6.1 Writing Percents as Decimals Teacher Notes

POD:

Objective:

How to Write a Percent Greater Than 100 Fraction:

1.) Write the percent as a fraction with a denominator of 100.
2.) Simplify the fraction if needed (this is your fraction answer).

How to Write a Percent Less Than 100 Fraction:

1.) Write the percent as a fraction with a denominator of 100.
2.) To get rid of the decimal in the numerator, move the decimal point to the RIGHT as many spaces as needed. This is the number of zeros you need to add to the denominator.

Examples:

Write each percent as a decimal and fraction in simplest form

1. 25%
   a. 25% = .25
   b. 25% = $\frac{25}{100} = \frac{1}{4}$
2. 0.35%
   a. 0.35% = 0.0035
   b. 0.35% = $\frac{0.35}{100} = \frac{35}{10{,}000} = \frac{7}{2{,}000}$ (You MUST move the decimal out of the numerator)
3. 240%
   a. 240% = 2.4
   b. 240% = $\frac{240}{100} = 2\frac{2}{5}$
4. 0.5%
   a. 0.5% = 0.005
   b. 0.5% = $\frac{0.5}{100} = \frac{5}{1{,}000} = \frac{1}{200}$

How to Write a Fraction as a Percent

1.) Convert the fraction to decimal (divide)
2.) Multiply by 100 OR Move the decimal point 2 places to the RIGHT.
3.) Add zeroes if needed.
4.) Or, change the denominator to 100 and change the numerator

5) $\frac{17}{10} \times \frac{10}{10} = \frac{170}{100} = 170\%$

6) $\frac{9}{8} = 1.125 = 112.5\%$

6.2 Comparing and Ordering Percents, Fractions, and Decimals
Teacher Notes

POD:

Write as a decimal
1.) 125% = 1.25

Write as a fraction
2.) 32% 32/100=8/25

Write as a decimal
3.) $\frac{35}{100}$= .35

Objective: Students will be able to convert between percents, decimals, and fractions and order them and compare them.

How to Order Percents, Fractions, and Decimals:

1.) Convert all the numbers to same units.
2.) Order from least to greatest
3.) Write the order using original numbers.

Examples:

Order from least to greatest

1.) What form do you want to convert each to? Circle one

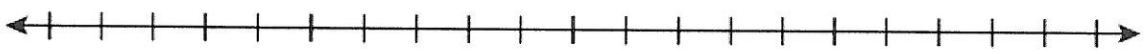
Percent Fraction Decimal

$\frac{3}{10}$, 0.74, 29%, $\frac{11}{25}$

Answer: 29%, $\frac{3}{10}$, $\frac{11}{25}$, 0.74

Show Your Work!!
30/100 74/100 29/100 44/100

Place the numbers in order, least to greatest on the number line



2.) What form do you want to convert each to? Circle one

Percent Fraction Decimal

68%, .63, 14/19

Answer .63, 68%, 14/19

Show Your Work!!
.68, .63, 14 ÷ 19 = .7368 ≈ .74

Place the numbers in order, least to greatest on the number line

3.) Which Number is greater?

$\frac{1}{8}$ or 14% Show your work

1 ÷ 8 = .125 which is 12.5%
14% is greater

4.) The table shows the portion of each age group that recycles plastic. Order the groups by the portion that recycle from least to greatest.

Age Group	Echo Boomers	Gen X	Baby Boomers	Matures
Portion that Recycles	51%	.57	.61	6/10

SHOW WORK
.51
.57
.61
.60
Answer: Echo Boomers, Gen X, Matures, Baby Boomers

6.3 Solving Percent Problems Using Proportions TEACHER NOTES

POD: Use mental math to solve each problem.

1.) 20% of 120 **24**

2.) 10% of 240 **24**

Objective: Students will find percents and wholes using proportions.

Homework: Percents and Proportions Handout

Proportions for Solving Percent Problems:

For either proportion, solve using cross products.

1.) $\frac{part}{whole} = \frac{\%}{100}$

2.) $\frac{is}{of} = \frac{\%}{100}$

Examples:

Use a proportion to solve. Round to the nearest tenth if necessary.

1.) What percent of 92 is 23?

$\frac{is}{of} = \frac{\%}{100}$ $\quad \frac{23}{92} = \frac{x}{100}$

$\frac{2300}{92} = \frac{92x}{92}$

x = 25%

2.) 36 is what percent of 125?

$\frac{is}{of} = \frac{\%}{100}$ $\quad \frac{36}{125} = \frac{x}{100}$

$\frac{3600}{125} = \frac{125x}{125}$

x = 28.8%

3.) 42 is 56% of what number?

