

# MATH SNACKS

## Ratey the Math Cat Guide and Answer Key for Instructors



The *Ratey the Math Cat* animation is available on iTunes U (search "Math Snacks") and at [mathsnacks.org](http://mathsnacks.org)

### Goals/Standards

By watching the video and completing the activities outlined below, students learn that:

- Rates and Unit Rates
- The importance of units
- Proportions are multiplicative situations.
- Patterns
- Translation from unit rate to table
- Identification of independent and dependent variables (Optional)

### Video Discussion:

With your students, watch the 3-minute video, *Ratey the Cat*, at <http://www.mathsnacks.com> and spend about 10 minutes discussing the big ideas or key points in the video. Ask:

- What do you think the video is about?
- What is so important about the word PER?
- Can you think of any other ways PER is used?
- What kinds of units can you remember from the video? Why do you think these are important?

### Vocabulary

Rate, unit rate, per, dependent variable \*, independent variable \*

### Learner Guide Page 1



#### Ratey the Math Cat Learner Guide

The *Ratey the Math Cat* animation is available on iTunes U (search "Math Snacks") and at [mathsnacks.org](http://mathsnacks.org)



1. In the *Ratey the Cat* video, there is a girl who is mowing lawns for \$10 each. Complete the table provided to show how much money she can make.

Lawns Mowed	Money Earned
1	
2	
3	
5	
10	250

2. Use one of the situations listed below (or one you create using per) and write a short story word problem using your own numbers and provide a solution. If you need help figuring out the answer, draw a picture to represent your story.

Here are some examples, miles per hour, windows per hour, gallons of milk per week, gallons of water per shower, miles per gallon, words per minute

Here is an example for Calls per Hour: I worked for my father making calls for his business. He paid me \$.75 per call. I made 55 calls yesterday. How much money did I earn? *Answer:  $$.75 \times 55 = \$41.25$ .*




### Learner Guide Page 2

3. Nutritional information and labels per pound, per serving.

#### Nutrition Facts

Serving Size 4 oz. (113g)

Serving Per Container 4

#### Amount Per Serving

Calories 280

Calories from Fat 130

% Daily Value\*

Total Fat 14g

Saturated Fat 3.5g

Trans Fat 2.5g

Cholesterol 120 mg

Sodium 640mg

Total Carbohydrate 13g

Dietary Fiber 1g

Sugars 0g

Protein 24g

Calories per gram

Fat 9 • Carbohydrate 4 • Protein 4

A. How many servings are there **per** package?

B. The label says there are 280 calories **per** serving. How many calories is that **per** package?

C. What is the ratio of fat grams to carbohydrate grams for one serving?

D. What is the ratio of protein grams to carbohydrate grams for one serving?

E. What is the ratio of fat calories to carbohydrate calories for one serving?

F. What is the ratio of protein calories to carbohydrate calories for one serving?

G. Compare the ratios in question D and question F. What can you say about this food, by looking at these ratios.

H. If the package was split up between 8 people, how much of the following would be consumed.

a. grams of fat **per** person?

b. grams of protein **per** person?

3A. If one serving of this food was changed to 12 oz, create a new food label for the new serving size. (Note: The package size does not change)

#### Nutrition Facts

Serving Size 4 oz. (113g)

Serving Per Container 4

#### Amount Per Serving

Calories 280

Calories from Fat 130

% Daily Value\*

Total Fat 14g

Saturated Fat 3.5g

Trans Fat 2.5g

Cholesterol 120 mg

Sodium 213 mg

Total Carbohydrate 13g

Dietary Fiber 1g

Sugars 0g

Protein 24g

Fat 9 • Carbohydrate 4 • Protein 4

#### Nutrition Facts for Serving Size 12 oz (339g) label

A. Serving Per Container

Amount Per Serving

B. Calories

C. Calories from Fat

% Daily Value\*

D. Total Fat

E. Saturated Fat

F. Trans Fat

G. Cholesterol

H. Sodium

I. Total Carbohydrate

J. Dietary Fiber

K. Sugars

L. Protein



## Bonus Activities

Select one or more of these to do with your students after they've completed the *Learner Guide*.

It would also be beneficial to have students create a table showing their results and making predictions. If you would like to take it even further, the students can create a graph showing their results. However, it is important to realize that this is discreet data and should be represented as points on the grid and not as complete lines or line segments.

- 1. Texting Challenge:** Depending on your school policies, this activity may or may not be possible but it is very engaging for the students. Divide the class up into two or three different groups: The texters, the keyboarders and the writers. Find a small passage (at least 200 wds) and make copies for each student. Have a timer set for 1 min. Have each student either text, write or key the passage for one minute. Have them count the words they completed after one minute. This will give them the words per minute. Have them compare the results with the whole class to see which way of writing is most efficient. The students can then calculate the following: words per hour, words per second, characters per minute, characters per second, characters per hour etc. This can be repeated with each student doing all three methods to figure out which way of writing is most efficient for them individually.
- 2. Show Me:** Have students create an illustration of one of a situation similar to the ones in the video that demonstrates the idea of a ratio that clearly shows the units involved. 20 flowers per plant, 30 miles per gallon, 25 students per class, etc.
- 3. Let's Move:** Have students do a physical challenge and have them record the data in terms of various ratios. There are three examples provided, but there are many others that can be done to get the same results.
  - a. Trashcan basketball:** Set up a trash can and have students use paper balls to shoot baskets. Give them 30 seconds to shoot as many baskets as they can and count the shots taken and baskets made. They can record shots per minute (they will have to convert). They can record baskets made per minute (they will have to convert) They can also record shots and baskets made per second or per hour if that is something you want them to do.
  - b. Let's Jump:** Get a jump rope. Have students work in pairs. Each student should jump for one minute while the other records the number of jumps. They can then calculate jumps per minute, jumps per second, etc.
  - c. Measure Me:** Have students work in pairs. Each student can measure the number of footsteps it takes to walk down the hallway or across the classroom. They can calculate the number of steps PER distance and then compare with the class.

1. In the Ratey the Cat video, there is a guy who is mowing lawns for \$10 each. Complete the table provided to show how much money he can make

Lawns Mowed	Money Earned
1	10
2	20
3	30
5	50
10	100
25	250

*NOTE: If you want to make this more challenging, have students plot these points on a graph to see the linear relationship of this situation.*

2. Using one of the following examples: miles per hour, windows per hour, gallons of milk per week, gallons of water per shower, miles per gallon, words per minute. Make up a story from your life, fill out the table and draw a picture to represent the situation.

*NOTE: You can also re-watch the video to get some ideas. Do one situation with table and picture together as a class to guide students if needed.*

*ANSWERS will vary*

3. Nutritional information and labels per pound, per serving.

*Note: Please stress the importance of labeling the units for all problems.*

Nutrition Facts	
Serving Size 4 oz. (113g)	
Serving Per Container 4	
Amount Per Serving	
<b>Calories</b> 280	Calories from Fat 130
% Daily Value*	
<b>Total Fat</b> 14g	22%
Saturated Fat 3.5g	18%
Trans Fat 2.5g	
<b>Cholesterol</b> 120 mg	40%
<b>Sodium</b> 640mg	27%
<b>Total Carbohydrate</b> 13g	4%
Dietary Fiber 1g	4%
Sugars 0g	
<b>Protein</b> 24g	
Calories per gram	
Fat 9 • Carbohydrate 4 • Protein 4	

A. How many servings are there per package?

*ANSWER: 4 servings*

B. The label says there are 280 calories per serving. How many calories is that per package?

*ANSWER: 1120 calories*

C. What is the ratio of fat grams to carbohydrate grams for one serving?

*ANSWER: 14 g fat to 13 g carbs or 14:13*

D. What is the ratio of protein grams to carbohydrate grams for one serving?

*ANSWER: 24 g protein to 13 g carbs or 24:13*

E. What is the ratio of carbohydrate calories to fat calories for one serving?

*ANSWER: 126 fat calories to 52 carbohydrate calories or 126:52. This can also be reduced to 63:26*

F. What is the ratio of protein calories to fat calories for one serving?

*ANSWER: 96:52 reduced to 48:26 or 24:13*

G. Compare the ratios in question D and question F. What can you say about this food, by looking at these ratios.

*ANSWERS the ratios are the same.*

**Page 1 continued** Answer Key

H. If the package was split up between 8 people, how much of the following would be consumed.

a. grams of fat per person?

**ANSWER:**  $(14g)(4servings) 8 \text{ people} = 7 \text{ grams of fat per person}$

b. grams of protein per person?

**ANSWER:**  $(14g)(4servings) 8 \text{ people} = 12 \text{ grams of protein per person}$

**Page 2** Answer Key

**CHALLENGE:** If one serving of this food was changed to 12 oz, create a new food label for the new serving size. (Note: The package size does not change)

*Students can figure this out in many different ways. They can use the ratio 4:12, which is a 1:3 ratio when reduced. This gives the scale factor of 3. So if they multiply all relevant information by 3, they will have the correct answers.*

**4 oz Label**

<b>Nutrition Facts</b>	
Serving Size 4 oz. (113g)	
Serving Per Container 4	
<b>Amount Per Serving</b>	
<b>Calories</b> 280	Calories from Fat 130
	% Daily Value*
<b>Total Fat</b> 14g	22%
Saturated Fat 3.5g	18%
Trans Fat 2.5g	
<b>Cholesterol</b> 120 mg	40%
<b>Sodium</b> 213 mg	27%
<b>Total Carbohydrate</b> 13g	4%
Dietary Fiber 1g	4%
Sugars 0g	
<b>Protein</b> 24g	

**12 oz Label**

<b>Nutrition Facts</b>	
Serving Size 12 oz. (339g)	
Serving Per Container <i>1.3 or 1 1/3</i>	
<b>Amount Per Serving</b>	
<b>Calories</b> 840	Calories from Fat 390
	% Daily Value*
<b>Total Fat</b> 42 g	<b>66%</b>
Saturated Fat <i>10.5</i> g	<b>54%</b>
Trans Fat <i>7.5</i> g	
<b>Cholesterol</b> 360 mg	<b>120%</b>
<b>Sodium</b> 640 mg	<b>81%</b>
<b>Total Carbohydrate</b> 39 g	<b>12%</b>
Dietary Fiber 3 g	<b>12%</b>
Sugars 0 g	
<b>Protein</b> 72 g	