

Unit 6: Percents
18 Days (Instruction and Assessment)

Content Standards: A coherent set of standards that not only stress conceptual understanding of key ideas, but also continually return to organizing principles such as the properties of operations to structure those ideas.		
● 7.RP.3 - Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. ● 7.EE.3 - 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. 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. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.		
Practice Standards: The mathematical practices represent a picture of what it looks like for students to understand and do mathematics in the classroom and should be integrated into every mathematics lesson for all students.		
Students will have opportunities to: ● SMP1 - Make sense of problems and persevere in solving them ● SMP2 - Reason abstractly and quantitatively ● SMP3 - Construct viable arguments and critique the reasoning of others ● SMP4 - Model with Mathematics ● SMP5 - Use appropriate tools strategically ● SMP6 - Attend to precision ● SMP7 - Look for and make use of structure ● SMP8 - Look for and express regularity in reasoning		
Concepts from Previous Units	Big Ideas, Concepts, & Strategies for Current Unit	Connections to Upcoming Concepts
Fifth Grade ● Multiply and divide by powers of 10 and explain the placement of the decimal point. ● Find equivalent fractions. ● Compare decimals to the thousandths place. ● Use and interpret simple equations. Sixth Grade ● Understand ratios and describe ratio relationships. ● Understand and find percent as a rate per 100. ● Find the part and the whole of ratio relationships. ● Identify equivalent expressions. ● Solve one-step equations.	Seventh Grade ● Compare fractions, decimals, and percents. ● Use proportionality to solve percent problems. ● Use the percent equation. ● Solve percent problems involving percent of increase and decrease, and simple interest.	Eighth Grade ● Construct a function to model a linear relationship between two quantities ● Describe qualitatively the functional relationship between two quantities by analyzing the graph ○ Identify when a function is increasing or decreasing ○ Identify when a function is linear or nonlinear

Vocab.	Teacher Edition Vocabulary: percents, decimals, pie chart, bar graph, constant change, linear, percent increase, percent decrease Other Vocabulary: open number line, fish ladder, dam, electric turbine, markup, discount, simple interest, national debt, principal, annual interest rate,
---------------	--

			A Day - First Day of Lesson Vocabulary, Tasks to Support Learning for ALL, Guiding Questions & Supplements to Extend Learning:			B Day- Second Day of Lesson Opportunities forNumber Sense, Additional Task, Practice and Tiered Supports, or to Analyze Student Work	
Lesson	Learning Objectives	Student Objectives	Vocabulary and Tools	Implement Task for ALL Students from Big Ideas Curricular Resource	Supplemental Task As another option, for extra practice, as a day 2 task, or for students who need an extension	Implement Number Sense Routine	Select Practice Opportunity: Distributed Practice
6.1 (2 Days)	Learning 7.EE.3 1. Write percents as decimals. 2. Write decimals as percents. 3. Solve real-life problems.	6.1 Percents and Decimals Essential Question: <i>How are decimals and percents related to each other?</i>	Vocabulary in the Launch Percents Decimals Tools: Decimal Grids Percent Bars Calculators Vocabulary in the Summarize:	Task A: Selected Exercise: #40 Colors Guiding Questions: <i>What percent relates to the decimal in the chart? . . . What decimal relates to the percent in the chart?</i> <i>What percent would you write for red [other color]? Does that make sense looking at the picture of the piechart?</i> <i>What do you think they mean by red OR blue? Did anybody NOT choose red OR blue? What did they choose?</i> <i>What do you know about a pie chart to help you think about green?</i> <i>Do you have the right information?</i>	Task B: Selected Exercises: #38 School Guiding Questions: <i>How do you write a percent as a decimal?</i> <i>What does percent mean? How do you say the decimal you have written?</i> <i>How would that be written as a fraction?</i> <i>How could you determine the percent who travel by another method given what you know in the picture?</i> <i>What is represented in a pie chart?</i> <i>What information do you already know?</i>	Number Sense Routine could focus on: Ordering a mixed set of decimals, percents, and fractions Percent Sample Number Sense Routine	PJ: Activity 1: <i>Writing Percents as Decimals</i> PJ: Activity 3: <i>Writing Decimals as Percents</i> EX: #1-6, 31-34, FGR: #42-49

