Pennsylvania Mathematics

Assessment Anchors & Eligible Content: 5th Grade Math

Numbers and Operations in Base Ten M05.A-T

1 **Understand the place-value system.** M05.A-T.1

1 Demonstrate understanding of place-value of whole numbers and decimals, and compare quantities or magnitudes of numbers. M05.A-T.1.1

1 Demonstrate an understanding that in a multi-digit number, a digit in one place represents 1/10 of what it represents in the place to its left. Example: Recognize that in the number 770, the 7 in the tens place is 1/10 the 7 in the hundreds place. M05.A-T.1.1.1

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. Example 1: $4 \times 102 = 400$ Example 2: $0.05 \div 103 = 0.00005$ M05.A-T.1.1.2

3 Read and write decimals to thousandths using base-ten numerals, word form, and expanded form. Example: $347.392 = 300 + 40 + 7 + 0.3 + 0.09 + 0.002 = 3 \times 100 + 4 \times 10$ M05.A-T.1.1.3

4 Compare two decimals to thousandths based on meanings of the digits in each place using >, =, and < symbols. M05.A-T.1.1.4

5 Round decimals to any place (limit rounding to ones, tenths, hundredths, or thousandths place). M05.A-T.1.1.5

2 **Perform operations with multi-digit whole numbers and with decimals to hundredths** M05.A-T.2

1 Use whole numbers and decimals to compute accurately (straight computation or word problems). M05.A-T.2.1

1 Multiply multi-digit whole numbers (not to exceed three-digit by three-digit). M05.A-T.2.1.1

2 Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors. M05.A-T.2.1.2

3 Add, subtract, multiply, and divide decimals to hundredths (no divisors with decimals). M05.A-T.2.1.3

Nu Op Fractions M05.A-F

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Ise equivalent fractions as a strategy to add and subtract fractions M05.A-F.1

1 Solve addition and subtraction problems involving fractions (straight computation or word problems). M05.A-F.1.1

1 Add and subtract fractions (including mixed numbers) with unlike denominators. (May include multiple methods and representations.) Example: 2/3 + 5/4 = 8/12 + 15/12 = 23/12 M05.A-F.1.1.1

2 Apply and extend previous understandings of multiplication and division to multiply and divide fractions. M05.A-F.2

1 Solve multiplication and division problems involving fractions and whole numbers (straight computation or word problems). M05.A-F.2.1

1 Solve word problems involving division of whole numbers leading to answers in the form of fractions (including mixed numbers). M05.A-F.2.1.1

2 Multiply a fraction (including mixed numbers) by a fraction. M05.A-F.2.1.2

3 Demonstrate an understanding of multiplication as scaling (resizing). Example 1: Comparing the size of a product to the size of one factor on the basis of the size of the other factor without performing the indicated multiplication. Example 2: Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number. M05.A-F.2.1.3

4 Divide unit fractions by whole numbers and whole numbers by unit fractions. M05.A-F.2.1.4

Operations and Algebraic Thinking M05.B-O

1 Write and interpret numerical expressions M05.B-O.1

1 Analyze and complete calculations by applying the order of operations. M05.B-O.1.1

1 Use multiple grouping symbols (parentheses, brackets, or braces) in numerical expressions and evaluate expressions containing these symbols M05.B-O.1.1.1

2 Write simple expressions that model calculations with numbers and interpret numerical expressions without evaluating them. Example 1: Express the calculation “add 8 and 7, then multiply by 2” as 2 × (8 + 7). Example 2: Recognize that 3 × (18,932 + 921) is three times as large as 18,932 + 921 without having to calculate the indicated sum or product. M05.B-O.1.1.2

2 Analyze patterns and relationships. M05.B-O.2

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1 Create, extend, and analyze patterns. M05.B-O.2.1

1 Generate two numerical patterns using two given rules. 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 M05.B-O.2.1.1

2 Identify apparent relationships between corresponding terms of two patterns with the same starting numbers that follow different rules. Example: Given two patterns in which the first pattern follows the rule “add 8” and the second pattern follows the rule “add 2,” observe that the terms in the first pattern are 4 times the size of the terms in the second pattern. M05.B-O.2.1.2

Geometry M05.C-G

1 Graph points on the coordinate plane to solve real-world and mathematical problems. M05.C-G.1

1 Identify parts of a coordinate grid and describe or interpret points given an ordered pair. M05.C-G.1.1

1 Identify parts of the coordinate plane (x-axis, y-axis, and the origin) and the ordered pair (x-coordinate and y-coordinate). Limit the coordinate plane to quadrant I. M05.C-G.1.1.1

2 Represent real-world and mathematical problems by plotting points in quadrant I of the coordinate plane and interpret coordinate values of points in the context of the situation. M05.C-G.1.1.2

2 Classify two-dimensional figures into categories based on their properties. M05.C-G.2

1 Use basic properties to classify two-dimensional figures. M05.C-G.2.1

1 Classify two-dimensional figures in a hierarchy based on properties. Example 1: All polygons have at least three sides, and pentagons are polygons, so all pentagons have at least three sides. Example 2: A rectangle is a parallelogram, which is a quadrilateral, which is a polygon; so, a rectangle can be classified as a parallelogram, as a quadrilateral, and as a polygon. M05.C-G.2.1.1

Data and Measurement M05.D-M

1 Convert like measurement units within a given measurement system M05.D-M.1

1 Solve problems using simple conversions (may include multistep, real-world problems). M05.D-M.1.1

1 Convert between different-sized measurement units within a given measurement system. A table of equivalencies will be provided. Example: Convert 5 cm to meters M05.D-M.1.1.1

2 Represent and interpret data. M05.D-M.2

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1 Organize, display, and answer questions based on data. M05.D-M.2.1

1 Solve problems involving computation of fractions by using information presented in line plots. M05.D-M.2.1.1

2 Display and interpret data shown in tallies, tables, charts, pictographs, bar graphs, and line graphs, and use a title, appropriate scale, and labels. A grid will be provided to display data on bar graphs or line graphs. M05.D-M.2.1.2

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3 Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition. M05.D-M.3

1 Use, describe, and develop procedures to solve problems involving volume. M05.D-M.3.1

1 Apply the formulas V = l × w × h and V = B × 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. Formulas will be provided. M05.D-M.3.1.1

2 Find volumes of solid figures composed of two non-overlapping right rectangular prisms. M05.D-M.3.1.2