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| **ESTABLISHED GOALS:** |
| **Major (m) Idaho Core cluster for the Unit:** * 6.NS Compute fluently with multi-digit numbers and find common factors and multiples.

**6.RP Understand ratio concepts and use ratio reasoning to solve problems.*** **6.RP.2. Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship.**
* **6.RP.3b-d. 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.**

**Compute fluently with multi-digit numbers and find common factors and multiples.*** 6.NS.3. Fluently add, subtract, multiply, and **divide multi-digit decimals** using the standard algorithm for each operation.

**Not previously in Idaho State Standards for 6th grade.** | **Supporting and Additional (s/a) Idaho Core Standards for the Unit:** | **Bridging Idaho Core Standards from Previous Grade(s):*** 5.NF Use equivalent fractions as a strategy to add and subtract fractions.
* 5.NF Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
* 5.G Graph points on the coordinate plane to solve real world and mathematical problems.
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| **TRANSFER*****Students will be able to independently use their learning to persevere in solving a range of problems involving ratios and proportions.*** |
| **MEANING** |
| **Structure of Math / Overarching Understanding(s):**1. Use reasoning with ratios and rates to solve real-world and mathematical problems.

***Teacher Note:**** + *Relationships between fractions, decimals, and percents are developed in this unit. Students learn how these forms are related to one another and make decisions about when to use each form.*
	+ *Understanding and applying the relationships between fractions, decimals, and percents, students will solve real-world problems such as unit rate, measurement conversions, constant rate, and comparison of quantities.*
	+ *Fractions are viewed as rates, ratios, or parts of a proportion to provide underpinnings needed in seventh grade for work with proportional reasoning.*
 | **Understandings:****Students will understand that:*** Reasoning with ratios and rates help solve real-world and mathematical problems.
* An understanding of fractions, decimals and percentages will help in mathematical reasoning and problem solving.
* Unit rates ensure precision and consistency in comparing values and quantities.
* Using tables of equivalent ratios, tape diagrams, double number line diagrams, or equations develop ratio and proportional reasoning.
 | **Essential Questions:****Students will keep considering:*** How can knowledge of the relationship between decimals, percentages and fractions help simplify complex mathematical problems?
* What is the relationship between a ratio and a rate?
* How do you determine whether to use a decimal, fraction, or percentage?
* How does ratio and proportional reasoning help determine an unknown quantity?
* How does calculating a unit rate help you make decisions?
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| **ACQUISITION OF KNOWLEDGE AND SKILL****STUDENT-FRIENDLY LEARNING TARGET STATEMENTS** |
| **6.RP.2** Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. | MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively.MP.4 Model with mathematics.MP.6 Attend to precision.MP.7 Look for and make use of structure.* Create unit rates to name the amount of either quantity, in terms of the other quantity.
	+ I can write a unit rate.
	+ I can describe the relationship between the two quantities in a unit rate.
* Demonstrate understanding of unit rate.
	+ I can illustrate a unit rate using multiple models.
	+ I can explain unit rates using appropriate vocabulary.
* Interpret the relationship between unit rates and ratios.
	+ I understand that all ratios can be expressed as unit rates.
	+ I can model the relationship between the unit rate and a ratio.
* Generate ratios for a variety of unit rates.
	+ I can increase and decrease unit rates to provide solutions for real-world situations.
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| **6.RP.3.b** Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed? | MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively.MP.3 Construct viable arguments and critique the reasoning of others.MP.4 Model with mathematics.MP.5 Use appropriate tools strategically.MP.6 Attend to precision.MP.7 Look for and make use of structure.MP.8 Look for and express regularity in repeated reasoning.* Construct and reason about real-world problems involving unit pricing and constant speed.
	+ I can construct models to solve real-world problems involving unit price and constant speed.
	+ I can evaluate and determine accuracy of a solution.
	+ I can provide evidence to defend my solution.
* Solve unit rate problems involving unit pricing.
	+ I can transfer my unit rate knowledge to solve problems containing unit price.
* Solve unit rate problems involving constant speed.
	+ I can calculate constant speed using unit rates.
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| **6.RP.3.c** Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. | MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively.MP.3 Construct viable arguments and critique the reasoning of others.MP.4 Model with mathematics.MP.5 Use appropriate tools strategically.MP.6 Attend to precision.MP.7 Look for and make use of structure.MP.8 Look for and express regularity in repeated reasoning.* Construct models of equivalent fractions, decimals, and percents.
	+ I can model equivalent fractions, decimals, and percents.
* Convert decimals to percentages.
	+ I can provide the equivalent percentage given a decimal.
* Convert fractions to percentages.
	+ I can provide the equivalent percentage given a fraction.
* Explain the relationship between fractions, decimals, and percents.
	+ I can create and justify a conjecture explaining the relationship between fractions, decimals, and percents.
* Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 or 0.3 times the quantity).
	+ I can construct a model showing a percent using ratio concepts.
* Given a part and the percent, solve problems to find the whole.
	+ I can use equivalent ratio knowledge to find the whole given the percent and the part.
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| **6.RP.3.d** Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. | **MATHEMATICAL PRACTICES**MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively.MP.3 Construct viable arguments and critique the reasoning of others.MP.4 Model with mathematics.MP.5 Use appropriate tools strategically.MP.6 Attend to precision.MP.7 Look for and make use of structure.MP.8 Look for and express regularity in repeated reasoning.* Create a model to demonstrate equivalent units of measure.
	+ I can construct a variety of models showing equivalency within measurement units.
* Use models to discover the mathematical operation to extend the pattern.
	+ I can extend patterns using a model.
	+ I can examine and analyze a pattern to determine the mathematical operation used.
* Explain a comparison between various equivalent units of measure as a ratio (12 inches = 1 foot, 12:1).
	+ I can describe the relationship between equivalent units of measure and ratios.
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| 6.NS.3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. | MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively.MP.3 Construct viable arguments and critique the reasoning of others.MP.6 Attend to precision.MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.* Add multi-digit decimals using the standard algorithm.
	+ I can justify and explain the standard algorithm for adding multi-digit decimals
	+ I can add multi-digit decimals using the standard algorithm
* Subtract multi-digit decimals using the standard algorithm.
	+ I can justify and explain the standard algorithm for subtracting multi-digit decimals
	+ I can subtract multi-digit decimals using the standard algorithm
* Multiply multi-digit decimals using the standard algorithm.
	+ I can justify and explain the standard algorithm for multiplying multi-digit decimals
	+ I can multiply multi-digit decimals using the standard algorithm
* Divide multi-digit decimals using the standard algorithm.
	+ I can justify and explain the standard algorithm for dividing multi-digit decimals
	+ I can divide multi-digit decimals using the standard algorithm
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| **ASSESSMENT EVIDENCE:****Assessment Tasks that Provide Evidence for Claims including DOK**  | * **Claim #1/DOK 1, 2, 3, 4 (circle one):**

