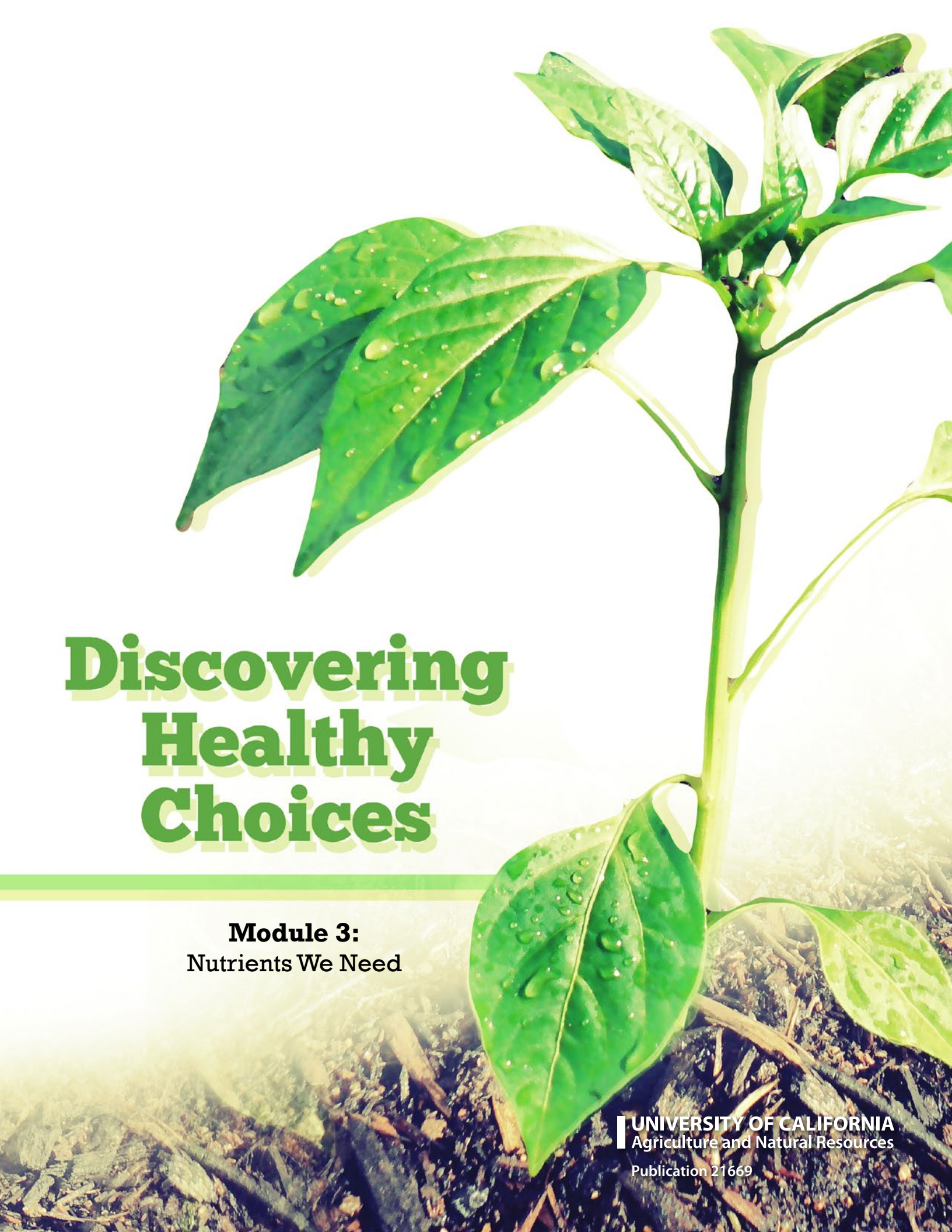

Discovering Healthy Choices

Module 3:
Nutrients We Need

UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources
Publication 21669

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UNIVERSITY OF CALIFORNIA Agriculture and Natural Resources

UC DAVIS CENTER for NUTRITION in SCHOOLS

Shaping Healthy Choices

Adapted from *Nutrition to Grow On*

This curriculum is an adaptation of *Nutrition to Grow On*, a garden-enhanced nutrition curriculum for upper elementary school children. Authors: Jennifer Morris and Sheri Zidenberg-Cherr, Department of Nutrition, University of California, Davis in collaboration with the California Department of Education and Mary Shaw, Solano County Master Gardener, University of California Cooperative Extension.

Results from Research

This curriculum was tested as part of the Shaping Healthy Choices Program research project during the 2012–2013 school year. Fourth grade youth participating in the Shaping Healthy Choices Program increased knowledge about nutrition and consumption of vegetables, and the rates of obesity were reduced from 56% to 38% (Scherr et al. 2014). In a subsequent study the Discovering Healthy Choices curriculum was implemented by fourth-grade teachers as part of the Shaping Healthy Choices Program in the 2013–2014 school year. Participating youth improved their knowledge about nutrition, critical thinking skills, and ability to identify vegetables (Linnell et al. 2016). Additionally, there was a significant reduction in average body mass percentile-for-age. The Shaping Healthy Choices Program was then piloted through the University of California CalFresh SNAP-Ed program and University of California Cooperative Extension and positive outcomes were observed, though they varied among implementation sites (Bergman et al. 2018). The research team attributed the variation to differences in fidelity to the curriculum, with the highest fidelity corresponding to the greatest improvements in outcomes.

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Facilitator Tips: How to Get the Most from This Curriculum

Teaching and Learning Strategies

All activities in the *Discovering Healthy Choices* curriculum were designed using experiential learning and inquiry. Experiential learning is grounded in the idea that experience is essential to learning and understanding. Specifically, experiential learning involves a recurring sequence of three distinct steps: 1) an experience ("Procedure/ Experiencing") that involves learner exploration; 2) a period of discussion and reflection ("Sharing, Processing, and Generalizing"), where learners share their reactions and observations, process their experience, and make generalizations to real-life examples; and 3) an opportunity to apply ("Apply") new knowledge and skills in an authentic manner, which helps learners deepen and broaden their understanding (it helps learning last!).

Inquiry is a teaching and learning strategy whereby learners are engaged in activities that require the observation and manipulation of objects and ideas in order to construct knowledge and develop skills. Inquiry is grounded in experience, focuses on the use and development of critical thinking skills, and targets the learning and application of specific content knowledge. Furthermore, inquiry starts with a question, and effective questioning strategies are critical when facilitating inquiry-based learning. Open-ended questions or prompts (e.g., "Explain what you know about…"; or "Discuss your understanding of…") promote learner inquiry and are considered more effective than closed-ended questions or prompts (e.g., "Name the parts of…"; or "What is the name of…?").

