Make a Rainbow on Your Plate Lesson Plan

GRADE LEVEL

Suggested for **Grades 2-5**.

Can be modified for PreK-1.

CONTENT AREAS

Maryland State Curriculum-Health

STANDARDS/GOALS

Standard 6.0 Nutrition and Fitness: Students will demonstrate the ability to use nutrition and fitness knowledge, skills, and strategies to promote a healthy lifestyle.

SKILLS/INDICATORS

6.0.A. Responses to Food
6.0.B. Food Production
6.0.D. Nutrients
6.0.E. Food and Health
6.0.F. Nutrition and Physical Activity Guidelines

VENUE

Classroom

Time to allot for Part I: 30 min.
Time to allot for Part II: 45 min.

Title & Summary

"Make a Rainbow on Your Plate" is a lesson to introduce students to the concept of eating a variety of fruits and vegetables for better health by incorporating fruits and vegetables of different colors into the diet. A variety of fruits and vegetables is needed to provide all the different nutrients and other substances in fruits and vegetables necessary for growth, development, body maintenance and repair, and prevention of disease.

Objectives

Students will:

- Differentiate how senses affect food choices
- Recognize that variety in colors of fruits and vegetables in the diet is important to good health
- Distinguish fruits and vegetables as plant food sources and not animal food sources
- Identify and define fruit and vegetable sources of nutrients
- Recognize that foods are categorized into groups
- Recognize MyPyramid as an outline for healthy eating and classify fruits and vegetables into the correct food group in MyPyramid
- Describe how fruits and vegetables keep the body healthy
- Discuss and understand the importance of farms, agriculture and local foods in the community

Materials

Materials needed for each student:

Maryland Agriculture Map Handout
MyPyramid for Kids Handout
Fruit and Vegetable Nutrients and Their Functions Chart
Make a Rainbow on Your Plate Worksheet
Fruits and Vegetables by Color Category Chart
Farm to School Seasonal Availability Chart
10 Reasons to Buy Local Handout
Is There a Rainbow on Your Plate Take Home Chart *(optional)*

Materials needed for class:

Maryland Agriculture Map Poster
Pictures of Fruits and Vegetables
Large (one quart/4 cup) Measuring Cup *(optional)*
Fruits and Vegetables of Different Colors for Sampling or Ingredients for Fruit or Vegetable Pizza *(optional)*
Food, Supplies and Utensils for Sampling or Making Pizza *(optional)*

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Background

See "Fruit and Vegetable Nutrition Teacher Information". Review the "What is Agriculture" lesson.

Vocabulary

See "Fruit and Vegetable Nutrition Teacher Information".

Procedure

Part I

Post the Maryland Agriculture Map for all students to see and study, and distribute black and white copies of the Maryland Agriculture Map for students to refer to for discussion. Generate discussion about Maryland agriculture and local agricultural products using these questions:

Review definitions and concepts of agriculture from What is Agriculture lesson.
What do the symbols on the map mean? Which are plant foods or products? Which are animal?
Where is the county you live in? What agricultural products are produced in your county? Any fruits or vegetables? If not, where can you get locally grown vegetables (farm or roadside stand, farmers' markets, grocery store, garden, etc.) fruits and vegetables?
How many counties have farms that grow and sell a lot of vegetables?
What regions are these counties in?
(Western = Garrett and Allegany)
(North Central = Washington, Frederick, Montgomery, Howard, Carroll, Baltimore and Harford)
(Southern = Anne Arundel, Prince George's, Calvert, Charles and St. Mary's)
(Northern Eastern Shore = Cecil, Kent, Queen Anne's, Talbot and Caroline)
(Southern Eastern Shore = Dorchester, Wicomico, Somerset and Worcester)
When you see fruits and vegetables growing on the farm or in the garden near you, are they different from what is on the map? If so, what does this mean? (The map is based on market sales, the dollar value of the products sold at markets, and not necessarily what is grown. So, some products, or commodities, are sold for more money, or have a higher dollar value. However, they are not more important to our economy and our health).
What color are the fruits and vegetables that you see growing?

Part II

Using the MyPyramid for Kids poster or handout, review the basic five food groups (grains, vegetables, fruits, dairy, and meat and beans). Note that beans can be in either the vegetables or meat and beans group. Oils, represented by the yellow band, are not a group, but foods with healthy oils are recognized as part of a healthy die on MyPyramid. Stress the fruits and vegetables group and concepts, including the band color, variety within the fruits and vegetables groups, the different colors of fruits and vegetables and the amount of fruits and vegetables needed every day (demonstrate how much is 4 cups total: 2 ½ cups vegetables and 1 ½ cups fruit for children ages 6-11 years; an amount equal to a large, one quart measuring cup). A crude way to estimate 4 cups is by 8 handfuls. See MyPyramid.gov for more information.

Generate class discussion about why fruits and vegetables are important for good health. Highlight and define key nutrients and phytochemicals on the Fruit and Vegetable Nutrients and Their Functions Chart. Emphasize that plant pigments are phytochemicals that protect us from disease, and that there are many of them. Pigments give

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the fruits and vegetables their colors. One way to get a variety of nutrients and phytochemicals is to eat fruits and vegetables of different colors everyday (a variety). Brainstorm ways to eat colors at meals and snacks.

Give each student a "Make a Rainbow on Your Plate Activity Worksheet" and allow students time to complete it.

Optional: Bring in different colored fruits and vegetables for students to explore with their senses, and then let students use the last sense- taste! Make a guessing game out of it if you want. Place individual fruits or vegetables in a brown paper bag or box. Have students feel it without looking and describe how it feels. Then, have them look at it and describe how it looks. Explore inside and out of the fruit or vegetable. Lastly, wash and cut it up for students to taste, and have them describe how it tastes. Keep the mystery vegetable a secret and have students try to guess what it is based on the descriptions.

