

Nutrition and Wellness

Course

Principles of Health Science

Unit XII

Nutrition and Wellness

Essential Question

What steps can be taken to ensure a healthy diet and lifestyle?

TEKS

130.202(c) 1D, 1K, 9B, 9C

Prior Student Learning

Know the difference between junk food and healthy food.

Estimated time

2-4 hours

Rationale

Nutrition plays an important role in maintaining health and wellness. The foods we eat are determined by many different factors, yet we must still obtain the proper nutrients in whatever foods we eat.

Objectives

After completion of this lesson, the student will be able to:

- Identify good food choices
- Apply diet-planning principles to develop nutritional diet plans
- Calculate the percentage of nutrients in a given food item
- Analyze the nutritional content of foods
- Create an "ideal" 1-day menu that satisfies daily nutritional requirements for an adolescent
- Assess the adequacy of personal diet

Engage

Have students brainstorm some foods or snacks they think are healthy, and then some they think are unhealthy. Write both lists on the board. Have a student volunteer pick one item from each list that they would like to eat. Look up both items, and share with the class the difference in total calories, calories from fat, sodium content, etc.

OR

Interpret a variety of labels for nutritional content. (Teacher note: have a variety of labels made into transparencies/handouts.)

Key Points

- I. Nutrition
 - A. Is defined as all body processes relating to food including: digestion, absorption, metabolism, circulation and elimination
 - B. These processes allow the body to use food for energy, maintenance of health, and growth
- II. Wellness
 - A. Is defined as a state of good health with optimal body function
 - B. To improve wellness one must choose foods that are needed by the body, and not just foods that taste good.
- III. Diet
 - A. The food and beverages we eat and drink

- B. Over time the diet we choose will be helpful or harmful to our bodies

(See **Diet Planning Principles Notes**)

IV. Essential Nutrients

- A. Composed of chemical elements found in food
- B. They are used by the body to perform many different body functions
- C. Six groups of essential nutrients
 - 1. Carbohydrates: major source of readily usable human energy
 - a. Commonly called “starches” or “sugars”
 - b. Examples include breads, cereals, pastas, potatoes
 - 2. Lipids: commonly called fats and oils
 - a. Fats help maintain body temperature by providing insulation, cushion to organs, and help flavor food
 - b. Examples include butter, margarine, oils, cream, fatty meats, cheeses, and egg yolk.
 - 3. Proteins: are the basic components of all body cells
 - a. Essential for building and repairing tissue, regulating body functions, and providing energy and heat
 - b. Examples include animal meats, fish, milk, cheeses, and eggs, beans, and nuts
 - 4. Vitamins: are organic compounds that are essential to life
 - a. Important for metabolism, tissue building, and regulation of body processes
 - b. Examples include Vitamin A, B, C,D, E and many others
 - 5. Minerals: are inorganic elements found in all body tissues
 - a. Regulate body fluids, assist in various body functions, contribute to growth, and aid in building tissues
 - b. Examples include calcium, zinc, potassium, and sodium
 - 6. Water: is found in all body tissues
 - a. Essential for the digestion of food, makes up most of the blood plasma and cytoplasm of cells and helps move waste material

V. Food choices

- A. Personal preference
- B. Habit
- C. Ethnic heritage and tradition
- D. Availability, convenience and cost
- E. Positive and negative associations
- F. Emotional comfort
- G. Body image
- H. Nutritional

VI. Food labels

- A. Food and Drug Administration (FDA) and United States

Department of Agriculture (USDA) are responsible for ensuring food is labeled correctly.

B. All labels must have:

1. The name of the product
2. The name and address of the manufacturer
3. The net contents (weights, measure, or count)
4. The ingredients in descending order of predominance by weight
5. The number of servings and the serving size
6. The quantities of specified nutrient and food constituents
 - a. Examples: fat, saturated fat, cholesterol, sodium, carbohydrates, calories and percentage of calories in fat
 - b. Daily values: may be higher or lower depending on your calorie needs
 - c. Percent daily values: are based on a 2,000 calorie diet, but food labels will also show for a 2,500 calorie diet
 - d. Daily requirements for basic nutrients
 1. Total Daily Fat = 65g for 2000; 80g for 2500
 2. Saturated Fat = 20g for 2000; 25g for 2500
 3. Cholesterol = 300mg for 2000; 300mg for 2500
 4. Sodium = 2,400mg for 2000; 2,400mg for 2500
 5. Potassium = 3,500mg for 2000; 3,500mg for 2500
 6. Total Carbohydrates = 300g for 2000; 375g for 2500
 7. Fiber = 25g for 2000; 30g for 2500
7. 12 descriptive terms have been set by the government that are often seen on food packages
 - a. Definitions have been set for words appearing on food labels to eliminate confusion by consumers.
 - b. Examples include: free, reduced, lean, extra lean, low, fewer, high, more, good source, less, light, and healthy

