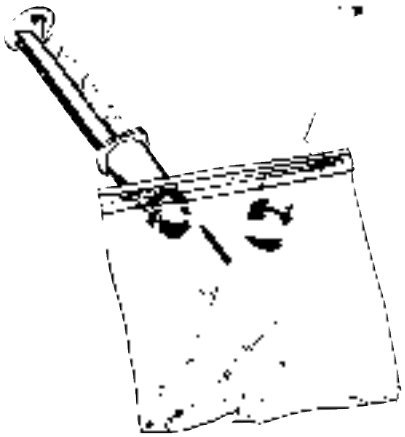
OVERVIEW
FOOD AND NUTRITION



GOALS

The **Food and Nutrition Module** consists of four sequential investigations that help students understand what food is, what it is made of, and how several nutrient groups contribute to healthful nutrition.

FOSS EXPECTS STUDENTS TO

- Observe and investigate properties of foods.
- Become aware of carbohydrates, proteins, fats, and vitamins as components of food.
- Gain experience with indicators.
- Use indicators to test for acid, vitamin C, sugar, and fat in foods.
- Relate the results of investigations and experiments to the amount of chemicals in foods.
- Become aware of guides for healthy nutrition.
- Become informed consumers, able to gather information about food products.
- Apply mathematics in the context of science.
- Acquire vocabulary associated with nutrition.
- Use scientific thinking processes to conduct investigations and build explanations: observing, communicating, comparing, organizing, and relating.

OVERVIEW CONTENTS

FOOD AND NUTRITION MODULE MATRIX

SYNOPSIS	SCIENCE CONTENT	THINKING PROCESSES
1. THE FAT TEST		
Students are introduced to fats in the human diet and conduct a fat search using the brown-paper technique. Equal weights of different food samples are spread on a specific area and allowed to soak into the paper. The area of spread for each food is compared to a sample of 100% fat.	• Brown paper can be used to indicate fat content in foods. • Fat is a nutrient found in many foods. • Foods can contain different kinds of fats, saturated (solid at room temperature) or unsaturated (liquid at room temperature).	• Observe evidence for the presence of fats in foods. • Organize and communicate results of the fat test. • Compare the amount of fat in common lunch foods. • Relate the area covered by oil from a food to the percentage of fat in that food.
2. THE SUGAR TEST		
Students use yeast metabolism as an indicator of the presence of sugar in foods. They experiment with different kinds of cereals and relate the amount of gas produced by yeast to the amount of sugar in the cereal. They use the sugar test to test foods for the presence of sugar.	• Yeast can be used to indicate sugar in foods. • A product of yeast metabolism is carbon dioxide, the same gas produced by most organisms. • Sugar is a simple carbohydrate, which is a nutrient found in foods. • Some foods contain more sugar than others do.	• Observe and describe evidence of yeast metabolism. • Organize and communicate results of experiments using yeast as an indicator of sugar. • Conduct controlled experiments.
3. THE ACID TEST		
Students use baking soda as an indicator of acid. In a closed system, the volume of gas produced by the acid/baking soda reaction is related to the concentration of acid in the sample. Students test foods for general acid content and for a specific acid, vitamin C, using indophenol.	• The sour taste of foods is due to acid. • Baking soda and acid react chemically to form new products, one of which is carbon dioxide. • Baking soda can be used to indicate acid. • Indophenol can be used to indicate vitamin C, ascorbic acid.	• Observe and describe the chemical reaction between baking soda and acids. • Compare the concentration of acid in foods to vinegar. • Organize and communicate findings. • Relate the taste of food to acid. • Relate the number of drops needed to trigger an indicator to the concentration of vitamin C.
4. FREE LUNCH		
Students learn that foods often combine different kinds of nutrients. They guess the identity of lunch items from lists of ingredients. They assemble hypothetical lunches and analyze them in terms of their fat, carbohydrate, and protein content. They calculate the number of calories contributed by each nutrient group and assess the nutritional value of their lunches.	• Calories are a measure of the amount of energy in foods. • Labels on food packages provide nutritional information on carbohydrates, proteins, fats, vitamins, and calories. • Fats have more than twice as many nutritional calories as carbohydrates and proteins.	• Observe nutritional information on food packages. • Organize nutritional information for a lunch menu. • Relate the kinds of ingredients in the foods to the nutritional calories.

