



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

Goals/Standards

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

- The importance of units
- Rates and unit rates
- Proportions as multiplicative situations
- Patterns
- Translating unit rates to a table and a graph
- Identification of independent and dependent variables (optional)

Video Discussion:

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

- What do you think the animation 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

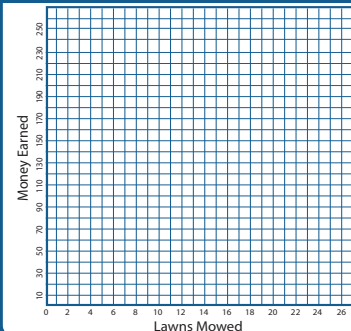
The *Ratey the Math Cat* animation is available on iTunes U (search "Math Snacks") and at mathsnacks.org



1. In *Ratey the Math Cat*, the character mowing lawns earns \$10 **PER** lawn. Complete the table below, which represents money earned **PER** lawn.

Lawns Mowed	Money Earned
1	
2	
3	
5	
10	250

A. Plot the data from question 1 on the grid below.

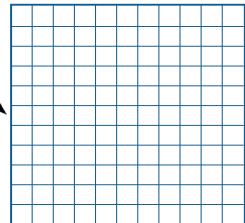


Learner Guide Page 2

2. List 5 different rates, from your life, using the word **PER**, such as "2 hours of video games **PER** day."

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-
-
-
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A. Using one of the rates you listed in question 2, fill out a table and complete a graph that represent your rate. Label the table and the graph appropriately, and be sure the scale on your x and y axis allows you to plot all of your points.



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

3. Questions about nutritional information

A. How many servings are there **PER** container?

B. The label says there are 280 calories **PER** serving. How many calories are there **PER** container?

C. If this container of food was divided equally among 8 people:

- How many grams of fat would there be **PER** person?
- How many grams of protein would there be **PER** person?

Bonus: How many protein calories are there **PER** serving?

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Bonus Activities

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

As they are doing the activity, have them keep track of their rates using the word PER. After they have completed the activity and recorded their rates, have them create a table representing their rates. Once the table is complete, have them draw a graph to represent their rates graphically. Make sure the students LABEL their tables and graphs appropriately. (Note: It is important to realize that this data may be discrete and not continuous and should be represented on the graph with single points and not necessarily with lines or line segments. However, lines could be used for prediction purposes.)

Always allow plenty of time for discussion and sharing after each activity to make sure the students clearly understand how rates are patterns that can be represented in a table and a graph.

- 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 a situation similar to those in the video that demonstrates the idea of a ratio and 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. Three examples of physical challenges are provided, but there are, of course, many others that can be used 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 while counting 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 and help each other measure the number of footsteps it takes each of them to walk down the hallway or across the classroom. Have them calculate the number of steps PER distance for their route, then compare their results with classmates'.

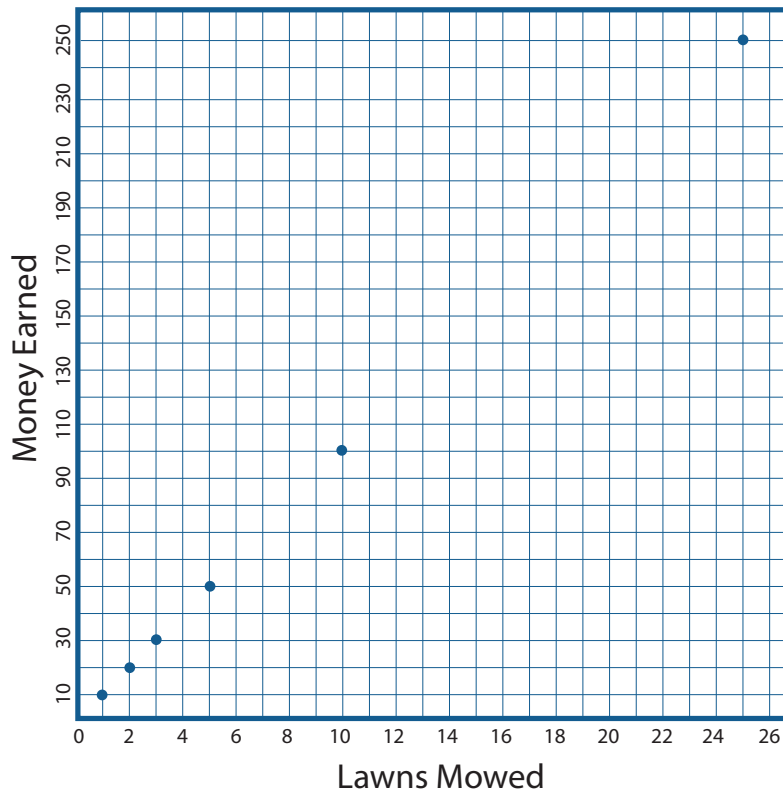
Page 1 Answer Key

1. In *Ratey the Math Cat*, the character mowing lawns earns \$10 *PER* lawn. Complete the table below, which represents money earned *per* lawn.

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 in this situation.

- A. Plot the data from question 1 on the grid below.



Page 2 Answer Key

2. List 5 different rates, from your life, using the word *PER*, such as "2 hours of video games *PER* day."

ANSWER: will vary. Make sure students label the table and graph appropriately.

3. Questions about nutritional information

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

Nutrition Facts Serving Size 4 oz.
(113g). Servings Per Container 4

Amount Per Serving		
		% Daily Value*
Calories 280	Calories from Fat 130	
Total Fat 14g		22%
Saturated Fat 3.5g		18%
Trans Fat 2.5g		
Cholesterol 120 mg		40%
Sodium 640mg		27%
Total Carbohydrate 13g		4%
Dietary Fiber 1g		4%
Sugars 0g		
Protein 24g		
Calories per gram		
Fat 9 • Carbohydrate 4 • Protein 4		

3A. How many servings are there PER container?

ANSWER: 4 servings

3B. The label says there are 280 calories PER serving. How many calories are there PER container?

ANSWER: 1120 calories

3C. If this container of food was divided equally among 8 people:

a. How many grams of fat would there be PER person?

**ANSWER: $(14g)(4\text{servings}) = 56\text{ grams per package.}$
 $56/8 = 7\text{ grams per person.}$**

b. How many grams of protein would there be PER person?

**ANSWER: $(24)(4) = 96\text{ grams per package.}$
 $96/8 = 12\text{ grams per person}$**

Bonus: How many protein calories are there PER serving?

ANSWER: 96 calories. 24 protein grams x 4 calories per gram. $24 \times 4 = 96\text{ calories}$