Make a Rainbow Fruit Pizza: use whole wheat or whole grain English muffins; spread with low fat cream cheese; top with favorite fruits of different colors (banana, kiwi, strawberries, blueberries or purple grapes, mango or peach). Check for food allergies first.

Make a Rainbow Vegetable Pizza: use whole wheat or whole grain English muffins; spread with pizza sauce; top with cheese and vegetables of different colors (green pepper, red pepper, yellow tomato, mushrooms or onions, black olives). Check for food allergies first.

Assessment

Accurate completion of the Make a Rainbow on Your Plate Worksheet.
Contribution to discussions.

Extensions

Invite a farmer to your class to show and talk about what he/she grows and why agriculture is important to the community.

Visit a farm or farmers' market and have students find as many different kinds of fruits and vegetables of different colors as they can. Talk about why students don't see some of their favorite or familiar fruits and vegetables (climate, not locally grown, seasonal, fresh and not processed, etc.).

Investigate unusual colors of fruits and vegetables: blue potatoes, blue carrots, orange or yellow tomatoes, purple green beans, purple asparagus, white peaches, yellow watermelon, golden kiwi, purple or golden cauliflower, broccoflower, and others.

Determine if a tomato is a fruit or a vegetable. Have students hunt for clues in science books and on the internet, or interview the science teacher. When is a tomato a fruit? When is it a vegetable? Does it really matter to your body if it's a fruit or vegetable? What other vegetables may actually be fruits?

Write a school menu using local produce. Invite the cafeteria manager or employee to help the class with menu planning. Have students write a catchy menu promotion to entice kids to select and eat the local menu items while informing them about the fruits and vegetables. Use descriptive words and include a variety of colors.

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Compare the nutritional value of fruits and vegetables to determine which ones have a lot of vitamin C, vitamin A, fiber, magnesium, etc. Use Nutrition Facts Labels on food packages or use internet resources. Select a combination of fruits and vegetables that will provide 100% of the US RDA for vitamins A and C. Internet sources for Nutrition Facts Labels and Nutrient Charts are www.harvestofthemonth.com/EdCorner/nutrition-labels.asp and www.harvestofthemonth.com/EdCorner/nutrient-graphs.asp. Another source for Nutrition Facts Labels is www.fns.usda.gov/tn/Resources/POC_topic6.pdf.

Home Link

Have students take home the Produce for Better Health Foundation's "Activity 4: Is There a Rainbow on Your Plate" worksheet. Challenge the students to eat all colors every day for a week.

Resources

See "Fruit and Vegetable Teacher Resources".

