

learning focus:

- ✓ use rates to solve problems, including measurement conversions
- ✓ convert between fractions, decimals, and percents
- ✓ model and apply percents to real-world situations to find the percent, part, and whole

RATES & PERCENTS UNIT

15 DAY CCSS-ALIGNED UNIT



A MANEUVERING THE MIDDLE® RESOURCE

RATES & PERCENTS



a 15 day CCSS-aligned unit

CCSS: 6.RP.2, 6.RP.3, 6.RP.3b, 6.RP.3c, 6.RP.3d

**ready-to-go, scaffolded
student materials**

RATES AND PERCENTS UNIT

Table of Contents

PAGE	TOPIC	RESOURCE
5	Sample Pacing Guide	
7-10	Ideas for Implementation & Helpful Hints	
11-18	Binder Covers, Dividers, and Spine Labels	
19-20	Intro to Rates	Student Handout 1
21	Intro to Rates	Homework 1
23-24	Rates as Comparisons	Student Handout 2
25	Rates as Comparisons	Homework 2
27-28	Measurement Conversions	Student Handout 3
29	Measurement Conversions	Homework 3
31-32	Representing Rates	Student Handout 4
33	Representing Rates	Homework 4
35-36	Rates Quiz	Quiz 1
37-38	Modeling Percents	Student Handout 5
39	Modeling Percents	Homework 5
41-42	Fractions, Decimals, and Percents	Student Handout 6
43	Fractions, Decimals, and Percents	Homework 6
45-46	Solving Percents with Proportions	Student Handout 7
47	Solving Percents with Proportions	Homework 7
49-50	Percent Application: Finding the Part	Student Handout 8
51	Percent Application: Finding the Part	Homework 8
53-54	Percent Application: Finding the Percent	Student Handout 9
55	Percent Application: Finding the Percent	Homework 9
57-58	Percents Quiz	Quiz 2

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student friendly + real-world application

use of grade level modeling

Unit: Rates and Percents
Homework 7

Name _____
Date _____ Pd _____

SOLVING PERCENTS WITH PROPORTIONS

In 1-6, record the problem number in the box with the correct solution. For percent solutions, leave off the percent sign. Then solve questions 7 and 8. Use a tape diagram to help.

60	7	40	75
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1. 63 is what percent of 84? 2. What is 45% of 60?

3. 16 is 25% of what number?

4. What percent is 36 of 90? 5. What number is 90% of 140?

6. What percent of 20 is 14? 7. What is 45% of 60? 8. 16 is 25% of what number?

9. What number is 90% of 140? 10. 44 is 46% of what number?

12. What percent is equivalent to the proportion below?

□	□	□	□
□	□	□	□
□	□	□	□
□	□	□	□

7. Describe and correct the error Karl made solving the problem below.

What number is 24% of 80? $\frac{80}{x} = \frac{24}{100}$
 $x = 333$

Unit: Rates and Percents
Student Handout 7

Name _____
Date _____ Pd _____

SOLVING PERCENTS WITH PROPORTIONS

PROPORTIONS

- Two _____ ratios are also called a proportion.
- You can use a proportion to solve for a missing value, x , in two ways:
 - Determining the _____.
 - _____.

Find the missing value in the proportion below.

1. $\frac{8}{9} = \frac{x}{81}$ 2. $\frac{4}{7} = \frac{32}{x}$ 3. $\frac{x}{20} = \frac{180}{240}$

USING PROPORTIONS TO FIND PERCENTS

- Percent is a part to whole ratio, where the whole is always _____.
- Each percent can be modeled on a 10x10 grid and can also be written as a _____.
- You can use a proportion to solve the problem where: $\frac{\%}{100} = \frac{\text{part}}{\text{whole}}$

part: 1, whole: 5, rotate 90°, $\frac{\%}{100} = \frac{\text{part}}{\text{whole}}$, $\frac{\%}{100} = \frac{1}{5}$, 100%, 100%

error analysis

Use your understanding of proportions to set up a percent proportion and solve.

4. Use the tape diagram below to set up a proportion and solve.

30	□	□	□	□	x
20%					100%

5. Use the tape diagram below to set up a proportion and solve.

□	□	□	□	48
x				
25%				100%

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streamline your planning process with unit overviews

RATES AND PERCENTS OVERVIEW

STANDARDS

6.RP.2 Understand the concept of unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship.

6.RP.3 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

6.RP.3b Solve unit rate problems including those involving unit pricing and constant speed.

6.RP.3c Find a percent of a quantity as a rate per 100, solve problems involving finding the whole, given a part and the percent.

