Project M³

Mentoring Mathematical Minds

Correlation to the Common Core State Standards

GRADE 5

Kendall Hunt

PROJECT **M³**

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Mathematical
Minds

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Common Core State Standards	Project M³: Mentoring Mathematical Minds

Operations & Algebraic Thinking

Write and interpret numerical expressions.

5.OA.A.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	**Level 3-4: Awesome Algebra** Chapter 1, Lesson 1 **Level 3-4: Awesome Algebra** Chapter 3, Lessons 1-3
5.OA.A.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product.*	**Level 3-4: Awesome Algebra** Chapter 1, Lesson 1 **Level 3-4: Awesome Algebra** Chapter 2, Lesson 3

Analyze patterns and relationships.

5.OA.B.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*	**Level 3-4: Awesome Algebra** Chapter 1, Lessons 1-3 **Level 5-6: Record Makers and Breakers** Chapter 1, Lessons 3-4 **Level 5-6: Record Makers and Breakers** Chapter 2, Lessons 1-4

Number & Operations in Base Ten

Understand the place value system.

5.NBT.A.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	**Level 3-4: Unraveling the Mystery of the MoLi Stone** Chapter 1, Lesson 1 **Level 3-4: Unraveling the Mystery of the MoLi Stone** Chapter 2, Lesson 3 **Level 3-4: Unraveling the Mystery of the MoLi Stone** Chapter 4, Lesson 2 **Level 3-4: How Big Is Big?** Chapter 1, Lessons 1-3 **Level 3-4: How Big Is Big?** Chapter 2, Lesson 1

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5.NBT.A.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	**Level 4-5: The Tenth Street Pet Sanctuary** Chapter 1, Lesson 3 **Level 4-5: The Tenth Street Pet Sanctuary** Chapter 2, Lesson 1
5.NBT.A.3 Read, write, and compare decimals to thousandths.	**Level 4-5: The Tenth Street Pet Sanctuary** Chapter 1, Lessons 1-3
5.NBT.A.3.A Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.	**Level 4-5: The Tenth Street Pet Sanctuary** Chapter 1, Lesson 1
5.NBT.3.A.B Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	**Level 4-5: The Tenth Street Pet Sanctuary** Chapter 1, Lessons 1, 3
5.NBT.A.4 Use place value understanding to round decimals to any place.	**Level 3-4: How Big Is Big?** Chapter 2, Lesson 2 **Level 4-5: The Tenth Street Pet Sanctuary** Chapter 1, Lessons 2-3 **Level 4-5: The Tenth Street Pet Sanctuary** Chapter 2, Lesson 1
Perform operations with multi-digit whole numbers and with decimals to hundredths.	
5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm.	**Level 3-4: In Search of the Yeti** Chapter 1, Lesson 3 **Level 3-4: In Search of the Yeti** Chapter 2, Lessons 1-3 **Level 3-4: In Search of the Yeti** Chapter 3, Lessons 1-2 **Level 5-6: Record Makers and Breakers** Chapter 1, Lesson 4 **Level 5-6: Record Makers and Breakers** Chapter 2, Lessons 1-4 **Level 5-6: Our Environment Matters** Chapter 2, Lesson 3
5.NBT.B.6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	**Level 5-6: Record Makers and Breakers** Chapter 2, Lessons 1-4 **Level 5-6: Our Environment Matters** Chapter 2, Lesson 3
5.NBT.B.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	**Level 4-5: The Tenth Street Pet Sanctuary** Chapter 1, Lesson 3 **Level 4-5: The Tenth Street Pet Sanctuary** Chapter 2, Lessons 1-3 **Level 5-6: Our Environment Matters** Chapter 1, Lessons 1-3

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Number & Operations—Fractions

