

## 8.6: Exercises

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### Multiple Choice

1. By definition, carbohydrates contain which elements?

- A. carbon and hydrogen
- B. carbon, hydrogen, and nitrogen
- C. carbon, hydrogen, and oxygen
- D. carbon and oxygen

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2. Monosaccharides may link together to form polysaccharides by forming which type of bond?

- A. hydrogen
- B. peptide
- C. ionic
- D. glycosidic

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3. Which of the following is *not* a complex carbohydrate?

- A. chitin
- B. starch
- C. disaccharide
- D. none of the above

4. An example of a monosaccharide is \_\_\_\_\_.

- 1. fructose
- 2. glucose
- 3. galactose
- 4. all of the above

5. Cellulose and starch are examples of:

- 1. monosaccharides
- 2. disaccharides
- 3. lipids
- 4. polysaccharides

6. Plant cell walls contain which of the following in abundance?

- 1. starch
- 2. cellulose
- 3. glycogen
- 4. lactose

7. Lactose is a disaccharide formed by the formation of a \_\_\_\_\_ bond between glucose and \_\_\_\_\_.

- 1. glycosidic; lactose
- 2. glycosidic; galactose
- 3. hydrogen; sucrose
- 4. hydrogen; fructose

## Matching

Match each polysaccharide with its description.

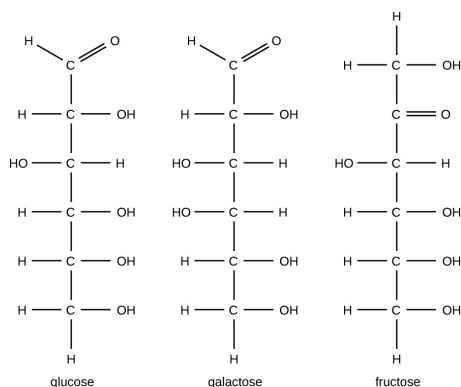
___chitin	A. energy storage polymer in plants
___glycogen	B. structural polymer found in plants
___starch	C. structural polymer found in cell walls of fungi and exoskeletons of some animals
___cellulose	D. energy storage polymer found in animal cells and bacteria

## Short Answer

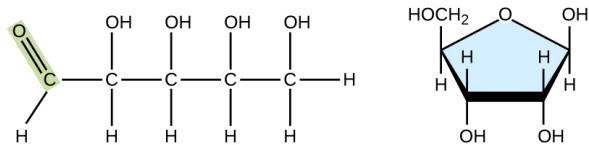
1. What are monosaccharides, disaccharides, and polysaccharides?
2. What are carbohydrates? Describe their structure.
3. Put the following carbohydrates in order from smallest to largest:  
cellulose; fructose; sucrose
4. Name three carbohydrates that contain glucose as a monomer.
5. Which do you think is faster to digest — simple sugars or complex carbohydrates? Explain your answer.
6. What are the similarities and differences between muscle glycogen and liver glycogen?
7. Which carbohydrate is used directly by the cells of living things for energy?
8. Why is it impossible for humans to digest food that contains cellulose?
9. Describe the similarities and differences between glycogen and starch

## Critical Thinking

1. The figure depicts the structural formulas of glucose, galactose, and fructose. (a) Circle the functional groups that classify the sugars either an aldose or a ketose, and identify each sugar as one or the other. (b) The chemical formula of these compounds is the same, although the structural formula is different. What are such compounds called?



2. Structural diagrams for the linear and cyclic forms of a monosaccharide are shown. (a) What is the molecular formula for this monosaccharide? (Count the C, H and O atoms in each to confirm that these two molecules have the same formula, and report this formula.) (b) Identify which hydroxyl group in the linear structure undergoes the ring-forming reaction with the carbonyl group.



## Contributor

- Template:ContribOpenSTAXMicrobiology

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