The inquiry-based activities in the *Discovering Healthy Choices* curriculum were designed using the 5-step Experiential Learning Cycle by Pfeiffer and Jones (1983): Experience, Sharing, Processing, Generalizing, and Application. It is recommended that adequate time be allotted for youth learners to proceed through each step in order for learning to be maximized.

Behavior Change Strategies

As part of *Discovering Healthy Choices*, learners will discover nutrition concepts through hands-on and garden-based nutrition activities. Garden-based activities allow youth to enhance nutrition knowledge, preferences for vegetables, and consumption of fruits and vegetables, and also gives them an opportunity to explore agriculture and the environment while improving life skills, self-esteem, social skills, and behavior (Heim et al. 2009; Jaenke et al. 2012; Lineberger and Zajicek 2002; Linnell et al. 2016; McAleese and Rankin 2007; Morgan et al. 2010; Morris and Zidenberg-Cherr 2002; Parmer et al. 2009; Robinson-O'Brien et al. 2009; Scherr et al. 2014).

The *Discovering Healthy Choices* curriculum activities were designed using the Social Cognitive Theory as a framework (Glanz and Viswanath 2008). The structure and content of the activities address Social Cognitive Theory domains of behavioral capabitlity, self-efficacy, and reciprocal determinism. A detailed description of how the behavior change strategies were applied is available elsewhere (Linnell et al. 2016).

Target Audience

Discovering Healthy Choices was developed for youth in upper elementary school (grades 4–6) and to be used in formal and non-formal educational settings. Curriuclum activities support educational standards for grades K–12 and may be adapted for use in other grade levels.

Facilitator Tips: How to Get the Most from This Curriculum (cont.)

Organization of the Learning Environment: Creating Environments Where Learning Happens

The activities in the *Discovering Healthy Choices* curriculum were designed to be facilitated in a small group-learning environment. Learners construct understanding through inquiry using observations, the manipulation of objects and ideas, and personal reflection. However, learning is a social endeavor where dialogue and reflection with others are critical elements. Therefore, creating physical and social environments where learners can carry out inquiry will help learners organize their thoughts and develop an understanding of the content and processes being emphasized in specific curriculum activities.

Organization of the Curriculum

The modules are sequenced so that foundational concepts are discovered first and then built upon with more advanced concepts as they continue through the modules.

Each module consists of one hands-on activity, one application activity in the instructional garden, and multiple take-home application activities. When learners apply their new knowledge and skills in authentic situations, this is when they are able to develop deeper understanding of the subject matter. At this point, youth have already completed the hands-on activities that have introduced new concepts and skills. The application activities provide the youth with the opportunity to take what they have learned and apply it to independent, real-world situations in the instructional garden, at home, or in the classroom. This application of knowledge is a critical step of the learning process.

Curriculum Activity Layout

- **Activity Title**
  The activity title introduces the facilitator to the topic that will be addressed during the activity.

- **Background Information**
  This introductory section provides facilitators with a brief overview of the subject matter and provides examples that help to explain the importance of the topic.

  > **Facilitator Tip:** The background information is not meant to be shared with the youth prior to the activity. Rather, it is intended to support facilitators by providing factual information that may help ground and inform group discussions.

- **Life Skills**
  Life skills are abilities that help youth become productive, contributing members of society. The activities are designed to provide youth with the opportunity to practice particular life skills that are utilized in everyday life. The life skills targeted are listed for each activity (Norman and Jordan n.d.).

- **Subject Links**
  This describes other subject areas that are connected to the module.**Education Standards Supported**

  This curriculum supports Common Core State Standards, Next Generation Science Standards, and California Nutrition Education Competencies. Specific details for standards addressed for each grade level is described in the "Education Standards Supported" section on page 9.

- **Time Required**
  Each module includes an estimate of the time needed to complete the activities. The actual time required for the activities will vary based on level of learner interest, size of the group, age of the group members, and the setting in which the activities take place.

Facilitator Tips: How to Get the Most from This Curriculum (cont.)

- **Learning Objectives: Concepts and Vocabulary**
  Facilitators are provided with a list of defined concepts and vocabulary that is meant to be discovered by the youth during their exploration and completion of the activities. The list should not be provided to the youth at the beginning of the activity. At the end of each activity, the facilitators should ensure that the appropriate terms and concepts have been discovered by or introduced to the youth.

- **Suggested Groupings**
  Suggestions are provided for the group size designed for each activity. The suggested groupings are meant to help facilitate quality learning among the youth. Some activities are designed for youth to work in either small groups, large groups, or individually.

- **Materials Needed**
  A list of the materials needed to complete the activities is provided for the facilitator. The list describes the materials to be used. Most materials are provided (these are marked with an *); however, other materials will need to be obtained prior to activity implementation.

- **Getting Ready**
  This list describes what needs to be done by the facilitator to prepare for the activity, how many of each of the materials to prepare, and what tasks need to be completed prior to the beginning of the activity.

- **Opening Questions/Prompts**
  Questions or prompts presented at the beginning of each activity are meant to draw the youth into the topic being addressed in the activity. Responses to the questions will provide the facilitator with an understanding of what the youth already know about the topic. Facilitators should encourage the youth to record their answers to these introductory questions on the provided flip chart paper, as this is an important part of the learning process. This is the point when the activity begins with the youth. Opening Questions/Prompts should be asked as they are written. Open-ended questioning is a key element of inquiry-based learning.

- **Procedure (Experiencing)**
  This is the part of the curriculum when the youth experience and complete the activity itself. It is highly recommended that facilitators read the procedure in its entirety before implementing with the youth so that the activity flows smoothly. It is important for youth to record their observations, ideas, and other thoughts during the procedure on the flip chart paper provided, as this is an important part of the learning process.

- **Facilitator Tips**
  These are suggestions and additional information for the facilitator.

- **Sharing, Processing, and Generalizing**
  Following the procedure, there is a period of reflection, during which time the youth come back together as one group and share their observations with each other. This phase provides youth an opportunity to communicate their findings, listen to what others discovered, consider the various thought processes, and learn from each other. It helps to solidify what the youth have learned throughout the course of the activity. This phase also contains prompts that allow the youth to engage in thinking about how they went about solving a problem. This is called meta-cognition, which is considered a key element in developing a deeper understanding.

- **Concept and Term Discovery/Introduction**
  At this point of the activity, most of the concepts will have most likely already been discovered by the youth. Many concepts will have already been defined by now as well. However, some concepts may have been missed or poorly understood and need to be clarified; additionally, technical terms may need to be introduced to the youth. Ensure that all terms/concepts have been discovered or introduced to the youth. Additionally, make certain that any misconceptions have been addressed.

Facilitator Tips: How to Get the Most from This Curriculum (cont.)

