



LESSON PLAN A

DIET DEFICIENCIES: WHAT'S THE DEAL?

Time Frame: One 45-minute session

Learning Objectives:

- Develop knowledge of the different types of nutrients.
- Learn about vitamin deficiencies in the American diet.
- Learn how to read food labels to identify nutrients.
- Understand how to read nutrition labels in order to make healthier choices.
- Become familiar with natural sources of various vitamins and minerals.
- Share knowledge about the importance of vitamin D and potassium with family members.

Materials for Lesson Plan:

- Food packaging with labels (from the New Food Labels activity and extras)
- "V is for Vital Nutrients" Worksheet
- Pencils

Overview:

According to national surveys, Americans do not always get enough vitamin D and potassium in their diets. Why is this important? Because people who don't get enough of these nutrients in their diet have a greater risk for chronic disease. That's why vitamin D and potassium are now required on the nutrition label, replacing vitamins A and C. (When the nutrition label was first established, vitamins A and C were deficient in American diets, but this is no longer the case.)

Discussion:

- **What is a nutrient?** A nutrient is something that supplies nourishment. Nutrients help plants and animals grow and function properly. There are six categories of nutrients: **Carbohydrates, Proteins, Fats, Vitamins, Minerals and Water.**
- **What is an essential nutrient?** Essential nutrients are those that the human body needs but can't make enough of on its own. The best source of these key nutrients is in the foods we eat, but if that is not possible you may need to take a vitamin supplement. There are **13 vitamins and 15 minerals** that are considered essential nutrients. Our bodies need these to function well and fight off disease.
- **What is a macronutrient?** Macronutrients are nutrients the body requires in large quantities. **Calcium and potassium** are two examples of macronutrients.
- **What is a deficiency?** A deficiency means you're lacking a certain nutrient in your diet. This is especially important during childhood when our bodies are developing.

- Doctors now say Americans do not always get enough **vitamin D** and **potassium** in their diets. That's why vitamin D and potassium are now required on the nutrition label. Can anyone find one of these nutrients on one of your food labels?
- Why do we need to pay extra attention to vitamin D and potassium? Because people who don't get enough of these nutrients in their diet have a greater risk for chronic disease over time. In the short term, they can have problems like weak bones, frequent infections or feeling tired a lot of the time (**vitamin D deficiency**) or having muscle cramps (**potassium deficiency**).
- Sunlight is the main source of vitamin D, providing 80–90% of your daily requirement. That's one more reason why it's important to get outside to run and play (and to limit screen time) every day. When exposed to the sun your body "makes" its own vitamin D, which in turn helps it absorb calcium and phosphate from our diet. But due to indoor lifestyles and increased use of high SPF sunscreen, roughly half of children and adults are deficient in this critical nutrient. We also get vitamin D from a small number of foods, such as oily fish and eggs, and from vitamin supplements. It's difficult to get enough vitamin D from food alone; that's why many packaged foods are fortified with it.
- **Fortified foods** are those that have been "boosted" with extra nutrients. Foods that already contain a certain nutrient can have more added. In other cases, a food can have nutrients added that are not normally there. Fortified foods provide most of the vitamin D in the American diet. Almost all types of milk are fortified with vitamin D, but check the labels to make sure. Ready-to-eat breakfast cereals often contain added vitamin D, as do some brands of orange juice, yogurt, margarine and other food products.
- **Potassium** is a vital nutrient. It is part of every cell in our bodies! Potassium is found in a wide variety of plant and animal foods and in beverages. Many fruits and vegetables are excellent sources, including potatoes. Baked potatoes with skins are one of the best sources! (If you boil potatoes, half the potassium is lost in the water.) Meats, poultry, fish, milk, yogurt, and nuts also contain potassium. Whole-wheat flour and brown rice are good sources as well.

Activity A. Nutrient Hunt

Divide the class into two groups. Have one group focus on vitamin D, the other on potassium. Then give students the following instructions:

Instructions to Students:

Group 1. Vitamin D Detectives

Research different types of foods that are fortified with vitamin D. Make a list of both fresh and packaged foods.

- Search the food wrappers and packages used in the How to Read a Food Label activity to see if you can find vitamin D on any of the food labels.
- Homework assignment: Hunt for vitamin D on the food labels in your cupboards at home or take a trip to a local store to look at items on the shelves and in the refrigerated section. Compare different types of fortified cereals and yogurts. Which ones have the most vitamin D?
- Create a flyer, write a song or draft a public service announcement to promote foods that are rich in vitamin D.

