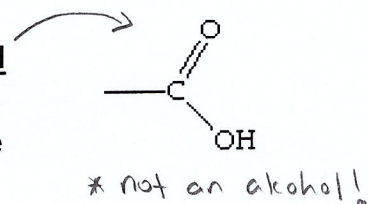


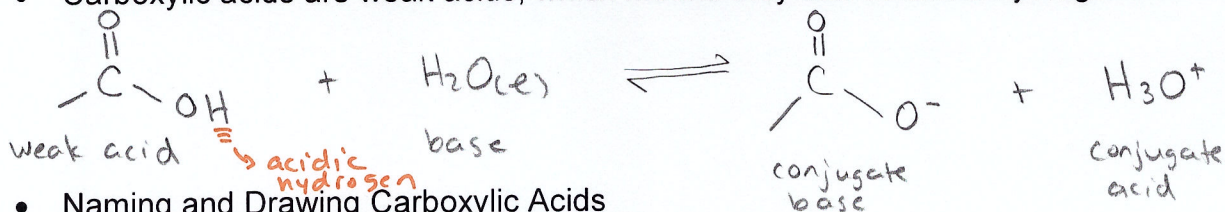
CARBOXYLIC ACIDS

- A **carboxylic acid** is an organic compound that contains a **carboxyl group**, or $-\text{COOH}$ group

* Carboxylic acids can still be saturated hydrocarbons because the double bond isn't between carbon-carbon atoms



- Carboxylic acids are weak acids, which means they can donate a hydrogen ion



- Naming and Drawing Carboxylic Acids

Step 1: Identify the root

- Identify and name the longest carbon chain (ie. parent alkane) that includes the carbon in the carboxyl group
- The carbon in the carboxyl group is always numbered as carbon 1 when numbering the carbons in the main chain

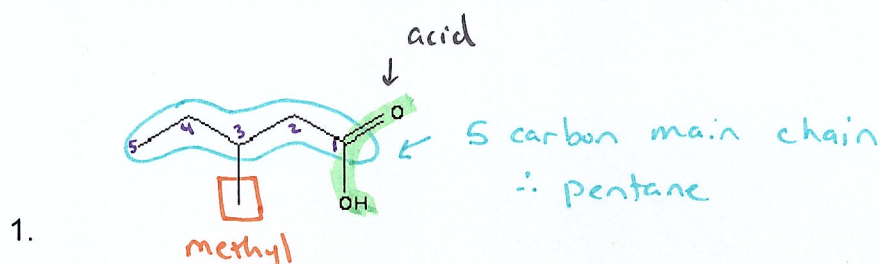
Step 2: Identify the suffix

- Drop the $-e$ at the end of the name of the parent alkane and replace it with " $-oic\ acid$ "

Step 3: Identify the prefix:

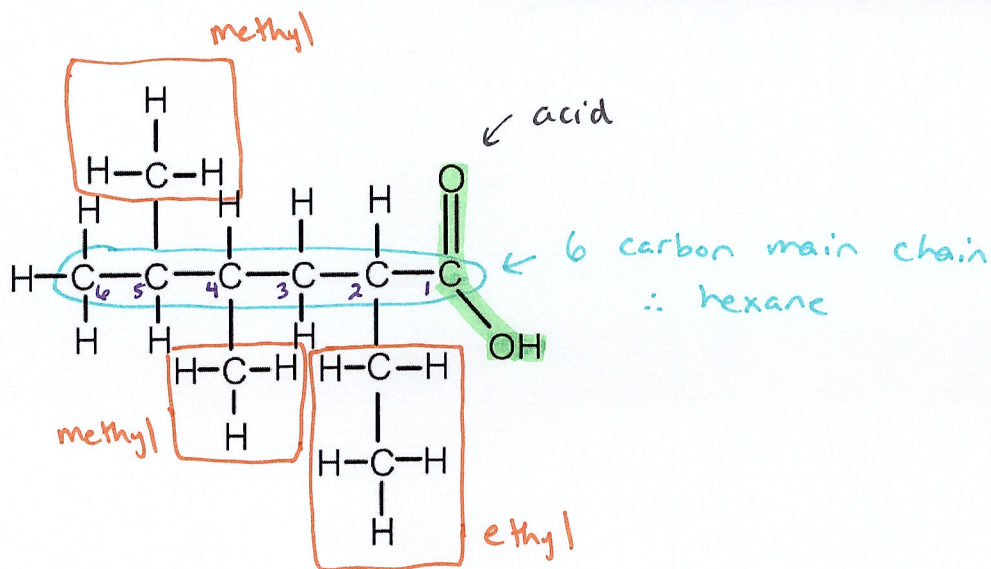
- Name and number any alkyl side groups attached to the main carbon chain using the same rules as before

