


Chapter 6	Percents
MAFS.7.EE.2.3	<p>Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically.</p> <p>Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</p>
Essential Question	<p>How does a decimal point move when you rewrite a percent as a decimal or decimal as a percent?</p> <p><i>In this lesson I am learning how to convert numbers between fractions, decimals, and percents so I can use the form most appropriate in certain context.</i></p>
6.1 Percents and Decimals	<p>Writing Percents as Decimals</p> <p>Words Remove the percent symbol. Then divide by 100, or just move the decimal point two places to the left.</p> <p>Numbers $23\% = 23.\% = 0.23$</p> <p>Writing Decimals as Percents</p> <p>Words Multiply by 100, or just move the decimal point two places to the right. Then add a percent symbol.</p> <p>Numbers $0.36 = 0.36 = 36\%$</p>
	<p>MATCHING Match the decimal with its equivalent percent.</p> <p>1. 0.42 2. 4.02 3. 0.042 4. 0.0402</p> <p>A. 4.02% B. 42% C. 4.2% D. 402%</p> <p>5. OPEN-ENDED Write three different decimals that are between 10% and 20%.</p> <p>6. WHICH ONE DOESN'T BELONG? Which one does <i>not</i> belong with the other three? Explain your reasoning.</p> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px 10px;">70%</div> <div style="border: 1px solid black; padding: 2px 10px;">0.7</div> <div style="border: 1px solid black; padding: 2px 10px;">$\frac{7}{10}$</div> <div style="border: 1px solid black; padding: 2px 10px;">0.07</div> </div>

Homework 6.1 Practice A #1-16	Write the percent as a decimal.										
	7. 78%	8. 55%	9. 18.5%								
	10. 57.4%	11. 33%	12. 9%								
	13. 47.63%	14. 91.25%	15. 166%								
	16. 217%	17. 0.06%	18. 0.034%								
Homework 6.1 Practice A #18-33	Write the decimal as a percent.										
	19. 0.74	20. 0.52	21. 0.89								
	22. 0.768	23. 0.99	24. 0.49								
	25. 0.487	26. 0.128	27. 3.68								
	28. 5.12	29. 0.0371	30. 0.0046								
Homework 6.1 Practice A #17, 34	31. ERROR ANALYSIS Describe and correct the error in writing 0.86 as a percent.										
	<div> $0.86 = \underbrace{00.86}_{\text{WRONG}} = 0.0086\%$</div>										
Homework 6.1 Practice A #35	32. MUSIC Thirty-six percent of the songs on your MP3 player are pop songs. Write this percent as a decimal.										
Homework 6.1 Practice A #36-37	33. CAT About 0.34 of the length of a cat is its tail. Write this decimal as a percent.										
Homework 6.1 Practice A #35	34. COMPUTER Write the percent of free space on the computer as a decimal.										
	<table><tr><th>Volume</th><th>Capacity</th><th>Free Space</th><th>% Free Space</th></tr><tr><td>(C:)</td><td>149 GB</td><td>133 GB</td><td>89 %</td></tr></table>			Volume	Capacity	Free Space	% Free Space	(C:)	149 GB	133 GB	89 %
Volume	Capacity	Free Space	% Free Space								
(C:)	149 GB	133 GB	89 %								
Homework 6.1 Practice A #40-43	Write the percent as a fraction in simplest form and as a decimal.										
	35. 36%	36. 23.5%	37. 16.24%								

