## **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 and there are solid 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 cannot make enough of, or do not make it at all and so we must obtain them from food.

- Fat: a nutrient is used as a source of energy; it is also important for protecting the cells in our bodies.
- **Fiber:** a nutrient 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.

#### Concepts and Vocabulary (continued)

- **Protein**: a nutrient that is used for energy; it helps to build and repair tissues and organs like muscles and the heart.
- **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 that is necessary for moving oxygen and nutrients throughout our bodies; 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.

#### Activity 3.1: Classroom Activity Getting Ready

- 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.

**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)
- Provide each group with a sheet of flip chart paper and markers to answer opening questions.

#### **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 the 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 nutrinets listed are those that meet the FDA requirement for labeling that foods "contain," are "good sources", 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, Fats 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

It is important that the youth 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 to the functions of their bodies. 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, vitamins, B-Vitamins, Vitamin A, Vitamin C, and Vitamin D.** 

## 3.2

### Activity 3.2: Classroom Concept Application

#### **Getting Ready**

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

#### 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 U.S., 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:

http://vric.ucdavis.edu/main/virtual\_tour.htm http://www.wikipedia.org http://legacy.pma.com/producedb/index.cfm

#### 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 garden type growing in their 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** 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)

**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

#### **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.
- 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, and where in the garden 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 *Profiling Our Garden* 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.

#### Activity 3.4: Home Concept Application Getting Ready

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

#### 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.

#### <u>Activity 3.5: Goal Setting Application</u>

#### Procedure (Experiencing)

- 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.

**Time Required** 5 to 10 minutes

#### Materials Needed

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

> Time Required 5 to 10 minutes

Materials Needed (\*Materials provided in curriculum)

\*Goal Setting (Appendix 3I)

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#### APPENDIX 3A: Food Cards (Set 1)

#### Cheese



#### Whole-Wheat Bread



#### APPENDIX 3A: Food Cards (Set 1)

Eggs



#### Fish



#### APPENDIX 3A: Food Cards (Set 1)







Potato



Module 5. Multients we need

#### APPENDIX 3A: Food Cards (Set 1)

#### Chicken



#### Broccoli



#### APPENDIX 3A: Food Cards (Set 1)

#### Peanuts





#### Oats



#### APPENDIX 3A: Food Cards (Set 1)

#### Apple





#### Milk



#### APPENDIX 3A: Food Cards (Set 1)

#### Tomato





#### Grapes



#### APPENDIX 3A: Food Cards (Set 1)

#### Spinach



#### **Bok Choy**





#### APPENDIX 3A: Food Cards (Set 1)

#### Avocado





#### Beans



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

# 3B

## 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. These 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.

#### **APPENDIX 3C: Nutrient Information Sheet**



| Food     | Key Nutrients and their Functions   |
|----------|---|
| Apples   | Carbohydrates<br>Fiber: helps our digestive system function properly.<br>Vitamin C: keeps our gums healthy and helps our wounds heal.   |
| Avocados | Carbohydrates and fat (mostly oils but some solid fat).<br>Fiber: helps our digestive system function properly.<br>Vitamin C: keeps our gums healthy and helps our wounds heal.   |
| Beans    | <ul> <li>A lot of protein and some carbohydrate.</li> <li>Fiber: helps our digestive system function properly.</li> <li>B-Vitamins: break down fat, protein and carbohydrates for energy and help in growth, maintenance and repair of the cells in our bodies.</li> <li>Iron: a mineral that helps carry oxygen throughout our body.</li> </ul>        |
| Bok Choy | Not much carbohydrates, protein or fat.<br><b>Fiber:</b> helps our digestive system function properly.<br><b>Vitamin A:</b> important for vision.<br><b>Vitamin C:</b> keeps our gums healthy and helps our wounds heal.<br><b>Iron:</b> a mineral that helps carry oxygen throughout our body.   |
| Broccoli | Not much carbohydrates, protein or fats.<br><b>Fiber:</b> helps our digestive system function properly.<br><b>Vitamin A:</b> important for vision.<br><b>Vitamin C:</b> keeps our gums healthy and helps our wounds heal.<br><b>Iron:</b> a mineral that helps carry oxygen throughout our body.<br><b>Calcium:</b> helps build strong teeth and bones. |
| Carrots  | Not much carbohydrates, protein or fats.<br><b>Fiber:</b> helps our digestive system function properly.<br><b>Vitamin A:</b> important for vision.<br><b>Vitamin C</b> : keeps our gums healthy and helps our wounds heal.  |
| Cheese   | A lot of protein and some fat (mostly solid fat).<br>Vitamin A: important for vision.<br>Calcium: helps build strong teeth and bones.   |
| Chicken  | A lot of protein and some fat (mostly solid fat).<br><b>Iron:</b> a mineral that helps carry oxygen throughout our body.<br><b>B-Vitamins:</b> 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.<br><b>Vitamin A:</b> important for vision.<br><b>B-Vitamins:</b> break down fat, protein and carbohydrates for energy and help in<br>growth, maintenance and repair of the cells in our bodies.<br><b>Iron:</b> a mineral that helps carry oxygen throughout your body.   |