$\frac{is}{of} = \frac{\%}{100}$ $\quad \frac{42}{x} = \frac{56}{100}$

$\frac{4200}{56} = \frac{56x}{56}$

x = 75

4.) 20% of 25 is what number?

$\frac{is}{of} = \frac{\%}{100}$ $\quad \frac{x}{25} = \frac{20}{100}$

$\frac{500}{100} = \frac{100x}{100}$

x = 5

5.) In a school band of 24 students, 8 students are 7th graders. What percent of the band is 7th graders?

$$\frac{is}{of} = \frac{\%}{100} \qquad \frac{8}{24} = \frac{x}{100}$$

$$\frac{800}{24} = \frac{24x}{24}$$

$x = 33.3\%$

6.) Of 140 seventh-grade students, 15% earn the Presidential Physical Fitness Award. How many students earn that award?

$$\frac{x}{140} = \frac{15}{100} \qquad \frac{100x}{100} = \frac{2100}{100}$$

$X = 21$

21 Students

6.4 Solving Percent Problems Using Equations Teacher Notes

POD: Use proportions to solve.

1.) 24 is what percent of 32?

2.) What number is 62% of 50?

Objective: Students will write and solve percent equations.

How to Solve Percent Problems Using Equations:

1.) Translate the problem into an algebraic equation:
   a. "is" means = (equal)
   b. "of" means • (multiply)
   c. "what", "what number", or "what percent" is the unknown, represent the unknown with a variable

2.) Solve the equation. **(Make sure you turn percents into decimals!!!)**

Examples

Write an equation, then solve.

1.) What number is 39% of 377? Equation: $x = .39 \cdot 377$ Answer: $x = 147.03$	2.) 27% of 60 is what number? Equation: $.27 \cdot 60 = x$ Answer: $x = 16.2$
3.) 40% of what number is 30? Equation: $.40 \cdot x = 30$ $\frac{.40x}{.40} = \frac{30}{.40}$ Answer: $x = 75$	4.) 39 is what percent of 260? Equation: $39 = x \cdot 260$ $\frac{39}{260} = \frac{260x}{260}$ $x = 0.15$ (TURN INTO A PERCENT!) Answer: $x = 15\%$
5.) The price of a new version of a computer game is 120% of the price of the original version. The original version cost $48. What is the cost of the new version? 120% = 1.20 Equation: $x = 1.20 \cdot 48$ Answer: $x = \$57.60$	

6.) Nine hundred thirty-six students, 65% of the entire student body, attended the football game. What is the size of the student body?

936 is 65% of the student body

$$\frac{936}{0.65} = \frac{0.65 \cdot n}{0.65}$$

n = 1,440 students

7.) During a telephone survey, 320 people, or 25% of those called, said they were listening to the same station at the time of the call. How many people were called?

320 is 25% of the total people called

$$\frac{320}{0.25} = \frac{0.25 \cdot n}{0.25}$$

n = 1,280 people

6.5 Percent of Change Teacher Notes

POD:

1.) 64 people completed a survey about their favorite pets. If eight people said their favorite pet was a fish, what percent of people had a different favorite pet? (Use equation)

87.5%

2.) 20% of people said that green was their favorite color. If ten people said this, how many people took part in the survey? (Use proportion)

50

Objective: Students will be able to find the percent of increase or decrease in real life problems.

Vocabulary:

1. percent of change – the percent a quantity increases or decreases from its original amount

2 Options for Determining the Percent of Change:

(big number-little number) ☺

1.) $\frac{\text{amount of change}}{\text{original amount}} = \frac{\text{percent of change}}{100}$

OR

2.) $\text{percent of change} = \frac{\text{amount of change}}{\text{original amount}}$

Examples: Find each percent of change. Tell whether the change is an increase or decrease.

1. from 96 to 78

$\frac{96-78}{96} = \frac{18}{96} = 0.1875$

18.8% decrease

2. From 87 to 108

$\frac{108-87}{87} = \frac{21}{87} = 0.241$

24.1% increase

3. Last year, a school had 632 students. This year the school has 670 students. Find the percent of increase in the number of students.