MAFS.7.EE.2.3	<p>Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically.</p> <p>Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</p>																		
Essential Question	<p>How can you order numbrs that are written as fracions, decimals, and percents? <i>In this lesson I am learning how to convert between fractions, decimals, and percents so I can order them.</i></p>																		
6.2 Comparing and Ordering	<p>When comparing fractions, decimals, and percents, write the numbers as ALL fractions, ALL decimals, or ALL percents.</p>																		
	<div><div><p>1. NUMBER SENSE Copy and complete the table.</p><p>2. NUMBER SENSE How would you decide whether $\frac{3}{5}$ or 59% is greater? Explain.</p><p>3. WHICH ONE DOESN'T BELONG? Which one does <i>not</i> belong with the other three? Explain your reasoning.</p><div><div>40%</div><div>$\frac{2}{5}$</div><div>0.4</div><div>0.04</div></div></div><table><thead><tr><th>Fraction</th><th>Decimal</th><th>Percent</th></tr></thead><tbody><tr><td>$\frac{18}{25}$</td><td>0.72</td><td></td></tr><tr><td>$\frac{17}{20}$</td><td></td><td>85%</td></tr><tr><td>$\frac{13}{50}$</td><td></td><td></td></tr><tr><td></td><td>0.62</td><td></td></tr><tr><td></td><td></td><td>45%</td></tr></tbody></table></div>	Fraction	Decimal	Percent	$\frac{18}{25}$	0.72		$\frac{17}{20}$		85%	$\frac{13}{50}$				0.62				45%
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Homework 6.2 Practice A #1-12	<p>Tell which number is greater.</p> <div><div>4. 0.9, 95%</div><div>5. 20%, 0.02</div><div>6. $\frac{37}{50}$, 37%</div><div>7. 50%, $\frac{13}{25}$</div><div>8. 0.086, 86%</div><div>9. 76%, 0.67</div><div>10. 60%, $\frac{5}{8}$</div><div>11. 0.12, 1.2%</div><div>12. 17%, $\frac{4}{25}$</div><div>13. 140%, 0.14</div><div>14. $\frac{1}{3}$, 30%</div><div>15. 80%, $\frac{7}{9}$</div></div>																		
Homework 6.2 Practice A #14-19	<p>Use a number line to order the numbers from least to greatest.</p> <div><div>16. 38%, $\frac{8}{25}$, 0.41</div><div>17. 68%, 0.63, $\frac{13}{20}$</div></div>																		

18. $\frac{43}{50}$, 0.91, $\frac{7}{8}$, 84%

19. 0.15%, $\frac{3}{20}$, 0.015

20. 2.62, $2\frac{2}{5}$, 26.8%, 2.26, 271%

21. $\frac{87}{200}$, 0.44, 43.7%, $\frac{21}{50}$


Homework
6.2 Practice A
#22

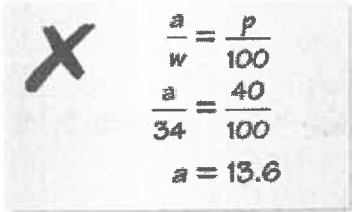
22. **TEST** You answered 21 out of 25 questions correctly on a test. Did you reach your goal of getting at least 80%?

Homework
6.2 Practice A
#23

23. **POPULATION** The table shows the portions of the world population that live in four countries. Order the countries by population from least to greatest.

Country	Brazil	India	Russia	United States
Portion of World Population	2.8%	$\frac{7}{40}$	$\frac{1}{50}$	0.044

MAFS.7.RP.1.3	Use proportional relationships to solve multistep ratio and percent problems.
Essential Question	How Can you write a proportion that solves percent problems? <i>In this lesson I will learn how I can write a proportion so I can use them to solve problems.</i>
6.3 The Percent Proportion	$\frac{\text{is}}{\text{of}} = \frac{\%}{100}$ $\frac{\text{part}}{\text{whole}} = \frac{\%}{100}$
	<p>1. VOCABULARY Write the percent proportion in words.</p> <p>2. WRITING Explain how to use a proportion to find 30% of a number.</p> <p>3. NUMBER SENSE Write and solve the percent proportion represented by the model.</p>  <p>4. WHICH ONE DOESN'T BELONG? Which proportion does <i>not</i> belong with the other three? Explain your reasoning.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$\frac{15}{w} = \frac{50}{100}$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$\frac{12}{15} = \frac{40}{n}$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$\frac{15}{25} = \frac{p}{100}$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$\frac{a}{20} = \frac{35}{100}$</div> </div>
Homework 6.3 Practice A #1-8, 11-14	<p>Write and solve a proportion to answer the question.</p> <div style="display: flex; justify-content: space-between;"> <p>5. What number is 24% of 80?</p> <p>6. 15 is what percent of 40?</p> </div> <div style="display: flex; justify-content: space-between; margin-top: 100px;"> <p>7. 15 is 30% of what number?</p> <p>8. What number is 120% of 70?</p> </div> <div style="display: flex; justify-content: space-between; margin-top: 100px;"> <p>9. 20 is what percent of 52?</p> <p>10. 48 is 75% of what number?</p> </div> <div style="display: flex; justify-content: space-between; margin-top: 100px;"> <p>11. What percent of 25 is 12?</p> <p>12. 14 is what percent of 56?</p> </div> <div style="display: flex; justify-content: space-between; margin-top: 100px;"> <p>13. 25% of what number is 9?</p> <p>14. 36 is 0.9% of what number?</p> </div>

