

**MATH - GRADE 5**  
**Assessment Anchors & Eligible Content**  
**Pennsylvania Department of Education**  
**2007**

## **M5.A Numbers and Operations**

### **M5.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.**

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**M5.A.1.1** Express numbers in equivalent forms.

***Reference: 2.1.5.A***

**M5.A.1.1.1** Use expanded notation to represent whole numbers or decimals (whole numbers less than 10,000,000 and decimals through hundredths).

## **M5.A Numbers and Operations**

### **M5.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.**

**M5.A.1.2** Demonstrate understanding of place value of whole numbers and decimals.

***Reference: 2.1.3.1***

**M5.A.1.2.1** Match the standard form to the word form of decimal numbers through the hundredths.

**M5.A.1.2.2** Identify the place value of a digit (from millions through hundredths).



## M5.A Numbers and Operations

### M5.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.

**M5.A.1.3** Compare quantities or magnitudes of numbers.

**Reference:**  
**2.11.5.A**

**M5.A.1.3.1** Compare whole numbers through 9 digits using the words more, less, equal, least, most, greater than, less than or the symbols  $<$ ,  $>$ ,  $=$ .

**M5.A.1.3.2** Compare and/or order decimals through the hundredths. (Limit sets for ordering to no more than 4 numbers.)

**M5.A.1.3.3** Compare proper fractions through 16ths with like and unlike denominators.



## **M5.A Numbers and Operations**

### **M5.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.**

**M5.A.1.4** Use simple applications of negative numbers (number line, counting, temperature).

***Reference: 2.1.5.F***

**M5.A.1.4.1** Locate/Identify integers on a number line (greater than or equal to -20).

**M5.A.1.4.2** Identify negative temperatures on a thermometer (through  $-20^{\circ}\text{C}$  or  $^{\circ}\text{F}$ ).



## **M5.A Numbers and Operations**

### **M5.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.**

**M5.A.1.5** Use or develop models to represent fractions and/or mixed numbers.

***Reference: 2.1.5.D***

**M5.A.1.5.1** Use or develop regions and/or sets (e.g., circle graph, base ten blocks) to model fractions and mixed numbers through hundredths (may include reducing the fractions).



## M5.A Numbers and Operations

### M5.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.

**M5.A.1.6** Apply number theory concepts (i.e., primes, factors, multiples, composites).

**Reference: 2.1.5.E**

**M5.A.1.6.1** Define/list/identify prime and composite numbers less than or equal to 100.

**M5.A.1.6.2** Define/list/identify factors and/or multiples of a given whole number less than or equal to 50.



## M5.B Numbers and Operations

### M5.A.2 Understand the meanings of operations, use operations and understand how they relate to each other.

**M5.A.2.1** Solve problems involving decimals, fractions and/or whole numbers (straight computation or word problems).

**Reference: 2.2.5.A, 2.2.5.B, 2.2.5.C, 2.2.5.I**

**M5.A.2.1.1** Solve problems involving addition, subtraction, multiplication and division of whole numbers (multipliers up to 2 digits – divisors one digit) and decimals including money (answer through hundredths – no division with decimals).

**M5.A.2.1.2** Solve problems involving addition and subtraction of fractions (through 16ths – like and unlike denominators – for unlike denominators, the LCD must be one of the given denominators).

**M5.A.2.1.3** Choose the correct operation(s) to solve a problem (no more than 2 operations).

## M5.B Numbers and Operations

### M5.A.3 Compute accurately and fluently and make reasonable estimates.

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**M5.A.3.1** Apply estimation strategies to a variety of problems.

**Reference: 2.2.5.D, 2.2.5.E, 2.2.5.G**

**M5.A.3.1.1** Round whole numbers through millions and decimals through hundredths.

**M5.A.3.1.2** Use estimation to solve problems involving whole numbers and/or decimals (up to 2-digit multipliers, single-digit divisors or multiples of 10; whole numbers through thousands and decimals through hundredths).