Starting an Instructional Garden

- **Books and Downloadable Resources**
  Gardens for Learning: A Guide for Creating and Sustaining Your School Garden. Available at the California School Garden Network website, http://www.csgn.org.

  Getting Started: A Guide for Creating School Gardens as Outdoor Classrooms. Available at the Center for Eco Literacy website, http://www.ecoliteracy.org/downloads/getting-started.

  Sunset Western Garden Book (9th ed). 2012. New York, NY: Time Home Entertainment.

- **School Garden Grant Opportunities**
  California Fertilizer Foundation awards grants of $1,200 to California K–12 school garden programs. Awards include educational materials. Applications reviewed in January and June. The grant application is available at the California Fertilizer Foundation website, http://www.calfertilizer.org.

  KidsGardening offers a variety of grant programs with awards of up to $500. Information about grants is available at the KidsGardening website, https://kidsgardening.org.

  Western Growers Foundation offers grants and start-up supplies for school gardens in California and Arizona. Information and grant applications are available at the Western Growers Foundation website, http://www.wga.com.

Extension Opportunities Beyond the Learning Setting

Discovering Healthy Choices was developed as part of the Shaping Healthy Choices Program. The Shaping Healthy Choices Program is a multicomponent approach to improving children's food choices. Other components of this program include a curriculum for cooking demonstrations, *Cooking Up Healthy Choices*, and family newsletters called *Team Up for Families*.

Cooking Up Healthy Choices is directly linked to *Discovering Healthy Choices*. It was developed to offer more opportunities for youth to apply the concepts they have learned through the participation in five cooking demonstrations.

The *Team Up for Families* newsletters include messages about what the youth are learning in the *Discovering Healthy Choices* curriculum, in addition to positive nutrition-related parenting practices. Each of the eight newsletters is designed to link to each of the eight modules in *Discovering Healthy Choices*.

Food Safety and Other Considerations

The *Discovering Healthy Choices* curriculum includes activities where food is prepared for consumption and for handling. When preparing foods, it is important to follow food safety guidelines published by the Food and Drug Administration at their website, http://www.fda.gov/Food/FoodborneIllnessContaminants/BuyStoreServeSafeFood/ucm255180.htm. It is also important to be aware of youths' food allergies and alter recipes accordingly.

Facilitator Tips: How to Get the Most from This Curriculum (cont.)

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Educational Standards Supported

Next Generation Science Standards Supported

	Modules	K	1	2	3	4	5	6	7	8	9	10	11	12
Life Science Progression														
LS1.A Structure and function	2, 3				•	•	•	•	•	•	•	•	•	•
LS1.C Organization for matter and energy flow in organisms	2, 3, 5	•	•	•	•	•	•	•	•	•	•	•	•	•
LS2.A Interdependent relationships in ecosystems	2, 3, 7	•	•	•	•	•	•							
LS2.B Cycles of matter and energy transfer in ecosystems	2, 3, 7	•	•	•	•	•	•	•	•	•	•	•	•	•
LS4.D Biodiversity and humans	2, 3, 7	•	•	•	•	•	•							
Science and Engineering Practices														
1. Asking questions and defining problems	1, 2, 3, 4, 5, 6, 7, 8	•	•	•	•	•	•	•	•	•	•	•	•	•
3. Planning and carrying out investigations	2, 3, 4, 5, 7	•	•	•	•	•	•	•	•	•	•	•	•	•
4. Analyzing and interpreting data	2, 3, 4, 5, 7, 8	•	•	•	•	•	•	•	•	•	•	•	•	•
5. Using mathematics and computational thinking	2, 4, 6	•	•	•	•	•	•	•	•	•	•	•	•	•
6. Constructing explanations and designing solutions	2, 3, 4, 8	•	•	•	•	•	•	•	•	•	•	•	•	•
7. Engaging in argument from evidence	1, 2, 3, 4, 7	•	•	•	•	•	•				•	•	•	•
8. Obtaining, evaluating, and communicating information	1, 2, 3, 4, 5, 6, 7, 8	•	•	•	•	•	•	•	•	•	•	•	•	•
Crosscutting Concepts														
1. Patterns	2, 3, 4, 5, 7, 8	•	•	•	•	•	•	•	•	•				
3. Scale, Proportion, and Quantity	2, 3, 4, 6, 8	•	•	•	•	•	•							

- **Standard is not applicable for grade level**
- **Supports standard for grade level**
- **Can be adapted to support standard for grade level**

Educational Standards Supported (continued)

Common Core State Standards in English Language Arts Supported

	Modules	K	1	2	3	4	5	6	7	8	9	10	11	12
Reading Standards for Literature														
Key Ideas and Details	1	•	•	•	•	•	•	•	•	•	•	•	•	•
Craft and Structure	1, 2, 3, 4, 5, 6, 7, 8	•	•		•	•		•	•	•	•	•	•	•
Range of Reading and Level of Text Complexity	1, 2, 3, 4, 5, 6, 7, 8	•	•											
Reading Standards for Informational Text														
Key Ideas and Details	1, 2, 3, 5	•	•	•	•	•	•	•	•	•	•	•	•	•
Craft and Structure	1, 2, 3, 5, 6	•	•	•	•	•	•	•	•	•	•	•	•	•
Integration of Knowledge and Ideas	1, 3, 7	•	•	•	•	•	•	•		•				
Range of Reading and Level of Text Complexity	1, 2, 3, 4, 5, 6, 7, 8	•	•	•	•	•	•							
Reading Standards: Foundational Skills														
Print Concepts	1, 2, 3, 4, 5, 6, 7, 8	•	•	-	-	-	-	-	-	-	-	-	-	-
Phonological Awareness	1, 2, 3, 4, 5, 6, 7, 8	•	•	-	-	-	-	-	-	-	-	-	-	-
Phonics and Work Recognition	1, 2, 3, 4, 5, 6, 7, 8	•	•	•	•	•	•	-	-	-	-	-	-	-
Fluency	1, 2, 3, 4, 5, 6, 7, 8		•	•	•	•	•	-	-	-	-	-	-	-
Writing Standards														
Text Types and Purposes	1, 2, 3, 4, 5, 6, 7, 8				•	•	•	•	•	•	•	•	•	•
Production and Distribution of Writing	1				•	•	•	•	•	•	•	•	•	•
Research to Build and Present Knowledge	1, 2, 3, 4, 5, 6, 7, 8	•	•	•	•	•	•	•	•	•	•	•	•	•
Range of Writing	1, 2, 3, 4, 5, 6, 7, 8	-	-	-	•	•	•	•	•	•	•	•	•	•
Speaking and Listening Standards														
Comprehension and Collaboration	1, 2, 3, 4, 5, 6, 7, 8	•	•	•	•	•	•	•	•	•	•	•	•	•
Presentation of Knowledge and Ideas	1, 2, 3, 4, 5, 6, 7, 8	•	•	•	•	•	•	•	•	•	•	•	•	•
Language Standards														
Conventions of Standard English	1, 2, 3, 4, 5, 6, 7, 8	•	•	•	•	•	•	•	•	•	•	•	•	•
Knowledge of Language	1, 2, 3, 4, 5, 6, 7, 8	-	-	•	•	•	•	•	•	•				
Vocabulary Acquisition and Use	1, 2, 3, 4, 5, 6, 7, 8	•	•	•	•	•	•	•	•	•	•	•	•	•