VII. Healthy Diet

- A. Calcium and regular exercise help reduce the risk of osteoporosis
- B. A fatty diet increases the risk of cancer
- C. Saturated fats and cholesterol are linked to a greater risk of heart disease
- D. Foods that contain higher fiber content – grains, fruits and vegetables – reduce the risk of cancer
- E. Sodium increases the risk of high blood pressure
- F. Fruits and vegetables reduce the risk of cancer

- G. Folic acid decreases the risk of neural tube defects in fetuses
- H. Soluble fiber from whole oats as part of a diet low in saturated fat and cholesterol reduces the risk of heart disease
- VIII. Designing a nutritious diet
 - A. Start with foods you like
 - B. Select foods from all the food groups
 - C. Choose nutrient dense foods within each group
 - D. Use food labels when selecting an individual item

Activity

- I. Complete the Nutritional Project. See teacher guidelines.
- II. Using a recipe from home, gather information from labels for each of the ingredients. Calculate the amount of calories in one serving of the recipe; how many grams of fat, cholesterol, sodium, etc. Determine if this is a healthy recipe and how a recipe can be changed to become healthier (e.g. yogurt instead of sour cream, low fat margarine instead of regular margarine, etc.)
- III. Locate a recipe for a rich food. Convert this recipe to a heart healthy recipe. (See sample recipes)

Assessment

Successfully determine the nutritional content of food

Materials

A variety of food labels
 Transparencies of food labels
 Calorie books
 Calculators
 Copy of RDA's
 Copy of Exchange List
 Copy of the Food Guide Pyramid

Accommodations for Learning Differences

For reinforcement, the student will create a poster of the food guide pyramid.

For enrichment, the student will develop a nutritional information pamphlet suitable for a certain population, such as diabetics.

National and State Education Standards

National Health Science Cluster Standards
 HLC06.02 Safety, Health, and Environmental
 Health care workers will understand the fundamentals of wellness

and the prevention of disease processes. They will practice preventive health behaviors among the clients.

TEKS

130.202(c) (1)D organize, compile, and write ideas into reports and summaries;

130.202(c) (1)K identify the concepts of health and wellness throughout the life span;

130.202(c) (9)B identify wellness strategies for disease prevention; and

130.202(c) (9)C evaluate positive and negative effects of relationships on physical and emotional health such as peers, family, and friends and in promoting a healthy community.

