

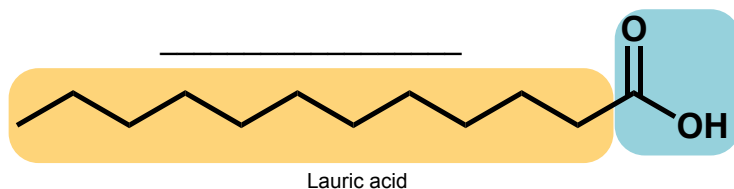
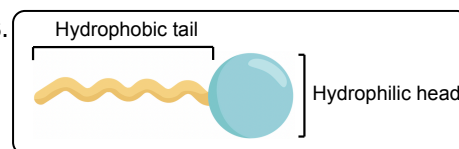
CONCEPT: FATTY ACIDS

• Most **fatty acids** contain even number of Carbons (_____) with a general formula $\text{CH}_3(\text{CH}_2)___\text{COOH}$.

• Fatty Acids are **amphipathic** molecules, having _____ nonpolar and polar parts.

□ Hydrocarbon **tail** is _____ and **hydrophobic**.

□ Carboxylic acid **head** is _____ and **hydrophilic**.



• The _____ the hydrocarbon tail, the _____ nonpolar the fatty acid.

□ Overall fatty acids are _____.

EXAMPLE: Which of the following statements about fatty acid structure is correct?

- a) Carboxylic acid group of the fatty acid is polar and does not interact with aqueous environments.
- b) Fatty acids contain a nonpolar head with a polar tail.
- c) Fatty acids are amphoteric.
- d) Fatty acids consist of a hydrophilic head and a hydrophobic tail.




PRACTICE: Which of the following fatty acids would you expect to be more soluble in cyclohexane?

- a) Palmitic acid (16 Cs)
- b) Stearic acid (18 Cs)
- c) Lauric acid (12 Cs)
- d) none of the above

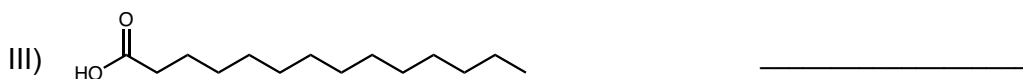
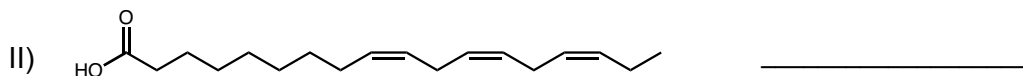
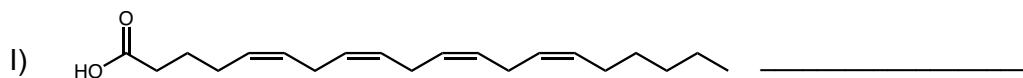
CONCEPT: FATTY ACIDS

Saturated vs Unsaturated Fatty Acids

- **Saturated:** fatty acids contain only _____ bonds.
- **Unsaturated:** fatty acids contain at least one _____ bond.
 - Mono- and poly- prefixes indicate one and multiple _____ bonds respectively.
 - Naturally occurring fatty acids contain cis (____ configuration) double bonds.

Saturated vs Unsaturated	
Saturated	 Lauric acid
Unsaturated	 Oleic acid
	 Linoleic acid

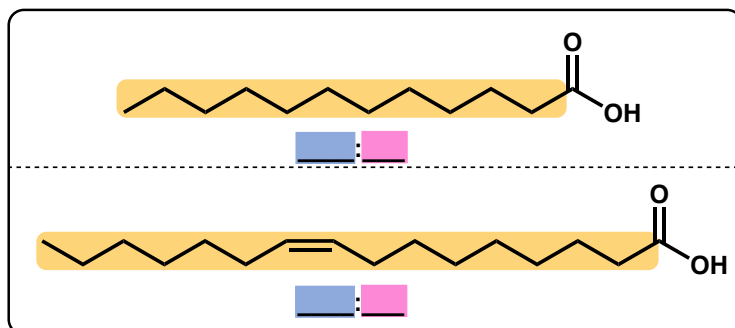
EXAMPLE: Classify each fatty acid as saturated (S), monounsaturated (mono), or polyunsaturated (poly).



