

Food Analysis



Real World Energy
Learner Worksheet
Grade Level: 9-12

Name:

Part 1: Background Questions

Read the food analysis backgrounder and answer the following questions.

1. Complete the following table.

| Body Fuel Type | Role of Fuel in the Body | Examples of Foods that Provide the Fuel |
|----------------|--------------------------|---|
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| | | |

2. What fuel type is used as a source of energy when carbohydrates are depleted?

3. You are planning a long hike that is quite strenuous. List at least three food items that would be good to take on the hike for keeping up your energy supply.

4. Provide a definition for "balanced diet." What does it mean and why is it important?

5. What is a calorie?

Part 2: Lab Investigation

Record your observations from your tests on the food items in the observation chart below.

Observations Chart:

A (-) sign means that a certain molecule is not present in a food sample. A (+) sign means that a certain molecule is present in a food sample. Place a (-) sign if the food item does not contain sugars, starch, proteins or fats. Place a (+) sign if the food item contains sugars, starch, proteins or fats.

| Food Item | Presence of sugars (colour turns green, yellow, orange, red-brown) | Presence of starch (colour changes from a red-brown to purple or blue-black colour) | Presence of proteins (colour changes to pink, violet or purple) | Presence of fats (can see through the paper, paper is translucent) |
|-----------|---|--|---|---|
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Questions:

- List the food items that tested positive for more than one category.

- In the table below, list other foods that you think would test positive for the various categories.

| Food Category | List foods (other than the ones that you tested) that you think would test positive for the following |
|---------------|---|
| Sugars | |
| Starch | |
| Proteins | |
| Fats | |

3. You are given food samples. One sample contains only glucose, one contains only starch, one contains both glucose and starch, and one contains both glucose and starch. How would you test these samples to determine which nutrients are present? What test results would you expect?

| Sample | Test | Result |
|-------------------------|------|--------|
| Glucose only | | |
| Starch only | | |
| No glucose or starch | | |
| Both glucose and starch | | |

Part 3: Lab Demonstration

Calorimetry Observations:

| Food Tested | Mass of Food (g) | Initial Temp. of Water (°C) | Final Temp. of Water (°C) | Change in Temp. of Water (°C) |
|-------------|------------------|-----------------------------|---------------------------|-------------------------------|
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To compare the amount of heat given off by different foods, you need to find the amount of heat produced per gram of food. To find this, divide the temperature change of the water by the mass of food that was burned.

$$\text{Heat produced per gram of food} = \frac{\text{Heat gained by water (change in temperature)}}{\text{Mass of food burned}}$$

Questions:

1. Which food increased the water temperature the most?

2. Which food contained the most energy?

3. Where do you find information about calories in daily life?

4. Calculate the amount of calories present in a sample food item based on the experiment below.