- Standard is not applicable for grade level
• Supports standard for grade level
• Can be adapted to support standard for grade level

Educational Standards Supported (continued)

Common Core State Standards Supported in Literacy in History/Social Studies, Science, and Technical Subjects 6-12

	Modules	6	7	8	9	10	11	12
Reading Standards for Literacy in History/Social Studies								
Integration of Knowledge and Ideas	1, 2, 4	•	•	•	•	•		
Reading Standards for Literacy in Science and Technical Subjects								
Key Ideas and Details	2, 3, 4	•	•	•	•	•	•	•
Integration of Knowledge and Ideas	2, 3, 4	•	•	•	•	•	•	•
Range of Reading and Level of Text Complexity	2, 3, 4, 5, 6, 7, 8	•	•	•	•	•	•	•
Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects								
Text Types and Purposes	1, 2, 3, 4, 5, 6, 7, 8	•	•	•	•	•	•	•
Production and Distribution of Writing	1, 2, 3, 4, 5, 6, 7, 8	•	•	•	•	•	•	•
Research to Build and Present Knowledge	1, 2, 3, 4, 5, 6, 7, 8	•	•	•	•	•	•	•
Range of Writing	1, 2, 3, 4, 5, 6, 7, 8	•	•	•	•	•	•	•

- Standard is not applicable for grade level
• Supports standard for grade level
• Can be adapted to support standard for grade level

Educational Standards Supported (continued)

Common Core State Standards in Mathematics

	Modules	K	1	2	3	4	5	6	7	8	9	10	11	12
Counting and Cardinality	2, 4, 5, 6	•	-	-	-	-	-	-	-	-	-	-	-	-
Operations and Algebraic Thinking	2, 3, 4, 5, 6	•	•	•	•	•		-			-	-	-	-
Number and Operations in Base Ten	2, 4, 5, 6				•		•	-			-	-	-	-
Number and Operations - Fractions	4, 5, 6, 7	-	-	-	•	•	•	-			-	-	-	-
Measurement and Data	2, 3, 4, 5, 6	•	•	•	•	•	•	-			-	-	-	-
Geometry	2, 3, 4, 5	•	•				•				-	-	-	-
Ratios and Proportional Relationships	2	-	-	-	-	-	-	•			-	-	-	-
The Number System	4, 5, 6	-	-	-	-	-	-	•			-	-	-	-
Statistics and Probability	2	-	-	-	-	-	-	•			-	-	-	-
Number and Quantity														
Quantities	2	-	-	-	-	-	-	-	-	-	•	•	•	•

- Standard is not applicable for grade level
• Supports standard for grade level
• Can be adapted to support standard for grade level

Educational Standards Supported (continued)

Nutrition Education Competencies Supported

	Modules	K	1	2	3	4	5	6	7	8	9	10	11	12
1. Overarching Nutrition Competency: Essential Nutrition Concepts - All youth will know the relationships among nutrition, physiology, and health.														
1a. Know the six nutrient groups and the functions.	3, 5	•	•	•	•	•	•	•	•	•	•	•	•	•
1b. Know nutrition and health guidelines.	4, 5, 6, 8	•	•	•	•	•	•	•			•	•	•	•
1c. Know factors affecting energy balance.	2, 5, 6	•	•	•	•	•			•	•				
1d. Describe how nutritional needs vary throughout the life cycle.	5	•	•	•	•	•	•	•	•	•	•	•	•	•
1e. Identify the physiological processes in digestion, absorption, and metabolism of nutrients.	3, 5	•	•	•					•	•				
1f. Explain the influence of nutrition and physical activity on health.	2, 3, 5, 8	•	•	•	•	•	•	•						
1g. Know principles of handling (growing, harvesting, transporting, processing, storing, and preparing) foods for optimal food quality and safety.	8	•	•	•	•	•	•	•	•	•	•	•	•	•
1h. Consider the interactions among nutrition science, ecosystems, agriculture, and social systems that affect health, including local, national, and global perspectives.	1, 2, 3	•	•	•	•	•	•	•	•	•	•	•	•	•
2. Overarching Nutrition Competency: Analyzing Nutrition Influences														
All youth will demonstrate the ability to analyze internal and external factors influencing food choices and health outcomes.	7	•	•	•	•	•	•	•	•	•	•	•	•	•

- Standard is not applicable for grade level
• Supports standard for grade level
• Can be adapted to support standard for grade level

Educational Standards Supported (continued)

Nutrition Education Competencies Supported (continued)

	Modules	K	1	2	3	4	5	6	7	8	9	10	11	12
3. Overarching Nutrition Competency: Accessing Valid Nutrition Information														
All youth will demonstrate the ability to access and analyze nutrition information, products, and services to analyze the accuracy and validity of nutrition claims.	2, 5, 6, 7	•	•	•	•	•	•	•	•	•	•	•	•	•
4. Overarching Nutrition Competency: Interpersonal Communication about Nutrition														
All youth will demonstrate the ability to use interpersonal communication skills to optimize food choices and health outcomes.	7						•	•						
5. Overarching Nutrition Competency: Decision Making for Nutrition Choices														
All youth will demonstrate the ability to use decision-making skills to optimize food choices and health outcomes.	2, 3, 5, 6, 8	•	•	•	•	•	•	•	•	•	•	•	•	•
6. Overarching Nutrition Competency: Goal Setting for Nutrition														
All youth will demonstrate the ability to use goal-setting skills to enhance nutrition and health.	2, 3, 5, 6, 8		•	•	•	•	•	•	•	•	•	•	•	•
7. Overarching Nutrition Competency: Practicing Nutrition-Enhancing Behaviors														
All youth will demonstrate the ability to practice nutrition-related behaviors that reduce risk and promote health.	2, 3, 5, 6, 8	•	•	•	•	•	•	•	•	•	•	•	•	•
8. Overarching Nutrition Competency: Nutrition Promotion														
All youth will demonstrate the ability to promote and support a sustainable, nutritious food supply and healthy lifestyles for families and communities.	1, 2, 3, 5, 8	•	•	•	•	•	•	•	•	•	•	•	•	•

- Standard is not applicable for grade level
• Supports standard for grade level
• Can be adapted to support standard for grade level

Module 3: Nutrients We Need

Background Information

Nutrients play an important role in the lives of all living organisms. Nutrients that we obtain from food provide our bodies with the means and materials to grow, stay healthy, and give us **energy** to think, learn, and play. In order to maintain healthy bodies, it is important to understand the roles different nutrients play in our bodies and what foods can provide them.

