

Grade 8 Number Specific Outcomes	Key Understandings underpinning the Curriculum Outcomes from FSIM: Number Resource Books	Sample Diagnostic Tasks and Activities	Sample Learning Tasks Selected from FSIM: Number Resource Books	Math Station Ideas:
N8.1 Demonstrate understanding of the square and principle square root of whole numbers concretely or pictorially and symbolically.	Patterns and Algebra KU6: • Some numbers have interesting or useful properties. Investigating the patterns in these special numbers can help us to understand them better.	Case Study 4 (Number Sense Book) pp. 94 - 96	Operation Sense: Pages 276 - 277 • Square Numbers • Areas of Squares • Square and Triangular Numbers	Square Root Matching Game (online interactive) Square Root Cannon (online interactive) Exploring Square Roots (online interactive) Square Roots with Cheese Its and a Graphic Organizer (link to instructions) Squares and Square Roots Puzzle Game (printable) Khan Academy: Understanding Square Roots (online interactive)

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N8.2 Expand and demonstrate understanding of percents greater than or equal to 0% (including fractional and decimal percents) concretely, pictorially, and symbolically.	Fractions KU7: • A fraction symbol may show a ratio relationship between two quantities. Percentages are a special kind of ratio we use to make comparisons easier. Operations KU3: • Multiplying numbers is useful when we: - Repeat quantities - Use rates - Make ratio comparisons or changes (scales) - Make arrays and combinations - Need products of measures. Computations KU8: • Thinking of a problem as a number sentence often helps us solve it. Sometimes we need to rewrite the number sentence in a different but equivalent way. Operations Background Notes: Multiplication and Division Problems (Operation Sense, p. 25)	Did You Know (Operation Sense Book, p. 59) Did You Know (Operation Sense Book, p. 81) Case Study 4 (Operation Sense Book, pp. 189 - 191) Sensible Fractions (Number Sense Book, p.165)	Number Sense: Pages 165 - 168 • Proportional Relationships • Discounts • Units of Measure • Ratio Relationships • Percentages • Finding Percentages Operation Sense: Pages 54 - 55 • Changes in Ratio • Rate Situations • Scales • Combination Problems • Multiplication • Rate Problems Operation Sense: Pages 99 - 101 • Everyday Problems • Exploring Word Problems • Unknown Quantity	Khan Academy: Intro to Percentages (online interactive) Now and Then Game (link to instructions/printables) The Menu Game at the Terribly Terrific Taco (Game Board 2 – Advanced) (printable) Sort the Percents (online interactive)

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N8.3 Demonstrate understanding of rates, ratios, and proportional reasoning concretely, pictorially, and symbolically.	Fractions KU7: • A fraction symbol may show a ratio relationship between two quantities. Percentages are a special kind of ratio we use to make comparisons easier. Operations KU3: • Multiplying numbers is useful when we: - Repeat quantities - Use rates - Make ratio comparisons or changes (scales) - Make arrays and combinations - Need products of measures. Computations KU8: • Thinking of a problem as a number sentence often helps us solve it. Sometimes we need to rewrite the number sentence in a different but equivalent way. Operations Background Notes: Multiplication and Division Problems (Operation Sense, p. 25)	Did You Know (Operation Sense Book, p. 59) Did You Know (Operation Sense Book, p. 81) Case Study 4 (Operation Sense Book, pp. 189 - 191) Sensible Fractions (Number Sense Book, p.165)	Number Sense: Pages 165 - 168 • Proportional Relationships • Discounts • Units of Measure • Ratio Relationships • Percentages • Finding Percentages Operation Sense: Pages 54 - 55 • Changes in Ratio • Rate Situations • Scales • Combination Problems • Multiplication • Rate Problems Operation Sense: Pages 99 - 101 • Everyday Problems • Exploring Word Problems • Unknown Quantity	Ratios and Rates Video: 8min 49sec (online) What is a Ratio? Video: 7:24 (online) What is a Proportion? Video: 4:55 (online) Solving Ratio, Rate, and Proportion Problems Video: 8:07 (online) Ratios and Proportions (online; printable) "Scale Drawings" p. 209-210 TS-CM 6-8 "Look-Alike Rectangles" p. 208 TS-CM 6-8 "Rectangle Ratios – Revisited Graphically" p. 211 TS-CM 6-8 "Dripping Faucet" p. 212 TS-CM 6-8

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N8.4 Demonstrate understanding of multiplying and dividing positive fractions and mixed numbers, concretely, pictorially, and symbolically.	Fractions KU6: • A fractional number can be written as a division or as a decimal. Operations KU7: • Properties of operations and relationships between them can help us to decide whether number sentences are true. Computations KU5: • There are strategies to help us do calculations in our head. Computations KU7: • We can calculate with fractions. Sometimes renaming fractions is helpful for this. Computations KU8: • Rounding, imagining a number line, and using properties of numbers and operations help us to estimate calculations.	Sharing Chocolate Bars (Number Sense Book, p. 155) Pizza Problems (Number Sense Book, p. 157) Ways to Share (Number Sense Book, p. 158) Buying Apples (Course Book, pp.110 and .164)	Number Sense: Pages 157 - 159 • Ordering Collections Operation Sense: Pages 91 - 93 • Target Multiplication • Target Division • Equivalent Statements Operation Sense: Pages 1159-161 • Partitioning with Fractions • Converting Operation Sense: Pages 180 - 181 • Dividing Whole Numbers by Fractions • Area Problems • Finding Fractions Operation Sense: Pages 187 - 188 • Estimating Fractions • Exact or Approximate • Estimating Thirds	Khan Academy: Multiplying Fractions (online interactive) Khan Academy: Multiplying Fractions Word Problems (online interactive) Khan Academy: Mixed Number Multiplication and Division (online interactive) Fractions Jeopardy (online interactive) Multiplying Fractions (online interactive) Product and Quotient Fraction Card Games (printable) "Water, Walking, and Wheels" p. 129-130 TS-CM 6-8 "Quilting Pieces" p. 132 TS-CM 6-8

				"Playground Problem" p. 132-133 TS-CM 6-8
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N8.5 Demonstrate understanding of multiplication and division of integers concretely, pictorially, and symbolically.	Operations KU7: • Properties of operations and relationships between them can help us to decide whether number sentences are true. Operations KU9: • We make assumptions when using operations. We should check that the assumptions make sense for the problem. Computations KU5: • There are strategies we can practise to help us do calculations in our head. Computations KU8: • Rounding, imagining a number line, and using properties of numbers and operations help us to estimate calculations.		<i>Multiplication and division of integers are extensions of multiplication and division of whole numbers, fractions, and decimals. No learning tasks are specifically identified for integers.</i>	Integers Jeopardy (online interactive) Multiply and divide with Integers (online interactive) Face Off! An Integer Card Game (printable) Connect Four: Multiplying and Dividing Integers (printable) Integer Operations Bingo (printable)