-C-C-H
H   H   H
```

Skeletal Formula of Propane:
```
   /\  \\
    \  
```

**Butane**
Molecular Formula: $C_4H_{10}$

Full Displayed Formula of Butane:
```
H   H   H   H
H-C-C-C-C-H
H   H   H   H
```

Skeletal Formula of Butane:
```
   /\  \\
  /    \
```

**Pentane**
Molecular Formula: $C_5H_{12}$

Full Displayed Formula of Pentane:
```
H   H   H   H   H
H-C-C-C-C-C-H
H   H   H   H   H
```

Skeletal Formula of Pentane:
```
   /\  \\
  /    \
   /\  \\
```

Examples of the Skeletal Formulae of a few Branched Alkanes:

**Methylbutane**
Molecular Formula: \( \text{C}_8\text{H}_{12} \)

![Methylbutane Skeletal Formula]

or any of the following equivalents:

- ![Methylbutane Equivalent 1]
- ![Methylbutane Equivalent 2]
- ![Methylbutane Equivalent 3]

or equivalents, e.g. may be drawn counting carbons from the right- or left- and with the methyl-group shown above- or below- the main alkane chain.

**Dimethylpropane**
Molecular Formula: \( \text{C}_8\text{H}_{12} \)

![Dimethylpropane Skeletal Formula]

**3,3-Dimethylpentane**
Molecular Formula: \( \text{C}_{10}\text{H}_{20} \)

![3,3-Dimethylpentane Skeletal Formula]

or equivalent, e.g. rotating by 90 degrees would not change the meaning of (i.e. molecule represented by) this skeletal formula.

or equivalent, e.g. if drawn rotated by 90 degrees the same molecule would be represented - but such organic molecules are usually drawn with the longest carbon-chain horizontal (as above).
Linear Amines: (Read more about naming amines)

Structure of Methanamine
Molecular Formula: CH₃NH₂

Structure of Ethanamine
Molecular Formula: CH₃CH₂NH₂

Structure of Propan-1-amine
Molecular Formula: CH₃CH₂CH₂NH₂

Structure of Butan-1-amine
Molecular Formula: CH₃CH₂CH₂CH₂NH₂

Structure of Pentan-1-amine
Molecular Formula: CH₃CH₂CH₂CH₂CH₂NH₂
Linear Carboxylic Acids: (Read about naming carboxylic acids)

Structure of Formic Acid
Molecular Formula: $\text{CH}_2\text{O}_2$

Structure of Ethanoic Acid
Molecular Formula: $\text{C}_2\text{H}_2\text{O}_2$

Structure of Propanoic Acid
Molecular Formula: $\text{C}_3\text{H}_2\text{O}_2$

Structure of Butanoic Acid
Molecular Formula: $\text{C}_4\text{H}_4\text{O}_2$

Structure of Pentanoic Acid
Molecular Formula: $\text{C}_5\text{H}_6\text{O}_2$
Cyclohexane and Benzene

Structure of Cyclohexane
Molecular Formula: \( \text{C}_6\text{H}_{12} \)
Read more about cycloalkanes

Structure of Benzene
Molecular Formula: \( \text{C}_6\text{H}_6 \)

Notice that the regular hexagons that form part (or all) of the skeletal formulae are approx. the same size as the carbon ring drawn out in the full displayed formulae on the left.

In the case of skeletal formulae, the presence of the appropriate number of hydrogen atoms attached to each carbon is assumed - UNLESS replaced by something else, e.g. a carbon chain or functional group. For example, consider the structure and representations of ethylbenzene:

Structure of Ethylbenzene
Molecular Formula: \( \text{C}_9\text{H}_{10} \)