There are six classes of nutrients: carbohydrates, protein, fat, water, minerals and vitamins. These six types of nutrients serve different functions in our bodies. The main function of **carbohydrates** is to provide our bodies with energy. Carbohydrates are classified into two categories: simple and complex. Simple carbohydrates are found in foods like fruit, milk, and vegetables. These carbohydrates provide energy slightly faster than complex carbohydrates. Complex carbohydrates are present in foods like starchy vegetables, beans, and whole wheat products. **Fiber**, which is found in foods like fruit, vegetables, and beans, is a special type of carbohydrate that is not typically digested in humans but is important for our digestive system to function properly. **Proteins**, which are found in beans and meat products, provide our bodies with another source of energy, help build and repair our muscles, and are important parts of cell structure and function. **Fats** from foods like avocados, nuts, and meat products are stored in the body and also provide a source of energy. Fats are also an important part of the structure of cells in our bodies. There are two types of fats. **Oils** are fats that are liquid at room temperature. **Solid fats** are fats that are solid at room temperature. **Water** is a nutrient that helps transport materials through our body and helps regulate body temperature. **Minerals**, like **calcium** and **iron**, are important for growth, development, and maintenance of the tissues and cells in our bodies. **Vitamins**, like **vitamin A** and **vitamin C**, are important for growth, development, and maintenance of the tissues and cells in our bodies.

Some of the nutrients are considered **essential**. This means that our bodies can't make enough of it (or can't make it at all), so we must obtain them from food. Regardless of the specialized functions of nutrients, all are needed in certain amounts for maintaining health.

Concepts and Vocabulary

- **B-vitamins:** a group of many vitamins that help break down fat, protein, and carbohydrates for energy. They are also important for the growth, maintenance, and repair of the cells in our bodies.
- **Calcium:** a mineral that helps us build strong bones and teeth.
- **Carbohydrates**: a nutrient that provides the first source of energy that our bodies use; they provide energy to the body when needed immediately.
- **Energy**: something needed to fuel all processes in the body, from regulating our body temperature to being physically active.
- **Essential nutrients:** nutrients that our bodies do not make or cannot make enough of them and so we must obtain them from food.
- **Fat**: a nutrient that is a source of energy and is stored in the body. Fats are also an important part of the structure of cells in our bodies.
- **Fiber:** a type of carbohydrate that helps our digestive system to function properly.
- **Iron:** a mineral that is an important part of the blood because it carries oxygen to all of the tissues.
- **Minerals**: elements that are needed for growth, development, and maintenance of the body's tissues, like iron and calcium.
- **Nutrients**: substances our bodies need to grow and stay healthy.
- **Oils**: fats that are liquid at room temperature.
- **Potassium:** a mineral that helps our cells function.
- **Protein**: a nutrient that is used for energy; it helps to build and repair tissues and organs like muscles and the heart.

Concepts and Vocabulary (continued)

- **Solid fats**: fats that are solid at room temperature.
- **Vitamin A:** a vitamin that is important for our vision.
- **Vitamin C:** a vitamin that is important to keep our gums healthy and help our wounds heal.
- **Vitamin D:** a vitamin that is needed to help our bodies use calcium.
- **Vitamins**: molecules needed for growth, development, and maintenance of the body's tissues, like vitamin A and vitamin C.
- **Water**: a molecule made of hyrdrogen and oxygen that is necessary for moving oxygen and nutrients throughout our bodies. It also helps to regulate body temperature.

Life Skills

Cooperation, Communication, Critical Thinking, Healthy Life-Style Choices, Teamwork, Problem-Solving.

Subject Links

English-Language Arts, Nutrition, Health

Educational Standards Supported

Discovering Healthy Choices curriculum supports Next Generation Science Standards, Common Core State Standards, and California Nutrition Education Competencies. For specific details on standards and grade levels, please see page 9.

3.1

Activity 3.1: Classroom Activity

Getting Ready

Time Required
60 to 75 minutes

Suggested Groupings
Small groups of 3 to 4 youth

Materials Needed
(*Materials provided in curriculum)

- Flip chart paper
- Markers or writing utensils
- **Food Cards (Set 1)* (Appendix 3A)
- **Protein, Fat, and Carbohydrate Cards (Set 2)* (Appendix 3B)
- **Nutrient Information* (Appendix 3C)
- **Observations* (Appendix 3D)

- Make copies of *Food Cards (Set 1)* (Appendix 3A); one set for each group.
- Make copies of *Protein, Fat and Carbohydrates Cards (Set 2)* (Appendix 3B); one set for each group.
- Make copies of *Nutrient Information* (Appendix 3C); one for each group.
- Make copies of the *Observations* sheet (Appendix 3D); one for each group.
- Organize the class into small groups of 3 to 4 youth.

  Facilitator Tip: These can be the same groups that were formed in Lesson 1, Activity 1. By doing so, the youth may continue developing teamwork skills with the same group members.
- Provide each group with a sheet of flip chart paper and markers to answer opening questions.

3.1

Opening Questions/Prompts

Ask the youth to respond to each question/prompt below by recording them on the flip chart paper provided and sharing their ideas verbally.

- Explain what you know about what a nutrient is.
- Explain what you know about different types of nutrients.
- Explain what you know about foods that are considered nutritious.

Procedure (Experiencing)

1. Provide each group with one set of *Food Cards (Set 1)* and one copy of the *Observations* sheet.
2. Ask each group to look carefully through the set of cards and observe similarities and differences between the foods. Ask each group to write down their observations on the *Observations* sheet under question number 1.
3. Have the youth sort the cards according to similarities and differences.
4. Provide each group with *Protein, Fat, and Carbohydrate Cards (Set 2)* and ask the youth to read the cards.
5. Ask the youth to categorize which foods from the cards in Set 1 they think fall within each of the categories from the cards in Set 2 (Protein, Fat, and Carbohydrate).
6. Ask each group to write down their observations on the *Observations* sheet under question number 2.
7. Distribute the *Nutrient Information* sheet to each group.

   Facilitator Tip: The nutrients listed on the sheet meet the FDA requirement for labeling that foods "contain," are "good sources" of, and "provide" a nutrient. These nutrients represent at least 10% of the Daily Value for one serving of the food.
8. Ask the youth to read the information and categorize the foods they chose based on the nutrients.
9. Ask each group to write down their observations on the *Observations* sheet under question number 3.