	<p>15. 75% of 124 is what number?</p> <p>16. 110% of 90 is what number?</p> <p>17. What number is 0.4% of 40?</p> <p>18. 72 is what percent of 45?</p>
	<div>  <p> $\frac{a}{w} = \frac{p}{100}$ $\frac{a}{34} = \frac{40}{100}$ $a = 13.6$ </p> </div> <p>19. ERROR ANALYSIS Describe and correct the error in using the percent proportion to answer the question below. “40% of what number is 34?”</p>
Homework 6.3 Practice A #9	<p>20. FITNESS Of 140 seventh-grade students, 15% earn the Presidential Physical Fitness Award. How many students earn the award?</p>
	<p>21. COMMISSION A salesperson receives a 3% commission on sales. The salesperson receives \$180 in commission. What is the amount of sales?</p>

MAFS.7.EE.2.4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
Essential Question	How can you use an equivalent form of the percent proportion to write and solve an equation? <i>In this lesson I will learn how to write a percent equation so I can solve percent problems.</i>
6.4 The Percent Equation	Is means equals Of means multiply The “what” is the variable
	<p>1. VOCABULARY Write the percent equation in words.</p> <p>2. REASONING A number n is 150% of number m. Is n greater than, less than, or equal to m? Explain your reasoning.</p> <p>3. DIFFERENT WORDS, SAME QUESTION Which is different? Find “both” answers.</p> <div> <div>What number is 20% of 55?</div> <div>55 is 20% of what number?</div> </div> <div> <div>20% of 55 is what number?</div> <div>$0.2 \cdot 55$ is what number?</div> </div>
Homework 6.4 Practice A #1-8	<p>Write and solve an equation to answer the question.</p> <p>4. What number is 24% of 80?</p> <p>5. 15 is what percent of 40?</p> <p>6. 15 is 30% of what number?</p> <p>7. What number is 120% of 70?</p> <p>8. 20 is what percent of 52?</p> <p>9. 48 is 75% of what number?</p>

10. 20% of 150 is what number?

11. 45 is what percent of 60?

12. 35% of what number is 35?

13. 0.8% of 150 is what number?

14. 29 is what percent of 20?

15. 0.5% of what number is 12?

16. What percent of 300 is 51?

17. 120% of what number is 102?

MAFS.7.RP.1.3	Use proportional relationships to solve multistep ratio and percent problems.
MAFS.7.EE.1.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, $a + 0.05a = 1.05a$ means that “increase by 5%” is the same as “multiply by 1.05.”
Essential Question	How can you find percents of increase or decrease? <i>In this lesson I will learn about percents of increase and decrease so I can describe changes in amounts as a percents.</i>
6.5 Percents of Increase and Decrease	$\frac{\text{change}}{\text{original}} = \frac{\text{bigger} - \text{smaller}}{\text{first}}$ <p>Increase: $x + (\% \text{ as decimal})x$ Decrease: $x - (\% \text{ as decimal})x$</p> <p>Percent Error: $\frac{\text{error}}{\text{actual}}$</p>
	<p>1. VOCABULARY How do you know whether a percent of change is a <i>percent of increase</i> or a <i>percent of decrease</i>?</p> <p>2. NUMBER SENSE Without calculating, which has a greater percent of increase?</p> <ul style="list-style-type: none"> • 5 bonus points on a 50-point exam • 5 bonus points on a 100-point exam <p>3. WRITING What does it mean to have a 100% decrease?</p>
Homework 6.5 Practice A #1-4	<p>Find the new amount.</p> <p>4. 8 meters increased by 25% 5. 15 liters increased by 60%</p> <p>6. 50 points decreased by 26% 7. 25 penalties decreased by 32%</p>

Homework
6.5 Practice A
#5-10

Identify the percent of change as an *increase* or a *decrease*. Then find the percent of change. Round to the nearest tenth of a percent if necessary.

