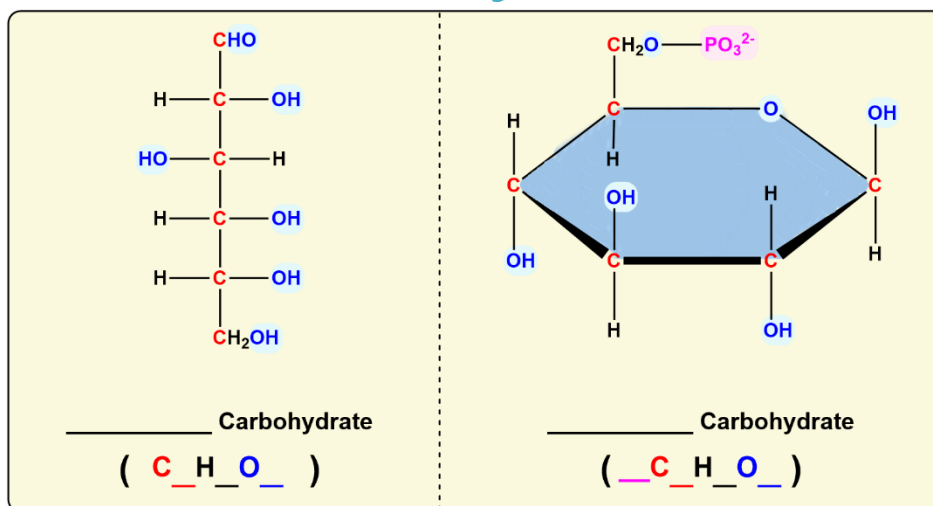


CONCEPT: CARBOHYDRATES

- **Carbohydrates:** carbon-based-molecules hydrated with many _____ groups (-OH).
 - Also referred to as _____, the Greek word meaning “sugars”.
- When “_____” was originally coined, it referred to compounds with the formula $C_n(H_2O)_n$.
 - _____ **carbohydrates:** fit $C_n(H_2O)_n$ formula exactly (ex. glucose).
 - _____ **carbohydrates:** can slightly differ from $C_n(H_2O)_n$ & can also have _____, N or S atoms too.

EXAMPLE: Simple vs. Complex Carbohydrates.

Carbo-Hydrates

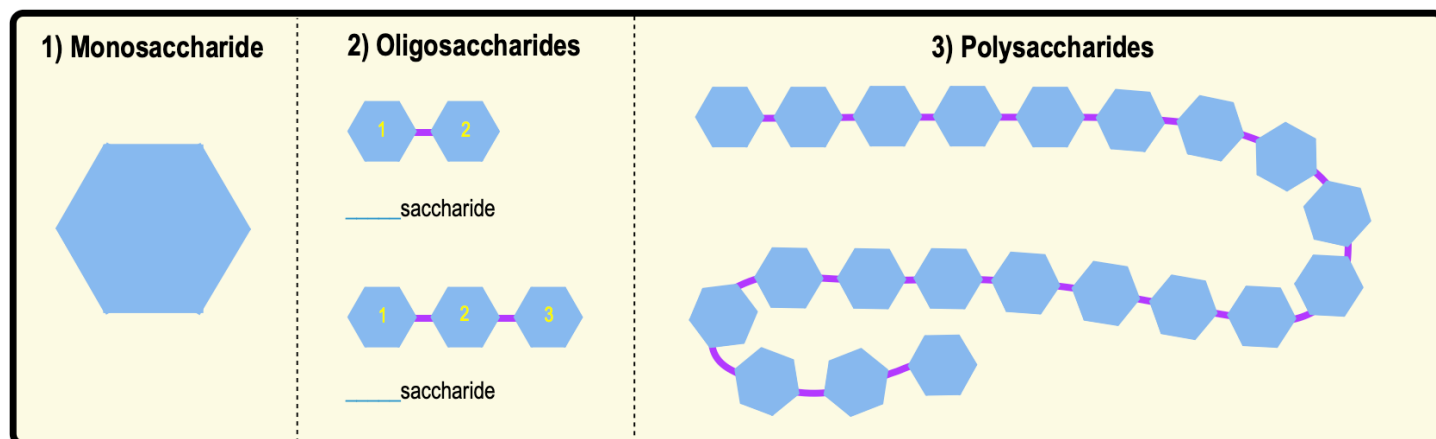


PRACTICE: Which of the following chemical formulas represents that of a simple carbohydrate?

- a) $C_2H_2O_2$. b) $C_6H_{12}O_6$. c) $C_5H_4O_3$. d) $C_3H_6O_9$.

3 Size Classes of Carbohydrates

- 1) _____ **saccharide:** a *single* carbohydrate unit or _____ (ex. glucose).
- 2) _____ **saccharide:** 2 to ~ _____ covalently linked monosaccharides.
- 3) _____ **saccharide:** _____ 20 covalently linked monosaccharides (_____).



