



LESSON PLAN B

Food Scientists

Time Frame: Three 40-minute sessions

Learning Objectives:

- Identify the importance of nutrients and learn about the role they play in physical health.
- Learn about the nutrients found in different foods in the five food groups.
- Understand the importance of a balanced diet.

Materials for Lesson Plan:

- Bite-sized samples of each food group (for Activity A)
- Supermarket circulars from newspapers, pictures of food items from magazines collected from home (for Activity B)
- Copies of activity cards (for Activity C)

Overview:

In this lesson plan you'll use direct instruction to teach students about the nutrients found in different foods in the five food groups: Dairy, Protein Foods, Fruit, Vegetables and Grains. The following notes are based directly on the content older students will be quizzed on in Activity A. All students will benefit from learning key points in this content, whether or not they go on to do the quizzes.

Follow your lessons on the five food groups with Q&A sessions to reinforce learning. Optional: Pass out bite-sized samples of each food group after the Q&As.

Part A. Feed Your Brain

Time Frame: 40 minutes

Materials for Activity:

- Bite-sized samples of each food group
- Paper plates, cups and utensils to go with food/drink samples

Part 1. Discussion

Lead a discussion to cover key content about the nutritional value of foods found in the five food groups.

Fruits: All kinds count!

What kinds count? Any fruit or 100% fruit juice counts as part of the Fruit Group. Fruits may be fresh, canned, frozen or dried, and may be whole, cut-up or pureed. Eating the whole fruit is better than drinking just its juice. This is because fiber is lost during the juicing process. Learn more here: [About the Fruit Group | MyPlate](#)

[Pass out bite-sized samples of food from the Fruit Group. It can be fresh, canned, frozen or 100% juice.]

Vegetables: Who's in your group?

Veggies are divided into different subgroups — each with different types and amounts of vitamins and minerals. That's why it's important to mix things up! Learn more here: [About the Vegetable Group | MyPlate](#)

Vegetable subgroups:

- Dark-green vegetables: Broccoli, kale, bok choy, and romaine lettuce
- Red and orange vegetables: Red peppers, tomatoes, sweet potatoes, pumpkins
- Beans and peas
- Starchy vegetables: Corn, potatoes

Variety is the spice of life! Eat a variety of:

- Vegetable subgroups
- Raw and cooked vegetables
- Colors of vegetables (eat the rainbow!)

[Pass out bite-sized samples of food from the Vegetable Group. Raw, crunchy veggies are the most popular.]

Protein Foods: Don't get stuck in a rut!**[Top Tips on Getting Your Protein](#)**

- Vary your protein routine
- Eat seafood twice a week

Raise your hand if you like peanut butter. That's a good source of protein, but what if you had a peanut butter sandwich every day for an entire year? Do you think you'd get tired of that? What about a hamburger? Would it be a balanced diet to eat 365 hamburgers in a year? Probably not. Chicken is a leaner meat, but you'd probably get tired of that too if you ate it every single day.

What are some other kinds of protein foods? In addition to lean meats, other healthy options include seafood, beans and peas, nuts, nut butters, and soy products such as tofu, tempeh, and veggie burgers. Learn more here: About Protein Foods | MyPlate <https://www.choosemyplate.gov/protein-foods>

[Pass out bite-sized samples of food from the Protein Foods Group. Be sure to check your school or classroom food policy if serving any foods containing nuts.]

Grains: Hit your goal – make sure half are whole!

Do you know the difference between Whole Grains and Refined Grains? Whole includes whole-grain flour, bread and brown rice, while refined includes white flour, white bread and white rice. Grain products with high levels of solid fats and/or added sugars (e.g., donuts, cakes) should be occasional treats and chosen less often.

How's your balance? When it comes to eating whole grains, most Americans are falling short. **Remember: At least half of all the grains eaten should be whole grains.** This is a smart way to ensure you get the fiber and nutrients you need for a healthy, balanced diet.

Learn more here: About the Grains Group | MyPlate <https://www.choosemyplate.gov/grains>

[Pass out bite-sized samples of food from the Grains Group. Choose a whole-grain snack like crackers or pretzels.]

Dairy: Drink (and eat) up!

True or false, raise your hands!

- All dairy foods contain calcium. (F)
- All calcium-rich foods are also dairy foods. (F)
- All foods in the Dairy Group contain calcium. (T)

Maybe we should call this the “Dairy with Calcium” food group. Yes, it’s confusing! That’s because there are some dairy foods – like cream cheese, butter and ice cream – that do not contain enough calcium to be part of the club!

All foods in the Dairy Group contain calcium – a mineral that is important for building and maintaining strong bones and teeth, regulating blood pressure, and is also important for the nervous system. Milk, yogurt and cheese are all good examples.

