

**Topic:** Metabolism Food Label Lunch Lab

**Summary:** Students will design a lunch based on the type of biomolecules in food they would eat.

**Goals & Objectives:** Students will be able to identify what their food is made out of and make decisions on would that food be useful to eat to supply enough energy for school.

**Time Length:** 40 minutes

**NGSS Standards:** HS-LS1-6. Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.

**Materials:**

Textbook, class notes, food labels (either on a package or printed from the Internet) and pencil or pen

**Prerequisite Knowledge:** 4 Biomolecules and Metabolism

**Procedures:**

1. Have students take out their notes on biomolecules and metabolism or tell the students which section they are to use in the textbook.
2. Provided many food labels, around the classroom. Students will use 20 minutes to find and copy the biomolecule information from 8 food labels.
3. Once students have chosen 8 food and copied their food labels, they need to use their notes to answer the second page of the activity.
4. Students use the graph on page 3 to answer questions on page 3.
5. On page 4, students chose one of their foods and write a claim evidence reasoning paragraph on why that food would be optimal for school.

**Accommodations:** Students with an IEP can take the handout home if they need extra time.

## Metabolism & the Optimal Meal for School

1) What are the four biomolecules?

- a.
- b.
- c.
- d.

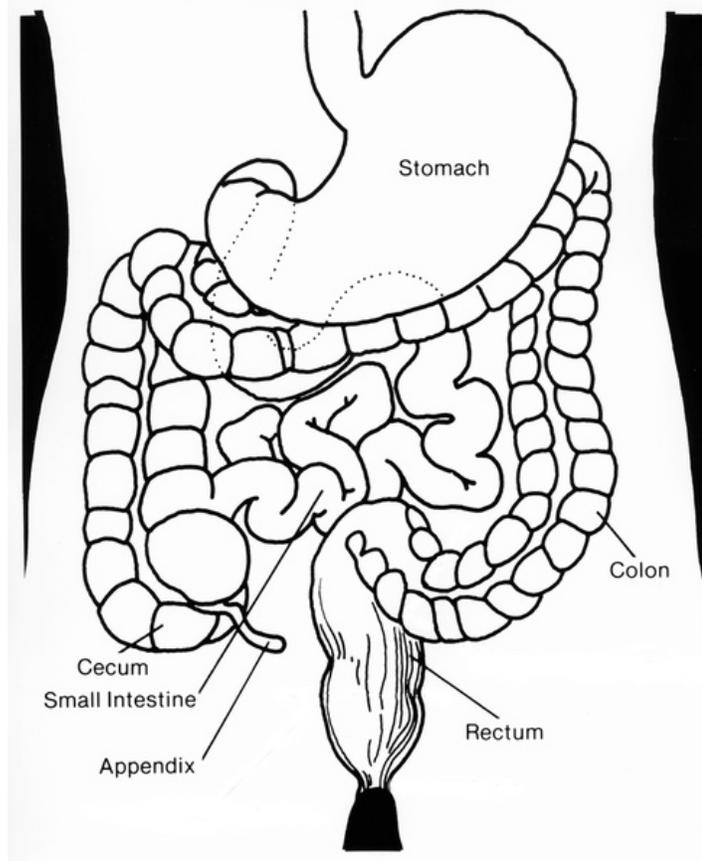
2) Observe the food labels for 8 different foods that you would eat.

3) Record in the data table below the name of the food and the total amount in **grams** of fat (lipids), proteins, and carbohydrates.

<b>Nutrition Facts</b>		
Serving Size 1 cup (236ml)		
Servings Per Container 1		
Amount Per Serving		
<b>Calories</b> 80	Calories from Fat 0	
% Daily Value*		
<b>Total Fat</b> 0g	←	0%
Saturated Fat 0g		0%
Trans Fat 0g		
<b>Cholesterol</b> Less than 5mg		0%
<b>Sodium</b> 120mg		5%
<b>Total Carbohydrate</b> 11g	←	4%
Dietary Fiber 0g		0%
Sugars 11g		
<b>Protein</b> 9g	←	17%
Vitamin A 10% • Vitamin C 4%		
Calcium 30% • Iron 0% • Vitamin D 25%		
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.		

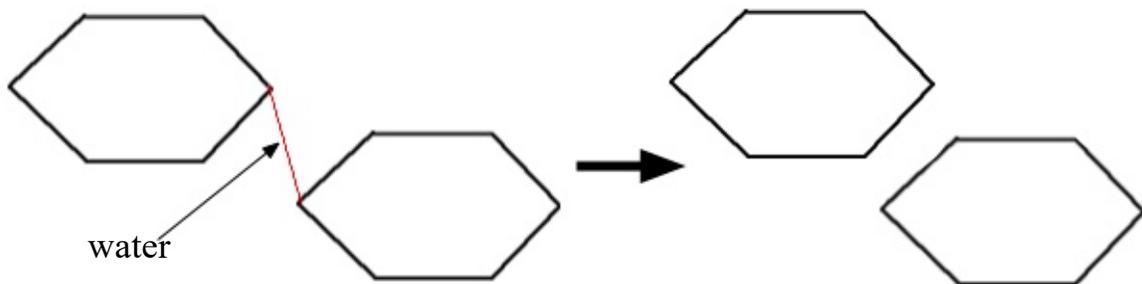
Data Table:

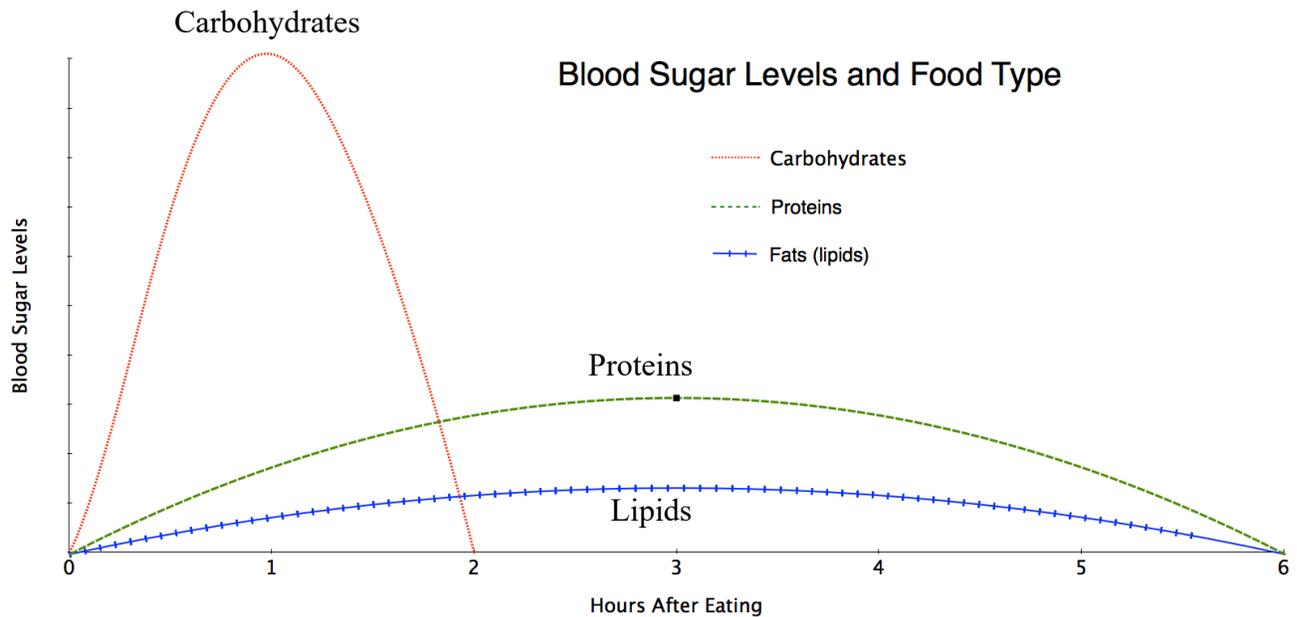
Name of Food	Total Carbohydrates	Total Fat	Protein	Total Calories
	g	g	g	kcal
	g	g	g	kcal
	g	g	g	kcal
	g	g	g	kcal
	g	g	g	kcal
	g	g	g	kcal
	g	g	g	kcal
	g	g	g	kcal



Your digestive system will break down the food you eat into smaller molecules called monomers.

- 4) What is the monomer of a carbohydrate? \_\_\_\_\_
- 5) What is the monomer of a protein? \_\_\_\_\_
- 6) The process of breaking down a larger molecule, called a polymer, into its monomers is called \_\_\_\_\_.
- 7) Draw circle and label the diagram below using the following words (polymer, monomer).





Notice in the graph that both fats and proteins can increase blood sugar levels but fat and proteins are not made out of sugars. It makes sense that carbohydrates are broken down into sugars, but not fat or proteins. Your body uses enzymes to convert the monomers of proteins (amino acids) into glucose.

8) What type of biomolecule is an enzyme? \_\_\_\_\_

9) What trend do you notice about carbohydrates in the graph above? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

10) Predict why is blood sugar important to understanding the type of food you eat. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

11) What trend do you notice about proteins and fats in the graph above? \_\_\_\_\_

\_\_\_\_\_

Fat can also clog your arteries (blood vessels) and cause a heart attack or stroke if eaten in large quantities over time. The fatty acids and cholesterol can attach to the sides of blood vessels, especially when they are inflamed, and cause a blood clot.

12) What type of food (carbohydrate, protein, fat) would be best for learning in school?

\_\_\_\_\_

13) Design the most optimal meal to last you all at day at school. Your goal is to avoid having a large fluctuation in your blood sugar. Your meal needs to include a main food and include how many servings for that food. The meal does not have to use the food you observed on page one, but it does need to have real nutrition facts. *If you eat more than one serving, then you will need to multiply the number of serving for the grams of carbohydrates, fats, proteins, and calories for that food.*

#1

Type of Food	Carbohydrates	Fats	Proteins	Calories
	g	g	g	kcal
Number of Servings _____	Multiply each by the # of servings			
<b>Total</b>	g	g	g	kcal

14) Write a Claim Evidence Reasoning three sentence paragraph. This paragraph will be about food you chose above and explain why you chose that food using information from page 3. Fill in the paragraph using the sentence frames.

I claim that \_\_\_\_\_ would be the ideal lunch/brunch for school. The evidence to support my claim is that food has \_\_\_\_\_ number of grams of \_\_\_\_\_ and has \_\_\_\_\_ number of grams of \_\_\_\_\_.

The reason why I chose the food is that \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_