Group 2. Potassium Police

Follow the same instructions as above, but focus on potassium instead. You may also use the list in the reference section at the end of the lesson.

Activity A. Play Nutritionist

A nutritionist is a healthcare professional who advises people on which foods to eat.

Instructions to Students:

Pretend you're a nurse, doctor or nutritionist.

Part 1. Your patient has muscle and bone weakness. They are frequently ill and feel blue in the winter. Write a prescription recommending they eat more foods rich in vitamin D. Give a list of suggested foods and recipes, including both natural sources and fortified foods.

Part 2. Your patient is feeling tired, weak and has muscle cramps. Write a prescription recommending they eat more foods rich in potassium. Give a list of suggested foods and recipes that are rich in this important nutrient.

Family Connection:

Get Your Daily D!

Make a poster for your home kitchen about the importance of vitamin D. Include information like: How much exposure to sunshine should you try to get each day?

Nutrient Booster Recipes

Make recipes for one or two winning combos with vitamins and minerals we all need to boost in our diets. For example, a banana split made with low-fat frozen yogurt, bananas and what else? (Pistachios? Raisins?) Or how about pumpkin muffins? Pumpkin, milk and eggs all have potassium. Could you add any other ingredients to the recipe? (Pumpkin seeds?)

Student Reference Material:

FDA Tips

- Choose nutrients wisely.
- Pick foods that are higher in “nutrients to get more of,” and lower in “nutrients to get less of.”
- Get More: Potassium, fiber, vitamin D, iron and calcium.
- Get Less: sodium, trans fat, saturated fat, cholesterol and sugars
- Potassium is a vital mineral and electrolyte that helps keep our body functioning. Our heart, muscles and nerves all require potassium.

About Electrolytes

Electrolytes are chemicals that conduct electricity when mixed with water and help keep the body hydrated. They also regulate nerve and muscle function, balance blood pressure, and help rebuild damaged tissue. Potassium, calcium, magnesium, sodium and bicarbonate are all examples of electrolytes.

Potassium-Rich Foods*

Including milligrams (mg) of potassium

Dried apricots, 1 cup: 1,511 mg
Avocado, medium: 975 mg
Winter squash, cubed, 1 cup, cooked: 896 mg
Sweet potato, medium, baked with skin: 694 mg
Potato, medium, baked with skin: 610 mg
White beans, canned, drained, half cup: 595 mg
Yogurt, fat-free, 1 cup: 579 mg
Kiwifruit, 1 cup: 562 mg
Halibut, 3 ounces, cooked: 490 mg
100% orange juice, 8 ounces: 496 mg
Oranges, 1 cup: 326 mg
Broccoli, 1 cup, cooked: 457 mg

Cantaloupe, cubed, 1 cup: 431 mg
Banana, 1 medium: 422 mg
Honeydew melon, 1 cup: 388 mg
Pork tenderloin, 3 ounces, cooked: 382 mg
Lentils, half cup, cooked: 366 mg
Milk, 1% low fat, 8 ounces: 366 mg
Cherries, 1 cup: 342 mg
Salmon, farmed Atlantic, 3 ounces, cooked: 326 mg
Pistachios, shelled, 1 ounce, dry roasted: 295 mg
Raisins, quarter cup: 250 mg
Chicken breast, 3 ounces, cooked: 218 mg
Tuna, light, canned, drained, 3 ounces: 201 mg

Good Sources of Vitamin D*

Fatty fish, like tuna, mackerel and salmon
Beef liver
Foods fortified with vitamin D, like some dairy products, orange juice, soy milk and cereals
Cheese and eggs

*Source: U.S. Department of Agriculture (USDA)

Further Reference Material:

[USDA Changes to the Nutrition Facts Label](#)

[NIH: Vitamin D Fact Sheet for Health Professionals](#)

[NIH: Potassium Fact Sheet for Health Professionals](#)



LESSON PLAN B

FOCUS ON FIBER

Time Frame: One 45-minute session

Learning Objectives:

- Develop knowledge about fiber as an important nutrient.
- Learn how to read food labels to identify nutrients.
- Become familiar with sources of fiber in a range of different foods.
- Share knowledge about the importance of fiber with family members.

Materials for Lesson Plan:

- Food packaging with labels (from the How to Read the New Food Labels activity and extras)
- “Nutrients by the Numbers: Fiber” worksheet
- “Kitchen Chef Challenge” resources (download)
- Pencils

Overview:

According to surveys, Americans get roughly half the recommended amount of fiber in their diets each day. This lesson teaches students about the importance of fiber, how to look for it on food labels, and how to factor it into healthy choices throughout the day.