Calcium can also be found in non-dairy sources like: tofu made with calcium, in canned salmon and sardines (if bones are eaten), in some leafy greens (collards and spinach), in soybeans and green soybeans (edamame), and in calcium-fortified foods and drinks like soymilk, other plant-based “milks” and cereals.

Low-fat and fat-free (skim) milk has all of the vitamins, minerals and protein found in whole milk or other reduced fat milks, but with less solid fat. Learn more here: About the Dairy Group | MyPlate <https://www.choosemyplate.gov/dairy>

[Pass out bite-sized samples of food from the Dairy Group. Calcium-fortified cereal with choice of milk or soymilk in a paper cup is always a fun choice!]

Heads Up: Moderation is the Key

Sodium (Salt)

Packaged and prepared meat, poultry, canned beans and vegetables and seafood products are common sources of sodium (salt). Sodium is added to packaged foods sometimes during processing such as in curing meat, enhancing flavor, or as a preservative. In canned beans and vegetables, rinsing and draining them can significantly reduce the sodium levels while still retaining important nutrients. While you need sodium to survive, it is important to pay attention to your overall sodium intake. Children and adults should eat less than 2,300 mg of sodium per day. Explain that 1 teaspoon of table salt is equal to 2,300 milligrams of sodium.

Oils (liquid) and fats (solid)

Oils are fats that are liquid at room temperature, like the vegetable oils used in cooking. Oils are not a food group, but they do provide essential nutrients and are therefore included in USDA recommendations for what to eat. For ages 9–13, the daily allowance for oils is 5 teaspoons. A number of foods are naturally high in healthy oils, like nuts, olives, some fish, and avocados. In addition to essential fatty acids, oils are a major source of vitamin E.

Other foods that are mainly oil include mayonnaise, certain salad dressings, and soft (tub or squeeze) margarine. Check the Nutrition Facts label to find margarines with 0 grams of trans fat. Amounts of trans fat are required to be listed on labels.

Saturated and Trans Fats vs. MUFAs and PUFAs

Solid fats are fats that are solid at room temperature, like beef fat, butter, and shortening. Solid fats contain more saturated fats and/or trans fats than oils. Saturated fats and trans fats tend to raise “bad” (LDL) cholesterol levels in the blood, which in turn increases the risk for heart disease. To lower risk for heart disease, cut back on foods containing saturated fats and trans fats.

Most of the fats you eat should be polyunsaturated (PUFA) or monounsaturated (MUFA) fats. Oils are the major source of MUFAs and PUFAs in the diet. PUFAs contain some fatty acids that are necessary for health – called “essential fatty acids.” The MUFAs and PUFAs found in fish, nuts, and vegetable oils do not raise LDL (“bad”) cholesterol levels in the blood.

Part B. Nutri-Pro Quizmasters

Time Frame: 40 minutes

Part 1. Fun Food Facts

Start with some fun facts to get students’ brains in gear. These facts will prepare them for the Charades/10 Questions game (grades 3–5) and/or the MyPlate quiz (grade 5).

Q: Which two food groups should you try to eat more of every day?

A: Fruits and vegetables

Fruits and vegetables are a healthy way to get the **nutrients** and **energy** your body needs to feel and look good.

Q: Which food group is most important for building strong bones and teeth?

A: Dairy

Dairy products contain **calcium**, which is very important for children and teens who are still growing. The Dairy Group includes most foods made from milk, including yogurt and cheese. Calcium-fortified soy milk also counts as a dairy food.

Q: Name a type of nut or a vegetable that’s high in **calcium**.

A: Almonds and broccoli are both good sources.

Q: Name something that’s high in protein and is also a dairy.

A: Yogurt or cheese

Q: Fill in the blank: Make sure half of your grains are _____.

A: Whole grains

Grains include any foods made from a cereal grain such as wheat, rice, barley or cornmeal. At least half of all your grain servings should come from whole-grain foods, as they provide more **fiber** and **nutrients**.

Q: Meat and chicken are part of the Protein Foods Group. Name another kind of protein that swims in the rivers or the sea.

A: Fish

Protein builds bones, muscles, blood and other body parts. Protein-rich foods keep us feeling full. The Protein Foods Group includes more than just meat, poultry and fish. Other foods like eggs, beans, peas, soy products, nuts and seeds all fall into the protein food group.

Q: Name a kind of protein food that grows on trees or in the ground.

A: Beans, peas, soybeans, peanut butter, nuts and seeds.

Q: Name some foods that most people assume are vegetables — but are actually fruit!

A: Peppers, tomatoes, squash, cucumbers and pumpkins

A fruit is something that contains the seeds of a plant. Have you ever scooped the pulp and seeds out of a pumpkin to carve a jack-o-lantern? The seeds are a clue. A pumpkin is a fruit, not a vegetable!

