

NAME \_\_\_\_\_

## 2.2 Review

### 2.2 a. What are the main nutrients found in food? 2.2 b. How can carbohydrates, lipids, and proteins be detected in food?

Sugar, starches, lipids, and proteins are found in food. These nutrients supply the energy and resources needed by our cells to function correctly.

Tests on food require specific chemical indicators.

\*Starch is identified with - \_\_\_\_\_

\*Sugar is identified with - \_\_\_\_\_

\*Protein is identified with - \_\_\_\_\_

### 2.2 c. What types of foods supply sugar, starch, proteins, and lipids? 2.2 d. How can food labels be used to evaluate dietary choices? 2.2 f. What are basic recommendations for a diabetic diet?

Nutrition Facts	
Serving Size 1 cup (228g)	
Servings Per Container 2	
<b>Amount Per Serving</b>	
<b>Calories 250</b>	Calories from Fat 110
<b>% Daily Value*</b>	
<b>Total Fat 12g</b>	18%
Saturated Fat 3g	15%
Trans Fat 3g	
<b>Cholesterol 30mg</b>	10%
<b>Sodium 470mg</b>	20%
<b>Potassium 700mg</b>	20%
<b>Total Carbohydrate 31g</b>	10%
Dietary Fiber 0g	0%
Sugars 5g	
<b>Protein 5g</b>	
Vitamin A	4%
Vitamin C	2%
Calcium	20%
Iron	4%
* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g

Start here

Check calories

Quick guide to % DV

5% or less is low  
20% or more is high

Limit these

Get enough of these

Footnote

\*Sugars and starches come from carbohydrates. Grains, fruits, veggies, dairy, sweets.

\*Proteins come from dairy, meat, beans, nuts, eggs

\*Lipids come from saturated, unsaturated, and trans fats. Meat, oils, nuts, veggies, dairy.

\*Food labels give us an idea of how much to eat based on a 2000 calorie diet. Serving sizes and daily values are guides.

\*Diabetic diets are based on high protein low carbohydrate/sugar foods.

\*Would this food label represent a food that would be recommended or avoided? Explain your choice.

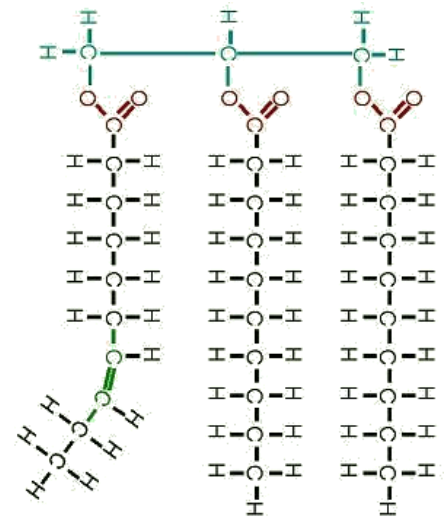
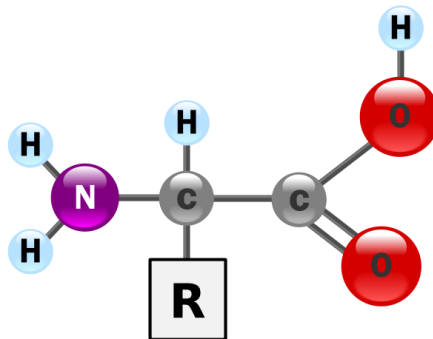
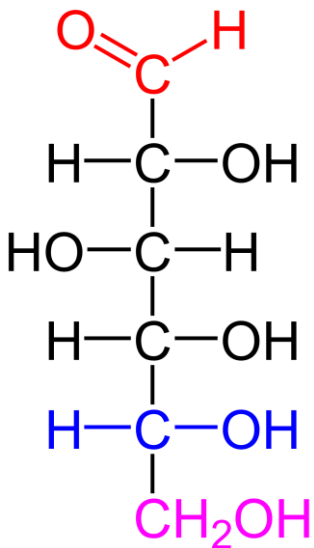
### 2.2 e. What role do basic nutrients play in the function of the human body?