Discussion Points:

Q: What is fiber?

A: Fiber is an important nutrient. It is found in many whole grains, fruits, vegetables, beans and nuts.

Q: How much do you need?

A: Lots of kids and adults don’t get enough fiber. In fact, surveys show that Americans are only getting half the fiber they need each day. That’s why fiber is highlighted in red on the new Food Nutrition label as a nutrient to “get enough of” each day.

Q: Do you get enough fiber each day? What’s the recommended amount?

A: Girls age 9–13 should get 26 grams of fiber a day. Boys age 9–13 should get 31 grams of fiber each day.

Q: How can you tell if a food is high in fiber?

A: High-fiber foods have 5 or more grams of fiber. Foods with more than 2.5 grams are good choices, too.

Benefits of fiber:

- Fiber helps us digest the foods we eat.
- Fiber keeps us feeling full longer, so we don't eat too much.
- Fiber helps regulate our body's use of sugars.

Go for whole!

Whole foods are generally good sources of fiber. For example, an orange has much more fiber than a glass of orange juice. Peels are key, too. A whole apple, skin and all, has more fiber than a peeled one. Potatoes with skins are higher in fiber and nutrients. Throw away the peels and you throw away important vitamins and minerals!

Tips for boosting your daily fiber:

- Eat whole fruits to get the most fiber.
- Choose breakfast cereals that list a whole grain as their first ingredient.
- Craving a crunchy snack? Snack on raw vegetables.
- Try beans instead of meat in favorite foods like tacos, chili or spaghetti sauce.

Activity A. Plan a Nutrient-Packed Breakfast**Materials for Lesson Plan:**

- MyPlate template
- Sample food labels and reference material (below)
- Meal Planning worksheet
- Pencils and erasers

Use your MyPlate template and menu-planning skills to select a breakfast that includes at least one-third of your daily recommended amount of fiber. Bonus points if you can include one-half your daily requirement.

Why include lots of fiber at breakfast time? 1) There are lots of great fiber-rich options for "breakfast foods;" 2) fiber fills you up and keeps hunger at bay until lunchtime; 3) you'll meet a third or a half of your day's requirement straight away.

Instructions to Students:

1. Use the sample food labels and resources below to plan a well-balanced breakfast that meets either one-third or one-half of your daily recommended amount of fiber.
2. Use a notebook or scrap paper to do your calculations, then make a list of each breakfast item. Next to each item, list the serving size, the calories and the fiber.
3. Optional: Draw your own food items or use clip art from the Meal Planning worksheet to decorate your MyPlate template.

Activity B. Kitchen Chef Challenge**Instructions to Students:**

Who can plan the most nutritious breakfast?

Base your judging on the following criteria:

- How high can you go with % DV of each nutrient in the red zone? (fiber, vitamins and minerals)
- How low can you go with nutrients in the yellow zone? (fat, cholesterol and sodium)
- Is half your plate made up of fruits and vegetables?

- Do you have something from each of the five food groups?
- How many calories is your breakfast? What is this in terms of % DV?

Finalists are those who meet most or all of the criteria. Have finalists present their breakfast menus to the class. Afterward, lead a class discussion to decide as a group on the winning menu. Students must explain the reasoning behind their vote and show their math during the discussion.

Extension:**Nutrition Number Crunchers**

In addition to fiber, calculate the quantities and % DV of the other key nutrients listed on food label: calcium, iron, potassium and vitamin D. Write these on the margins of the MyPlate template or on a separate sheet of paper.

Further Reference:

USDA: Food and Nutrition Information Center | Fiber Information

[Choose My Plate: Why is it important to eat grains, especially whole grains?](#)

[Harvard School of Public Health | Nutrition Source: Fiber](#)

[Mayo Clinic: High-Fiber Foods](#)

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.

Standard 8. Advocate for personal, family, and community health.

Worksheets & Downloads:

V is for Vital Nutrients!

Word: Nutrient

Definition: A substance our bodies need in order to grow and function well.

Which of the following are examples of nutrients?


Circle the words:

Proteins Doughnuts Fats Vitamins Minerals Water Energy Drinks

Fill in the missing letters:

1. Potassium is part of every ce ___ ___ in the body. We can't live without it!
2. B ___ ___ ___ potatoes with skin are high in potassium. B ___ ___ ___ or mashed potatoes have half the potassium.
3. Fruits like ___ ___ n ___ ___ s and ___ v ___ ___ d ___ ___ are good sources of potassium, too.
4. Almost all types of cow's milk in the U.S. are fortified with vitamin D, but ___ ___ ___ cream and ___ h ___ ___ s ___ are not.
5. Fortified breakfast ___ e ___ ___ a ___ and fortified ___ ___ ___ ___ ___ juice are good sources of vitamin D too.
6. Vitamin D helps our bodies absorb calcium, which is good for our ___ ___ ___ s.