Sharing, Processing, and Generalizing

1. Ask the youth in each group to share what they observed and recorded on their *Observations* sheets.
2. Follow the lines of thinking developed through general thoughts, observations, and questions raised by the youth. If necessary, use more targeted questions/prompts:
   - Explain how you went about categorizing the *Food Cards*.
   - Explain how you categorized the cards according to Proteins, Fat, and Carbohydrates, and what your conclusions were.
   - Explain any patterns you might have noticed regarding different types of foods that have similar nutrients.
   - Explain how you think humans might be able to go about obtaining all the nutrients they need through their diets.

Concept and Term Discovery/Introduction

Youth should understand the variety of nutrients found in different foods, and that it is important that we eat a variety of foods to get all the nutrients we need. It is also important that youth understand the importance of the different nutrients and the variety of functions they perform. Additionally, make sure that key vocabulary terms are either discovered by the youth or introduced to them: **nutrients, essential nutrients, energy, carbohydrates, fiber, protein, fat, oils, solid fats, minerals, calcium, iron, potassium, vitamins, B-vitamins, vitamin A, vitamin C, and vitamin D.**

3.2

Activity 3.2: Classroom Concept Application

Getting Ready

1. Make copies of the *Where in the World* handout (Appendix 3E), one for each youth.

Time Required
30 to 60 minutes

Facilitator Tip: this can be done during classroom time or as a homework assignment. This activity will help prepare the youth for Activity 3.3: Garden Concept Application.

Materials Needed
(*Materials provided in curriculum)
- **Where in the World* (Appendix 3E)

Procedure (Experiencing)

1. Provide the youth with the *Where in the World* handout.
2. Ask the youth to find out if the plants that are growing in their group's garden plot are grown in the United States, in other countries, and/or in the state of California. If they are grown in California, find out where.
3. Ask the youth to record their findings on the *Where in the World* handout.

Facilitator Tip: Youth may research this in the library or on the internet. Some suggested websites for research include

- The University of California Cooperative Extension Virtual Tour of Vegetable Production website, http://vric.ucdavis.edu/main/virtual_tour.htm
- The Wikipedia website, http://www.wikipedia.org

3.3

Activity 3.3: Garden Concept Application

Getting Ready

- Make copies of the *Vegetable Profile* worksheet (Appendix 3F) so that each group has one copy for each of the vegetables growing in their group's garden plot.
- Make copies of the *Nutrition Facts* handouts (Appendix 3G); one for each group.
- Make copies of the *Nutrition and Agriculture Around the World* handouts (Appendix 1A); one set for each group.
- Organize the class into small groups of 3 to 4 youth.

  Facilitator Tip: These can be the same groups that were formed in Lesson 1, Activity 1. By doing so, the youth may continue developing teamwork skills with the same group members.
- Provide each group with a sheet of flip chart paper and markers to answer opening questions.

Time Required
60 to 75 minutes

Suggested Groupings
Small groups of 3 to 4 youth

Materials Needed
(* Materials provided in curriculum)
- Flip chart paper
- Markers or writing utensils
- **Vegetable Profile* worksheets (Appendix 3F)
- **Nutrition Facts* handouts (Appendix 3G)
- **Nutrition and Agriculture Around the World* handouts (Appendix 1A)
- Blank paper
- Tape measurers

3.3

Opening Questions/Prompts

Ask the youth to respond to each question below by recording them on the flip chart paper provided and sharing their ideas verbally.

- Explain what you know about nutrients.
- Explain what you know about what different nutrients do to help keep our bodies healthy.
- Explain what you know about vegetables that are grown in different countries.
- Explain what you know about vegetables that are grown in California.

Procedure (Experiencing)

1. Provide copies of the *Vegetable Profile* worksheet and *Nutrition Facts* handout to each group. Groups need one copy of the *Vegetable Profile* worksheet for each type of vegetable growing in their garden plot; groups need only one *Nutrition Facts* handout.
2. Ask the youth to complete one *Vegetable Profile* worksheet for each vegetable they are growing in their assigned garden plot. To help them, they can use the *Nutrition Facts* handout, the *Nutrition and Agriculture Around the World* handouts from Activity 1.1, and/or their findings from Activity 3.2.

   Facilitator Tip: The nutrinets listed on the Nutrition Facrts handout are those that meet the FDA requirement for labeling that foods "contain," are "good sources" of, and "provide" a nutrient. These nutrients represent at least 10% of the Daily Value for one serving of the food.
3. Provide each group with a sheet of blank paper.
4. Ask the youth to use the blank paper to make a map of the vegetables in their garden plot. This map should provide the dimensions of their garden plot, the plants being grown in their garden plot, and where in the garden plot each plant type is located.

   Facilitator Tip: The completed *Vegetable Profile* worksheets and garden plot maps can be put into a binder and assembled into a classroom garden portfolio, or they can be displayed on the classroom wall.

Sharing, Processing, and Generalizing

1. Have each group share their *Vegetable Profiles* and the map of their garden plot.
2. Follow the lines of thinking developed through general thoughts, observations, and questions raised by the youth. If necessary, ask more targeted questions/prompts.
   - Explain how you went about identifying the characteristics of each vegetable in your garden plot to complete the *Vegetable Profile* worksheets.
   - Explain what you noticed about the different types of vegetables in your garden plots and the similarities and differences in the nutrients they have.

Concept Term Discovery/Introduction

Make sure that youth understand the different nutrients found in different types of vegetables. Youth should understand that different types of vegetables are from different countries, but also many are grown in the United States and regionally within the state of California.

3.4

Activity 3.4: Home Concept Application

Getting Ready

- Make copies of *Where Our Nutrients Come From* (Appendix 3H); one copy for each youth.

Time Required
5 to 10 minutes

Materials Needed
(*Materials provided in curriculum)
- **Where Our Nutrients Come From* (Appendix 3H)

Procedure (Experiencing)

1. Provide each youth with a copy of the *Where Our Nutrients Come From* handout.
2. Explain to the youth that they will bring this activity home and complete it with their families.
3. Explain that this activity is to visit a farmer's market or the grocery store to find out where different types of produce come from. Ask them to select five vegetables to investigate. To find out, ask the people who work there or look for labels that say where the vegetable or fruit was grown.
4. When the youth return with the completed sheet, ask the youth to share what they learned.