Texas College and Career Readiness Standards

English Language Arts

II. B. Understand new vocabulary and concepts and use them accurately in reading writing and speaking.

III. B. Develop effective speaking styles for both group and one on one situations.

IV. A. Apply listening skills as an individual and as a member of a group in a variety of settings.

IV. B. 2. Listen actively and effectively in one-on-one communication situations.

Mathematics

I. B. 1. Perform computations with real and complex numbers.

IV. A. 1. Select and use the appropriate type of unit for the attribute being measured.

IV. B. 1. Convert from one measuring system to another

Science

II. A. 1. Understand the real number system and its properties.

II. A. 7. Use calculators, spreadsheets, computers, etc., in data analysis.

DIET PLANNING PRINCIPLES

- I. Diet Planning principles
 - A. Adequacy – provides sufficient energy and enough of the nutrients to meet the needs of most healthy people to maintain their health.
 - B. Balance – eat a variety of foods to obtain all the nutrients.
 - C. Nutrient Density – a measure of the nutrients a food provides relative to the energy it provides. The more nutrients and the fewer kilocalories, the higher the nutrient density.
 - D. Energy control – managing energy intake.
 - E. Moderation – select foods low in fat and sugar, they promote weight gain.
 - F. Variety – select foods from different food groups
- II. Diet and Health Recommendations
 - A. Reduce fat intake to 30% or less of kilocalories.
 - B. Reduce saturated fatty acids to less than 10% of kilocalories.
 - C. Reduce cholesterol to less than 300 mg a day.
 - D. Increase starch and complex carbohydrates.
 - E. Keep protein intake at moderate levels.
 - F. Maintain appropriate body weight by balancing food intake and exercise.
 - G. Limit alcohol to less than one ounce a day.
 - H. Salt intake should be less than 6 grams a day.
 - I. Maintain adequate calcium intake.
 - J. Avoid dietary supplements in excess of RDA's in a given day.
 - K. Maintain an optimum intake of fluoride.
- III. Dietary guidelines – combines the diet and health recommendations with the diet-planning principles
 - A. Eat a variety of foods.
 - B. Balance the food you eat with physical activity.
 - C. Maintain or improve your weight.
 - D. Choose a diet with plenty of grain products, vegetables and fruits.
 - E. Choose a diet low in fat, saturated fat and cholesterol.
 - F. Choose a diet moderate in sugars.
 - G. Choose a diet moderate in salt and sodium.
 - H. Maintain an optimum intake of fluoride.
- IV. Diet planning guides – used to plan nutritious diets
 - A. Food group plans
 - 1. Foods similar in nature and nutrient content are used in diet planning.
 - 2. Daily food guide –
 - a. places food into five groups based on nutrients in the food.
 - aa. breads, cereals and grains
 - bb. vegetables
 - cc. fruits
 - dd. meat, poultry, fish and alternatives
 - ee. milk, cheese and yogurt
 - b. One food may be substituted for another within the same group.

- c. Does not specify energy intake.
- B. Exchange list
 - 1. Used to help control calorie intake.
 - 2. Developed for people with diabetes but anyone can use it to plan diets.
 - 3. Does not guarantee adequate vitamin and mineral intake.
 - 4. Categorized by the three nutrients.
 - a. carbohydrate group
 - b. fat group
 - c. protein group
- C. Food guide pyramid
 - 1. Provides a pictorial depiction of the Daily Food Guide.
 - 2. Grains, fruits and vegetables are emphasized.
 - a. 75% of a person's diet should come from these.
 - 3. White dots scattered throughout all groups represent fat and sugars found in all groups.
 - 4. Some things are not included in the pyramid that we eat and drink.
 - a. Alcohol – it is not considered a nutrient.
 - b. Coffee, tea, spices – with the exception of water very few nutrients are found in these.
- V. Recommended Dietary Allowances.
 - A. The amount of selected nutrients considered adequate to meet the known nutrient needs of healthy people
 - B. Prepared in table form by age, sex and height.
 - C. Developed for energy and nutrients for which deficiencies occur.
 - 1. Requirement – the amount of a nutrient that will maintain normal biochemical and physiological functions and prevent symptoms of a deficiency.
 - 2. Deficiency – the amount of a nutrient below which almost all healthy people can be expected, over time to develop symptoms of a deficiency.
 - D. RDA's are broad and set well above the average requirements.
 - 1. Most people fit near the mid-point on the scale.
 - 2. RDA's are NOT minimum requirements and should not be exceeded.
 - a. Upper safe limit – the amount of a nutrient that appears safe for most health people. When exceeding this limit, there is concern that some people will experience symptoms of toxicity.
 - aa. Fluoride is an example
 - E. RDA's have been developed for;
 - 1. Energy
 - a. Energy intake must equal energy expended if a constant body weight is to be maintained.
 - b. Energy requirement depends on lifestyle.
 - 2. Protein
 - 3. Vitamins – have very specific recommended allowances

4. Some minerals
 5. No RDA has been set for fats or carbohydrates.
- D. Important things to remember about RDA's
1. The estimates are for healthy people
 2. RDA's are NOT minimum requirements nor are they optimal requirements for everyone.
 3. RDA's should be met by eating a variety of foods.
 4. Apply to average daily intakes.
 5. RDA's are best used to establish and evaluate nutritional programs for a population or group.