Use equivalent fractions as a strategy to add and subtract fractions.	
5.NF.A.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*	**Level 4-5: Treasures From the Attic** Chapter 1, Lessons 2, 4 **Level 4-5: Treasures From the Attic** Chapter 2, Lessons 1-2 **Level 5-6: Our Environment Matters** Chapter 1, Lessons 1-3
5.NF.A.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*	**Level 3-4: Digging for Data** Chapter 1, Lesson 1 **Level 3-4: Digging for Data** Chapter 3, Lessons 1, 3 **Level 4-5: Treasures From the Attic** Chapter 1, Lessons 2, 4 **Level 4-5: Treasures From the Attic** Chapter 2, Lessons 1-2 **Level 5-6: Our Environment Matters** Chapter 1, Lessons 1-3

Apply and extend previous understandings of multiplication and division.	
5.NF.B.3 Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*	**Level 4-5: Treasures From the Attic** Chapter 2, Lesson 3 **Level 5-6: Our Environment Matters** Chapter 1, Lessons 2-3
5.NF.B.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.	**Level 5-6: What Are Your Chances?** Chapter 1, Lessons 4 -5 **Level 5-6: What Are Your Chances?** Chapter 2, Lessons 1-3
5.NF.B.4.A Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. *For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)*	**Level 4-5: Treasures From the Attic** Chapter 2, Lesson 1

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5.NF.B.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. **A.** Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. *For example, use a visual fraction model to show $(2/3) \times 4 = 8/3$, and create a story context for this equation. Do the same with $(2/3) \times (4/5) = 8/15$. (In general, $(a/b) \times (c/d) = ac/bd$.)* **B.** Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.	**Level 4-5: Treasures From the Attic** Chapter 1, Lesson 4 **Level 4-5: Treasures From the Attic** Chapter 2, Lessons 1, 3 **Level 5-6: Our Environment Matters** Chapter 1, Lessons 1-3
5.NF.B.6 Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	**Level 4-5: Treasures From the Attic** Chapter 1, Lesson 4 **Level 4-5: Treasures From the Attic** Chapter 2, Lesson 3 **Level 5-6: Our Environment Matters** Chapter 1, Lessons 2-3 **Level 5-6: What Are Your Chances?** Chapter 1, Lessons 4-5 **Level 5-6: What Are Your Chances?** Chapter 2, Lessons 1-3
5.NF.B.7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. **A.** Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$.* **B.** Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$.* **C.** Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*	**Level 4-5: Treasures From the Attic** Chapter 2, Lesson 3

Measurement & Data

Convert like measurement units within a given measurement system.	
5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	**Level 3-4: In Search of the Yeti** Chapter 3, Lessons 1-2

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Represent and interpret data.	
5.MD.B.2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*	**Level 3-4: Digging for Data** Chapter 1, Lesson 3 **Level 3-4: Digging for Data** Chapter 3, Lesson 3
Geometric measurement: understand concepts of volume.	
5.MD.C.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement. **A.** A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. **B.** A solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of *n* cubic units.	**Level 5-6: Designer Boxes** Chapter 1, Lessons 1-3
5.MD.C.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	**Level 5-6: Designer Boxes** Chapter 1, Lessons 1-3
5.MD.C.5 Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. **A.** Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. **B.** Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.	**Level 3-4: In Search of the Yeti** Chapter 3, Lessons 1-2 **Level 5-6: Designer Boxes** Chapter 1, Lessons 1-3

Geometry

Graph points on the coordinate plane to solve real-world and mathematical problems.	
5.G.A.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).	**Level 4-5: Getting Into Shapes** Chapter 2, Lessons 2-3 **Level 5-6: Record Makers and Breakers** Chapter 1, Lessons 1-3 **Level 5-6: Record Makers and Breakers** Chapter 2, Lessons 1-4

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5.G.A.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.	**Level 4-5: Getting Into Shapes** Chapter 2, Lessons 2-3 **Level 5-6: Record Makers and Breakers** Chapter 1, Lessons 1-3 **Level 5-6: Record Makers and Breakers** Chapter 2, Lessons 1-4
Classify two-dimensional figures into categories based on their properties.	
5.G.B.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. *For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.*	**Level 4-5: Getting Into Shapes** Chapter 1, Lessons 1-3
5.G.B.4 Classify two-dimensional figures in a hierarchy based on properties.	**Level 4-5: Getting Into Shapes** Chapter 1, Lessons 1-2