Draw a picture of doing something fun in the sun to get more vitamin D.



Vitamin D: The "Sunshine Vitamin"

Answer key:

Circle the words:

Proteins Fats Vitamins Minerals Water

1. cell
2. baked / boiled
3. bananas / avocados
4. ice / cheese
5. cereal / orange
6. bones

Nutrients by the Numbers: Fiber Worksheet

Put this alphabetical list into numerical order, according to grams of fiber. List the foods in descending order, from most fiber per gram to the least.

Sources of fiber			Ranked from most to least	
Food	Serving Size	Fiber	Food	Fiber
Almonds	23 nuts	3.5 grams		
Avocados	½ raw	6.7 grams		
Baked beans	1/2 cup	5.2 grams		
Banana	one, peeled	3.1 grams		
Blackberries	½ cup	3.8 grams		
Blueberries	½ cup	1.8 grams		
Broccoli	1 cup	5.1 grams		
Brown rice	1 cup (cooked)	3.5 grams		
Carrots	1 cup	3.4 grams		
Oatmeal	1 cup (cooked)	4 grams		
Oatmeal	1 packet (instant)	3 grams		
Orange	1, peeled	3.1 grams		
Peas	1/2 cup	4.4 grams		
Popcorn	3 cups (air-popped)	3.5 grams		
Potato (with skin)	1 medium	4 grams		
Peanut butter	2 tablespoons	1.9 grams		
Raisins	1/2 cup	3 grams		
Raspberries	1/2 cup	4 grams		
Strawberries	1 cup	3 grams		
Whole-wheat pasta	1 cup	6.3 grams		
Bread, White	2 slices	1.5 grams		
Bread, Whole-Grain	2 slices	5 grams		
Waffle, Plain	2 waffles	1 gram		
Waffle, Whole-whea	2 waffles	3 grams		

These are average numbers; actual fiber amounts vary from brand to brand. Check the food label on each package. White breads range from 0 to 4 grams of fiber per 2-slice serving, the high end being for white wheat bread. Whole-grain breads range from 4 to 6 grams per 2-slice serving.

Skin or No Skin?

	With skin (Fiber in grams)	Without skin (Fiber in grams)	
Baked potato	4 grams	3 grams	One medium size
Baked sweet potato	4 grams	3 grams	One medium size
Apple	3.0 grams	1.4 grams	Slices, one cup
Pear	4.3 grams	4.0 grams	Slices, one cup

Nutrition Facts

12 servings per container

Serving size **1/2 muffin (144g)**

	Per 1/2 muffin		Per 1 muffin	
Calories	380		760	
	% DV*		% DV*	
Total Fat	16g	21%	32g	41%
Saturated Fat	3g	15%	6g	30%
<i>Trans</i> Fat	0g		0g	
Cholesterol	50mg	17%	100mg	33%
Sodium	480mg	21%	960mg	42%
Total Carb.	56g	20%	112g	41%
Dietary Fiber	2g	7%	4g	14%
Total Sugars	32g		64g	
Incl. Added Sugars	30g	60%	60g	120%
Protein	3g		6g	
Vitamin D	0.1 mcg	0%	0.2mcg	2%
Calcium	40mg	4%	80mg	6%
Iron	2mg	10%	4mg	20%
Potassium	190mg	4%	380mg	8%