#### **APPENDIX 3C: Nutrient Information Sheet**



| Fish                 | <ul> <li>A lot of protein and some fat (mostly oils).</li> <li>B-Vitamins: break down fat, protein and carbohydrates for energy and help in growth, maintenance and repair of the cells in our bodies.</li> <li>Vitamin D: it helps our bodies use calcium (found in some fish like salmon and mackerel)</li> </ul>   |  |
|----------------------|---|--|
| Grapes               | Not much carbohydrates, protein or fats.<br><b>Vitamin C</b> : keeps our gums healthy and helps our wounds heal.  |  |
| Milk                 | <ul> <li>A lot of protein and some fat (mostly solid fat).</li> <li>Vitamin A: important for vision.</li> <li>B-Vitamins: break down fat, protein and carbohydrates for energy and help in growth, maintenance and repair of the cells in our bodies.</li> <li>Calcium: helps build strong teeth and bones.</li> <li>Vitamin D: it helps our bodies use calcium.</li> </ul> |  |
| Oats                 | A lot of carbohydrates and protein.<br><b>Fiber:</b> a nutrient that helps our bodies digest food.<br><b>Iron:</b> a mineral that helps carry oxygen throughout our body.   |  |
| Peanuts              | <ul> <li>A lot of protein and fat (mostly oils).</li> <li>Fiber: helps our digestive system function properly.</li> <li>B-Vitamins: break down fat, protein and carbohydrates for energy and help in growth, maintenance and repair of the cells in our bodies.</li> </ul>  |  |
| Potatoes             | <ul> <li>A lot of carbohydrates.</li> <li>Fiber: helps our digestive system function properly.</li> <li>Iron: a mineral that helps carry oxygen throughout our body.</li> <li>B-Vitamins: break down fat, protein and carbohydrates for energy and help in growth, maintenance and repair of the cells in our bodies.</li> </ul>  |  |
| Spinach              | Not much carbohydrates, protein or fats.<br>Vitamin A: important for vision.<br>Vitamin C: keeps our gums healthy and helps our wounds heal.<br>Iron: a mineral that helps carry oxygen throughout our body.  |  |
| Tomatoes             | Not much carbohydrates, protein or fats.<br><b>Vitamin A:</b> important for vision.<br><b>Vitamin C</b> : keeps our gums healthy and helps our wounds heal.   |  |
| Whole Wheat<br>Bread | <ul> <li>A lot of carbohydrates.</li> <li>Fiber: helps our digestive system function properly.</li> <li>Iron: a mineral that helps carry oxygen throughout our body.</li> <li>B-Vitamins: break down fat, protein and carbohydrates for energy and help in growth, maintenance and repair of the cells in our bodies.</li> </ul>  |  |

#### 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.

#### 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 U.S.?

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

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

#### **APPENDIX 3G: Nutrition Facts**



| Vegetables                | A Good Source of These Nutrients                       |
|---------------------------|--|
| Beets                     | B-vitamins, Vitamin C, Fiber                           |
| Black Beans               | Protein, B-vitamins, Fiber, Iron                       |
| Black-Eyed Peas (cowpeas) | Carbohydrates, Protein, B-vitamins, Fiber, Iron        |
| 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                                       |
| Leeks                     | Vitamin A, B-vitamins, Vitamin C, Iron                 |
| Lettuce                   | Water  |
| Okra                      | B-vitamins, Vitamin C, Fiber                           |
| Onion                     | Vitamin C  |
| Potatoes                  | Carbohydrates, Fiber                                   |
| Radishes                  | Water  |
| Soybeans                  | Fat (oils), Protein, Calcium, Iron                     |
| Spinach                   | Vitamin A, Vitamin C                                   |
| Summer Squash             | Vitamin C  |
| Sweet Potatoes            | Vitamin A, Fiber                                       |
| Swiss Chard               | Vitamin A, Vitamin C                                   |
| Taro Root                 | Protein, Vitamin C, Calcium, Iron, Fiber               |
| Tomatoes                  | Vitamin A, Vitamin C                                   |
| Winter Squash             | Vitamin A, Vitamin C                                   |

# 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 5 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 and findings below.

#### APPENDIX 31: 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?