CONCEPT: CARBOHYDRATES

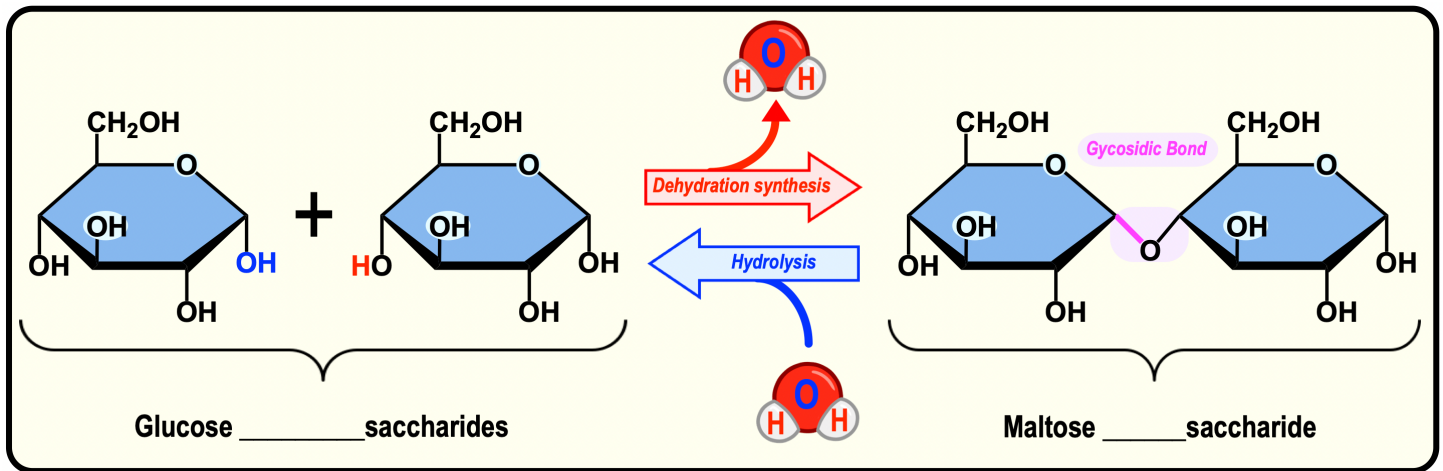
Formation & Breakdown of Polysaccharides

● Recall: *Dehydration Synthesis*: links _____ saccharides together to _____ polysaccharides.

□ _____ **Bonds**: the *covalent bonds* that link *monosaccharides* together.

□ *Hydrolysis*: _____ down polysaccharides into individual monosaccharides.

EXAMPLE: Formation of a maltose from two glucose molecules.



PRACTICE: Monosaccharides are linked together via a _____ reaction, forming a _____ bond.

- a) Hydrolysis ; Glycosidic.
- b) Dehydration synthesis ; Hydrogen.
- c) Hydrolysis ; Peptide.
- d) Dehydration synthesis ; Glycosidic.
- e) Hydrolysis ; Hydrogen.

PRACTICE: Which of the following chemical reactions results in energy release when glycosidic bonds are broken?

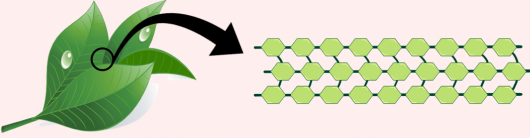
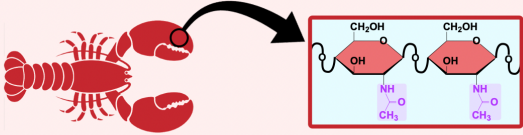
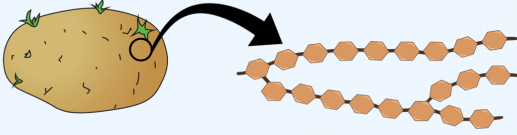
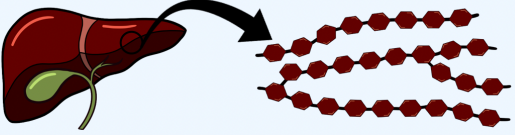
- a) Condensation reaction.
- b) Dehydration synthesis reaction.
- c) Hydrolysis reaction.
- d) Hydrogen bonding.

CONCEPT: CARBOHYDRATES

Carbohydrate Functions

- Carbohydrates can be *structurally & functionally* _____, but have _____ main functions:
 - Structural Support:** used to build _____ (ex. cellulose, chitin, etc.).
 - Energy-Storage:** used for _____-term _____-storage (ex. starch & glycogen).

EXAMPLE: Polysaccharides in Plants and Animals.

Function	Polysaccharides in Plants	Polysaccharides in Animals
Structural Support 	 _____: most abundant carbohydrate found in <i>plant cell walls</i> .	 _____: found in the <i>exoskeletons</i> of insects and crustaceans (ex. lobsters).
Energy Storage 	 _____: Storage form of glucose in <i>plants</i> .	 _____: Storage form of glucose in <i>animals</i> .

PRACTICE: Animal cells store energy in the form of _____, and plant cells store energy in the form of _____.

- Sucrose ; glucose.
- Disaccharides ; monosaccharides.
- Starch ; glycogen.
- Cellulose ; chitin.
- Glycogen ; starch.

PRACTICE: Which polysaccharide is an important component in the structure of lobsters and insects?

- Chitin.
- Cellulose.
- Starch.
- Glycogen.
- Polypeptides.