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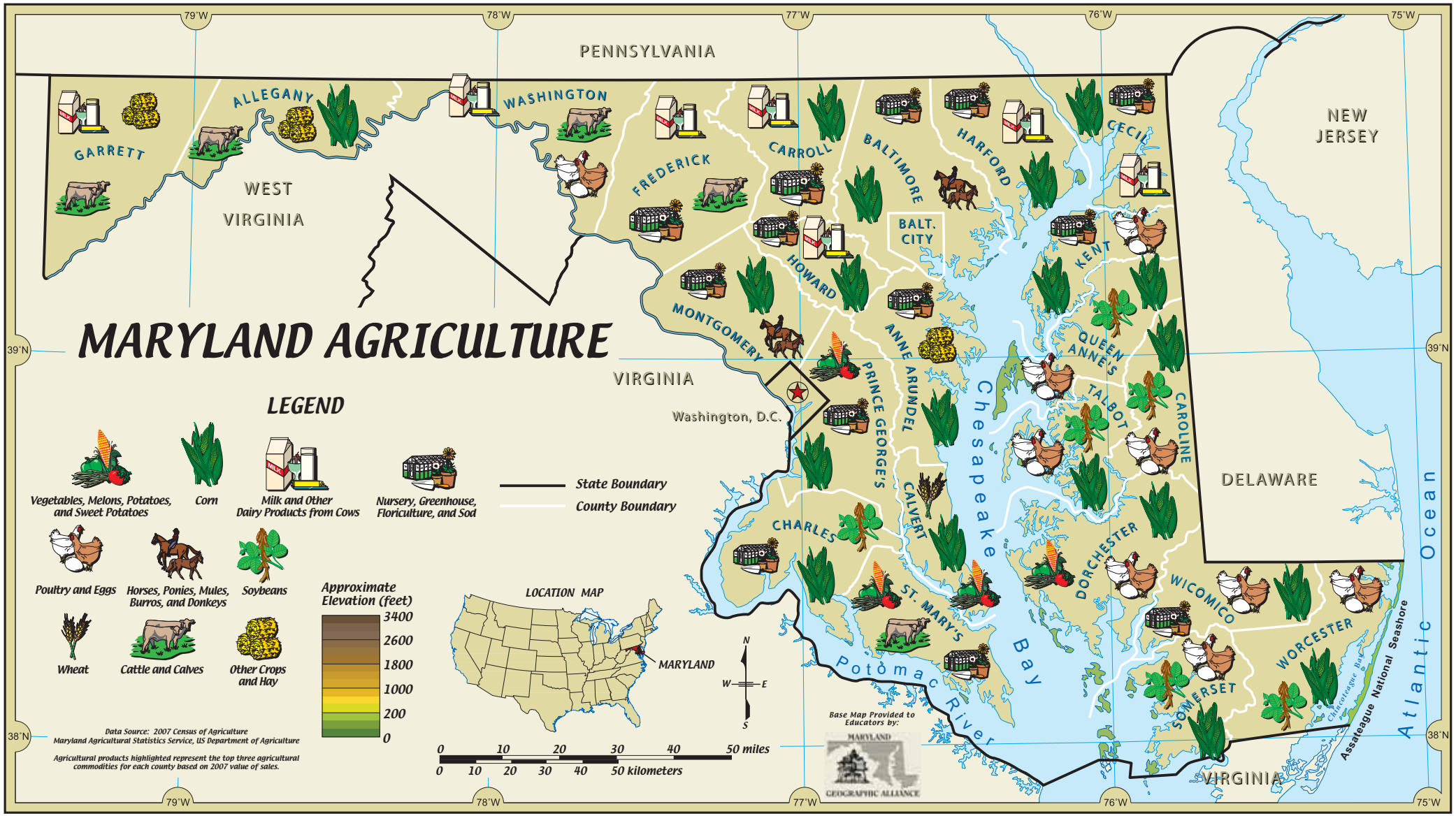
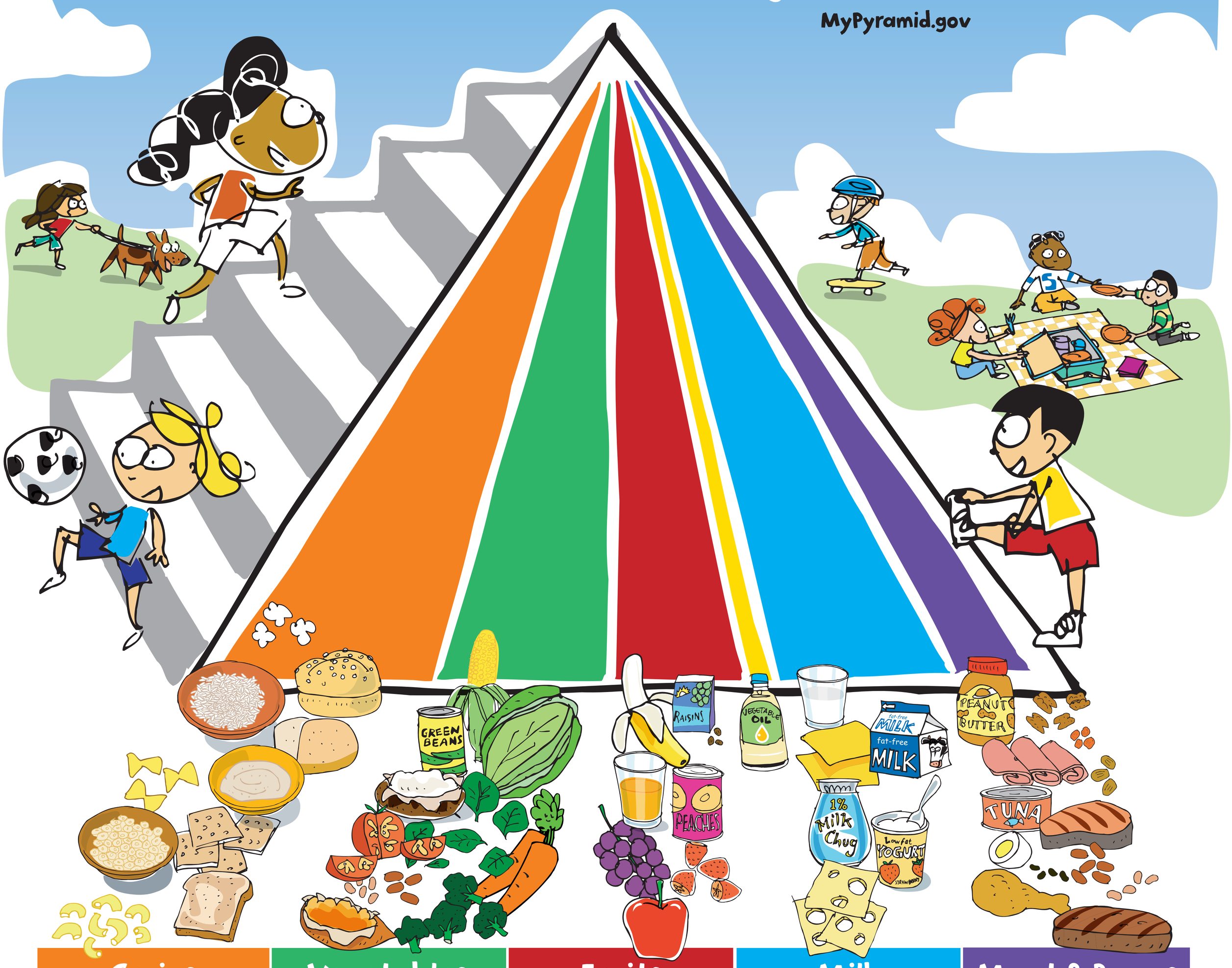


This map was made possible by the Maryland Agricultural Education Foundation, Inc.

MyPyramid For Kids

Eat Right. Exercise. Have Fun.

MyPyramid.gov



Grains
Make half your grains whole

Start smart with breakfast. Look for whole-grain cereals.

Just because bread is brown doesn't mean it's whole-grain. Search the ingredients list to make sure the first word is "whole" (like "whole wheat").

Vegetables
Vary your veggies

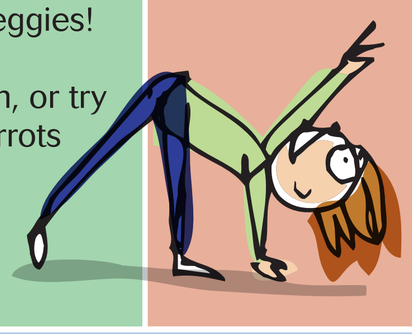
Color your plate with all kinds of great-tasting veggies.

What's green and orange and tastes good? Veggies! Go dark green with broccoli and spinach, or try orange ones like carrots and sweet potatoes.