8. 12 inches to 36 inches

9. 75 people to 25 people

10. 50 pounds to 35 pounds

11. 24 songs to 78 songs

12. 10 gallons to 24 gallons

13. 72 paper clips to 63 paper clips

14. 16 centimeters to 44.2 centimeters

15. 68 miles to 42.5 miles

16. ERROR ANALYSIS Describe and correct the error in finding the percent increase from 18 to 26.



$$\frac{26 - 18}{26} \approx 0.31 = 31\%$$

Homework
6.5 Practice A
#11

17. VIDEO GAME Last week, you finished Level 2 of a video game in 32 minutes. Today, you finish Level 2 in 28 minutes. What is your percent of change?

18. PIG You estimate that a baby pig weighs 20 pounds. The actual weight of the baby pig is 16 pounds. Find the percent error.

25. The percent of sales tax is 6%. What is the sales tax on a skateboard that costs \$98?

26. You are shopping for a cell phone. At which store should you buy the cell phone?

Store	Original Price	Discount
A	\$129	30%
B	\$135	35%
C	\$150	40%

Nicole bought a meal in a town that has no sales tax. She tips 20%.

Select all meals Nicole could buy for less than \$15 total.

- ☐ \$12.36
- ☐ \$12.50
- ☐ \$13.00
- ☐ \$14.79
- ☐ \$14.99

Maggie is buying a jacket. The expression shown represents the sales tax on the jacket price, j .

0.08/

Write an expression in terms of j to represent the total amount that Maggie spends on the jacket, including tax.

Which expression represents that x was doubled and then decreased by 25%?

- A. $2x - 0.25x$
B. $0.25x - 2x$
C. $2(x - 0.25x)$
D. $2x - (2x - 0.25x)$

The cost of a barrel of beans, b , fluctuates by 17% in both directions during a three-month period. Match each verbal description of the high and low cost of a barrel of beans with all equivalent expressions.

[illegible]

MAFS.7.RP.1.3	Use proportional relationships to solve multistep ratio and percent problems.																								
Essential Question	How can you find discounts and selling prices? <i>In this lesson, I will learn about discounts and markups, so I can calculate selling prices.</i>																								
6.6 Discounts and Markups	Discounts A discount is a decrease in the original price of an item. Markups To make a profit, stores charge more than what they pay. The increase from what the store pays to the selling price is called a markup .																								
Homework 6.6 Practice A #1-2	<p style="text-align: center;"><u>Find the sale price.</u></p> <p style="text-align: center;">First think, "That number minus that percent OF (multiply) that number."</p> <table><tr><th>Original Price</th><th>Percent of Discount</th><th>Equation</th><th>Sale Price</th></tr><tr><td>\$80</td><td>20%</td><td>$80 - .20(80) = x$</td><td></td></tr><tr><td>\$42</td><td>15%</td><td></td><td></td></tr><tr><td>\$120</td><td>80%</td><td></td><td></td></tr><tr><td>\$112</td><td>32%</td><td></td><td></td></tr><tr><td>\$69.80</td><td>60%</td><td></td><td></td></tr></table>	Original Price	Percent of Discount	Equation	Sale Price	\$80	20%	$80 - .20(80) = x$		\$42	15%			\$120	80%			\$112	32%			\$69.80	60%		
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\$69.80	60%																								

Homework
6.6 Practice A
#3-4

Find the original price.

First ask yourself, "If that's the percent OFF what is the percent ON?"

Original Price	Percent of Discount	Equation	Sale Price
	25%	$100\% - 25\% = 75\%$ $40 = .75x$	\$40
	5%		\$57
	80%		\$90
	64%		\$72
	15%		\$146.54

Homework
6.6 Practice A
#5-6


Find the percent discount.

First ask yourself, "How much money did I save?"

Original Price	Percent of Discount	Equation	Sale Price
\$60		$\$60 - \$45 = \$15$ $15 = x(60)$	\$45
\$82			\$65.60
\$95			\$61.75

<p>Homework 6.6 Practice A #7</p>	<p>Find the selling price.</p> <p>17. Cost to store: \$50 Markup: 10%</p> <p>18. Cost to store: \$80 Markup: 60%</p> <p>19. Cost to store: \$140 Markup: 25%</p>
	<p>Find the original price, discount, sale price, or selling price.</p> <p>20. Original price: \$82 Discount: 10% Sale price: ?</p> <p>21. Original price: \$125 Discount: ? Sale price: \$81.25</p> <p>22. Original price: ? Discount: 36% Sale price: \$32</p> <p>23. Cost to store: \$32 Markup: 16% Selling price: ?</p>
	<p>James pays \$120.00 for golf clubs that are on sale for 20% off at Golf Pros. At Nine Iron, the same clubs cost \$8.00 less than they cost at Golf Pros. They are on sale for 13% off.</p> <p>What is the original cost of the clubs at Nine Iron?</p>