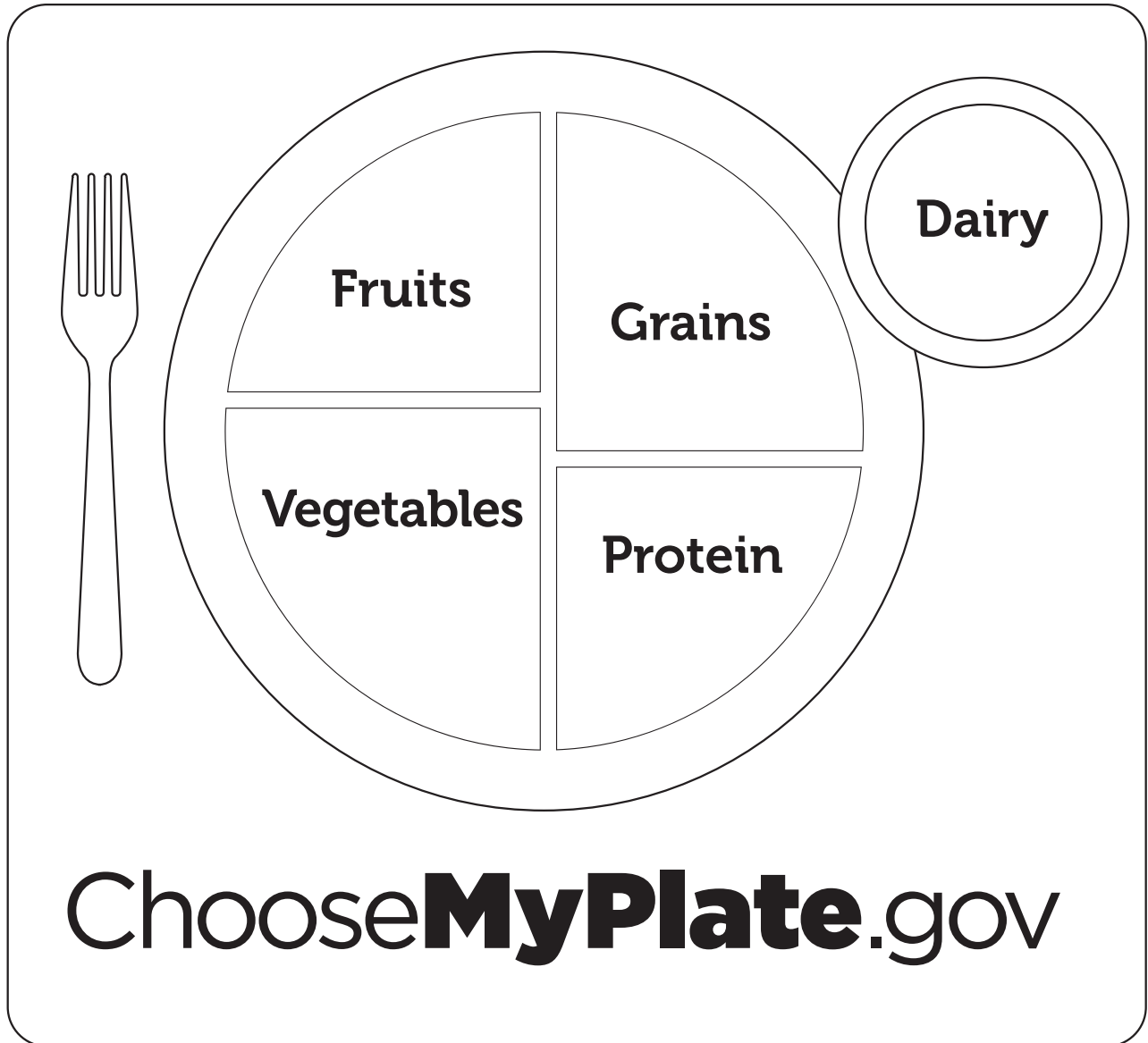
* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.



Nutrition Facts	Wheat Squares Sweetened	Corn Flakes Not Sweetened	Mixed Grain Flakes Sweetened
1 serving per container			
Serving size 1 box	(35g)	(19g)	(27g)
Amount per serving			
Calories	130	70	100
	% Daily Value*	% Daily Value*	% Daily Value*
Total Fat	0g 0%	0g 0%	0g 0%
Saturated Fat	0g 0%	0g 0%	0g 0%
<i>Trans Fat</i>	0g	0g	0g
Cholesterol	0mg 0%	0mg 0%	0mg 0%
Sodium	0mg 0%	200mg 9%	120mg 5%
Total Carbohydrate	29g 11%	17g 6%	24g 9%
Dietary Fiber	3g 11%	1g 4%	1g 4%
Total Sugars	8g	6g	13g
Includes Added Sugars	8g 16%	5g 10%	13g 26%
Protein	4g	1g	1g
	% Daily Value*	% Daily Value*	% Daily Value*
	2mcg 10%	2mcg 10%	0mcg 0%
Vitamin D	0mg 0%	0mg 0%	0mg 0%
Calcium	2mg 10%	1mg 6%	4mg 20%
Iron	120mg 2%	80mg 2%	30mg 0%
Potassium			
Vitamin A		10%	10%
Vitamin C		15%	90%
Thiamin		15%	25%
Riboflavin		10%	25%
Niacin		10%	20%
Vitamin B ₆		20%	20%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.





Meal Planning