Fruits
Focus on fruits

Fruits are nature's treats – sweet and delicious.

Go easy on juice and make sure it's 100%.



Milk
Get your calcium-rich foods

Move to the milk group to get your calcium. Calcium builds strong bones.

Look at the carton or container to make sure your milk, yogurt, or cheese is lowfat or fat-free.

Meat & Beans
Go lean with protein

Eat lean or lowfat meat, chicken, turkey, and fish. Ask for it baked, broiled, or grilled – not fried.

It's nutty, but true. Nuts, seeds, peas, and beans are all great sources of protein, too.

For an 1,800-calorie diet, you need the amounts below from each food group. To find the amounts that are right for you, go to MyPyramid.gov.

Grains	Vegetables	Fruits	Milk	Meat & Beans
Eat 6 oz. every day; at least half should be whole	Eat 2 1/2 cups every day	Eat 1 1/2 cups every day	Get 3 cups every day; for kids ages 2 to 8, it's 2 cups	Eat 5 oz. every day

Oils Oils are not a food group, but you need some for good health. Get your oils from fish, nuts, and liquid oils such as corn oil, soybean oil, and canola oil.

Find your balance between food and fun

- Move more. Aim for at least 60 minutes everyday, or most days.
- Walk, dance, bike, rollerblade – it all counts. How great is that!

Fats and sugars – know your limits

- Get your fat facts and sugar smarts from the Nutrition Facts label.
- Limit solid fats as well as foods that contain them.
- Choose food and beverages low in added sugars and other caloric sweeteners.

MyPyramid.gov
STEPS TO A HEALTHIER YOU

U.S. Department of Agriculture
Food and Nutrition Service
September 2005
FNS-381

USDA

TEAM NUTRITION • USDA
teamnutrition.usda.gov

MyPyramid

Food Intake Patterns

The suggested amounts of food to consume from the basic food groups, subgroups, and oils to meet recommended nutrient intakes at 12 different calorie levels. Nutrient and energy contributions from each group are calculated according to the nutrient-dense forms of foods in each group (e.g., lean meats and fat-free milk). The table also shows the discretionary calorie allowance that can be accommodated within each calorie level, in addition to the suggested amounts of nutrient-dense forms of foods in each group.

Daily Amount of Food From Each Group

Calorie Level[1]	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200
Fruits[2]	1 cup	1 cup	1.5 cups	1.5 cups	1.5 cups	2 cups	2 cups	2 cups	2 cups	2.5 cups	2.5 cups	2.5 cups
Vegetables[3]	1 cup	1.5 cups	1.5 cups	2 cups	2.5 cups	2.5 cups	3 cups	3 cups	3.5 cups	3.5 cups	4 cups	4 cups
Grains[4]	3 oz-eq	4 oz-eq	5 oz-eq	5 oz-eq	6 oz-eq	6 oz-eq	7 oz-eq	8 oz-eq	9 oz-eq	10 oz-eq	10 oz-eq	10 oz-eq
Meat and Beans[5]	2 oz-eq	3 oz-eq	4 oz-eq	5 oz-eq	5 oz-eq	5.5 oz-eq	6 oz-eq	6.5 oz-eq	6.5 oz-eq	7 oz-eq	7 oz-eq	7 oz-eq
Milk[6]	2 cups	2 cups	2 cups	3 cups	3 cups	3 cups	3 cups	3 cups	3 cups	3 cups	3 cups	3 cups
Oils[7]	3 tsp	4 tsp	4 tsp	5 tsp	5 tsp	6 tsp	6 tsp	7 tsp	8 tsp	8 tsp	10 tsp	11 tsp
Discretionary calorie allowance[8]	165	171	171	132	195	267	290	362	410	426	512	648

1 **Calorie Levels** are set across a wide range to accommodate the needs of different individuals. The attached table "Estimated Daily Calorie Needs" can be used to help assign individuals to the food intake pattern at a particular calorie level.

2 **Fruit Group** includes all fresh, frozen, canned, and dried fruits and fruit juices. In general, 1 cup of fruit or 100% fruit juice, or 1/2 cup of dried fruit can be considered as 1 cup from the fruit group.

3 **Vegetable Group** includes all fresh, frozen, canned, and dried vegetables and vegetable juices. In general, 1 cup of raw or cooked vegetables or vegetable juice, or 2 cups of raw leafy greens can be considered as 1 cup from the vegetable group.

Vegetable Subgroup Amounts are Per Week

Calorie Level	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200
Dark green veg.	1 c/wk	1.5 c/wk	1.5 c/wk	2 c/wk	3 c/wk	3 c/wk	3 c/wk	3 c/wk	3 c/wk	3 c/wk	3 c/wk	3 c/wk
Orange veg.	.5 c/wk	1 c/wk	1 c/wk	1.5 c/wk	2 c/wk	2 c/wk	2 c/wk	2 c/wk	2.5 c/wk	2.5 c/wk	2.5 c/wk	2.5 c/wk
Legumes	.5 c/wk	1 c/wk	1 c/wk	2.5 c/wk	3 c/wk	3 c/wk	3 c/wk	3 c/wk	3.5 c/wk	3.5 c/wk	3.5 c/wk	3.5 c/wk
Starchy veg.	1.5 c/wk	2.5 c/wk	2.5 c/wk	2.5 c/wk	3 c/wk	3 c/wk	6 c/wk	6 c/wk	7 c/wk	7 c/wk	9 c/wk	9 c/wk
Other veg.	3.5 c/wk	4.5 c/wk	4.5 c/wk	5.5 c/wk	6.5 c/wk	6.5 c/wk	7 c/wk	7 c/wk	8.5 c/wk	8.5 c/wk	10 c/wk	10 c/wk

4 **Grains Group** includes all foods made from wheat, rice, oats, cornmeal, barley, such as bread, pasta, oatmeal, breakfast cereals, tortillas, and grits. In general, 1 slice of bread, 1 cup of ready-to-eat cereal, or 1/2 cup of cooked rice, pasta, or cooked cereal can be considered as 1 ounce equivalent from the grains group. **At least half of all grains consumed should be whole grains.**

5 **Meat & Beans Group** in general, 1 ounce of lean meat, poultry, or fish, 1 egg, 1 Tbsp. peanut butter, 1/4 cup cooked dry beans, or 1/2 ounce of nuts or seeds can be considered as 1 ounce equivalent from the meat and beans group.