				Summarize <i>Explain how you determined the percent for red?... red OR blue?... green?</i> <i>Why does that make sense?</i> <i>How do decimals relate to percents?</i>	Summarize: <i>How are decimals related to percents?</i> <i>How are percents related to fractions?</i> <i>How is your pie chart related to your answer in part c? Why?</i>		
6.2 (2 Days)	Learning 7.EE.3 1. Compare and order fractions, decimals, and percents. 2. Solve real-life problems.	6.2 Comparing and Ordering Fractions, Decimals, and Percents Essential Question: <i>How can you order numbers that are written in different forms?</i>	Vocabulary in the Launch Open number line Tools: Decimal Grids Calculators Vocabulary in the Summarize:	Task A: Selected Exercise: #31 Sleep Guiding Questions: <i>What are some percents or decimals that you have memorized [like $\frac{1}{2}$, 0.50, 50%]? Looking at one of these, what do you know for sure? [less than a half, more than a half, etc] What can you do to compare two that are very close to each other?</i> Summarize <i>What were some of the easier decimals, fractions, or percents to place? Why?</i> <i>Which were a little harder to tell?</i> <i>What did you do to determine where the number should be placed in the order?</i> <i>Where did your sleep fit in the list?</i>	Task B: Activity 2: Ordering Numbers Guiding Questions: <i>What are some percents or decimals that you have memorized [like $\frac{1}{2}$, 0.50, 50%]? Looking at one of these, what do you know for sure? [less than a half, more than a half, very small, much closer to 1, etc] How are these numbers related to numbers you know for sure? What can you do to compare two numbers that are very close to each other?</i> Summarize <i>What were some of the easier decimals, fractions, or percents to place? Why?</i> <i>Which were a little harder to tell?</i> <i>What did you do to determine where the number should be placed in the order?</i>		PJ: Activity 3: <i>The Game of Math Card War</i> PJ: 6.2 Practice EX: #1-3, 20-23, 26-29 FGR: #33-36

6.3 (2 days)	Learning 7.RP.3 1. Use the percent proportion to find parts, wholes, and percents.	6.3 The Percent Proportion Essential Question: <i>How can you use models to determine percent questions?</i>	Vocabulary in the Launch Tools: calculator Vocabulary in the Summarize:	Task A: Potential Two Day Task <u>Activity 1-3: Estimating a Part, a Percent, and a Whole</u> Guiding Questions: <i>What's another way to think about 50%?</i> <i>What can you determine (say for sure) looking at the model?</i> <i>How can you fill in what you do know on the model?</i> <i>How does that help you determine what you still need to figure out?</i> Summarize <i>What are the different strategies you used to determine the different amounts?</i> <i>As you worked through each problem, did you find an efficient method that worked every time?</i> It's appropriate after this lesson to show students how to set up a proportion to solve.	Task B: Follow up to Task A <u>Activity 4: Using Ratio Tables</u> Guiding Questions: <i>What's another way to think about the relationship in the table?</i> <i>What can you determine (say for sure) looking at the table?</i> <i>How does that help you determine what you still need to figure out?</i> Summarize <i>What are the different strategies you used to determine the different amounts?</i> <i>As you worked through each problem, did you find an efficient method that worked every time?</i> It's appropriate after this lesson to show students how to set up a proportion to solve.		PJ: 6.3 Practice EX: #22-28, 32-35
6.4 (2 days)	Learning 7.RP.3; 7.EE.3 1. use the percent equation to find parts, wholes, and percents. 2. solve real-life	6.4 The Percent Equations Essential Question: <i>How can you use a percent proportion to solve a percent problem?</i>	Vocabulary in the Launch Tools: calculator Vocabulary in the Summarize:	Task A: <u>Activity 1 and 2: Solving Percent Problems and Finding Parts</u> Guiding Questions: <i>What is the pie chart telling us?</i> <i>What do we know for sure by looking at the pie chart?</i> <i>How could you find the percent of</i>	Task B: none chosen given that task A has two parts, but teacher can choose another task if desired/needed Guiding Questions: Summarize		PJ: Practice 6.4 EX: #4-9, 18-22

	problems.			students who have voted for ...? Did your classmates have a different way? Does their method work? Why or why not? How is the question being asked in Activity 2 different than the question being asked in Activity 1? How would you determine how many students are represented by each percentage? What do you know for sure about the pie chart? Summarize What solution did you come up with for Activity 1? For Activity 2? What was the same about these problems and what was different? How do the different methods for solving the two types of problems differ?			
	Mid-Unit Assessment:						
6.5 (2 Days)	Learning 7.EE.3 - Find percent of increase. - Find percent of decrease.	6.5 Percents of Increase and Decrease Essential Question: <i>What is percent of increase? What is percent of decrease?</i>	Vocabulary in the Launch Fish ladders Dams Electric turbines Tools: calculator Vocabulary in the Summarize:	Task A: <u>Activity 1: Percent of Increase and Decrease</u> Guiding Questions: What do we know about the young salmon returning downstream? What percent of the young salmon survive? What percent do not survive? What do we show in the table? If ____ make it past dam 1, then what are we calculating for dam 2?	Task B: <u>Activity 2: Percent of Increase and Decrease</u> Guiding Questions: What do we know about the population and the increase? How does that help us project the population each year moving forward?		PJ: Practice 6.5 EX: #3, 4, 6, 8, 10, 14, 16, 24 FGR: #32-36