SAMPLE RECIPES

<u>Lasagna</u>	<u>Calories</u>	<u>Fat Grams to Calories</u>
1 pound of ground beef	1320	84 grams x 9 = 756
1 cup chopped onion	55	0
2 cloves garlic, minced	10	0
1-16 oz. can tomatoes, cut up	100	2 grams x 9 = 18
1-8 oz. can of tomato sauce	75	0
1-6 oz. can tomato paste	165	1.5 grams x 9 = 13.5
2 teaspoons dried basil, crushed		
1 teaspoon dried oregano, crushed		
1 teaspoon fennel seed, crushed		
1/8 teaspoon ground red pepper		
8 oz. lasagna noodles	840	4 grams x 9 = 36
1 beaten egg	75	5 grams x 9 = 45
2 cups ricotta cheese	860	64grams x 9 = 576
¾ cup grated Parmesan cheese	100	8 grams x 9 = 72
1 tablespoon dried parsley flakes		
½ teaspoon pepper		
8 ounces mozzarella cheese, grated or sliced	640	40grams x 9 = 360
TOTAL 4240		1876.5 Fat calories

In a large skillet heat the oil and cook meat, onion, and garlic until meat is brown and onion is tender. Drain off fat. Stir in the next seven ingredients. Cover and simmer for 15 minutes, stirring mixture often.

Meanwhile, cook noodles according to package directions. Drain.

Stir together egg, ricotta cheese, ½ cup of the Parmesan cheese, parsley, and pepper.

In a 13x9x2 inch baking dish layer half of the noodles, half of ricotta cheese mixture, half of the mozzarella, and half of the meat sauce. Repeat layers; sprinkle with remaining Parmesan cheese. Bake in a 375 oven for 30-35 minutes or till heated through. Let stand for 10 minutes. Makes 10 servings.

Calories: Total = 4240 divided by 10 servings = 424 Calories

Fat Calories: 1876.5 Fat Calories

% of calories from fat = $1876.5/4240 = .4425 \times 100 = 44.25 \%$

Low-Fat Lasagna	Calories	Fat Grams to Calories
1 pound ground raw lean turkey (white meat only)	720	$12 \times 9 = 108$
1 cup chopped onion	55	0
2 cloves garlic, minced	10	0
1-16 oz. can tomatoes, cut up	100	$2 \times 9 = 18$
1- 8 oz. can tomato sauce	75	0
1- 6 oz. can tomato paste	165	$1.5 \times 9 = 13.5$
2 teaspoons dried basil, crushed		
1 teaspoon dried oregano, crushed		
1 teaspoon fennel seed, crushed		
1/8 teaspoon ground red pepper		
8 ounces lasagna noodles	880	$4 \times 9 = 36$
1 beaten egg	76	$5 \times 9 = 45$
2 cups low-fat cottage cheese	410	$8 \times 9 = 72$
3/4 cup grated Parmesan cheese	100	$8 \times 9 = 72$
1 tablespoon dried parsley flakes		
1/2 teaspoon pepper		
8 ounces mozzarella cheese (low moisture, part skim milk), grated or sliced.	640	$40 \times 9 = 360$

TOTAL 3231 724.5 Fat Calories

Spray a large skillet with PAM or olive oil. Cook meat, onion, and garlic till meat is brown and onion is tender. Drain off any fat. Stir in the next seven ingredients. Cover and simmer for 15 minutes, stirring mixture often.

Meanwhile, cook noodles according to package directions. Drain.

Stir together egg, cottage cheese, 1/2 cup of the Parmesan cheese, parsley, and pepper.

In a 13x9x2 inch baking dish, layer half of the noodles, half of the cottage cheese mixture, half of the mozzarella, and half of the meat sauce. Repeat the layers, sprinkle with remaining Parmesan cheese. Bake in a 375 oven for 30-35 minutes or until heated through. Let stand for 10 minutes. Makes 10 servings.

Calories: 3231 divided by 10 servings = 323 calories

Fat Calories = 724.5 Calories

% of calories from fat = $724.5/3231 = .2242 \times 100 = 22.42\%$

Nutrition Project Teacher Guidelines

Pass out the Counting Calories work-sheet and have students calculate their daily caloric recommended values for each of the three nutrients as well as learn to calculate how many kilocalories of each nutrient are present in various types of food.