Carbohydrates and sugar are used as the body's primary energy source. Glucose is used to produce molecules of ATP. Proteins are used to build muscle, form enzymes and hormones, and repair cellular parts. Lipids are also an energy source. They provide more energy than carbohydrates but are not used until the carbohydrate supply is gone. They provide the material for the cell membrane and fat-soluble vitamins.

### 2.2 g. What are the main structural components of carbohydrates, proteins, and lipids?

MONOMER	POLYMER
Monosaccharide (glucose, fructose, galactose)	Carbohydrate (C, H, O)
Amino Acid (20 different)	Protein (amine, variable group, carboxyl group)
Glycerol + Fatty Acid Chain	Saturated/Unsaturated fat (Triglyceride)

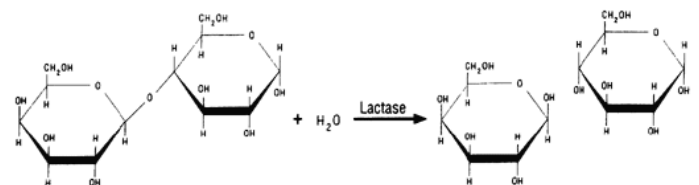
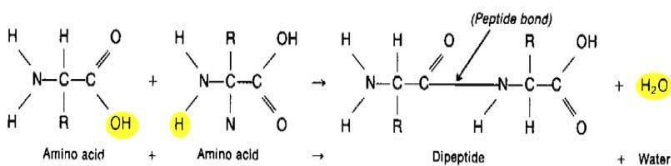
Identify each of the polymers below and the elements/components in the table.



### 2.2 h. What is dehydration synthesis and hydrolysis? 2.1 i. How do dehydration synthesis and hydrolysis relate to harnessing energy from food?

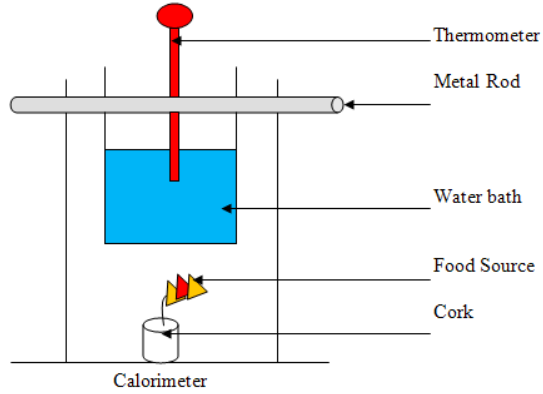
Dehydration Synthesis "Remove water and come together"	Comparison	Hydrolysis "Split with water"
The reaction that builds macromolecules. As 2 molecules join to form 1, they give off a water molecule. This reaction <b>requires</b> energy.	They are exact opposites.	The reaction that splits macromolecules, typically during digestion. Each water molecule can break one bond. This reaction <b>releases</b> energy.

Label the following reactions as dehydration synthesis and hydrolysis.



## 2.2 j. How is the amount of energy in food determined?

The energy in food is determined by calorimetry ("energy measurement"). Food is burned to break the chemical bonds. The heat released by the bonds breaking is captured in water. The change in mass and the change in temperature are used to determine the cal/g in the food sample.



$$\text{Calories in Food Sample} = (600\text{g})(\text{Change in Water Temperature } [^{\circ}\text{C}]) \left( \frac{1 \text{ Calorie}}{\text{Kg}^{\circ}\text{C}} \right) \left( \frac{1\text{Kg}}{1000\text{g}} \right)$$

Calories per Gram (Cal/g) =

$$\text{Calories in Food Sample (Cal)} \div \text{Change in the Mass of the sample (g)}$$