6 **Milk Group** includes all fluid milk products and foods made from milk that retain their calcium content, such as yogurt and cheese. Foods made from milk that have little to no calcium, such as cream cheese, cream, and butter, are not part of the group. Most milk group choices should be fat-free or low-fat. In general, 1 cup of milk or yogurt, 1 1/2 ounces of natural cheese, or 2 ounces of processed cheese can be considered as 1 cup from the milk group.

7 **Oils** include fats from many different plants and from fish that are liquid at room temperature, such as canola, corn, olive, soybean, and sunflower oil. Some foods are naturally high in oils, like nuts, olives, some fish, and avocados. Foods that are mainly oil include mayonnaise, certain salad dressings, and soft margarine.

8 **Discretionary Calorie Allowance** is the remaining amount of calories in a food intake pattern after accounting for the calories needed for all food groups—using forms of foods that are fat-free or low-fat and with no added sugars.

Estimated Daily Calorie Needs

To determine which food intake pattern to use for an individual, the following chart gives an estimate of individual calorie needs. The calorie range for each age/sex group is based on physical activity level, from sedentary to active.

	Calorie Range	
Children	**Sedentary →**	**Active**
2–3 years	1,000 →	1,400
Females		
4–8 years	1,200 →	1,800
9–13	1,600 →	2,200
14–18	1,800 →	2,400
19–30	2,000 →	2,400
31–50	1,800 →	2,200
51+	1,600 →	2,200
Males		
4–8 years	1,400 →	2,000
9–13	1,800 →	2,600
14–18	2,200 →	3,200
19–30	2,400 →	3,000
31–50	2,200 →	3,000
51+	2,000 →	2,800

Sedentary means a lifestyle that includes only the light physical activity associated with typical day-to-day life.

Active means a lifestyle that includes physical activity equivalent to walking more than 3 miles per day at 3 to 4 miles per hour, in addition to the light physical activity associated with typical day-to-day life.

U.S. Department of Agriculture
Center for Nutrition Policy and Promotion
April 2005

USDA

Fruit and Vegetable Nutrition Teacher Information

Most children are not consuming the recommended amounts and types of fruits and vegetables. Recent data from the Center for Disease Control (CDC), Youth Risk Behavior Surveillance Survey (U.S. 2009) show that only 22.3% of high school students report eating fruits and vegetables (excluding fried potatoes and potato chips) five or more times daily. Less than half of Americans age 2 and older consumed at least 2 servings of fruits and 3 of vegetables in 2003-04; only 7% of children age 2-19 years consumed dark green or orange vegetables (Healthy People 2010 Progress Review, CDC, 2008). According to MyPyramid, children ages 6 to 18 years need 4 to 6 ½ cups of fruits and vegetables a day, depending on their age, gender and physical activity level (*see www.mypyramid.gov for more information*). Yellow/orange and dark green vegetables should be consumed regularly, an amount equal to 5 to 5 ½ cups per week. Variety and quantity is encouraged to supply the diverse nutrients that different fruits and vegetables have and to yield the wide-ranging health benefits. One way to achieve variety is to incorporate different colors of fruits and vegetables into the daily diet.

Compounding the health effects of the low nutrient value food choices of today's youth is the growing number of children not at a healthy weight, but who are overweight or obese children. Common causes of obesity include physical inactivity, poor diet, genetics, or a combination of these factors. Regularly consuming more calories from foods than the body uses (expends) results in positive energy balance, and weight gain occurs. Too much weight gain leads to overweight and obesity. Among youth, there is a disproportionate consumption of more energy dense foods, including high fat and/or sugar foods and beverages, compared with lower calorie, nutrient dense foods, such as fruits and vegetables. The net result is a greater number of overweight and obese children at risk for obesity related chronic diseases, including early heart disease and diabetes, and other conditions that affect physical and emotional health, including bone problems and low self-esteem.

In addition to essential nutrients (vitamins, minerals, carbohydrates, protein and water) necessary for normal growth and development and energy, fruits and vegetables provide fiber and phytochemicals that promote optimum health and help prevent chronic disease. Low fruit and vegetable intake in children is associated with suboptimal intakes of vitamins A and C, and fiber. Compared to those who eat few fruits and vegetables, those who eat more as part of a healthy diet are less likely to develop heart disease, stroke and some cancers. A diet rich in fruits and vegetables can also reduce the risk of eye and digestive problems and lower blood pressure.

Eating a plentiful amount and variety of fruits and vegetables every day will provide key nutrients and other beneficial substances, such as fiber and phytochemicals. Fiber is the indigestible carbohydrate in plant foods that is important for normal functioning and health of the digestive tract. Phytochemicals, sometimes called "phytonutrients", are natural components of plant foods. The term "phyto" means plant. These plant compounds are not essential in human nutrition, yet more than a thousand phytochemicals have been discovered and offer a wide range of protective health benefits. Phytochemicals help "fight" disease by reducing inflammation, warding off infection and cancer, and speeding wound healing.