Assign students to record their food intake over 3 to 5 days, creating a diet log. Then, using the Nutri-Facts website (<http://www.nutri-facts.com/search.php>), have students calculate their caloric intake for each day on the Calorie Calculations worksheet.

After students have recorded their diet for several days, pass out the Calorie Comparisons worksheet. Have students calculate and record their average daily totals and compare these to the recommended values for each nutrient they calculated earlier.

Using the data from foods they eat, have students design an "ideal" 1-day menu appropriate for their own calorie needs. Each menu must include breakfast, lunch, dinner, and snacks for one (1) day. Use these percentages: 20% Fats, 50% Carbohydrates, 30% Proteins.

Counting Calories

- The average woman needs to consume 2000 calories/day.
- The average man needs to consume 2500 calories/day.
- I need to consume _____ total kcals each day.

According to the daily recommendations, the suggested distribution of nutrients in a healthy diet is:

- Fat = 20%
- Carbohydrate = 50%,
- Protein = 30%

Calculate how many

- Fat calories per day = $0.20 \times$ _____ total kcals = * _____ kcals of Fat/day
- Carbohydrate calories per day = $0.50 \times$ _____ total kcals = * _____ kcals of Carbohydrate/day
- Protein calories per day = $0.30 \times$ _____ total kcals = * _____ kcals of Protein/day

These are your recommended totals (insert into bottom of Calorie Comparisons table)

Calorie Calculations Example

For the next few days, you will keep track of all foods you eat and calculate your total caloric intake using the Calorie Calculations worksheets. Below is a sample calculation for a glass of milk.

Fat = 9 kcal/gram
Carbohydrate = 4 kcal/gram
Protein = 4 kcal/gram

2% Vitamin A Fortified Milk

Nutrition Facts		
Serving Size	1 cup (244g/8.7oz)	
Calories	122 kcal	
	% Daily Value	
Total Fat	4.68 g	8%
Saturated Fat	2.916 g	15%
Polyunsaturated Fat	1.354 g	
Monounsaturated Fat	0.173 g	
Cholesterol	20 mg	7%
Sodium	122 mg	6%
Total Carbohydrates	11.71g	4%
Dietary Fiber	0.0 g	0%
Sugars		
Protein	8.13 g	

Food 1: 2% Vitamin A fortified milk

Serving Size = 1 cup

Total Fat: 4.68 g/serving \times 9 kcal/fat g \times 1 servings = 42.12 kcals of fat

Total Carbohydrates: 11.71 g/serving \times 4 kcal/carb g \times 1 servings = 46.84 kcals of carb

Total Protein: 8.13 g/serving \times 4 kcal/protein g \times 1 servings = 32.52 kcals of protein

Calculated total calories = 121.48 kcal (42.12 + 46.84 + 32.52)

Printed total calories (on label) = 122 kcal

Name _____ Date _____ Period _____

Calorie Calculations—Day _____

Food 1: _____ Serving Size = _____

Total Fat: _____ g/serving \times 9 kcal/fat g \times _____ servings = _____ kcals of fat

Total Carbohydrates: _____ g/serving \times 4 kcal/carb g \times _____ servings = _____ kcals of carb

Total Protein: _____ g/serving \times 4 kcal/protein g \times _____ servings = _____ kcals of protein

Calculated total calories = _____ kcal

Printed total calories (on label) = _____ kcal

Food 2: _____ Serving Size = _____

Total Fat: _____ g/serving \times 9 kcal/fat g \times _____ servings = _____ kcals of fat

Total Carbohydrates: _____ g/serving \times 4 kcal/carb g \times _____ servings = _____ kcals of carb

Total Protein: _____ g/serving \times 4 kcal/protein g \times _____ servings = _____ kcals of protein

Calculated total calories = _____ kcal

Printed total calories (on label) = _____ kcal

Food 3: _____ Serving Size = _____

Total Fat: _____ g/serving \times 9 kcal/fat g \times _____ servings = _____ kcals of fat

Total Carbohydrates: _____ g/serving \times 4 kcal/carb g \times _____ servings = _____ kcals of carb

Total Protein: _____ g/serving \times 4 kcal/protein g \times _____ servings = _____ kcals of protein

