



Tomiris Issayeva

04/09/19

## Carbohydrates

*The word carbohydrate may often come up in our day-to-day lives in the context of food as it is used interchangeably with foods like pasta, pizza, bread, and so on. However, in science, the word carbohydrate refers to an organic molecule that is made up of carbon, oxygen, and hydrogen and is present in a variety of different foods. Carbohydrates are extremely important to living organisms as they store and provide energy for cells, and give structure to plants and some animals.*

### Material List

- Sheets with different types of carbohydrates
- Fill in the table worksheet
- Monosaccharide Molecules
- Names of different types of carbohydrates (4 corners)
- Coloring worksheet
- Crayons, markers, other supplies

### Key Words

- Carbohydrate
- Complex Carbohydrate
- Simple Carbohydrate
- Saccharide
- Mono
- Di
- Poly

### Activities

#### 1. Learning about different types of carbohydrates

Duration: 15 minutes

Explain to the students that there are 4 different types of carbohydrates and tell them about what they are and which foods they are found in (bullet points below). Also, show students the 4 different sheets that have the names of the 4 different types of carbohydrates and the foods associated with them. In addition, each of the sheets has a different number of monosaccharide molecules on the side; explain to them that the Monosaccharide sheet has only one molecule, which becomes intuitive when you focus on the prefix “mono,” which means one. Next, follow the same steps for the other 3 sheets. For instance, the Polysaccharide sheet has many monosaccharide molecules, which becomes intuitive because the prefix “Poly” means many and so a polysaccharide is made up of many monosaccharide molecules. When introducing each type of

carbohydrate make sure to place an emphasis on the different prefixes, which will help them distinguish the different kinds. Lastly, if it is helpful then you can ask the students to repeat each name after you very slowly.

- **Monosaccharides:** these are the simplest form of carbohydrates. They include the sugars glucose and fructose. Foods such as honey, maple syrup, white sugar, and other types of desserts are rich in monosaccharides. Simple carbohydrates cause bursts of energy once they are eaten because they are digested quicker.
- **Disaccharides:** are formed when two simple carbohydrates (two monosaccharides) are put together. They include the sugars sucrose and lactose. Lactose is the carbohydrate found in the milk that we drink.
- **Oligosaccharides:** are formed from 3-6 monosaccharides. Foods like legume beans, lentils, and chickpeas contain oligosaccharides.
- **Polysaccharides:** are long carbohydrate molecules that are commonly referred to as complex carbohydrates. There are four important types of complex carbohydrates but the one type that we eat is called starch. Starches are abundant in foods like potatoes, maize, and whole grain breads and cereals. Complex carbohydrates are the good kind of carbohydrates as they are considered whole and unprocessed foods. They also take longer to digest, which is why they help us sustain energy for longer periods.

## **2. Identifying different types of carbohydrates**

Duration: 10 minutes

Now that the students have an idea of the differences between types of carbohydrates, have them solidify their newly acquired knowledge by asking them to fill in the table. The table will have four columns titled Monosaccharides, Disaccharides, Oligosaccharides, and Polysaccharides. Below there will be a word bank with names of different foods. The goal is for the students to match each word from the word box with the correct column. As an alternative you can have the younger kids draw the foods instead of writing in the names.

Note: every food in the word bank is present in the 4 different carbohydrate sheets that were shown in the first activity. The students can use those sheets as a reference guide!

## **3. Making different carbohydrates out of a single monosaccharide**

Duration: 10 minutes

In this activity the students are going to work with the little monosaccharide molecule sheets. The goal is for the students to realize that taking two monosaccharides and putting them together creates a disaccharide, which is a different type of carbohydrate molecule from the original monosaccharide one! The students should begin with a single monosaccharide and then proceed to put two monosaccharides together. Next, the students will work up to placing 4-6 monosaccharides together. At this stage, point out to them the fact that they have now formed an oligosaccharide. Lastly, the students will put many monosaccharides together in order to create a polysaccharide. After this step, emphasize that they have created a long and complex carbohydrate that is made up of

many monosaccharide molecules put together. This should help the students why polysaccharides are called complex whereas monosaccharides are called simple!

#### **4. Four Corners**

Duration: 10 minutes

In this interactive activity the students are going to run to the right corner/table after listening to the description that has been read out to them. For example, if you read “A food high in starch”, then the students should run to the table that has the word Polysaccharide. The descriptions and their corresponding tables are below:

- Unprocessed Whole Grain Bread → Polysaccharides
- Sugar → Monosaccharide
- Potato → Polysaccharide
- Lentils → Oligosaccharide
- Whole Grain Cereal → Polysaccharide
- Cookies → Monosaccharide
- Starch → Polysaccharide
- French Fries → Monosaccharide
- Milk → Disaccharide
- Honey → Monosaccharide
- Processed White Bread → Monosaccharide

#### **5. Coloring activity**

Duration: 5 minutes

At this point in the lesson the students probably have a better understanding of what a carbohydrate is and the fact that the molecule exists in different types and has a number of functions. Pass out the coloring worksheet and let the students color in different breads and grains while keeping in mind that they are all a carbohydrate!

#### **Conclusion**

Today we learnt about the chemistry of the carbohydrate molecule, which is a very useful and important knowledge as we carbohydrates make up a very large portion of what we consume on the daily basis. There are four different types of carbohydrates that include monosaccharides, disaccharides, oligosaccharides, and polysaccharides. Make sure to emphasize the fact that everything is good in moderation so it is never good to restrict oneself from eating foods that are simple carbohydrates only because they are considered less healthy than the complex ones!

#### **Instructor Comments**

# Carbohydrates in every day lives!

Fill in the table:

Monosaccharides	Disaccharides	Oligosaccharides	Polysaccharides

## Word Bank:

- Starch
- Potatoes
- Whole grain bread
- Lentils
- White bread
- Whole grain cereal



LIVE HEALTHY!

EAT YOUR  
Breads and Grains!