6.RP.3d Use ratio reasoning to convert measurement units, manipulate and transform units appropriately when multiplying or dividing quantities.

✓ key vocabulary

✓ vertical alignment

sample
pacing
calendar

PIC IDEAS

- Rates are a way of comparing
- Proportional relationships e:
- Proportional relationships a

ESSENTIAL QUESTION

- How do proportions explain
- What information and strate
- When would estimation be e
- How do I know that a relatio

RATES AND PERCENTS PACING GUIDE

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Intro to Rates	Rates as Comparisons	Measurement Conversions	Representing Rates	Rates Quiz
Student Handout 1 Homework 1	Student Handout 2 Homework 2	Student Handout 3	Student Handout 4	
DAY 6	DAY 7			
Modeling Percents	Fractions, Decimals, and Percents			
Student Handout 5 Homework 5	Student Handout 6 Homework 6			
DAY 11	DAY 12			
Percents Quiz	Percent Application: Finding the Whole			
Quiz 2	Student Handout 10 Homework 10			

RATES AND PERCENTS OVERVIEW

TOPIC	TEACHING TIPS
Unit Rate	<ul style="list-style-type: none"> • Rate can be a fun topic to introduce because we literally see it everywhere. I liked to have my students do silly tasks with a partner and then calculate their rate. Examples include jumping jacks, push-ups, etc. • For unit pricing, be sure to snap a few real-life pictures next time you go shopping and discuss how you can be a better shopper when you take the time to determine the unit rate. • Emphasize the concept that rate is a comparison of two quantities with different units.
Rates with Equations, Tables, and Graphs	<ul style="list-style-type: none"> • When the x-value is one, the unit rate will be the y-value. This can be a tricky concept for kids to understand. Consider giving them a highlighter and having them highlight the ordered pair in the graph and the values in the table.
Percent Models and Representations	<ul style="list-style-type: none"> • For students who are struggling it might be beneficial to use the base ten blocks for a more hands-on approach. I liked to connect the picture to the fraction over a hundred and then reduce in order to find the simplest form of the fraction. • Search www.illuminations.nctm.org for the "Fraction Model Interactive" for a great visual tool of fractions, decimals, and percents.
Finding Percent of a Number	<ul style="list-style-type: none"> • There are several ways to determine the percent of a number, including an equation, a proportion, or a percent bar. For students who struggle to understand what is happening in the problem, I would suggest having them set up a proportion every time. • It is also beneficial to have students memorize their benchmark fraction, decimal, and percents. This helps them to use reasonableness and problem solving skills when applying percents to real-world situations.
Percent Application	<ul style="list-style-type: none"> • Consider using a similar problem and similar information to show students how to set up problems and solve for different parts of the equation/proportion.

teaching ideas

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unit study guide + assessments



quizzes



editable unit test

Unit: Rates and Percents
Quiz 1

Name _____
Date _____ Pd _____

QUIZ: RATES

Answer the questions below. Be sure to show your work.

1. Duane can do 46 pull-ups in two minutes. Find the rate.

Answers

1. _____
2. _____
3. _____

Use the information to answer questions snapping $\frac{3}{4}$ of a picture per second.

2. How long will it take the camera to snap _____ pictures?

3. How many pictures can be snapped with _____ seconds?

Answer the questions below. Be sure to show your work.

4. A baker's dozen (13) of cookies is on sale for \$1.50. How much does each cookie cost?

5. The NFL regulation extra point is kicked from the goal line is the extra point kick? _____

6. How many kilograms are in 14,500 grams?

7. A water cooler holds 1,536 ounces of water. How many 16-ounce water bottles can be filled from the water cooler?

Unit: Rates and Percents
Review

Name _____
Date _____ Pd _____

RATES AND PERCENTS UNIT STUDY GUIDE

Solve each of the problems below. These represent the types of questions on your test. Be sure to ask questions if you need more help with a topic.

I CAN UNDERSTAND THE CONCEPT OF A RATE.

1. Four pounds of apples cost \$3.88. What is the price per pound?

2. _____ is _____ percent of _____.

I CAN USE UNIT RATES TO SOLVE PROBLEMS.

4. Yvonne paid \$18.72 for 8 gallons of gas. She then passed by another gas station advertising \$2.29 per gallon. How much would she have saved if she had purchased gas at the second location?

6. Protein bars come in a 4-pack box. The 4-pack costs \$7.68 and a single bar costs \$22.32. Which box is the better value?

SIXTH GRADE CURRICULUM

RATES AND PERCENTS

UNIT FIVE: ANSWER KEYS

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answer keys included