Q: Name something that counts as both a vegetable and a protein food?

A: Peas and beans!

Q: Name something that's high in protein and also a dairy product.

A: Yogurt or cheese

Q: Name something that comes from a cow but is NOT part of the dairy group.

A: Butter, cream cheese and ice cream

Q: Name a type of food that you can cook with, spread on bread, drizzle on salads, or fry potatoes with.

A: Oils and fats. Examples are salad dressing, butter, margarine or liquid oil that comes in a bottle. Try to keep this type of food to 4 teaspoons a day.

Part 2. Nutrient Nerd Study Guide

The following list contains terms that students will find encounter on the MyPlate quiz.

VITAMINS & VOCABULARY

Vitamin A is good for your eye health and immune system. Beta-carotene, a form of vitamin A, is what gives carrots and sweet potatoes their orange color.

Vitamin C is an important nutrient that is needed for the growth and repair of tissues in all parts of your body. **All fruits (and vegetables, too)** contain some amount of vitamin C.

Folate is one of the B vitamins and is needed by all of our cells for growth. **Fruits, vegetables and some whole grains** are a good source of folate.

Fiber is found in plant foods – like fruit, vegetables, whole grains and legumes. It keeps our digestion systems healthy and regular (to avoid constipation) and can help prevent some diseases. And fiber-rich foods make us feel full, so we're not tempted to eat too much.

Fructose is a natural sugar found in **fruit**. Fructose is what makes fruit taste sweet! Sometimes called fruit sugar, fructose is also found in some vegetables, honey, and other plants. Fructose is a carbohydrate, a source of energy for the body.

Lactose is the sugar found naturally in **milk**. It has a low glycemic index, meaning it doesn't raise your blood sugar as much as some other types of sugars. Lactose also helps your body absorb minerals like calcium, magnesium, and zinc.

Lactose-intolerant individuals can get calcium from sources such as lactose-free milk, calcium-fortified soy milk, yogurt and some cheeses, and kale and collard greens.

Potassium is an important nutrient found in a wide variety of foods – from **fruits** like bananas, dried apricots and orange juice to **vegetables** like spinach and potatoes. Some **beans** (white beans, soy beans), **fish** (halibut, tuna), and types of **dairy** (low-fat yogurt and milk) are good sources, too. Potassium supports our blood pressure, heart health, and muscle strength.

Pulp is the part of fruit that contains fiber. When fruit is made into juice, the pulp (and fiber) is usually removed. That's why eating whole fruit is best.

Part 3. Test Your Food Smarts!

Next, have 4th and 5th grade students complete each of the 5 quizzes online. Alternatively, you may do this as a group, using an overhead projector. You'll likely find less pressure, more collaboration, and better discussion questions as a result. Click on the link below:

[MyPlate Plate "Food Group" Quizzes](https://www.choosemyplate.gov/quiz)
<https://www.choosemyplate.gov/quiz>

Extension: Read-Aloud Book / Lesson Alternative

Good Enough to Eat: A Kids Guide to Food and Nutrition by Lizzy Rockwell

This informative book is a good choice for a read-aloud if you are not interested in the quiz portion of this lesson plan.

Teacher Reference:

Fruits vs. Vegetables

Why does the ChooseMyPlate.gov website include tomatoes and avocados in the Vegetable Group instead of the Fruit Group?

A number of foods that are considered fruits by botanists are part of the Vegetable Group. For example, tomatoes, avocados, eggplants, cucumbers, green peppers, zucchini, butternut squash and others are classified as fruits by botanists because they are the fleshy plant part surrounding its seeds. However, for nutritional and culinary purposes, these foods are considered to be vegetables rather than fruits. The nutritional classification of foods considers not just botany, but a food's nutrient content, use in meals, and taste. The Fruit Group includes botanical fruits that are sweet and/or tart in taste — those which are usually thought of as fruits by consumers. The Vegetable Group, on the other hand, includes those botanical fruits that are not sweet or tart and are usually consumed along with other vegetables or as a vegetable.

Part C. 10 Questions Game: What Am I?

Time Frame: 40 minutes

Materials for Activity:

- Copies of "10 Questions Game Cards" page
- Scissors (for cutting pages into squares)

Students play 10 Questions, using the printable activity cards at the end of this lesson plan. Classmates have to guess which nutrient or food they are. In addition to reinforcing content learned thus far, this game helps develop strategic thinking and communication skills.

Teacher Preparation:

Print 3–4 copies of the Activity Cards found at the end of this lesson plan. Keep one page of cards for yourself to use as reference. Cut the other pages into "cards" for playing the game. Fold each card in half, with the text inside. Put them in a box or bowl and have each student take one card out.