$670 - 632 = 38$

$\frac{38}{632} = \frac{x}{100}$

$632x = 38 \cdot 100$

$\frac{632x}{632} = \frac{3800}{632}$

$x = 6.0\%$

4. A tent is on sale for $48.75. Find the percent of discount if the original price for the tent was $74.99.

$74.99 - 48.75 = 26.24$

$$\frac{26.24}{74.99} = \frac{x}{100}$$

$74.99x = 26.24 \cdot 100$

$$\frac{74.99x}{74.99} = \frac{2624}{74.99}$$

$x = 35.0\%$

5. Kayla was 36 in. at age 3. At age 5 she is 42 in. tall. To the nearest percent, what is the percent of change in Kayla's height?

$$\frac{42-36}{36} = \frac{6}{36} = 0.16666 \quad x = 17\%$$

6. You estimate that the length of your classroom is 16 feet. The actual length is 21 feet. Find the percent error.

The amount of error is 21-16 = 5 feet

5/21 ≈ .238 or 23.8%

Section 6.6: Discounts and Markups Teacher Notes

POD: Use an equation to solve.

1.) What percent of 54 is 18?

33.3%

2.) 24 is 64% of what number?

37.5

Objective: Students will use percent of discounts and markups to find selling prices of tems.

Vocabulary:

1. sales tax - a percent you pay of a purchase price
2. discount - the amount of decrease in a price
3. markup - the increase from what the store pays to the selling price.

Formulas:

1. discount = discount rate • original price
2. sale price = original price - discount
3. sales tax = tax rate • purchase price
4. markup = markup rate • original selling price
5. total price = sales price + sales tax

Examples:

1.) Shoes priced at $74.95 are marked 25% off. Find the sales price.

discount = 0.25 • 74.95 = $18.74	sale price = $74.95 - 18.74 = $56.21

2.) A desk costs $159.99 and the sales tax rate is 6%. Find the total price.

sales tax = 159.99 • .06 = $9.60	total price = $159.99 + 9.60 = $169.59

3.) A $5 cap has a 70% markup. What is the markup and final selling price?

markup = percent of markup • store's cost m = .70 • 5 m = $3.50	selling price = cost + markup s = $5 + 3.50 s = $8.50

4.) Shoes are now $33 after a 40% discount. What is the original price of the shoes?

The sale price is: 100% - 40% = 60% of the original price.

33 is 60% of what number?

$\frac{33}{0.6} = \frac{0.60x}{0.60}$ Original price = $55

5.) A playstation game that costs $50.50 are marked 25% off. The sales tax rate is 7%. Find the discount, sale price, sales tax, and total price.

discount = 0.25 • 50.50 = $12.63	sale price = $50.50 – 12.63 = $37.87
sales tax = 0.07 • 37.87= $2.65	total price = $37.87 + 2.65 = $40.52

Section 6.7 Simple Interest Teacher Notes

POD:

1.) A pair of shoes costs $59.95 and is 25% off. If there is an 8.5% sales tax, what is the final price for the shoes?
$14.99, $44.96, $3.82, $48.78

Objective: Students will be able to use the simple interest formula to find interest earned or paid, annual interest rates, and amounts paid on loans.

Formula: I = prt (I: Interest, P: Principal, r: rate, t: time)

Examples: Find the simple interest and your total balance.

1.) principal = $500, interest rate = 3.5%, time = 2 years

I = prt $I = 500 \cdot .035 \cdot 2$

Simple Interest = $35 Total balance = $535

2.) Stephanie puts $2,000 into her bank account which pays 4.5% interest. How much interest will she have earned in 6 months? What will be the total in her bank account?

I = prt $I = 2{,}000 \cdot .045 \cdot .5$

Simple Interest = $45 Total money = $2,045

3.) Suppose you deposit money in a savings account. The interest rate is 6% per year. If you earn $42 in interest after 7 months, how much money did you deposit in the bank at the beginning?

$$42 = x \cdot .06 \cdot \frac{7}{12}$$

$$\frac{42}{.035} = \frac{0.035x}{.035}$$

Principal = $1200

4.) Jacob borrowed $5,000 for a period of 3 months. If he had to pay $118.75 in interest, what interest rate did he receive?

$$118.75 = 5000 \cdot x \cdot \frac{3}{12}$$

$$\frac{118.75}{1250} = \frac{1250x}{1250}$$

Interest = 0.095 = 9.5%

5.) Megan bought a computer system for $1,200 and the bank charges an interest rate of 18% per year. If she has to spend $324 in interest, how long is her loan?

$$324 = 1200 \cdot .18 \cdot x$$

$\frac{324}{216} = \frac{216x}{216}$

Years = 1.5 years (1 year and 6 months)

6.) You borrow $600 to buy a violin. The simple interest rate is 15%. You pay off the loan after 5 years. How much do you pay for the loan.

$I = 600 \cdot .15 \cdot 5$

$450