



You Are What You Eat!

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| Time | Grade Level | Content Area [s] |
|------------|-------------|------------------|
| 90 minutes | Grades 3–5 | Life Science |

Objective

Students will identify through testing which foods contain carbohydrates, fats, sugars, or proteins. These activities will help students connect the science of food makeup to the abundant variety available to them in their daily choices.

Activity Outline

- 1 Have students select one of the short articles from *Food and Nutrition* and present brief explanations of the main topic of the article to the class. The articles share a common theme: selecting healthy foods. As students provide overviews of the articles, the idea that students should eat a variety of foods including grains, proteins, carbohydrates, and oils—all in moderation—becomes evident.
- 2 Before starting the tests, have students (individually or as a class) make predictions about the category of each food from the materials list based on their readings and presentations from the book. Additionally, review Material Safety Data Sheets (MSDS), review proper safety, and model the procedures.

Materials

- Paper towels
- White paper
- Iodine solution [and MSDS]
- Benedict's solution [and MSDS]
- Matches
- Candle
- Dissecting needle
- *Food and Nutrition* by Tara Koellhoffer

For each group of 2–3 students:

- 1 teaspoon cooked hamburger
- 1 cracker
- 1 half-inch slice of a potato, apple, or pear
- 1–2 potato chips
- One 1 x 1 square in. of cheese

- 3 Distribute the food samples to each group and have them put each of the foods on a paper towel. Students should test each food sample for each category (fat, carbohydrate). To test for starch-type (complex) carbohydrates, students should add one drop of iodine to each food sample. If there is a color change to black, a starch is present in the food. If the drop remains a reddish brown (the original color of the iodine), no starch is present. To test for sugar-type (simple) carbohydrates, students should add a single drop of Benedict's solution to the sample (in a different spot) and once again watch for a color change. If there is a dark blue-green color change, sugars are present in the food. If the color is light blue-green, no sugar is present.
- 4 Using new samples of food, students should now test for fats by placing the food samples on a white sheet of paper. Using a sheet of paper on top of the samples, have them smash or mush the food samples on the paper.
- 5 Remove all of the food samples and inspect the paper for a translucent mark (the same type of mark that would be left from greasy fingers on a paper). If a translucent mark is evident, there is fat in the food. If the paper is simply wet, there is no fat present.
- 6 To test for proteins, conduct the following demonstration for the class. Collect a small amount of each food item, one at a time, on the dissecting needle, and place it over the candle flame. If the food sample begins to burn, remove it from the flame, and blow it out. Using a wafting motion with your hand, ask students to determine whether there is a rotten egg smell (sulfur) present. If so, the sample contains proteins that are being broken down by the flame. If no odor is present, proteins are not present in the food. Never place smoking materials directly under your or your students' noses.
- 7 Upon completion of the activities, students need to wash off tabletops and hands with soap and water. Be sure to properly dispose of the tested food items.

Goals

3-5: These activities will help students connect the science of food makeup to the abundant variety available to them in their daily choices.

Post Assessment

Refer back to the predictions made by the students and see how accurate they were. Were there any surprises?



Safety

Students must wear non-latex gloves, aprons, and indirectly vented chemical-splash goggles for the following activities. Nothing in this experiment should be put in or near the mouth—food in science class is for investigation only. The solutions and dissecting needles can be obtained from your district's high school biology class. During the demonstration involving fire, you must have an A-B-C type fire extinguisher in the room.

Before students begin, share information from the MSDS, review proper safety, and model the procedure.

Teaching through Trade Books

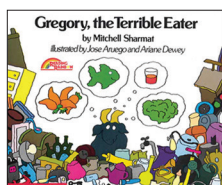
Activities inspired by children's literature

You Are What You Eat!

By Christine Anne Royce

Kids today have a dizzying array of food choices, but choosing healthily is a challenge. Making wise choices is essential in maintaining a healthy lifestyle. This month's topic of healthy foods fits into science nicely when students start to consider the value of what they are eating and experiment to determine the makeup of some of their favorite foods.

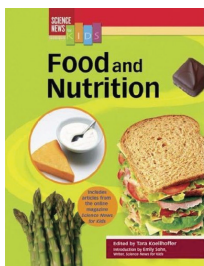
This Month's Trade Books



Gregory, the Terrible Eater
By Mitchell Sharmat.
Scholastic. 1985.
ISBN 0590433504.
Grades K–3

Synopsis

Gregory the Goat is a “terrible eater” from a goat’s perspective. He refuses to eat items such as tin cans and shoes, which are staples in a fictional goat’s diet. Rather, he wants to eat healthy things such as eggs, fruits, and vegetables. The illustrations help students see that they have a choice in selecting what they eat—even if it isn’t a popular choice.



