



## WOW at Home Lesson Plan Food Biochemistry

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**Program Duration:**

30-45 minutes (depends on how many substances tested)

**Recommended Grade Levels:**

Grades K-5

**Materials Needed:**

- Household food items
- Water (control)
- Brown paper bag
- Pen
- Small plastic cups to put test substances in
- Cups or bowls to put test substances in
- Iodine solution
- Dropper or syringe

**Learning Objectives**

Students will be able to determine fat and starch contents of many different foods.

**Preparation**

- Discuss with your child what fat and starches are
- Ask them what foods they think are fattier and starchier
- Provide examples of foods that have a high fat content or high starch content
- Ask them which food items they would be interested in testing

**Background**

Proteins, lipids (fats), and carbohydrates (sugar and starches) are the building block of living cells. They are referred to as biological macromolecules. These macromolecules are used to store energy that the body can use for everyday activities. Without these biological macromolecules, our bodies would not have the energy necessary to perform daily functions. Each of these macromolecules have their own different functions.

Carbohydrates provide cells with quick/short-term energy. Lipids provide cells with long-term energy. Proteins have many functions that help the function of cells such as providing structural support, sending chemical signals, speeding up chemical reactions, etc. Therefore, each of these macromolecules are used by the body in different ways, but are all important for growth, maintenance, and activity. This experiment provides a quick and easy way to determine which foods are high in fat and which foods contain starch.

**Activity****Fat Test**

1. Check out the worksheet provided for a list of items to test – feel free to add new items to test as well.
2. On a brown piece of paper, draw and label squares for each food sample.
3. Spread a little bit of each sample in its corresponding square. If the food is solid, make sure to crush it and smear on the paper.
4. Wait around 15 minutes for the food samples to dry.

5. Once dry, note which foods left translucent spot on the paper. Hold up to light if need to see better.

**Starch Test**

1. Check out the worksheet provided for a list of items to test – feel free to add new items to test as well.
2. Take a small sample of each food and put it in a plastic cup.
3. Add a drop or two of iodide solution onto each food sample.
4. Note on which foods the drop(s) of iodide turned blue.

\* For both tests, use water as a control to see that there are no changes (dip the brown piece of paper in water and add water drops to the food sample to show no change in both tests)

**Additional Questions**

1. Is there a certain trend to which foods had more fat?
2. Is there a certain trend to which foods had starch?
3. Which results were surprising or unexpected?
4. Why is it important to know which foods contain more fat and which contain starch?
5. Would you change your diet in any way to incorporate more/less foods that contain fat or starch?

**Summary**

Many foods are categorized by how much of the biological macromolecules they contain. If the food is high in fat content, it will be greasier than a food low in fat content. If a food contains starch and iodine is reacted with it, the reaction will yield a blue color. Understanding the makeup of food allows for a better diet and a healthier lifestyle. Moving forward, try to think about which foods contain more of which biological macromolecule!



<b>Fat Test: Translucent Spot Left?</b>			
<b>Substance</b>	<b>Your Guess (Y/N)</b>	<b>Actual (Y/N)</b>	<b>Ranking</b>
Water			
Milk			
Butter			
Peanut Butter			
Olive Oil			
Nutella			
Egg Whites			
Egg Yolks			
Yogurt			
Potato Chips			

<b>Starch Test: Blue Color?</b>		
<b>Substance</b>	<b>Your Guess (Y/N)</b>	<b>Actual (Y/N)</b>
Water		
Cooked Pasta		
Bread		
Crackers		
Flour		
Potato		
Sugar		
Corn Starch		
Potato Chips		