## **M5.B Numbers and Operations**

### **M5.A.3 Compute accurately and fluently and make reasonable estimates.**

**M5.A.3.2** Compute accurately without the use of a calculator (straight computation or 1 operation word problems).

***Reference: 2.2.5.A***

**M5.A.3.2.1** Use addition, subtraction, multiplication and division to compute accurately without a calculator (multipliers up to 2 digits, single-digit divisors or multiples of 10 – whole numbers through thousands and decimals through hundredths - no division with decimals).



## **M5.B Measurement**

### **M5.B.1 Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.**

**M5.B.1.1** Select appropriate units (customary or metric) to measure specific attributes of objects.

***Reference: 2.3.5.A***

**M5.B.1.1.1** Select the appropriate unit for measuring weight (mass), capacity, length, perimeter and area.



## M5.B Measurement

### M5.B.1 Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.

**M5.B.1.2** Solve problems using simple conversions and/or add and subtract measurements.

**Reference: 2.3.5.D, 2.3.5.E**

**M5.B.1.2.1** Convert using linear measurements, capacity, and weight (mass) within the same system to the unit immediately above or below the given unit (using only the units below – use a conversion chart or a “hint” with problems e.g., hint: 16oz = 1lb).

- Metric using mm, cm, m and km; mL and L; g and kg
- Customary using cup, pint, quart, gallon; in, ft, yd; oz, lb

**M5.B.1.2.2** Add or subtract linear measurements, (feet and inches) or units of time (hours and minutes), without having to regroup with subtraction (answer should be in simplest form).

## **M5.B Measurement**

### **M5.B.1 Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.**

**M5.B.1.3** Estimate and/or compare the perimeters or areas of 2 figures without computation.

***Reference:***  
***2.11.5.E, 2.3.5.C***

**M5.B.1.3.1** Estimate which polygon (shown on a grid) has a greater perimeter or area (compare either area to area or perimeter to perimeter).

**M5.B.1.3.2** Estimate the area of an irregular figure shown on a grid.



## **M5.B Measurement**

### **M5.B.2 Apply appropriate techniques, tools and formulas to determine measurements.**

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**M5.B.2.1** Use appropriate tools to determine measurements.

***Reference: 2.3.5.B***

**M5.B.2.1.1** Use a ruler to measure to the nearest  $\frac{1}{8}$  inch or centimeter.



## M5.B Measurement

### M5.B.2 Apply appropriate techniques, tools and formulas to determine measurements.

**M5.B.2.2** Solve problems involving length, time, weight (mass), capacity, temperature, perimeter and/or area.

**Reference:**  
**2.3.5.A, 2.3.5.B**

**M5.B.2.2.1** Find the perimeter of a figure drawn and labeled (with the same units throughout).

**M5.B.2.2.2** Find the area of a square or rectangle (with the same units throughout - whole numbers only).

**M5.B.2.2.3** Solve problems involving weight, time, temperature, length and capacity (with the same units throughout - limited to 3 digits).



## M5.C Geometry

### M5.C.1 Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.

**M5.C.1.1** Define and/or use basic properties of quadrilaterals (parallelograms, squares, rectangles, trapezoids, rhombi), triangles, circles, pyramids, cubes, and/or prisms.

**Reference: 2.9.5.B,  
2.9.5.C, 2.9.5.F,  
2.10.5.A**

**M5.C.1.1.1** Identify, and/or classify cubes, rectangular prisms or pyramids using faces, vertices and edges.

**M5.C.1.1.2** Identify and/or describe properties of all types of quadrilaterals (parallelogram, rectangle, rhombus, square, trapezoid).



## **M5.C Geometry**

### **M5.C.1 Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.**

**M5.C.1.2** Represent and/or use properties of lines, line segments, rays, points and planes.

***Reference: 2.9.5.1***

**M5.C.1.2.1** Identify, draw and/or label points, lines, line segments and rays.



## M5.C Geometry

### M5.C.2 Identify and/or apply concepts of transformations or symmetry.

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**M5.C.2.1** Analyze transformations and/or use symmetry to analyze mathematical situations.