Science News for Kids: Food and Nutrition
By Tara Koellhoffer.
Chelsea House. 2006.
ISBN 079109121X.
Grades 3–5

Synopsis

This book is part of a series that highlights news articles for students and is a great springboard to discussing a common topic—what we eat and more important how

what we eat affects our lives. The book uses a variety of strategies—articles, sidebars, illustrations, and pictures—to provide information on the topic of how to select healthy foods for a healthy lifestyle.

Curricular Connections

In many elementary schools, health and science are taught together. Making healthy food choices also falls under the Science in Personal and Social Perspectives standard, which states, “Nutrition is essential to health ... Recommendations for good nutrition include eating a variety of foods, eating less sugar and eating less fat” (NRC 1996, p. 140). These activities inform students about healthy eating habits, but these may differ from what they are eating at home, so it is important to treat this topic with sensitivity and to not pass judgment. This activity is meant to provide students with the opportunity to explore what “healthy foods” are in order to make informed decisions. The best lesson is to eat a varied diet—there are many choices and many kinds of food can be considered “healthy.”

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Reference

National Research Council (NRC). 1996. *National science education standards*. Washington, DC: National Academies Press.

Testing Foods

Purpose:

To identify through testing which foods contain carbohydrates, fats, sugars, or proteins

Procedure:

1. Have students select one of the short articles from *Food and Nutrition* and present brief explanations of the main topic of the article to the class. Throughout the articles, there is a common theme: selecting healthy foods. As students are providing overviews of the articles, the idea that students should eat a variety of foods including grains, proteins, carbohydrates, and oils—all in moderation—becomes evident.
2. Have the students put each of the foods on a paper towel. Students should test each food sample for each category (fat, carbohydrate), which means that they may need more than one sample of the food. Before starting, students individually or as a class should make predictions about the category of each food based on their readings and presentations from the book.
3. Before students begin, share information from the MSDS, review proper safety, and model the procedure. To test for starch-type (complex) carbohydrates, students should add one drop of iodine to each food sample. If there is a color change to black, a starch is present in the food. If the drop remains a reddish brown (the original color of the iodine), no starch is present. To test for sugar-type (simple) carbohydrates, students should add a single drop of Benedict's solution to the sample (in a different spot) and once again watch for a color change. If there is a dark blue-green color change, sugars are present in the food. If the color is light blue-green, no sugar is present.
4. Using new samples of food, students should now test for fats by placing the food samples on a white sheet of paper. Using a sheet of paper on top of the samples, have them smash or mush the food samples onto the paper. Remove all of the food samples and inspect the paper for a translucent mark (the same type of mark that would be left from greasy fingers on a paper). If a translucent mark is evident, there was fat in the food; however, if the paper is simply wet, there is no fat present.
5. To test for proteins, the teacher should

Materials

- Paper towels, white paper, iodine solution (and MSDS), Benedict's solution (and MSDS), matches, candle, dissecting needle, and the following food samples for each group of 2–3 students: 1 teaspoon *cooked* hamburger; 1 cracker; 1 half-inch slice of a potato, apple, or pear; 1–2 potato chips, and one 1 × 1 square in. of cheese.
- Students must wear nonlatex gloves, aprons, and indirectly vented chemical-splash goggles for the following activities. Nothing in this experiment should be put in or near the mouth—food in science class is for investigation only. The solutions and dissecting needles can be obtained from your district's high school biology class. During the demonstration involving fire, you must have an A-B-C type fire extinguisher in the room.



conduct a demonstration. Collect a small amount of each food item, one at a time, on the dissecting needle, and place it over a candle flame. If the food sample begins to burn, remove it from the flame, and blow it out. Using a wafting motion with your hand, ask students to determine whether there is a rotten egg smell (sulfur) present. If so, the sample contains proteins that are being broken down by the flame. If no odor is present, proteins are not present in the food. Never place smoking materials directly under your or your students' noses.

6. Upon completion of activities, students need to wash off tabletops and hands with soap and water. Be sure to properly dispose of the tested food items.
7. Refer back to the predictions made by the students and see how accurate they were. Were there any surprises?

Understanding what comprises a healthy diet is an important aspect of daily life. These activities will help students connect the science of food makeup to the abundant variety available to them in their daily choices.

