

Percents, Ratios, and the Canada Food Guide

Pillar: Healthy Eating

Division III

Grade Level: 8

Core Curriculum Connections: Mathematics

I. Rationale: Math is good for you, but it doesn't get much healthier than this! The series of activities in this lesson are based on the Canada Food Guide. Students are guided through instruction on percents and ratios and then practice what they have learned by solving a series of problems based on the information in the food guide.

II. Curriculum Outcomes:

- (GO) Apply the concepts of rate, ratio, percentage, and proportion to solve problems in a meaningful context.
- (SO #12) Use concepts of rate, ratio, proportion, and percent to solve problems in meaningful contexts.
 - pictorial representation
 - pictorial representation of fractions, percents, fractional percents and percents greater than 100.

III. Materials:

- Canada's Food Guide (one copy per student).
- various food labels for comparison: Milk label, 2 different labels from granola bar packages, and apple sauce.
- "Percent Problems" handout following the lesson

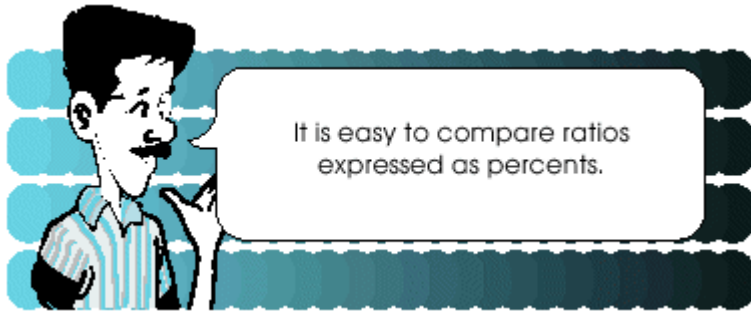
IV. Procedure:

Activating Strategies:

- Show students the label that contains the nutritional information for milk on an overhead.
- Discuss the breakdown of nutrients, specifically focusing on the column that indicates the percent daily value.
- Notice that some of the information is provided as **percents**.

Acquiring Strategies:

- Have students record the definition: A percent is a special ratio. It has 100 as the second term, but "100" is not written. Instead, a percent symbol is used. Percent means "out of 100".
- Using the nutritional information for milk. What is the percent daily value of calcium that is provided by one serving of milk? 30% or 30/100
- What percent daily value of Vitamin D is provided by one serving of milk? 45% or 45/100.



- If 3 out of 5 students or $\frac{3}{5}$ of students in this class drink enough milk each day, what percent is that fraction $\frac{3}{5} = \frac{\quad}{100}$
- If 3 out of 4 students get enough rest every night, the fraction can be written as a percent: $\frac{3}{4} = \frac{\quad}{100}$
- Express each of the following fractions as equivalent fractions with a denominator of 100 together on the board with the students.
- $\frac{8}{10}$ $\frac{14}{25}$ $\frac{17}{50}$ $\frac{4}{5}$ $\frac{17}{20}$ $\frac{5}{4}$
- Step 1: Express each ratio as a decimal number. (may use calculator)
- Step 2: Express each ratio as an equivalent ratio with a second term of 100.
- Step 3: Express each ratio as a percent.

Example 1

Patrick scored 20 out of 25 on one quiz and 25 out of 30 on another quiz. On which quiz did Patrick do better?

Solution

Step 1: Express each ratio as a decimal number. **Hint:** You may use a calculator.

Quiz 1

$$\frac{20}{25} = 0.8$$

Quiz 2

$$\frac{25}{30} \doteq 0.83$$

Step 2: Express each ratio as an equivalent ratio with a second term of 100.

Quiz 1

$$\frac{20}{25} \doteq 0.8 = \frac{80}{100}$$

Quiz 2

$$\frac{25}{30} \doteq 0.83 \doteq \frac{83}{100}$$

Step 3: Express each ratio as a percent.

Quiz 1

$$\frac{20}{25} = 0.8 = \frac{80}{100} = 80\%$$

Quiz 2

$$\frac{25}{30} \doteq 0.83 \doteq \frac{83}{100} \doteq 83\%$$

Step 4: Compare the percents.

$$83\% > 80\%$$

Patrick did better on the second quiz.

Use a calculator to answer question 2.

Applying Strategies:

- Work through the above questions and strategies together as a class.

V. Assessment Ideas:

- Collect the following assignment, “Percent Problems”. Check calculations and solutions for accuracy and understanding.

% PERCENT PROBLEMS %

Name: _____ Total: ____

Part A: Food Guide Calculations

1. The average 13 year old boy needs a total of 18 servings from all four food groups every day. Calculate the percentage of these servings that must come from each group.

Fruits and Vegetables: $\frac{6}{8} = \underline{\quad} = \frac{\quad}{100} = \underline{\quad} \%$

Grain Products: $\frac{6}{8} = \underline{\quad} = \frac{\quad}{100} = \underline{\quad} \%$

Milk and Alternatives: $\frac{4}{8} = \underline{\quad} = \frac{\quad}{100} = \underline{\quad} \%$

Meat and Alternatives: $\frac{2}{8} = \underline{\quad} = \frac{\quad}{100} = \underline{\quad} \%$

2. A teenage girl needs slightly less overall calories than a teenage boy. Calculate the percentage of the boys' servings that girls need in the following food groups.

Fruits: $\frac{7}{8} = \underline{\quad} = \underline{\quad} = \underline{\quad} \%$

Grains: $\frac{6}{7} = \underline{\quad} = \underline{\quad} = \underline{\quad} \%$

Meat: $\frac{2}{3} = \underline{\quad} = \underline{\quad} = \underline{\quad} \%$

3. $\frac{2}{6}$ of your servings of fruits and vegetables should be either dark green or orange. What percent is represented by this fraction?

4. At your age, for every serving of meat you have, you should have two servings of milk. How much more milk than meat should you include in your diet. Write as a fraction and then calculate the percent.

5. A rule of thumb is for vegetables to account for about half of your plate, meat for $\frac{1}{4}$ and grains for $\frac{1}{4}$. Calculate the percentage of your plate that should contain meat.

Part B: Nutritional Facts: Use the Food Labels

1. Which label represents the food that contains the greatest amount of protein per serving?
2. The food described by label #1 contains 8% of the recommended daily intake of fat. If one serving contains 5 grams, how many grams of fat are recommended in total every day. (* Hint: make equivalent fractions).

Step 1: Set up the fraction
(use the information that you know)

$$8\% = \frac{8}{100} = \frac{5}{\text{total per day}}$$

Step 2: Write it with a variable:

$$\frac{8}{100} = \frac{5}{x}$$

Step 3: Cross multiply to solve:

$$100 \times 5 = 500$$
$$500 \div 8 = x$$

Step 4:

3. Label #4 is taken from a container of unsweetened apple sauce. The apple sauce contains 8% of the fibre we need daily. If there are two grams of fibre in the apple sauce, how many grams do we need in total each day. (* Hint: use the example above to help you).

4. Label #2 is taken from a box of granola bars. Each bar contains 19 grams of carbohydrates which is 6% of our recommended daily intake. Use cross multiplication to determine the total grams of carbohydrates that our bodies need each day. (*Hint: follow the same procedure as the last two questions).

5. Compare labels #1a. and #1b. Write a fraction that shows the ratio of sugar in grams of 1a. to 1b. Then calculate the percent from this fraction.

6. Fibre is an essential nutrient to maintain our digestive health. Compare the amount fibre found in label #6a. to #6b (they are both granola bars). Write the ratio in fraction form and then convert it to a percent.

7. Write a ratio that compares the amount of sodium (salt) found in label #5a (whole grain rotini) to the amount of sodium in #5b.(macaroni and cheese). Write as a fraction and then as a percent.






8. Compare the nutritional facts listed on labels #6a. and # 6b. Complete the chart below by writing in the missing values.

NUTRITIONAL FACTS	RATIO #6 a.: #6b.	FRACTION 6a./6b.	DECIMAL #	PERCENT (%)
a. calories	130:150			
b. fat		$\frac{2}{4}$		
c. sodium		$\frac{65}{75}$		
d. fibre	4:2			
e. sugars		$\frac{8}{13}$		
f. protein	5:3			

9. Salt and other sodium compounds are used in processed foods for preserving, flavouring, and stabilizing other ingredients. Sodium is also present naturally in some foods.

Because excessive amounts of sodium may contribute to high blood pressure and strokes in some people, the recommended maximum daily amount of sodium is about 2400 mg (about 5 mL of table salt).

a. Complete a table like the following.

Serving	Amount of Sodium per Serving* (mg)	Percentage of Recommended Maximum Daily Amount (%)
 cereal and milk	225	
 bacon, eggs, and hashbrowns	1000	
 pasta and sauce	400	
 personal pizza	1100	
 burger and fries	1000	

*Note: The amount of sodium per serving varies with the ingredients.

b. Shane ate bacon, eggs, and hashbrowns for breakfast. He had a personal pizza for lunch. For supper he had a burger and fries. Calculate the percentage of the maximum daily recommended amount of sodium he consumed.

c. Samantha ate cereal and milk for breakfast. For lunch she had a personal pizza. For supper she had pasta and sauce. Calculate the percentage of the daily recommended amount of sodium she consumed.

d. Who consumed less sodium that day—Shane or Samantha?

e. Did either Shane or Samantha consume more than the recommended daily maximum of sodium? If so, who?