MAFS.7.RP.1.3	Use proportional relationships to solve multistep ratio and percent problems.
Essential Question	<p>How can you find the amount of simple interest earned on a savings account? How can you find the amount of interest owed on a loan?</p> <p><i>In this lesson, I will use the simple interest formula so I can calculate interest earned or owed.</i></p>
6.7 Simple Interest	<p>Simple Interest- is money earned on a savings account or an investment. It can also be money you pay for borrowing money.</p> <p>Interest- is the money paid or earned for the use of money.</p> <p>The principal- is the amount of money borrowed or deposited.</p> <div> <pre> graph TD SI[Simple interest] --> I ARI[Annual interest rate (in decimal form)] --> r P[Principal] --> P T[Time (in years)] --> t I --- I_eq[I = Prt] r --- I_eq P --- I_eq t --- I_eq </pre> </div>
	<ol style="list-style-type: none"> VOCABULARY Define each variable in $I = Prt$. WRITING In each situation, tell whether you would want a <i>higher</i> or <i>lower</i> interest rate. Explain your reasoning. <ol style="list-style-type: none"> you borrow money you open a savings account REASONING An account earns 6% simple interest. You want to find the interest earned on \$200 after 8 months. What conversions do you need to make before you can use the formula $I = Prt$?
Homework 6.7 Practice A #1-4, 10-11	<p>An account earns simple interest. (a) Find the interest earned. (b) Find the balance of the account.</p> <ol style="list-style-type: none"> \$600 at 5% for 2 years \$1500 at 4% for 5 years \$350 at 3% for 10 years \$1800 at 6.5% for 30 months

	<p>8. \$700 at 8% for 6 years</p> <p>9. \$1675 at 4.6% for 4 years</p> <p>10. \$925 at 2% for 2.4 years</p> <p>11. \$5200 at 7.36% for 54 months</p>
	<p>12. ERROR ANALYSIS Describe and correct the error in finding the simple interest earned on \$500 at 6% for 18 months.</p> <div>  $I = (500)(0.06)(18)$ $= \\$540$ </div>
Homework 6.7 Practice A #5-6	<p>Find the annual interest rate.</p> <p>13. $I = \\$24, P = \\$400, t = 2$ years</p> <p>14. $I = \\$562.50, P = \\$1500, t = 5$ years</p> <p>15. $I = \\$54, P = \\$900, t = 18$ months</p> <p>16. $I = \\$160.67, P = \\$2000, t = 8$ months</p>
Homework 6.7 Practice A #7-9	<p>Find the amount of time.</p> <p>17. $I = \\$30, P = \\$500, r = 3\%$</p> <p>18. $I = \\$720, P = \\$1000, r = 9\%$</p> <p>19. $I = \\$54, P = \\$800, r = 4.5\%$</p> <p>20. $I = \\$450, P = \\$2400, r = 7.5\%$</p>

	<p>21. BANKING A savings account earns 5% simple interest per year. The principal is \$1200. What is the balance after 4 years?</p>
	<p>22. SAVINGS You put \$400 in an account. The account earns \$18 simple interest in 9 months. What is the annual interest rate?</p>
	<p>An account earns annual simple interest. Find the interest earned, principal, interest rate, or time.</p> <div> <div> <p>23. Interest earned: \$84 Principal: \$600 Interest rate: 7% Time: ?</p> </div> <div> <p>24. Interest earned: ? Principal: \$1250 Interest rate: 3% Time: 4 years</p> </div> </div> <div> <div> <p>25. Interest earned: \$39.60 Principal: ? Interest rate: 11% Time: 6 months</p> </div> <div> <p>26. Interest earned: \$3250 Principal: \$5000 Interest rate: ? Time: 10 years</p> </div> </div>
	<p>An account earns annual simple interest. Find the <u>balance</u> of the account.</p> <div> <p>27. \$250 at 4% for 1 year</p> <p>28. \$2000 at 9% for 6 months</p> </div>
	<p>27. You deposit \$200 in an account earning 3.5% simple interest. How long will it take for the balance of the account to be \$221? (Hint: first see that <u>Interest earned</u> is Balance minus the Principal)</p>