EXAMPLES: Name the following carboxylic acids.



3-methylpentanoic acid

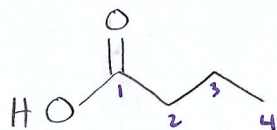
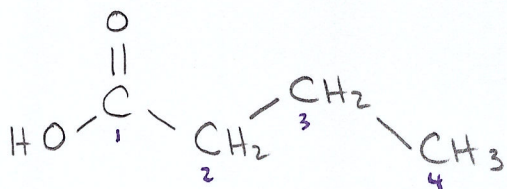
2.



2-ethyl-4,5-dimethylhexanoic acid

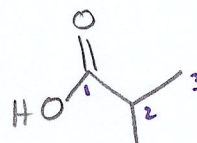
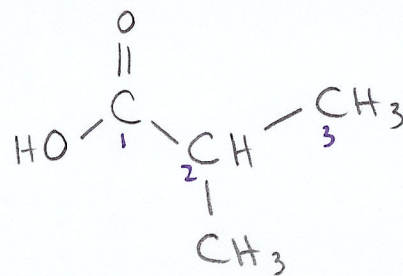
EXAMPLE: Draw and name two different carboxylic acids that have the molecular formula $C_4H_8O_2$.

↳ $\begin{matrix} \text{O} \\ \parallel \\ \text{C} \\ | \\ \text{OH} \end{matrix}$ can only be found at the end of a chain



butanoic acid

OR

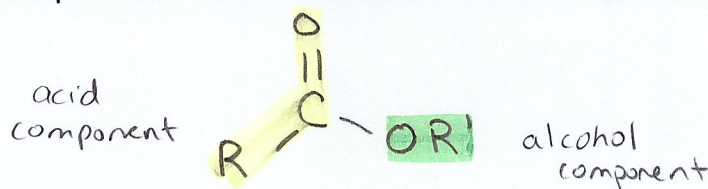
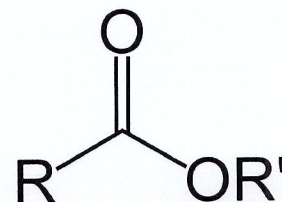


2-methylpropanoic acid

Now try pg. 570 # 33, 34

ESTERS

- An ester is a hydrocarbon derivative that contains the functional group as shown to the right
 - General formula for an ester is RCOOR' where the symbol R represents any hydrocarbon or just a hydrogen atom. The symbol R' represents a hydrocarbon that **cannot** be a hydrogen atom b/c molecule would be a carboxylic acid then!
- Esters usually have a smell/aroma; usually pleasant, fruity odours
- Naming and Drawing Esters
 - An ester is made up of two parts; an acid component and an alcohol component
 - These two parts of an ester are used in the naming of an ester



Step 1: Identify root

- The longest carbon chain that is attached and includes the carbon in the $\text{C}=\text{O}$ group (ie. acid part) is the root name of the ester.
- The root now also includes any side groups coming off this main chain. Use the same rules as before for identifying side groups.