Instructions:

- Cut out game cards and hand one to each student, face down on their desk. Or, fold each card in half, put in a bowl or box and have each student reach in and take one. Each card has the name of a type of food, along with some key facts.
- Tell students to look at their cards but to keep the information a secret!
- Offer students the opportunity to come to your desk for help if they have questions.

How to Play:

- Students take turns going to the front of the class to play the role of the food on their card.
- They may do this individually or in pairs.
- Classmates ask simple questions and try to guess the food type based on the answers given.

Give students ideas for possible questions to ask, such as:

Yes or No Questions:

- Are you an animal?
- Are you a plant?
- Do you belong to the Dairy Group? (repeat for other food groups)
- Are you sweet?
- Are you crunchy?
- Do you have seeds?

Simple Questions / One-Word Answers:

- What's your main nutrient?
- What do you taste like?
- Are you usually eaten raw or cooked?
- Are you an animal or a plant?
- Do you have feathers/fur?
- Where do you come from?

Family Connection:

Use the 10 Questions game cards in the activity above to teach and test your family members. Make more game cards yourselves, using reference sources and information learned at school.

Extension:

Play the "Picnic Pick-Up" online game:

<https://www.cdc.gov/bam/body/picnic-game.html>

Test your smarts in the Picnic Pickup Game! Look for foods that will help you maintain your energy level.

Community Connection:

Visit a local farm or farmer's market. Or ask a local farmer or farmer's market representative to visit your classroom to present examples of different types of fruit and vegetables and to explain how they're categorized into different groups (root vegetables, dark-green leafy vegetables, etc.).

Standards Alignment | Students will:**National Health Education Standards**

Standard 1. Comprehend concepts related to health promotion and disease prevention to enhance health.

Standard 3. Demonstrate the ability to access valid information, products, and services to enhance health.

Standard 5. Demonstrate the ability to use decision-making skills to enhance health.

Standard 7. Demonstrate the ability to practice health-enhancing behaviors and avoid or reduce health risks.

SHAPE America, National Physical Education Standards

Standard 1. The physically literate individual demonstrates competency in a variety of motor skills and movement patterns.

Standard 4. The physically literate individual exhibits responsible personal and social behavior that respects self and others.

Common Core State Standards

English Language Arts Standards > Speaking and Listening

Comprehension and Collaboration:

CCSS.ELA-LITERACY.SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.4.1.C - Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.

English Language Arts Standards > Reading: Informational Text

Key Ideas and Details:

CCSS.ELA-LITERACY.RI.4.3 - Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

Worksheets & Downloads:

10 Questions Game Cards: “What am I?”

<p>I am high in potassium and a good source of fiber. Many athletes like to eat me as a snack to keep their energy levels steady and to prevent muscle cramps. What am I?</p> <p>(Answer: Banana)</p>	<p>I am something many people don't get enough of, especially during the winter. That's why I'm often called the "sunshine vitamin." People can eat cheese, eggs, fortified orange juice or fortified cereal with milk to add me to their diet. What am I?</p> <p>(Answer: Vitamin D)</p>
<p>Milk, yogurt and cheese are full of me. Broccoli, kale and bok choy, too! I'm best known for building strong teeth and bones. What am I?</p> <p>(Answer: Calcium)</p>	<p>We're small and round or oval-shaped. We're kind of like cousins. We're high in fiber and nutrients and belong in two different food groups — Vegetables and Protein Foods. What are we?</p> <p>(Answer: Beans and Peas)</p>
<p>I'm high in protein and calcium. One cup of me equals one serving of dairy. Many people like to mix me with fruit. What am I?</p> <p>(Answer: Yogurt)</p>	<p>I'm a good source of low-fat protein food. One serving of me is about the size of a deck of cards. A silly human named a dance after me. What am I?</p> <p>Answer: (Chicken)</p>
<p>I'm made with cream from a cow, but I'm not part of the Dairy Group. People sometimes spread me on bread and I melt when I get hot. What am I?</p> <p>Answer: (Butter)</p>	<p>People from all over the world cook meals with me every day. Many people combine me with peas and beans for a high-protein meal. I come in white and brown varieties. What am I?</p> <p>(Answer: Rice)</p>
<p>We're from a subgroup of vegetables that includes spinach and romaine lettuce. We're rich in nutrients. What are we?</p> <p>(Answer: Dark-Green Vegetables)</p>	<p>Pumpkins and red peppers are part of our veggie group. We're high in vitamins A and C. What are we?</p> <p>(Answer: Red and Orange Vegetables)</p>
<p>When you eat hummus or falafel, you're eating foods from our vegetable subgroup. What are we?</p> <p>(Answer: Beans and Peas)</p>	<p>Our veggie subgroup includes corn and white potatoes but not sweet potatoes. What are we?</p> <p>(Answer: Starchy Vegetables)</p>