Bananas and OrangesBen’s Game WorldCafeteria FloorGas MileageJeremy’s BoardsMovie TicketsSandwiches |
| * **Claim #2/DOK 1, 2, 3, 4 (circle one):**

CerealGrandmas Sugar CookiesMarvin’s TilesPiano KeysPizza Party |
| * **Claim #3/DOK 1, 2, 3, 4 (circle one):**

Blue JeansBoxed orangesGirls vs boysJollyranchersMixed PaintPhoto CopyString Bean and SlimTown Populations |
| * **Claim #4/DOK 1, 2, 3, 4 (circle one):**

Big Bucks Skate ParkVideo for Skate ParkGrading Rubric for Big Bucks Skate ParkGoing MarblesWaverly Waves |
| **Materials/Resources** | [**http://commoncoretools.files.wordpress.com/2012/02/ccss\_progression\_rp\_67\_2011\_11\_12\_corrected.pdf**](http://commoncoretools.files.wordpress.com/2012/02/ccss_progression_rp_67_2011_11_12_corrected.pdf)[**http://schools.nyc.gov/NR/rdonlyres/A9F735CB-47E4-40F8-884F-EA54D0AB5705/0/NYCDOEG6MathRatios\_Final.pdf**](http://schools.nyc.gov/NR/rdonlyres/A9F735CB-47E4-40F8-884F-EA54D0AB5705/0/NYCDOEG6MathRatios_Final.pdf)[**http://illustrativemathematics.org/standards/k8**](http://illustrativemathematics.org/standards/k8)**Developing Essential Understanding of Ratios, Proportions & Proportional Reasoning Grades 6-8 NCTM** |
| **Sample Learning Plan****This is not intended to be a scope and sequence** |
| **Exploring and Making Connections****(Conceptual Understanding)** | **Practice****(Procedural Fluency)** | **Assessments****(Application)** |
| **6.RP.2, 6.RP.3b-d,**  |
| **Focus Task (to begin unit)**Jared is responsible for supplying Gatorade for his football team at next week’s games. Two stores are having a sale on Gatorade. Which store has a better deal? Justify your answer using a model.Albertsons6 – 20 ounce bottles for $9.00Smiths8 – 20 ounce bottles for $10.00 | **Sample learning tasks:****Teacher note: These tasks may need refinement based on the needs of your students. Not all tasks have been vetted.**There are numerous tasks that support these standards. They can be found in the folder of Sample Learning Tasks for this unit in Moodle.**Materials Resources:**Prentice Hall chapter 6 sections 2, 5, 6, 7, and 9Prentice Hall chapter 5 sections 7 and 8Prentice Hall chapter 9 sections 1 and 2Prentice Hall chapter 3 sections 3 and 6Story Problem Workbook 29, 33, 49, 50, 51, 63, 64, 65, and 66 | **Formative assessment by teacher using I Can statement checklist****Summative Assessment using items from unit plan in the Assessment Evidence section.** |

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| **6.NS.3** |
| **Focus Task (to begin unit)**: You are throwing a party for your classroom of 30 students. You have $45 to spend.

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| ITEM | SERVING | COST |
| Hot Fudge | 6 | $2.45 |
| Whip Cream | 10 | $1.30 |
| Cherries | 15 | $.85 |
| Ice Cream | 12 | $8.25 |

1. How many containers of ice cream are needed for each student to have one serving?
2. What is the total cost of the ice cream party if each student has hot fudge, whip cream, ice cream and a cherry? How much change will be returned from $45?
3. About how much of one serving of hot fudge cost?
 | **Sample learning tasks:****Teacher note: These tasks may need refinement based on the needs of your students. Not all tasks have been vetted.**Hair with FlairCampingEating out vs Eating at HomeOne Second of HomeworkPlace Value InvestigationPuppy Purchasing PowerThe Krave**Material Resources:**Prentice Hall chapter 1 sections 5, 7, 8 and 9Story Problem Workbook pages 23, 24, 25, 26, 27 | **Formative assessment by teacher using I Can statement checklist****Summative Assessment using items from unit plan in the Assessment Evidence section.** |