Unit 2: Health and Nutrition

OBJECTIVES

- Students will create and solve word problems related to health and nutrition.
- Students will recognize everyday math applications related to nutritional content of foods as well as exercise.
- Students will use addition, subtraction, multiplication, and division to solve health- and nutrition-related problems.
- Students will solve problems involving percents.
- Students will use information from tables to solve problems.
- Students will calculate averages.

LESSON MATERIALS

stopwatches, nutrition labels from a variety of foods and drinks, medicine cups in varying sizes, medicine droppers, medicine syringes, jump ropes and hand weights (optional), access to the Internet (optional)

LESSON PLAN

Introducing the Topic

What are some ways we use math when we are trying to stay healthy?

Have students brainstorm ways math is used in ways related to health and nutrition. Draw an outline of the human body on the board or on a poster. Give students sticky notes to write down ideas about how math might be used to take care of a person's health. Allow students to post their ideas within the outline of the body. Ideas mentioned should include counting calories, portion size, body temperature, and pulse rate.

If we are sick, what are some situations in which we would need to use math?

Bring in a variety of measuring spoons, medicine measuring cups, and droppers. Allow students to practice measuring water in different quantities. Discuss the markings and their meanings.

Key Concepts

How do we find the percent of a number?

Have ten students stand up at a time. Practice with the class finding the percent of the ten who meet certain criteria such as wearing a belt, wearing glasses, wearing sneakers, blond-haired, brown-eyed, etc.

Bring in nutrition labels for students to look at. Use these labels to provide practice in finding percents. For example, if the label shows information based on a 2,000-calorie diet and the sodium content is 190 mg, or 8% of the daily value, what is the total amount allowed for the day?

Unit 2: Health and Nutrition

Parent Letter

Photocopy the parent letter on page 24, and give each student a copy to take home. This letter explains the topics being studied in this unit and suggests a variety of activities to be completed at home.

Activity Sheets

Photocopy the activity sheets on pages 25–34, and have the students complete the activities. Allow the students to use calculators as necessary.

Extension Activities

Photocopy the list of extension activities on page 35. At the end of the unit, have each student choose one project to complete.

Assessment

Photocopy the unit assessment on pages 36–39, and have the students complete the activities to determine whether or not they have mastered the skills covered in this unit. Allow the students to use calculators as necessary.

Unit 2: Health and Nutrition

Dear Parents/Guardians:

We are currently learning about the math involved with staying healthy. This includes portion sizes, nutrition information from food packages, calorie intake, calories burned through exercise, and correct dosage of medicine. During this unit, your child will review a variety of math skills such as fractions, decimals, percents, addition, subtraction, multiplication, and division. At the end of the unit, your child will complete a project that demonstrates his or her ability to use these types of skills. To extend your child's learning, any at-home practice you can provide would be greatly appreciated. Below are several suggestions.

- Visit the web site www.mypyramid.gov with your child, and talk about the recommendations from the United States Department of Agriculture for portion sizes and exercise times.
- Look at nutrition labels from the food your family eats with your child. Discuss the meanings of the different numbers.
- Help your child keep a weekly schedule of time spent doing physical activities.
- Help your child track the time spent sleeping in a one-week period, and determine the average time he or she slept each night.
- Visit the web site www.fitwatch.com/database/searchexdb.html with your child to calculate the number of calories burned by doing various tasks.

Thank you for your cooperation.

Sincerely,

Name: _____ Date: _____

Reading Nutrition Labels – Part 1

DIRECTIONS: Use the nutrition label below from a can of chili to answer the questions.

Nutrition Facts

Serving Size 1 cup (248 g)
Servings Per Container 2

Amount Per Serving	
Calories 370	
Calories from Fat 180	
	% Daily Value*
Total Fat 20 g	31%
Saturated Fat 9 g	45%
Trans Fat 1 g	
Cholesterol 45 mg	15%
Sodium 930 mg	39%
Total Carbohydrates 26 g	9%
Dietary Fiber 9 g	36%
Sugars 2 g	
Protein 21 g	
Vitamin A	25%
Vitamin C	4%
Calcium	8%
Iron	15%

*Percent Daily Values are based on a 2,000-calorie diet. Your daily values may be higher or lower depending on your calorie needs.

1. How many calories per serving do not come from fat? _____

2. If you were to eat the whole can of chili, how many grams of fat would you be eating? _____

3. If you ate the whole can of chili and you were following a diet of 2,000 calories a day, how many more calories could you eat that day? _____

4. If you ate one serving of the chili, what percent of the rest of your diet for that day should contain vitamin C in order to get a full day's (100%) supply? _____

5. If you ate the whole can of chili, what percent of the rest of your diet for that day should contain sodium, in order to not go over the 100% supply? _____

   Does this look like a good food choice based on the nutrition facts? _____

   Why or why not? _____

Name: _____ Date: _____

Burning Calories – Part 1

DIRECTIONS: Use the information in the table below to answer the questions. Note that the table shows how many calories are burned by each activity in a ten-minute period, based on a person's weight.