Brightly colored fruits and vegetables are an indication of the presence of plant pigments. Many plant pigments are also antioxidants which help protect healthy cells against damage from free radicals formed when cells burn oxygen for energy during metabolism. Pigments, and other classes of substances, such as flavonoids, phenolic acids, and many others, are phytochemicals under scientific investigation for their health promoting effects. Scientists, nutritionists and leading health experts suggest eating a variety of colorful fruits and vegetables, especially deeply colored ones, for maximum benefit. Not only does color make fruits and vegetables appear enticing, their many wonderful shapes, smells, tastes and textures makes them fun and delicious to eat!

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Fruit and Vegetable Nutrients and Their Functions

Nutrient	Some Sources	Function or Health Impact
Vitamins		
Vitamin C	Citrus fruits, bell peppers, pineapple, melons, kiwi fruit, berries, grapes, guavas, banana, broccoli, cabbage, cauliflower, Brussels sprouts, tomatoes, potatoes, onion, radish, summer squash, asparagus, green beans	Heal cuts and wounds; healthy teeth, gums and immune system; antioxidant
Vitamin A (carotenoids)	Deep yellow and orange fruits and vegetables (apricots, peaches, cantaloupe, mango, orange, carrots, sweet potato, butternut squash, orange bell pepper); dark green vegetables (broccoli and leafy greens, like spinach, kale, collards, and romaine lettuce)	Prevents night blindness; healthy eyes, skin and immune system
Vitamin K	Lentils, green onions, leafy greens, cabbage, broccoli, Brussels sprouts	Blood clotting; healthy bones
Vitamin E	Corn; dried beans and peas, lentils, dark leafy greens, olives, sweet potato, avocado, (nuts)	Healthy heart and blood vessels; healthy immune system; antioxidant
Folate	Dark leafy greens, green peas, dried beans and peas, asparagus, lima beans, beets, okra, artichoke, cauliflower, strawberries, oranges	Prevents spinal cord birth defects; healthy nervous system
Minerals		
Iron	Lentils, spinach and dark leafy greens, dried beans and peas, lima beans, soybeans, raisins, dried apricot, prunes (dried plums)	Red blood cell formation and oxygen transport; normal cell functioning
Calcium	Dark leafy greens, green soybeans (Edamame), calcium fortified orange juice	Healthy bones and teeth; muscle contraction; maintain normal blood pressure
Magnesium	Dark leafy greens, dried beans and peas, artichoke, okra, butternut squash, soybeans, (nuts)	Healthy bones and teeth; enzyme processes; maintain normal blood pressure
Potassium	Dried beans and peas, lima beans, lentils, bananas, cherries, kiwi fruit, dried apricots, oranges, melon, potatoes, sweet potatoes, tomatoes, broccoli, avocado	Maintain fluid balance and healthy blood pressure; nerve function and muscle control
Others (*not required by the body and not considered essential nutrients)		
Protein	Dried beans and peas, soybeans, (nuts)	Wound healing; immune system; enzyme processes; muscle formation and contraction; cell structure; oxygen transport; fluid balance
Fiber*	Dried beans and peas, lentils, green beans, lima beans, peas, sweet potatoes, Brussels sprouts, broccoli, apples, oranges, pears, berries, dates, figs, oranges, guava, kiwi fruit, prunes (dried plums)	Reduces risk for heart disease; helps maintain healthy weight and normal blood sugar levels; prevents constipation
Phytochemicals*	All fruits and vegetables	Maintain eye and heart health; fight infection; antioxidants; reduces inflammation; potentially reduces cancer risk

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Vocabulary and Key State Health Curriculum Terms

Healthy weight- in children older than two years of age, weight and overweight is assessed by a measure called the Body Mass Index (BMI), which is an expression of body weight adjusted for height. BMI correlates with body composition (body fat). BMI for children and adolescents is age and gender specific. A healthy weight is defined as a BMI between the 5th and 84th percentile on the CDC growth charts for children and adolescents. When BMI is <85th percentile, body fat levels are likely to pose little health risk.

Overweight- children with a BMI between the 85th and 94th percentile on the CDC growth charts are considered overweight (American Academy of Pediatrics, 2007). Overweight children may or may not be at risk for health problems related to excess body fat.

Obese- a term that refers to an excess percentage of body weight due to fat that puts people at risk for many health problems. Children and adolescents with a BMI ≥95th percentile are obese.

Calorie- a unit of food energy; defined as the amount energy required to raise the temperature of a liter of water one degree centigrade; the commonly used and accepted term "calorie" actually refers to a kilocalorie (thus, 1,000 calories, or kilocalorie, is implied when using the word "calorie")

Energy balance- the relationship between caloric intake from food and caloric expenditure from the body's own maintenance and physical activity; energy balance = weight maintenance (calories in = calories out); positive energy balance = weight gain (calories in > calories out); negative energy balance = weight loss (calories in < calories out).

Chronic disease- a disease that can be controlled but not cured, and typically takes years to develop and a lifetime of treatment.

Variety- having many different kinds, as in colors of fruits and vegetables

Essential nutrients- chemical substances in food that are required by the body to live and grow, and that cannot be made by the body or made in sufficient amounts; the six major classes of nutrients are vitamins, minerals, carbohydrates, proteins, fats and water.

Nutrition- the interaction between food and the body to enable the body to use nutrients for growth, maintenance and repair.

Function (of food components)- the purpose or role of parts of foods in the human body

Vitamins- a group of essential nutrients used by the body in small amounts to perform and adjust body processes (organic).

Minerals- a group of essential nutrients used in small amounts for body functions (inorganic).

Carbohydrates- one of the energy nutrients in foods; includes sugars, starches, and fiber (organic).

Protein- one of the energy nutrients in foods; made up of building blocks called amino acids.