3.5

Activity 3.5: Goal Setting Application

Procedure (Experiencing)

Time Required
5 to 10 minutes

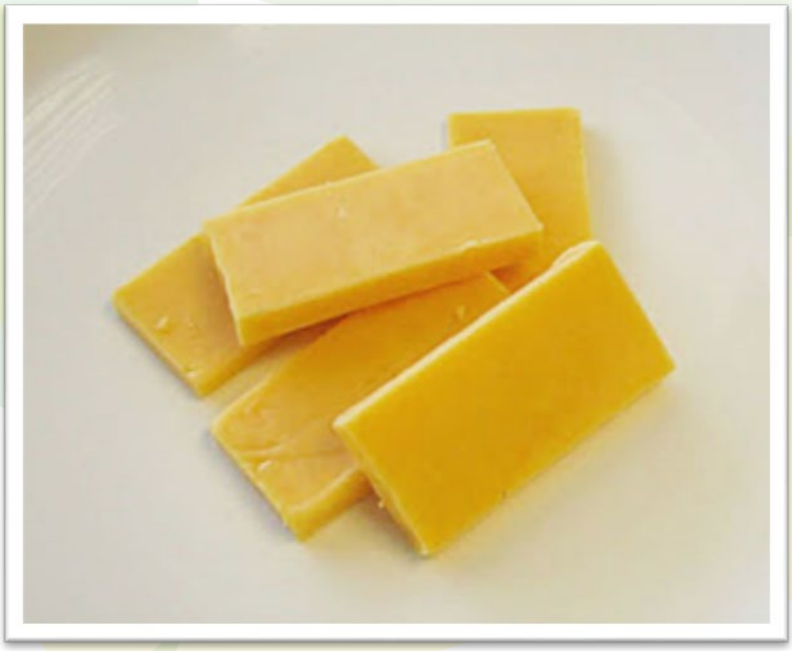
Materials Needed
(*Materials provided in curriculum)
- **Goal Setting* (Appendix 3I)

1. Provide each youth with a copy of the *Goal Setting* handout (Appendix 3I).
2. Ask the youth to bring home this week's goal setting sheet and complete it with their families. They will answer the following questions:
   - What are some things you can do to help ensure you obtain all the nutrients you need?
   - What are some things your family can do help achieve this goal?
3. When the youth return with the completed sheet, ask the youth to share the goals they set for themselves and for their families to get all the nutrients they need.

3A

APPENDIX 3A: Food Cards (Set 1)

Cheese



Whole-Wheat Bread

3A

APPENDIX 3A: Food Cards (Set 1)

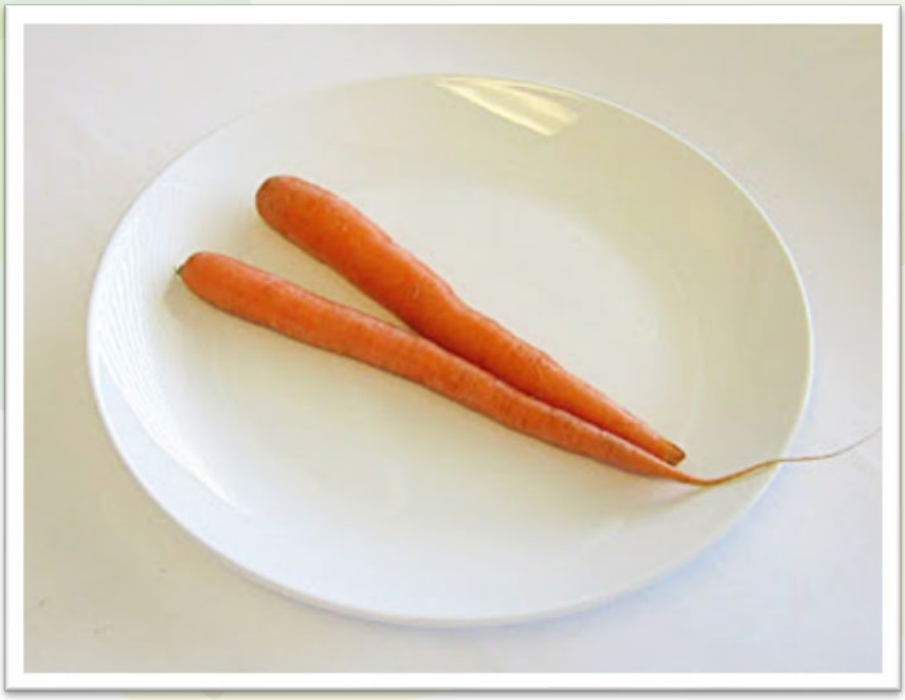
Eggs

Fish

3A

APPENDIX 3A: Food Cards (Set 1)

Carrots



Potato

3A

APPENDIX 3A: Food Cards (Set 1)

Chicken

Broccoli

3A

APPENDIX 3A: Food Cards (Set 1)

Peanuts

Oats

3A

APPENDIX 3A: Food Cards (Set 1)

Apple

Milk

3A

APPENDIX 3A: Food Cards (Set 1)

Tomato

Grapes

3A

APPENDIX 3A: Food Cards (Set 1)

Spinach

Bok Choy

3A

APPENDIX 3A: Food Cards (Set 1)

Avocado

Beans

3B

APPENDIX 3B: Protein, Fat, and Carbohydrate Cards (Set 2)

Protein

This nutrient provides our bodies with another source of energy, helps build and repair our muscles, and is important for cell structure and function.

Examples of food that have a lot of protein are beef, chicken, fish, peanuts, beans, and milk.

Fat

This nutrient provides a source of energy and is stored in the body. Fats are also an important part of the structure of cells in our bodies.

There are different types of fats. Oils are fats that are liquid at room temperature. They often have many nutrients that are important to our health. There are also fats that are solid at room temperature and should be limited in our diets.

Examples of foods that have oils include peanuts, fish, and avocados. Examples of foods that have solid fats are beef, chicken, and milk.

Carbohydrates

The main function of **carbohydrates** is to provide our bodies with energy. Carbohydrates are classified into two categories: simple and complex. Simple carbohydrates provide energy slightly faster than complex carbohydrates. Fiber is a special type of carbohydrate that is not typically digested in humans, but is important for our digestive system to function properly.

Simple carbohydrates are found in foods like fruit, milk, and vegetables.
Complex carbohydrates are present in foods like starchy vegetables, beans, and whole-wheat products.

Foods high in fiber include avocados, broccoli, whole wheat bread, carrots, and beans.