Activity & Calories Burned/10 min.

Activity	125 lbs.	150 lbs.	175 lbs.	200 lbs.
Aerobics (traditional at high intensity)	95	115	134	153
Gardening	41	49	57	65
Racquetball	75	90	105	120
Shopping	35	42	49	56
Sitting (reading or watching TV)	10	12	14	16
Sleeping	10	12	14	16
Standing (light activity)	20	24	28	32
Volleyball	28	34	40	45
Walking (15 min./mile)	44	52	61	70

Source: Reebok Instructor News, Volume 4, Number 2, 1997.

1. If you weigh 125 lbs., you burn 28 calories by playing volleyball for ten minutes. How many calories would you burn in 30 minutes? _____

2. How many calories would a person who weighs 125 lbs. burn by sleeping for seven hours? _____

3. How many calories would a person who weighs 200 lbs. burn by playing racquetball for 30 minutes? _____

4. How many calories would a person who weighs 125 lbs. burn in a week by walking 20 minutes a day? _____

5. How many calories would a person who weighs 175 lbs. burn by watching TV for an hour? _____

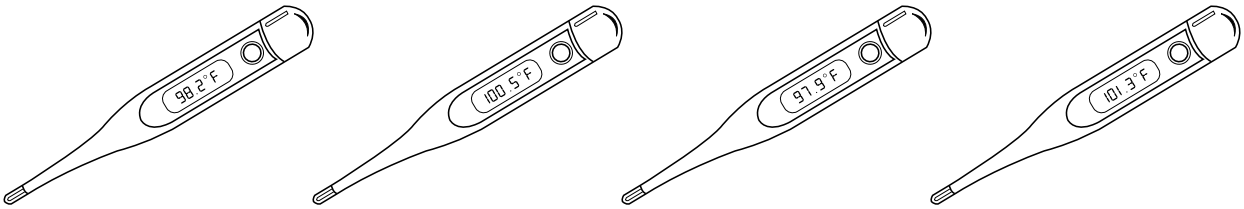
Bonus: How many calories would a 150-lb. person burn in a week by sleeping for seven hours each night? _____

Name: _____ Date: _____

Body Temperature and Proper Dosage of Medicine

If you are sick, you might take your temperature with a digital thermometer to see if you have a fever. Normal body temperature is thought to be 98.6˚F, but it can actually be one degree less or one degree more.

DIRECTIONS: Read the following thermometers. Under each one, write "fever" or "no fever."



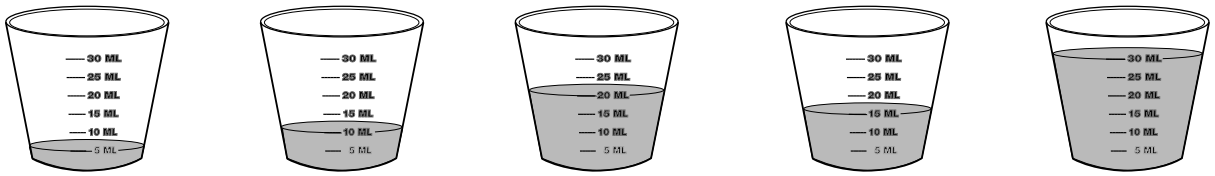
_____ _____ _____ _____

When taking medicine, it is very important to read the label carefully and to understand the amount of medicine that it is safe to take. Often the dosage will be written in terms of teaspoons (tsp.) and milliliters (ml). It is important not to use a regular spoon from the kitchen because spoons are not all the same size. Instead, use a graduated measuring cup or a measuring spoon.

Important conversions:

5 ml = 1 tsp.
1 ml = 1 cc
¼ tsp.= 1.25 ml
½ tsp. = 2.5 ml
¾ tsp. = 3.75 ml
1 ½ tsp. = 7.5 ml
1 Tbsp. = 15 ml

DIRECTIONS: Record the dosage of these liquid medicines.



_____ tsp. _____ tsp. _____ tsp. _____ Tbsp. _____ Tbsp.

Name: _____ Date: _____

Extension Activities

- Research the amount of calories burned per hour for a variety of exercises. Come up with an exercise plan for a week, outlining what you will do each day and how many calories each activity will burn.

- Bring in the nutrition labels from four of your favorite foods. Use them to write ten math word problems. Display the labels and problems on a poster.

- Create a survey asking people to rate how physically fit they see themselves on a scale from 1 to 10, with 10 being the most physically fit. Ask 20 people, record the results, graph the data, and find the average rating at which people see themselves.

- Create a survey asking 20 people about their favorite food. Record the data, then classify the food choices as healthy or unhealthy. Graph the results of the survey, and determine what percent of the food choices are healthy and what percent you would classify as unhealthy.

- Keep a food journal in which you record everything you eat in one day. Research the number of calories in each food you eat if the item does not have a nutrition label. Calculate the number of calories you consumed during that particular day.

- Find ten subjects of various ages to participate in an experiment. Take each person's resting heart rate and his or her heart rate after running in place for one minute. Make a table and a graph of the data you collect.

- Find your target heart rate. Do a variety of exercises and record your heart rate for each. Create a table to record your heart rate for each exercise. Write a paragraph explaining which exercise you think is most beneficial based on your target heart rate.

- Keep a sleep journal for one week. Calculate how much sleep you get each night and your average amount of sleep for the week. Write a paragraph explaining what you learned about your sleep patterns in relation to the recommendations for your age group.

- Do research using the web site www.mypyramid.gov to find out what foods can be eaten to provide the recommended portions from each food group. Plan three days worth of menus to meet these requirements.

- Research nutrition information for fast food. Make a poster to display the calories, grams of fat, and amount of sodium for five meals from different fast food restaurants.

Name: _____ Date: _____

Unit 2 Assessment

Part 1: Reading Nutrition Labels

DIRECTIONS: Look at the nutrition label below from a frozen pizza and answer the questions.

Nutrition Facts

Serving Size 1 slice (140 g)

Servings Per Container 8

Amount Per Serving	
Calories 400	
Calories from Fat 220	
	% Daily Value*
Total Fat 25 g	38%
Saturated Fat 11 g	55%
Trans Fat 1 g	
Cholesterol 50 mg	17%
Sodium 920 mg	38%
Total Carbohydrates 25 g	8%
Dietary Fiber 2 g	8%
Sugars 5 g	
Protein 18 g	
Vitamin A	15%
Vitamin C	2%
Calcium	30%
Iron	6%

*Percent Daily Values are based on a 2,000-calorie diet. Your daily values may be higher or lower depending on your calorie needs.

1. If you eat two slices of pizza, how many calories would you consume? _____

   How many more calories could you have for the day if you were on a 2,000-calorie-a-day diet? _____

2. If you eat three slices of pizza, how many calories would you consume? _____

   How many more calories could you have for the day if you were on a 2,000-calorie-a-day diet? _____

3. If you eat two slices, how many milligrams (mg) of sodium would you consume?

   _____

   What percent of the rest of your food for the day should contain sodium? _____

Name: _____ Date: _____

Unit 2 Assessment (Continued)

Part 2: Calories Burned

DIRECTIONS: Use the chart below to answer the questions.

Activity & Calories Burned/1 hr.			
Activity	**130 lbs.**	**170 lbs.**	**190 lbs.**
Basketball (nongame)	354	422	518
Bicycle riding (10 mph)	236	281	345
Bowling	177	211	259
Flag football	472	563	690
Frisbee	177	211	259

Source: www.nutristrategy.com/activitylist.htm

4. How many calories would a 170-lb. person burn by playing Frisbee for half an hour?

_____

5. How many calories would a 190-lb. person burn by playing flag football for half an hour? _____

6. How many calories would a 130-lb. person burn by bowling for two hours? _____

7. How many total calories would a 130-lb. person burn by playing basketball for half an hour and then riding a bicycle for an hour? _____

8. How many total calories would a 190-lb. person burn by playing flag football for an hour and then playing basketball for half an hour? _____

9. How many more calories does a 190-lb. person burn by playing flag football for half an hour than a 130 lb. person doing the same? _____

10. How many fewer calories does a 170-lb. person burn by playing basketball for an hour and a half than a 190-lb. person doing the same? _____

Name: _____ Date: _____

Unit 2 Assessment (Continued)

Part 3: Pulse Rate

DIRECTIONS: Calculate the maximum heart rate and the target heart rate for individuals of the following ages. Remember, to calculate target heart rate, first use the following formula to calculate maximum heart rate:

220 – age = maximum heart rate

Then, use that information in the following formula:
target heart rate = 50% to 85% of maximum heart rate

11. 23 years old

maximum heart rate: _____

target heart rate: _____ to _____

12. 19 years old

maximum heart rate: _____

target heart rate: _____ to _____

13. 41 years old

maximum heart rate: _____

target heart rate: _____ to _____

14. 65 years old

maximum heart rate: _____

target heart rate: _____ to _____

15. 71 years old

maximum heart rate: _____

target heart rate: _____ to _____

Name: _____ Date: _____

Unit 2 Assessment (Continued)

Part 4: Healthy Meal Choices

DIRECTIONS: Plan a lunch menu following these guidelines: one fruit, two vegetables, one dairy product, one serving of grains, and one portion of meat. Write four possible combinations.

FRUITS	VEGETABLES	MILK OR DAIRY	GRAINS	MEAT
1 nectarine 1 kiwi	½ c. squash ½ c. spinach ½ c. corn ½ c. peas	1 8 oz. glass of milk ¾ c. plain nonfat yogurt	½ c. rice 1 slice wheat bread	4 oz. pork chop 4 oz. ground beef

Lunch Menu #1

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Lunch Menu #2

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Lunch Menu #3

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Lunch Menu #4

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