Lesson 5: Ratios and Percentages

Objectives	Terms
• To understand what a ratio is and the different forms to express one. • To understand the relationship between ratios, fractions, decimals, percents and proportions. • To use tape diagrams to solve real-world scenarios using ratios.	• Fractions • Decimals ○ Place Values • Ratio • Percent • Tape Diagram • Proportion

Using Fractions & Decimals to Compare Values

Fractions compare the value of the _____ to the value of the _____, which represents the whole unit.

Fraction	How we read it	What it means
$\frac{1}{10}$	One-tenth	1 part out of 10
$\frac{1}{100}$	One- _____	1 part out of _____
$\frac{1}{1000}$	One- _____	1 part out of _____

Decimals are fractions with denominators of _____.

Decimal	How we read it	Equivalent Fraction
0.1	One-tenth	
0.01	One- _____	
0.001	One- _____	

- **Place Values**: Where a digit is in a number determines its value.
- **Decimal Place:** The position of a digit in a decimal number. Place value is its value based on its decimal place.
  - **Example:** _____

Place	Thousands	Hundreds	Tens	Ones	decimal	Tenths	Hundredths	Thousandths
Digit					.			
Expanded form					.			
Equivalent Fraction								

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Practice: Fill in the table with the indicated values.

Question	Answer
How many pennies are in a dollar?	
Identify the digit in the thousands place: $1,425.37	
Identify the digit in the hundreds place: $1,425.37	
Identify the digit in the tens place: $1,425.37	
Identify the digit in the ones place: $1,425.37	
Identify the digit in the tenths place: $1,425.37	
Identify the digit in the hundredths place: $1,425.37	
There are 2.5813 grams of sugar in a piece of candy. Identify the digit in the thousandths place.	

Using Fractions & Decimals to Write Percentages

Percents are comparisons out of _____. Percent mean "_____".

Percentages are values compared to 100.

Whole = denominator (100 parts)	Part = numerator	Parts out of 100	Fraction	Decimal	Percentage
$1.00 = 100 cents	$0.25	25 cents out of 100	$\frac{25}{100}$	0.25	25% of a dollar
1 meter = 100 centimeters	8.36 meters	836 centimeters out of 100	$\frac{836}{100}$	8.36	836% of a meter
1 century = 100 years	30 years	30 years out of 100	$\frac{30}{100}$	0.30	30% of a century

Ratio: A comparison of any _____.

Ways to express ratios: _____

How can you write the following relationship: A recipe calls for 2 cups of sugar for every 3 cups of flour.

Words

Symbols

Tape Diagram

Fraction

Decimal

Percentage

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Tape Diagrams are one way you can express ratios, fractions, decimals, and percentages visually.

Practice Problem

From 125 yards away, a marksman hit 9 out of 10 of the targets last year.

1. What would the number of targets hit be as a fraction?

- What does the "whole" represent?
- What does the "part" represent?
- How can you represent the number of targets hit as a fraction?

2. What would the number of targets hit be as a percentage?

- What does the "whole" represent?
- What does the "part" represent?
- How can you represent the number of targets hit as a percentage?

- You can use tape diagrams to find percentage of values that are not powers of ten.

Example: An item is regularly priced at $85. It is on sale or 60% off the regular price. Use the space and the tape diagram below to answer the following questions.

a. How much (in dollars) is discounted from the regular price?

b. What is the new price of the item (in dollars)?

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- **Proportions** compare parts to a whole and compare two ratios.
- You can use tape diagrams to help solve proportion problems.

Practice 1: Each marble bag sold by Lamar's Marble Company contains 5 blue marbles for every 6 red marbles. If a bag has 30 red marbles, how many blue marbles does it contain?

a. What is the ratio of blue marbles to red marbles?

b. What other information are we given?

c. Draw a tape diagram in the space below to model this ratio.

How many blue marbles will the bag contain?

Practice 2: A saleswoman earns 7% commission on all the merchandise that she sells. Last month she sold $4000 worth of merchandise. How much commission (in dollars) did she earn last month?

a. What information are we given?

b. Draw a tape diagram in the space below to model this ratio.

How much commission did the saleswoman earn last month?

Practice 3: In a recent year, 31.9% of all registered doctors were female. If there were 49,300 female registered doctors that year, what was the total number of registered doctors? Round your answer to the nearest whole number.

a. What information are we given?

b. Draw a tape diagram in the space below to model this ratio.

What was the total number of registered doctors?

Where will you see this in upcoming material?	What are the calculator skills you needed?