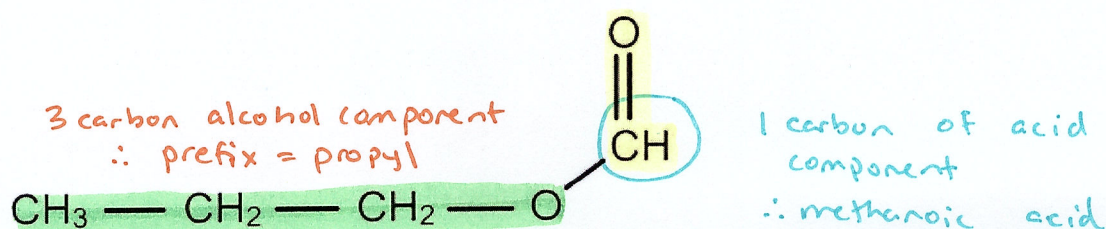
Step 2: Identify the suffix

- Remove the “-oic acid” from the name of the parent acid and replace it with “-oate”

Step 3: Identify the prefix

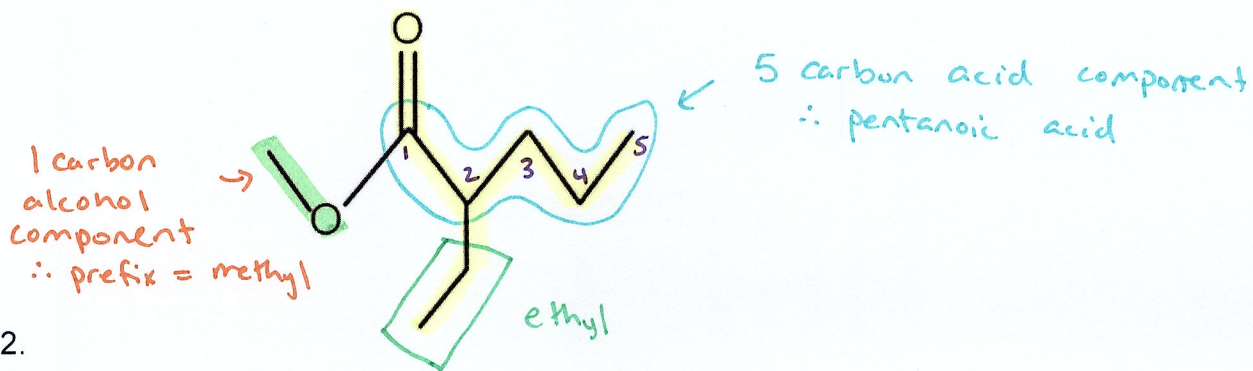
- To form the prefix, consider the alcohol part of the ester. Count the number of carbon atoms in the chain that is attached to the oxygen in the alcohol part. This alkyl group is the prefix.
- There is always a space between the alkyl group/prefix and the root

EXAMPLES: Name the following esters.



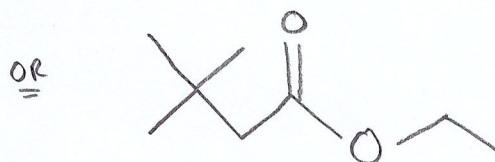
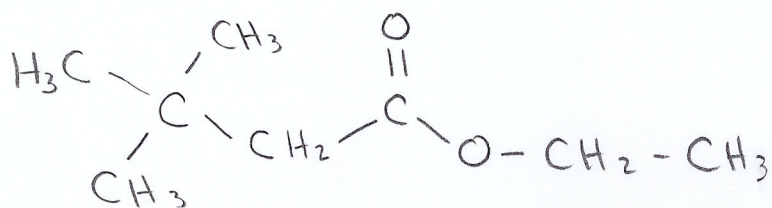
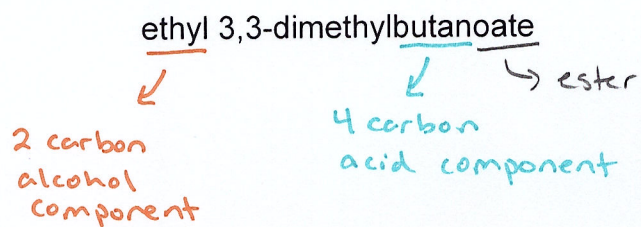
1.

propyl methanoate
↳ ester



methyl 2-ethylpentanoate

EXAMPLE: Draw the following ester.



Now try pg. 572 #37, 38