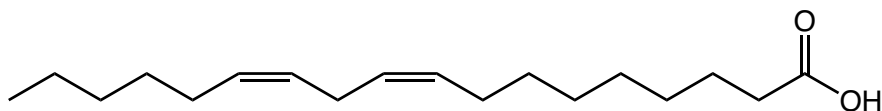
CONCEPT: FATTY ACIDS

Fatty Acid Shorthand Notations

- Fatty acids are assigned shorthand _____ for easy naming.
 - Number of _____ followed by a _____ of double bonds, separated by a colon.



EXAMPLE: Provide a shorthand notation for the following fatty acid below.

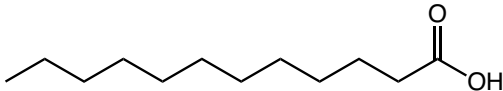
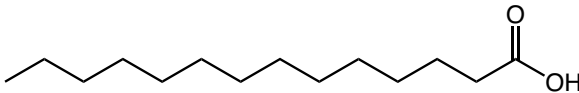
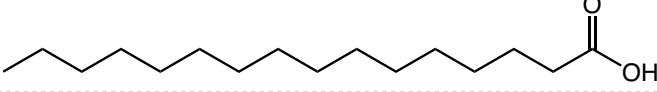
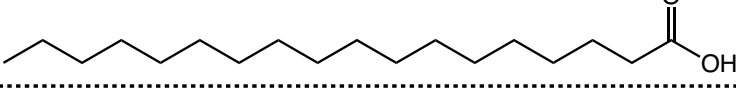
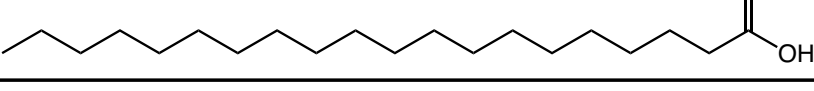


CONCEPT: FATTY ACIDS

Remembering Fatty Acids

- To be able to draw more complex lipids, we first need to memorize structures of the _____ fatty acids.

MEMORY TOOL 1:

Saturated Fatty Acids	
_____ Lauric acid (____:0)	
_____ Myristic acid (____:0)	
_____ Palmitic acid (____:0)	
_____ Stearic acid (____:0)	
_____ Arachidic acid (____:0)	

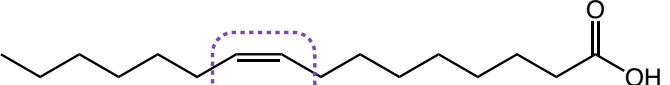
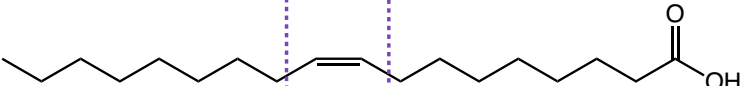
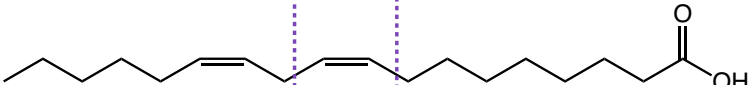
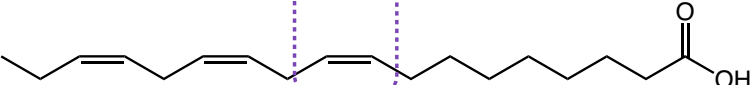
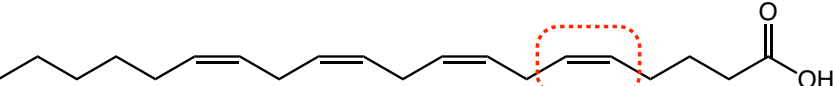
EXAMPLE: Without looking at the table above, identify number of carbons present in each saturated fatty acid.

- a) Myristic _____
- b) Arachidic _____
- c) Palmitic _____
- d) Lauric _____
- e) Stearic _____

PRACTICE: Provide a condensed structural formula for a fatty acid with 18 carbons (18:0) and give its common name.

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MEMORY TOOL 2:

Unsaturated Fatty Acids	
_____	Palmitoleic acid (_:_) 
_____	Oleic acid (_:_) 
_____	Linoleic acid (_:_) 
_____	Linolenic acid (_:_) 
_____	Arachidonic acid (_:_) 
Double bonds start at C9 from carbonyl C.	
5th acid, double bonds start at C5 from carbonyl C.	

EXAMPLE: Provide shorthand notations for each fatty acid.

- a) Linoleic _____
- b) Oleic _____
- c) Arachidonic _____
- d) Linolenic _____

PRACTICE: Provide a skeletal structure for Linolenic acid.