3C

APPENDIX 3C: Nutrient Information Sheet

Food	Key Nutrients and Their Functions
apples	Carbohydrates **Fiber:** helps our digestive system function properly. **Vitamin C**: keeps our gums healthy and helps our wounds heal.
avocados	Carbohydrates and fat (mostly oils but some solid fat). **Fiber:** helps our digestive system function properly. Potassium: a mineral that helps our cells function. **Vitamin C**: keeps our gums healthy and helps our wounds heal.
beans	A lot of protein and some carbohydrate. **Fiber:** helps our digestive system function properly. **B-Vitamins:** break down fat, protein, and carbohydrates for energy and help in growth, maintenance, and repair of the cells in our bodies. **Iron:** a mineral that helps carry oxygen throughout our body. Potassium: a mineral that helps our cells function.
bok choy	Not much carbohydrates, protein, or fat. **Fiber:** helps our digestive system function properly. **Vitamin A:** important for vision. **Vitamin C**: keeps our gums healthy and helps our wounds heal. **Iron:** a mineral that helps carry oxygen throughout our body.
broccoli	Not much carbohydrates, protein, or fat. **Fiber:** helps our digestive system function properly. **Vitamin A:** important for vision. **Vitamin C**: keeps our gums healthy and helps our wounds heal. **Iron:** a mineral that helps carry oxygen throughout our body. **Calcium**: helps build strong teeth and bones.
carrots	Not much carbohydrates, protein or fats. **Fiber:** helps our digestive system function properly. **Vitamin A:** important for vision. **Vitamin C**: keeps our gums healthy and helps our wounds heal.
cheese	A lot of protein and some fat (mostly solid fat). **Vitamin A:** important for vision. **Calcium**: helps build strong teeth and bones.
chicken	A lot of protein and some fat (mostly solid fat). **Iron:** a mineral that helps carry oxygen throughout our body. **B-Vitamins:** break down fat, protein, and carbohydrates for energy and help in growth, maintenance, and repair of the cells in our bodies.
eggs	A lot of protein. **Vitamin A:** important for vision. **B-Vitamins:** break down fat, protein, and carbohydrates for energy and help in growth, maintenance, and repair of the cells in our bodies. **Iron:** a mineral that helps carry oxygen throughout your body.

3C

APPENDIX 3C: Nutrient Information Sheet

fish	A lot of protein and some fat (mostly oils). **B-Vitamins:** break down fat, protein, and carbohydrates for energy and help in growth, maintenance, and repair of the cells in our bodies. **Vitamin D:** it helps our bodies use calcium (found in some fish like salmon and mackerel).
grapes	Not much carbohydrates, protein, or fats. **Vitamin C**: keeps our gums healthy and helps our wounds heal.
milk	A lot of protein and some fat (mostly solid fat). **Vitamin A:** important for vision. **B-Vitamins:** break down fat, protein, and carbohydrates for energy and help in growth, maintenance, and repair of the cells in our bodies. **Calcium**: helps build strong teeth and bones. **Vitamin D:** helps our bodies use calcium.
oats	A lot of carbohydrates and protein. **Fiber:** a nutrient that helps our bodies digest food. **Iron:** a mineral that helps carry oxygen throughout our body.
peanuts	A lot of protein and fat (mostly oils). **Fiber:** helps our digestive system function properly. **B-Vitamins:** break down fat, protein, and carbohydrates for energy and help in growth, maintenance, and repair of the cells in our bodies.
potatoes	A lot of carbohydrates. **Fiber:** helps our digestive system function properly. **Potassium:** a mineral that helps our cells function. **Iron:** a mineral that helps carry oxygen throughout our body. **B-Vitamins:** break down fat, protein, and carbohydrates for energy and help in growth, maintenance, and repair of the cells in our bodies.
spinach	Not much carbohydrates, protein, or fats. **Vitamin A:** important for vision. **Vitamin C**: keeps our gums healthy and helps our wounds heal. **Iron:** a mineral that helps carry oxygen throughout our body.
tomatoes	Not much carbohydrates, protein, or fats. **Potassium:** a mineral that helps our cells function. **Vitamin A:** important for vision. **Vitamin C**: keeps our gums healthy and helps our wounds heal.
whole wheat bread	A lot of carbohydrates. **Fiber:** helps our digestive system function properly. **Iron:** a mineral that helps carry oxygen throughout our body. **B-Vitamins:** break down fat, protein, and carbohydrates for energy and help in growth, maintenance, and repair of the cells in our bodies.

3D

APPENDIX 3D: Observations

1. **Explain how you categorized the foods and describe some of your observations.**

2. **Explain how you categorized the foods according to protein, carbohydrate, or fat. Describe some of your observations.**

3. **Explain how you categorized the foods according to vitamins and minerals. Describe some of your observations.**

3E

APPENDIX 3E: Where in the World

Investigate the fruits and vegetables that you planted in your garden plot.

List the vegetables being grown in your garden plot.

Which of the vegetables are grown by farmers in California?

Which of the vegetables are grown in other states in the United States?

Which of these vegetables are grown by farmers in other countries around the world?

3F

APPENDIX 3F: Vegetable Profile

Name of vegetable: _____

Describe or draw a picture of the vegetable in the box below.

What are the key nutrients found in this vegetable?

Nutrient	How does this nutrient help our bodies stay healthy?

Where in the world, the United States, or California is this vegetable grown?

3G

APPENDIX 3G: Nutrition Facts

Vegetables	Nutrients
beets	B-vitamins, vitamin C, fiber
black beans	protein, B-vitamins, fiber, iron, potassium
black-eyed peas (cowpeas)	carbohydrates, protein, B-vitamins, fiber, iron, potassium
broccoli	B-vitamins, vitamin C
cabbage	B-vitamins, vitamin C, fiber
carrots	vitamin A, vitamin C, fiber
chile pepper	vitamin A, B-vitamins, vitamin C
corn	B-vitamins, vitamin C
cucumbers	water
eggplant	water
fresh peas	protein, vitamin A, B-vitamins, vitamin C, fiber
garlic	carbohydrates, protein, B-vitamins, vitamin C, calcium
green beans	vitamin A, vitamin C, fiber
kale	vitamin A, B-vitamins, vitamin C, calcium, iron, fiber
kohlrabi	vitamin C, fiber, potassium
leeks	vitamin A, B-vitamins, vitamin C, iron
lettuce	water
okra	B-vitamins, vitamin C, fiber
onion	vitamin C
potatoes	carbohydrates, fiber, potassium
radishes	water
soybeans	fat (oils), protein, calcium, iron, potassium
spinach	vitamin A, vitamin C
summer squash	vitamin C
sweet potatoes	vitamin A, fiber, potassium
Swiss chard	vitamin A, vitamin C, potassium
taro root	protein, vitamin C, calcium, iron, fiber, potassium
tomatoes	potassium, vitamin A, vitamin C
winter squash	vitamin A, vitamin C, potassium

3H

APPENDIX 3H: Where Our Nutrients Come From

Visit a farmer's market or grocery store with your family to find out where the produce you purchase is grown. Select five vegetables to investigate.

To find out where the vegetables were grown, ask someone who works there or look for labels that say where the produce comes from.

Record your observations below.

3I

APPENDIX 3I: Goal Setting

What are some things you can do to help ensure you obtain all the nutrients you need?

What are some things your family can do to help achieve this goal?

Photo, Graphic, and Illustration Credits

Cover

- Plant—https://www.flickr.com/photos/aresauburnphotos/2508019220

Module 3: Nutrients We Need

- Photos in Food Cards (Set I)—Jessica (Dusti) Linnell