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Water- an essential nutrient; a liquid required by almost all living things.

Fiber- an indigestible carbohydrate found in plant foods that is important for the health of the digestive tract.

Phytochemicals- natural components found in fruits, vegetables and grains; sometimes called "phytonutrients"; not essential nutrients.

Pigments- plant pigments are molecules in plants that give them their characteristic colors; different pigments color fruits and vegetables blue/purple, yellow/orange, red, and green.

Antioxidants- vitamins, minerals, pigments and other plant substances that help protect healthy cells against damage from free radicals formed when cells burn oxygen for energy during metabolism.

Characteristics of foods- appearance (the way food looks); **shape** (the form it takes); **color** (a visual quality); **size** (how big it is); **smell** (what your nose tells you), **taste** (what your mouth tells you), and **texture** (how it feels); all of these characteristics affect the senses and food choices.

MyPyramid- a symbol showing Americans over the age of two years what a healthy diet looks like; most recent version of the government's food guide pyramid (2005).

Produce- fresh fruits and vegetables

In season- a time of year when fresh fruits and vegetables are available

Ripe (produce)- a mature stage and of the best quality and flavor ; ready to be eaten

Locally grown (local)- fresh food that is grown near where it will be sold or purchased

Maryland State Health Curriculum Standards Addressed
Grades PreK-5

Standard 6.0 Nutrition and Fitness: Students will use the ability to use nutrition and fitness knowledge, skills, and strategies to promote a healthy lifestyle.

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Make a Rainbow on Your Plate

Name _____

On the plates, write in fruits and vegetables to complete each meal and a snack. Make sure you have a rainbow of colors of fruits and vegetables (red, yellow or orange, white or brown, green, and blue or purple). Color in the square with the same color of the fruits and vegetables on each plate.

milk

cereal _____

_____

_____

Breakfast

☐ ☐

milk

turkey sandwich _____

_____

_____

Lunch

☐ ☐

water

yogurt _____

_____

_____

Snack

☐ ☐

milk

chicken and brown rice _____

_____

_____

Dinner

☐ ☐

Write in your answer to each of the questions.

How many different colors of fruits and vegetables are in the meals and snack all together? _____.

Which fruits and vegetables in the meals and snacks have vitamin A? (Hint: dark yellow, orange and dark green colored fruits and vegetables have vitamin A) _____.

Why is it important to eat a variety of colors of fruits and vegetables every day? _____

_____.

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Make a Rainbow on Your Plate- page 2

What color band on MyPyramid represents the fruit group? _____.

What color band on MyPyramid represents the vegetable group? _____.

Draw a line from the nutrient in the first list to its function in the second list.

Vitamin C	prevents heart disease and keeps digestive tract healthy
Vitamin A	a mineral that helps lower blood pressure and control muscles
Potassium	keeps teeth and gums healthy and fights infection
Fiber	not an essential nutrient, helps prevent disease, and could give plant foods color
Phytochemical	keeps eyes healthy and helps you see at night

For each color, write in one fruit and one vegetable grown in Maryland. Think about what grows in the garden or on a farm.

	Fruit	**Vegetable**
Red	_____	_____
Yellow or orange	_____	_____
White	_____	_____
Green	_____	_____
Blue or purple	_____	_____

UNIVERSITY OF MARYLAND EXTENSION
Solutions in your community

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Fruits & Vegetables* by Color Category

Blue/ Purple

Purple Asparagus
Purple Belgian Endive
Blackberries
Black currants
Black Salsify
Blueberries
Purple Carrots
Dried Plums
Eggplant
Elderberries
Purple Figs
Purple Grapes
Purple Peppers
Plums
Purple Potatoes
Raisins

Green

Green Apples
Artichokes
Arugula
Asparagus
Avocados
Green Beans
Broccoli
Broccoli Rabe
Brussels Sprouts
Green Cabbage
Celery
Chayote Squash
Chinese Cabbage
(Napa/Boc Choy)
Cucumbers
Endive
Green Grapes
Honeydew Melon
Kiwifruit
Leafy Greens
Leeks
Lettuce
Limes
Okra
Green Onion
Peas
Green Pears
Green Pepper
Spinach
Zucchini

White

Bananas
Brown Pears
Cauliflower
Dates
Garlic
Ginger
Jicama
Mushrooms
White Nectarines
Onions
Parsnips
White Peaches
White Potatoes
Shallots
Turnips

Yellow/ Orange

Yellow Apples
Apricots
Yellow Beets
Butternut squash
Cantaloupe
Carrots
Yellow Figs
Grapefruit
Golden Kiwifruit
Lemon
Mangoes
Nectarines
Oranges
Papayas
Peaches
Yellow Pears
Yellow Peppers
Persimmons
Pineapples
Yellow Potatoes
Pumpkin
Rutabagas
Yellow Summer Squash
Sweet Corn
Sweet Potatoes
Tangerines
Yellow Tomatoes
Yellow Watermelon
Yellow Winter Squash

Red

Red Apples
Beets
Blood oranges
Red Cabbage
Cherries
Cranberries
Pink/Red Grapefruit
Red Grapes
Red Onions
Red Pears
Red Peppers
Pomegranates
Red Potatoes
Radicchio
Radishes
Raspberries
Rhubarb
Strawberries
Tomatoes
Watermelon

*** color categorized by edible portion**

What's Ripe Now?