INTERDISCIPLINARY EXTENSIONS	FOSS SCIENCE STORIES	TECHNOLOGY/HOME CONNECTION
Language Extensions • Read food labels. • Look into ethnic cooking. • Research fats in processed foods. • Research worldwide fats. **Math Extensions** • Problem of the week. • Calculate percentage, alternative method **Science Extensions** • Add heat to the test. • Put fat in the refrigerator.	See the Science Stories folio. • *Face the Fats* • *The Digestive System*	www.fossweb.com Check the FOSS website for interactive simulations, to write questions to a scientist, for teaching tips, and to talk with other classes using FOSS. Home/School Connection: Students conduct the fat test on the foods they eat for dinner.
Language Extensions • Find sugars in food products. • Research sugar sources. • Test the effect of temperature on yeast. • Research breakfast around the world. **Math Extensions** • Problem of the week. • Calculate percentage of sugar. **Science Extensions** • Test various sugars. • Test liquids. • Test sugar substitutes.	See the Science Stories folio. • *A Sweet Story* • *Sugar Smarts* • *Living with Diabetes*	Home/School Connection: Students see and feel the effect sugar has on their bodies.
Language Extensions • Report on vitamins. • Research scurvy. • Report on fruits from around the world. **Math Extensions** • Problem of the week. • Graph results of vitamin-C test. **Science Extensions** • Test other acid foods. • Investigate orange drinks. • Find out what happens to the vitamin C.	See the Science Stories folio. • *Your Terrific Tongue* • *Vitamins* • *The Scourge of Seafarers* • *Linus Pauling*	Home/School Connection: Students check the foods they eat to see what vitamins they are getting.
Language Extensions • Research nutrition and growing up. • Make posters. • Make a nutritional information book. • Collect ads. • Investigate international diets. **Math Extensions** • Problem of the week. • Calculate calories and nutrients in foods. • Find out about school-lunch nutrition. **Science Extensions** • Stock a classroom supermarket. • Review fast food. • Ponder food additives. • Plan a breakfast or a supper.	See the Science Stories folio. • *Food Labels* • *Healthy Eating, International Style* • *Finding a Cause for Rickets* • *Healthy Kids* • *Living Cells* • *Blood: The Fluid That Connects*	Home/School Connection: Students will need extra time at home to work on presenting their projects to the class.

FOSS AND NATIONAL STANDARDS

The **Food and Nutrition Module** encourages students to develop the skills of investigation in order to build explanations based on knowledge and evidence. This module supports the following National Science Education Standards.

SCIENCE AS INQUIRY

Develop students' abilities to do and understand scientific inquiry.

- Identify questions; design and conduct scientific investigations to answer those questions.
- Employ tools to gather, analyze, and interpret data.
- Develop and communicate explanations using evidence.
- Use mathematics in scientific inquiry.
- Understand that scientists use different kinds of investigations and tools to develop explanations using evidence and knowledge.

CONTENT: LIFE SCIENCE

Develop students' understanding of functions of living systems.

- One of the systems of the human organism is the digestive system. This system interacts with the other systems in the human body.
- Disease is a breakdown in structures or functions of an organism and can be caused by improper nutrition.

SCIENCE AND TECHNOLOGY

Develop students' understandings about science and technology.

- Scientists work collaboratively in teams and use tools and scientific techniques to make better observations.

SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVES

Develop an understanding of personal health.

- Food provides energy and nutrients for growth and development. Nutrition requirements vary with body mass, age, sex, activity, and body functioning.