**Reference: 2.9.5.K,  
2.9.5.L**

**M5.C.2.1.1** Draw or identify a translation (slide), reflection (flip) or rotation (turn) of a 2-dimensional shape.

**M5.C.2.1.2** Identify the number of lines of symmetry and/or draw all lines of symmetry in a two-dimensional polygon.



**M5.C Geometry**

**M5.C.3 Locate points or describe relationships using the coordinate plane.**

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**Not assessed at Grade 5.**



## M5.D Algebraic Concepts

### M5.D.1 Demonstrate an understanding of patterns, relations and functions.

#### M5.D.1.1

Create or extend patterns.

**Reference: 2.8.5.A**

#### M5.D.1.1.1

Extend or find a missing element in a numerical or simple geometric pattern (+, -, x or  $\div$  of whole numbers). Pattern must show 3 repetitions.

#### M5.D.1.1.2

Create or replicate a numerical or geometric pattern showing 3 repetitions of that pattern (+, -, x or  $\div$  of whole numbers may be used).



## **M5.D Algebraic Concepts**

### **M5.D.1 Demonstrate an understanding of patterns, relations and functions.**

**M5.D.1.2** Analyze patterns.

***Reference: 2.8.5.C***

**M5.D.1.2.1** Form a rule based on a given pattern, or illustrate a pattern based on a given rule (+, -,  $\times$  or  $\div$  of whole numbers may be used). Patterns must show 3 repetitions.



## M5.D Algebraic Concepts

### M5.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables and/or graphs.

**M5.D.2.1** Select and/or use appropriate strategies, including concrete materials, to solve or represent expressions or number sentences.

**Reference:**  
**2.8.5.G, 2.8.5.F**

**M5.D.2.1.1** Solve for a missing number (blank, question mark, variable) in an equation involving a single operation whole numbers only.

**M5.D.2.1.2** Match a realistic situation to an equation, expression, inequality ( $<$ ,  $>$ ,  $=$ ), table or graph (variable must be isolated, e.g.,  $17 + 39 = n$ ).



**M5.D Algebraic Concepts**

**M5.D.3 Analyze change in various contexts.**

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**Not assessed at Grade 5.**



**M5.D Algebraic Concepts**

**M5.D.4 Describe or use models to represent quantitative relationships.**

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**Not assessed at Grade 5.**



## **M5.E Data Analysis and Probability**

### **M5.E.1 Formulate or answer questions that can be addressed with data and/or organize, display, interpret or analyze data.**

**M5.E.1.1** Organize, display and/or interpret data using pictographs, tallies, tables, charts, line, bar graphs.

***Reference: 2.6.5.A***

**M5.E.1.1.1** Display and/or interpret data shown in tallies, tables, charts, pictographs, bar graphs, line graphs and using a title, appropriate scale, and labels.  
A grid will be provided to display data on bar graphs or line graphs.



## **M5.E Data Analysis and Probability**

### **M5.E.2 Select and/or use appropriate statistical methods to analyze data.**

**M5.E.2.1** Describe data sets using mean, median, mode and/or range.

***Reference: 2.6.5.B***

**M5.E.2.1.1** Determine the mean/average (answer is a whole number), median (answer is a whole number or average of 2 numbers) and range of data (up to 10 numbers).

**M5.E.2.1.2** Identify the mode in a set of data (up to 10 numbers).



## **M5.E Data Analysis and Probability**

### **M5.E.3 Understand and/or apply basic concepts of probability or outcomes.**

**M5.E.3.1** Predict or determine all possible combinations, outcomes and/or calculate the probability of a simple event.

**Reference: 2.7.5.E, 2.7.5.H, 2.7.5.J**

**M5.E.3.1.1** Predict or determine whether some outcomes are certain, more likely, less likely, equally likely, or impossible (information could be represented by pictographs, bar graphs, charts, tables and/or spinners).

**M5.E.3.1.2** Determine the probability of an outcome (e.g., a coin toss, a roll of a number cube) and express as a fraction without reduction.



## **M5.E Data Analysis and Probability**

**M5.E.4 Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.**

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**Not assessed at Grade 5.**