PRODUCE	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Apples									
Asian Pears									
Black Raspberries									
Blackberries (Thornless)									
Blackberries (Thorns)									
Blueberries									
Cantaloupes									
Honeydew									
Nectarines									
Peaches									
Pears									
Plums									
Red Raspberries									
Red Raspberries (fall)*									
Sour Cherries									
Strawberries*									
Sweet Cherries									
Watermelons									
Watermelons (Sugarbaby)									

PRODUCE	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Asparagus									
Beans (Green or Snap)									
Beans (Lima)									
Beets									
Broccoli									
Cabbage									
Cauliflower									
Corn (Sweet)									
Cucumbers									
Eggplant									
Garlic									
Kale									
Lettuce									
Okra									
Peas (Blackeye)									
Peas (Green)									
Peppers*									
Potatoes (White)									
Pumpkins									
Salad Greens									
Spinach									
Squash (Summer)									
Squash (Winter)									
Sweet Potatoes									
Turnips									
Tomatoes*									

MARYLAND'S BEST Agriculture

Making Healthy Choices

www.mdfarmtoschool.org www.marylandsbest.net

10 Good Reasons to Buy Locally Grown

1 Locally grown food tastes and looks better.

Crops marketed close to home are picked at their peak and usually sold within 24 hours of harvesting. Food imported from far away must travel on trucks or planes and then it is stored in warehouses.

2 Local food supports local families.

The wholesale prices that farmers get for their products are usually very low, sometimes not more than the cost of producing them. Local farmers who sell directly to consumers cut out the middleman and can get full retail price for their food—which helps farm families be able to afford to continue farming their land.

3 Local food builds trust.

With all the issues related to food safety and homeland security, there's an assurance that comes from looking a farmer in the eye at the farmers' market, or driving by the fields where your food comes from.

4 Local food builds community.

When you buy direct from a farmer, you're engaging in a time-honored connection between eater and grower and you're supporting a local business. Getting to know folks who grow your food helps you know more about the place you live. In many cases, it gives you access to a place where you can go to enjoy nature and the seasons, and to learn more about how food grows.

5 Local food preserves open space.

When farmers get paid more for their products from nearby shoppers, they're less likely to sell farmland for development.

6 Local food keeps taxes down.

According to several studies, farms contribute more in taxes than they require in services, whereas most residential development contributes less in taxes than the cost of required services.

7 Local food benefits the environment and wildlife.

Massachusetts farmers are leaders in the use of environmentally sound growing practices. Our farms encompass a patchwork of fields, meadows, woods, streams, and ponds that provide essential habitat for wildlife.

8 Local food makes a lighter carbon footprint.

On average our food travels 1,500 miles from farm to plate. Moreover, each calorie of food produced requires an average of 10 calories of fossil-fuel inputs from travel, refrigeration and processing. Purchasing locally-grown food is a simple way to address the increasing expense of fossil fuels and the adverse effects of global warming from increased carbon emissions.

9 Local food preserves genetic diversity.

In industrial agriculture, plants are bred for their ability to ripen uniformly, withstand harvesting, survive packing and last a long time on the shelf, so there are only a few varieties in large-scale production. This leaves our food supply vulnerable to disease or disaster. Smaller local farms, in contrast, often grow many different varieties to provide a longer season, an array of colors, and the best flavors.

10 Local food is an investment in our future.

When you buy locally grown food, you're helping to preserve the strength and character of our community for our children and grandchildren.

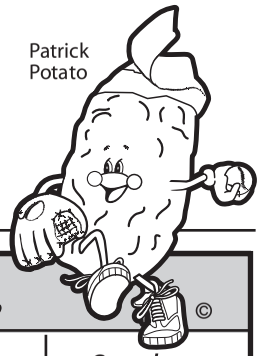
Massachusetts grown...and fresher!™

Massachusetts Department of Agricultural Resources
www.mass.gov/massgrown

Intermediate Grades

ACTIVITY 4

Is There a Rainbow on Your Plate



Part 1

How many servings of fruits and vegetables do you eat every day? Are you eating ones from all five color groups? Are you eating different ones from within each group? Find out by keeping track of what you eat. In the chart, record both the color group and the name of the fruit or vegetable you ate. One is done for you.

Part 2

Check your chart after a week to make sure you are eating a rainbow of colors and a variety of fruits and vegetables within each color group. If you are, congratulations! If not, work on eating a rainbow of fruits and vegetables every day!

Five Color Groups
Blue/Purple
Green
White
Yellow/Orange
Red

Servings of Fruits and Vegetables I Eat ©

Monday	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*	*Sunday*
Orange-Yellow/Orange						

TOTAL SERVINGS TODAY ▶

www.5aday.org www.dole5aday.com www.crayola.com/kids

Fruit and Vegetable Teacher Resources

Fruits and Veggies More Matters
www.fruitsandveggiesmorematters.org

nutrition information, recipes, activities for kids

Dole Food Company, Inc.
www.dole.com

nutrition information, teacher resources, recipes, activities for kids

Harvest of the Month
www.harvestofthemonth.com/EdCorner/index.asp
www.harvestofthemonth.com/download.asp

Network for a Healthy California teacher education resources on fruits and vegetables; literature links; student activities; nutrition information; cafeteria connections; classroom lessons and recipes; and pictures of fruits and vegetables

MyPyramid
www.mypyramid.gov

all about MyPyramid for preschoolers, kids and adults; teacher resources

USDA Team Nutrition
www.fns.usda.gov/tn/educators.html

FREE MyPyramid posters, handouts, lesson plans, etc. that teachers can order

Maryland Farm to School
www.marylandfarmtoschool.org

farm to school information and resources for teachers, parents, farmers, school foodservice personnel, and others; search for Maryland farm products by county; seasonal produce chart

Southern Maryland So Good
www.somarylandsogood.com

search for Southern Maryland farm products, farmers' markets, and farm activities; seasonal produce chart; activities for kids

Local Harvest
www.localharvest.org

find farmers' markets, community supported agriculture (CSA), family farms, and other sources of sustainably grown local food

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