				Summarize <i>How did you determine how many salmon made it through each dam? Were you able to calculate the 6th dam before calculating the previous dams? Why or why not? What do you notice about the shape of the graph? Why do you think that is?</i>	Summarize <i>How did you determine the population for each year? Were you able to calculate the population for 2018 before calculating the population for 2017? Why or why not? What do you notice about the shape of the graph? Why do you think that is?</i>		
6.6 (2 Days)	Learning 7.EE.3 1. Use percent of discounts to find prices of items. 2. Use percent of markups to find selling prices of items.	6.6 Discounts and Markups Essential Question: <i>How can you determine a percent discount or markup?</i>	Vocabulary in the Launch Tools: calculator Vocabulary in the Summarize:	Task A: <u>Activity 1: Comparing Discounts</u> Guiding Questions: <i>What are the partitions on the percent bar indicating? How do the partitions help you think about the percent? How would you determine the discount? How would you determine the sale price? Are they the same thing? Why or why not?</i> Summarize <i>Which store did you decide had the best deal? Explain why. Did you determine a quick way/mental method for determining a discount/sale price?</i>	Task B: <u>Activity 2 and 3: Finding the Original/Selling Price</u> Guiding Questions: <i>Would the original price be less or more than \$22.40? Do you have a guess of what the original price would be? Could you check your guess? How could you determine the original price for sure? What's another way to figure a 100% markup? How would you determine 25%? Does your answer make sense? How could you check?</i> Summarize <i>What were the markup costs of the different jewelry items? Did you determine a quick way/mental method for determining the markup?</i>		EX: #4-16, 22 PJ: 6.6 Practice

6.7 (2 Days)	Learning 7.EE.3 1. Use the simple interest formula to find interest earned or paid, annual interest rates, and amounts paid on loans.	6.7 Simple Interest Essential Question: <i>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?</i>	Vocabulary in the Launch Simple Interest Principal Annual Interest Rate National Debt Tools: calculator Vocabulary in the Summarize: Constant change Linear Loan Interest	Task A: <u>Activity 1: Finding Simple Interest</u> Guiding Questions: <i>What is the meaning of the different variables in the equation? How could you find the interest for more than 1 year? For part of a year?</i> Summarize <i>What was the interest earned in 6 months? What patterns did you notice in the chart or graph? Do you think this is a fair amount of interest to earn from a savings account?</i>	Task B: <u>Activity 3: The National Debt</u> Guiding Questions: <i>What is the meaning of the different variables in the equation? How could you find the interest for 1 year? How would you find the amount paid per day? Why would you want to find the amount paid per day? How would you find the amount paid per person? Why would you want to find the amount paid per day?</i> Summarize <i>What amount of interest does the US pay on \$16 trillion dollars in a year?...in a day?... per person? How did you determine these amounts? Why might it be useful to determine these amounts? When taking out a loan, what might be important to consider?</i>		PJ: Activity 2: Financial Literacy
	End of Unit Assessment:						
Vocab:	Teacher Edition Vocabulary: percents, decimals, pie chart, bar graph, constant change, linear, percent increase, percent decrease Other Vocabulary: open number line, fish ladder, dam, electric turbine, markup, discount, simple interest, national debt, principal, annual interest rate,						

Domains	Language Objective(s):	Sentence Stem(s):
Speaking	1. I can orally describe the steps I took to solve the problem. 2. I can orally describe my reasoning. 3. I can defend my strategy. 4. I can restate someone else’s thinking in my own words. 5. I can compare strategies.	• I need more time to think please. • I would like to add _____. • I think what you said is _____. • This is my strategy _____. • I agree/disagree with _____ because _____. • I would _____ instead. • This makes me think _____. • The evidence I have is _____. • What if _____? • How can that be _____? • Could you have _____? • How did you _____? • Why did you _____?
Reading	1. I can find important information in a word problem. 2. I can summarize the purpose of the word problem.	• The problem is asking me to find _____. • The purpose of the problem is _____.
Writing	1. I can write to explain my reasoning. 2. I can explain why my strategy works. 3. I can record drawings and equations to show my work.	• The problem is asking me to find _____. First I, _____ Next, _____. Finally I found out that _____. My strategy works because _____. • The problem is asking me to find _____. In the beginning _____. But then, _____. At the end, _____. My strategy works because _____. • These are the steps I took to find _____. First, _____. Second, _____. Third, _____. I got _____ as my solution. I solved the problem this way because _____. • The problem is asking me to determine _____. I used the _____ strategy. To solve this problem first I _____. Then, I _____. Next, _____. After that, I _____. Finally I found out that _____. I noticed _____. My strategy works because _____.