Calculated total calories = _____ kcal

Printed total calories (on label) = _____ kcal

Food 4: _____ Serving Size = _____

Total Fat: _____ g/serving \times 9 kcal/fat g \times _____ servings = _____ kcals of fat

Total Carbohydrates: _____ g/serving \times 4 kcal/carb g \times _____ servings = _____ kcals of carb

Total Protein: _____ g/serving \times 4 kcal/protein g \times _____ servings = _____ kcals of protein

Calculated total calories = _____ kcal

Printed total calories (on label) = _____ kcal

Food 5: _____ Serving Size = _____

Total Fat: _____ g/serving \times 9 kcal/fat g \times _____ servings = _____ kcals of fat

Total Carbohydrates: _____ g/serving \times 4 kcal/carb g \times _____ servings = _____ kcals of carb

Total Protein: _____ g/serving \times 4 kcal/protein g \times _____ servings = _____ kcals of protein

Calculated total calories = _____ kcal

Printed total calories (on label) = _____ kcal

Name _____ Date _____ Period _____

Calorie Calculations—Day _____

Food 6: _____ Serving Size = _____

Total Fat: _____ g/serving \times 9 kcal/fat g \times _____ servings = _____ kcals of fat

Total Carbohydrates: _____ g/serving \times 4 kcal/carb g \times _____ servings = _____ kcals of carb

Total Protein: _____ g/serving \times 4 kcal/protein g \times _____ servings = _____ kcals of protein

Calculated total calories = _____ kcal

Printed total calories (on label) = _____ kcal

Food 7: _____ Serving Size = _____

Total Fat: _____ g/serving \times 9 kcal/fat g \times _____ servings = _____ kcals of fat

Total Carbohydrates: _____ g/serving \times 4 kcal/carb g \times _____ servings = _____ kcals of carb

Total Protein: _____ g/serving \times 4 kcal/protein g \times _____ servings = _____ kcals of protein

Calculated total calories = _____ kcal

Printed total calories (on label) = _____ kcal

Food 8: _____ Serving Size = _____

Total Fat: _____ g/serving \times 9 kcal/fat g \times _____ servings = _____ kcals of fat

Total Carbohydrates: _____ g/serving \times 4 kcal/carb g \times _____ servings = _____ kcals of carb

Total Protein: _____ g/serving \times 4 kcal/protein g \times _____ servings = _____ kcals of protein

Calculated total calories = _____ kcal

Printed total calories (on label) = _____ kcal

Food 9: _____ Serving Size = _____

Total Fat: _____ g/serving \times 9 kcal/fat g \times _____ servings = _____ kcals of fat

Total Carbohydrates: _____ g/serving \times 4 kcal/carb g \times _____ servings = _____ kcals of carb

Total Protein: _____ g/serving \times 4 kcal/protein g \times _____ servings = _____ kcals of protein

Calculated total calories = _____ kcal

Printed total calories (on label) = _____ kcal

Food 10: _____ Serving Size = _____

Total Fat: _____ g/serving \times 9 kcal/fat g \times _____ servings = _____ kcals of fat

Total Carbohydrates: _____ g/serving \times 4 kcal/carb g \times _____ servings = _____ kcals of carb

Total Protein: _____ g/serving \times 4 kcal/protein g \times _____ servings = _____ kcals of protein

Calculated total calories = _____ kcal

Printed total calories (on label) = _____ kcal

Calorie Comparisons

	Food Name	Total Fat kcal	Total Carb kcal	Total Protein Kcal
Day 1	1.			
	2.			
	3.			
	4.			
	5.			
	6.			
	7.			
	8.			
	9.			
	10.			
Day 2	1.			
	2.			
	3.			
	4.			
	5.			
	6.			
	7.			
	8.			
	9.			
	10.			
Day 3	1.			
	2.			
	3.			
	4.			
	5.			
	6.			
	7.			
	8.			
	9.			
	10.			
Day 4	1.			
	2.			
	3.			
	4.			
	5.			
	6.			
	7.			
	8.			
	9.			
	10.			
Total =				
Average (Total/# of days) =				
Recommended Total =		*	*	*

My Ideal Menu (list foods here)

Based on knowledge of your own nutritional and caloric needs, create a healthy and delicious menu for a single day.

Breakfast:

Lunch:

Dinner:

Snacks:
