# Do now:

Jot down what can you remember about organic chemistry from last year.

We will have a class brainstorm so be prepared to contribute.

These ideas might help you:

- Functional groups
- Naming
- Isomers
- Reactions

# Learning objectives

- Recognise each of the following functional groups: *alkane, alkene, alkyne, haloalkane, carboxylic acid, amine, ester, aldehyde, ketone, amide, acyl chloride*

- Name compounds from the above groups that contain 8 or less carbon atoms in the main chain

- Draw compounds from the above groups that contain 8 or less carbon atoms in the main chain

# Functional groups

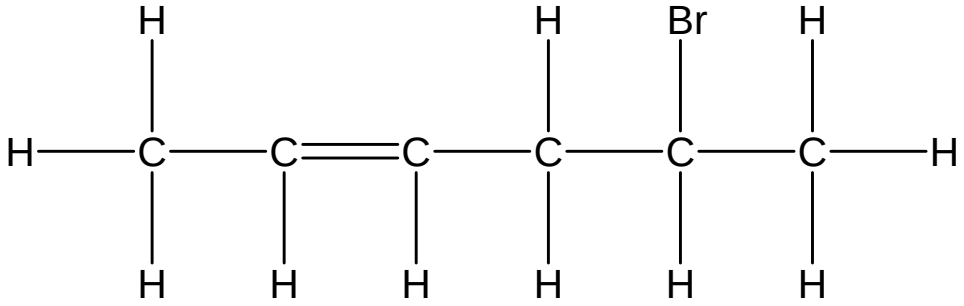
Last year we covered the properties and reactions of the following functional groups.

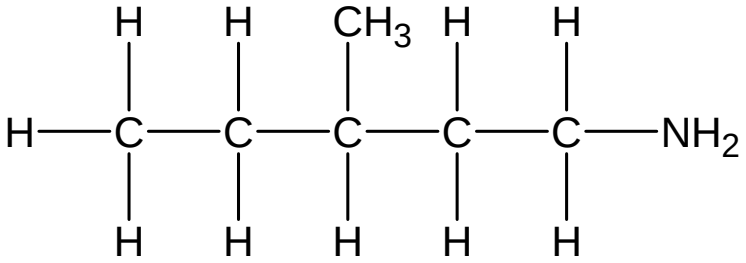
| Compound | Functional Group | Suffix (ending) | Example | Name |
|---|---|---|---|---|
| **Alkane** | **C – C** | **-ane** | **$CH_3CH_2CH_3$** | **propane** |
| **Alkene** | **C = C** | **-ene** | **$CH_3CHCH_2$** | **propene** |
| **Alkyne** | **C ≡ C** | **-yne** | **$CH_3CCH$** | **propyne** |
| **Haloalkane** | **C – X** | **-ane** | **$CH_3CH_2CH_2Cl$** | **1-chloropropane** |
| **Alcohol** | **C – OH** | **-anol** | **$CH_3CH_2CH_2OH$** | **propanol** |
| **Carboxylic acid** | **C – OOH** | **-anoic acid** | **$CH_3CH_2COOH$** | **propanoic acid** |
| **Amine** | **C – $NH_2$** | **-amine** | **$CH_3CH_2CH_2$ $NH_2$** | **propanamine** |

# Naming

The steps to name an organic compound are:

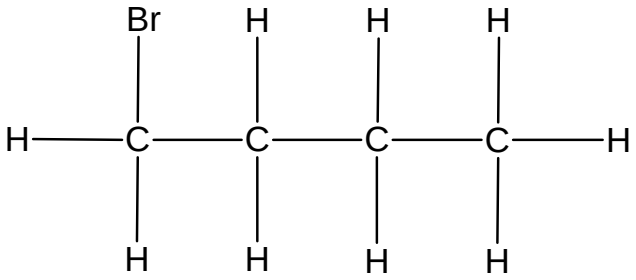
- Identify the longest carbon chain and name it with the prefix
- Identify the functional group and name it with the suffix
- Number the carbon chain
- Name and number any branches
- Put the name together from the above information

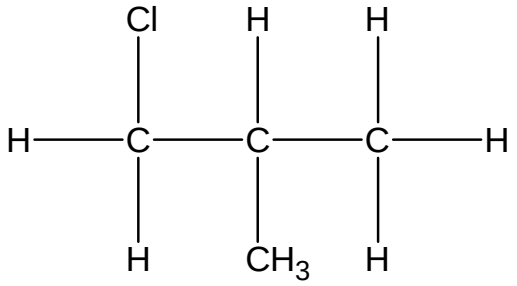


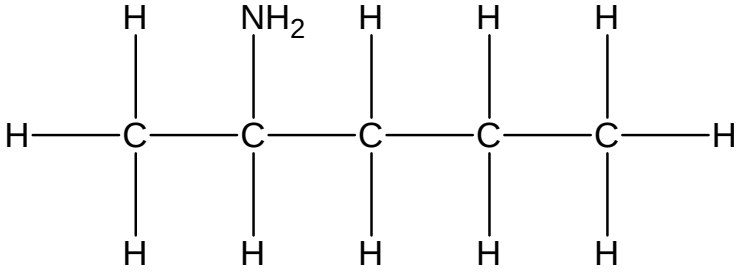



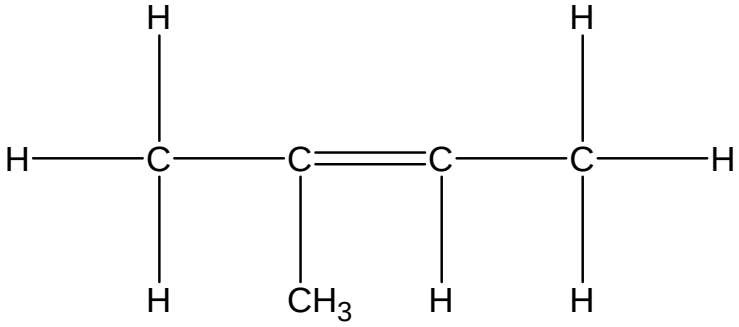
# Naming

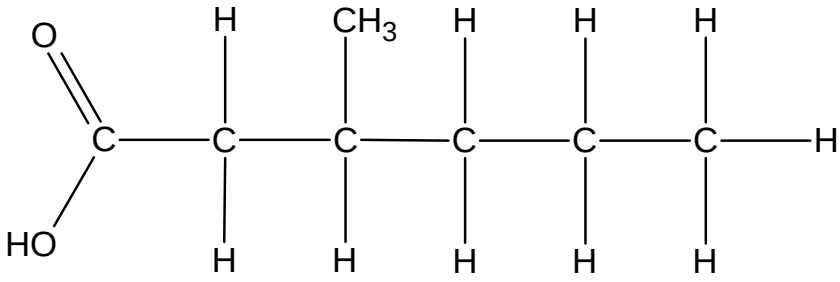
Name the following compounds:



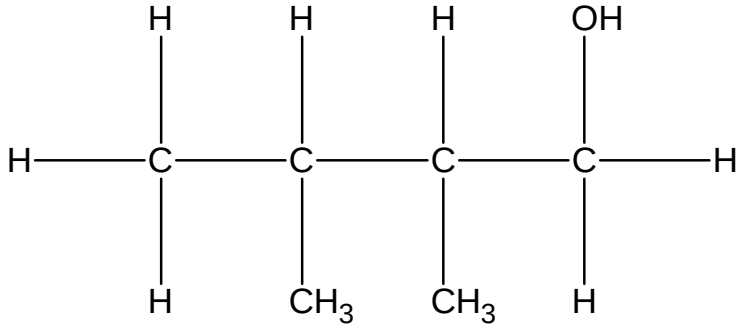



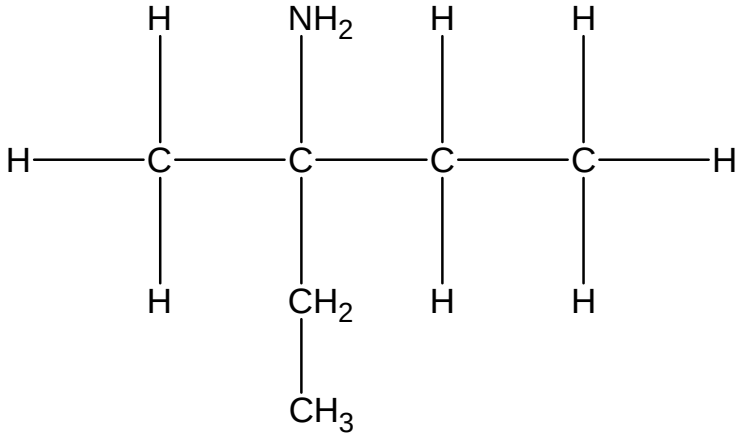



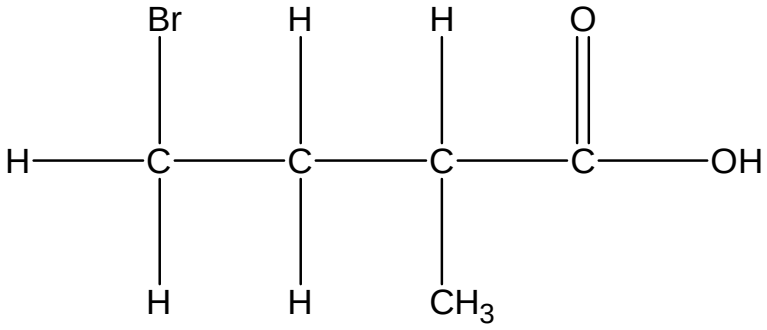



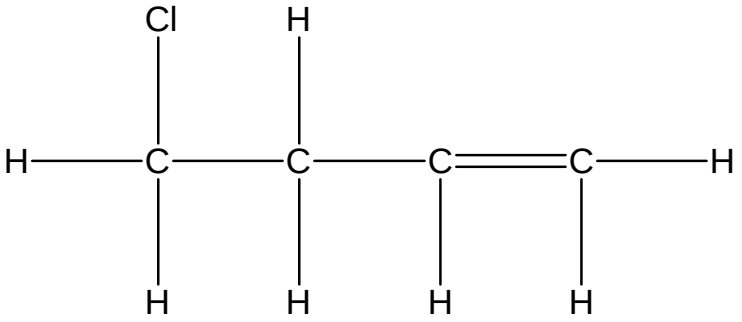
# Do now:

Name the following compounds:



# Drawing

The steps to draw an organic compound are:

- Identify the length of the carbon chain and draw it
- Identify the functional group and draw it in the position specified (position 1 if not specified)
- Identify any branches and their position and draw them

2-bromobutan-1-ol

4-methylpent-2-ene

# Drawing

butan-2-ol

1-bromopropan-2-ol

3-bromo-2-chlorohexane

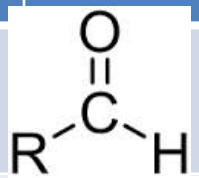
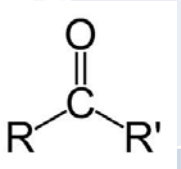
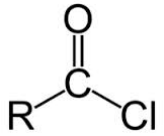
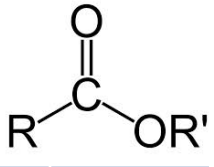
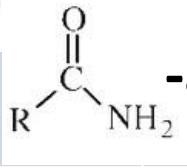
1-aminoethane

2-ethylpentanoic acid

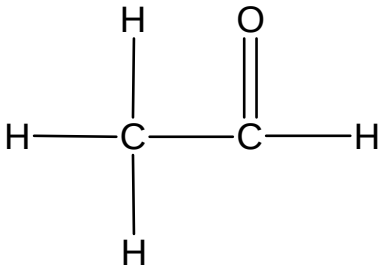
2,4-dichlorohex-1-ene

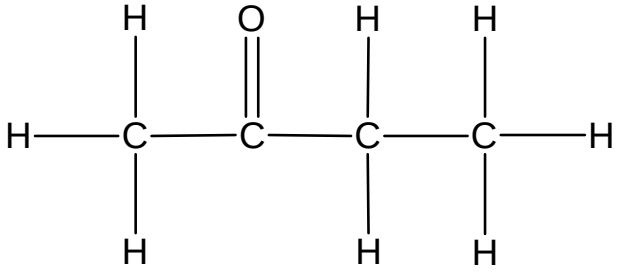
# Functional groups

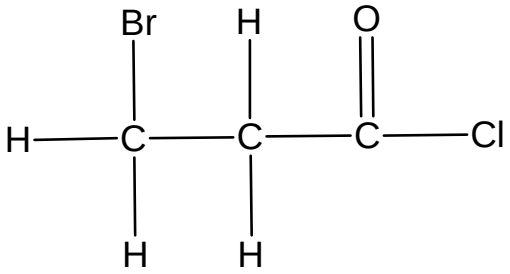
In addition to these we will look at the properties and reactions of 5 new functional groups.

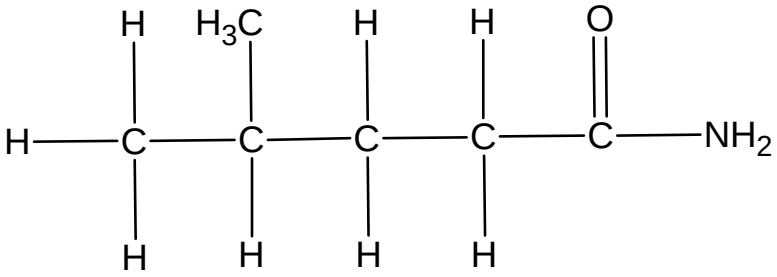
| Compound | Functional Group | Suffix (ending) | Example | Name |
|---|---|---|---|---|
| **Aldehyde** |  | **-anal** | **$CH_3CH_2CHO$** | **propanal** |
| **Ketone** |  | **-anone** | **$CH_3COCH_3$** | **propanone** |
| **Acid chloride** |  | **-anoyl chloride** | **$CH_3CH_2COCl$** | **propanoyl chloride** |
| **Ester** |  | **-yl … -anoate** | **$CH_3COOCH_3$** | **methyl ethanoate** |
| **Amide** |  | **-amide** | **$CH_3CH_2CONH_2$** | **propanamide** |

# Naming



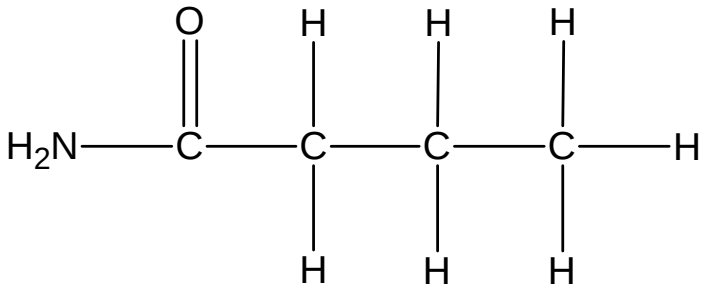



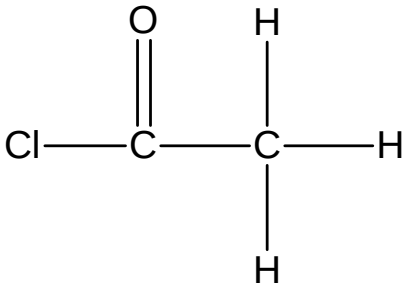



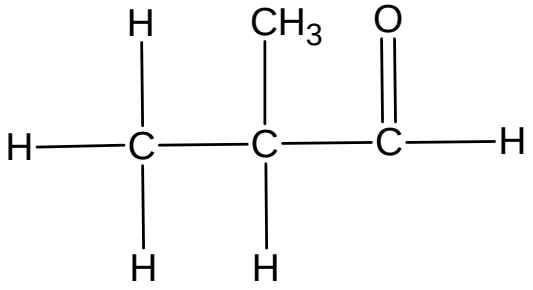



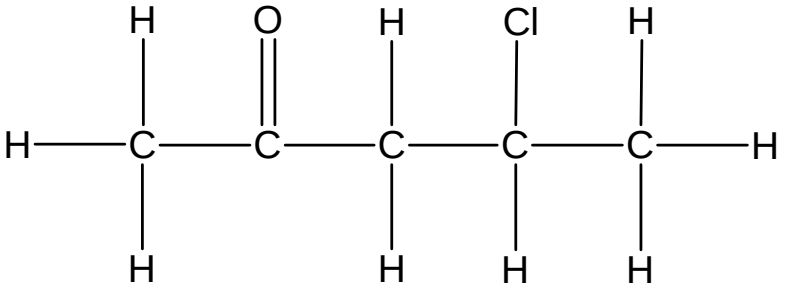
# Do now:

Name the following organic compounds



# Learning Objectives

- Name compounds from the above groups that contain 8 or less carbon atoms in the main chain
- Draw compounds from the above groups that contain 8 or less carbon atoms in the main chain
- Recognise the differences between *constitutional (structural)* and *stereoisomerism (geometrical and optical)*
- Identify the conditions needed for different types of isomerism to occur

# Drawing

hexan-2-one

pentanal

butanamide

2-methylbutanoylchloride

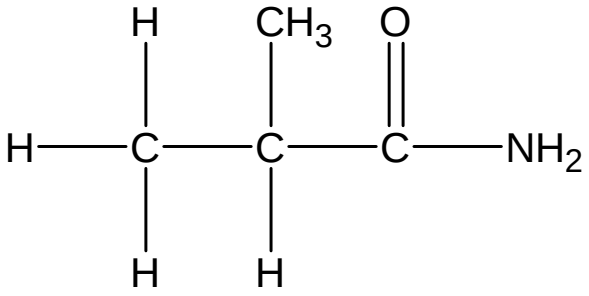
3-methylbutanal

4,4-dibromohexan-2-one

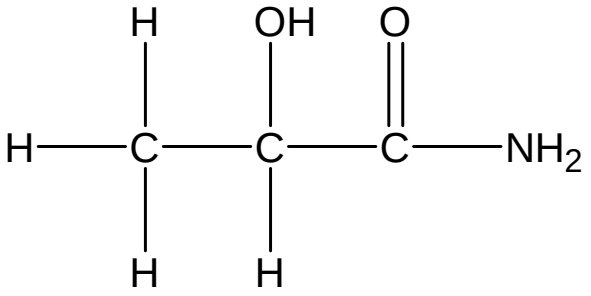
# One last thing

If an alcohol group is present in a compound along with one of the new functional groups we have learnt about (or a carboxylic acid) we need to name it as a side chain.

An alcohol side chain is named as **hydroxy**.




2-methylpropanamide

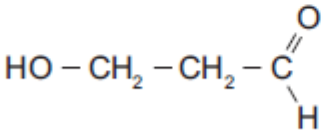
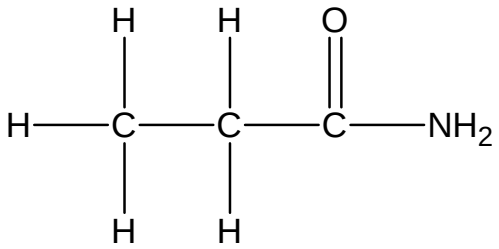
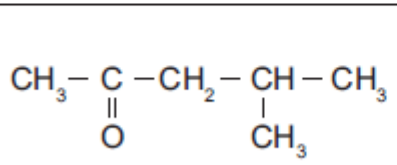



2-hydroxypropanamide

# 2013 Exam Q1

**QUESTION ONE**

(a) Complete the table below by giving the IUPAC systematic name or the structural formula for each compound.

| Structural formula | IUPAC systematic name |
|---|---|
|  | 3-hydroxypropanal |
|  | propanamide |
|  | 4-methylpentan-2-one |