

# CORE BODY OF KNOWLEDGE

## *Math-Sixth Grade*

### **Subject Area - Mathematics**

#### **Standard Area - 2.1: Numbers, Number Systems and Number Relationships**

##### **Grade Level - 2.1.6 GRADE 6**

**2.1.6.A:** Model and compare values of whole numbers, mixed numbers, fractions and decimals.

**2.1.6.B:** Represent whole numbers, fractions, mixed numbers, decimals, and percents in equivalent forms.

**2.1.5.C:** Use models to represent the concept of equivalent forms of a fraction, decimal, and/or percent.

**2.1.5.D:** Apply place value concepts to order and compare decimals; use the number line to order and compare decimals, fractions, and mixed numbers.

**2.1.5.E:** Apply number theory concepts to calculate the GCF (Greatest Common Factor) and/or LCM (Least Common Multiple) of two numbers.

**2.1.5.F:** Apply the associative, commutative, distributive and/or identity properties to write equivalent forms of expressions.

#### **Standard Area - 2.2: Computation and Estimation**

##### **Grade Level - 2.2.6: GRADE 6**

**2.2.6.B:** Add, subtract, multiply and divide whole numbers, decimals, fractions, and mixed numbers.

**2.2.6.C:** Apply the associative, commutative, distributive, and/or identify properties to evaluate numerical expressions.

**2.2.6.D:** Estimate results from calculations with basic operations of whole numbers and decimals and check the reasonableness of those estimates.

#### **Standard Area - 2.4: Mathematical Reasoning and Connections**

##### **Grade Level - 2.4.6: GRADE 6**

**2.4.6.A:** Use models, properties and relationships to draw conclusions and explain reasons for conclusions.

**2.4.6.B:** Use if...then statements to express conditional relationships.

#### **Standard Area - 2.5: Mathematical Problem Solving and Communication**

##### **Grade Level - 2.5.6: GRADE 6**

**2.5.6.A:** Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts.

**2.5.6.B:** Use appropriate mathematical terms, vocabulary, language, symbols, and graphs to explain clearly and logically solutions to problems.

## NUMBERS AND OPERATIONS: ANCHORS

**\*M6.A.1:** Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.

**\*M6.A.1.1:** Express numbers in equivalent forms.

**\*M6.A.1.1.1:** Represent common percents as fractions and/or decimals (e.g.,  $25\% = \frac{1}{4} = .25$ ) – common percents are 1%, 10%, 25%, 50%, 75%, 100%.

**\*M6.A.1.1.2:** Convert between fractions and decimals and/or differentiate between a terminating decimal and a repeating decimal.

**\*M6.A.1.1.3:** Apply number theory concepts (i.e., factors, multiples)

**\*M6.A.1.1.4:** Represent a mixed number as an improper:

**\*M6.A.1.2:** Compare quantities and/or magnitudes of numbers

**\*M6.A.1.2.1:** Compare and/or order whole numbers, mixed numbers, fractions and/or decimals (do not mix fractions and decimals-decimals through thousandths.).

**\*M6.A.1.3:** Apply number theory concepts (i.e., factors, multiples.)

**\*M6.A.1.3.1:** Find the Greatest Common Factor (GCF) of two numbers (through 50) and/or use the GCF to simplify fractions.

**\*M6.A.1.3.2:** Find the Least Common Multiple (LCM) of two numbers (through 50) and/or use the LCM to find the common denominator of two fractions.)

**\*M6.A.1.3.3:** Use divisibility rules for 2, 3, 5 and/or 10 to draw conclusions and/or solve problems.

**\*M6.A.1.4:** Use or develop models to represent percents.

**\*M6.A.1.4.1:** Model percents (through 100%) using drawings, graphs and/or sets (e.g., circle graph, base ten blocks, etc).

**\*M6.A.2:** Understand the meanings of operations, use operations and understand how they relate to each other.

**\*M6.A.2.1:** Select and/or use operations to simplify or solve problems

**\*M6.A.2.1.1:** Complete equations by using the following properties: associative, commutative, distributive and identify

**\*M6.A.3:** Compute accurately and fluently and make reasonable estimates.

**\*M6.A.3.1:** Apply estimation strategies to a variety of problems.

**\*M6.A.3.1.1:** Use estimation to solve problems involving whole numbers and decimals (up to 2-digit divisors and 4 operations)

**\*M6.A.3.2:** Solve problems with and without the use of a calculator.

**\*M6.A.3.2.1:** Solve problems involving operations (+, -,  $\times$ ,  $\div$ ) with whole numbers, decimals (through thousandths) and fractions (avoid complicated LCDs) – straight computation or word problems

## Standard Area - 2.9: Geometry

### Grade Level - 2.9.6: GRADE 6

**2.9.6.A:** Identify, define, label, and/or describe properties of 1-, 2-, and 3- dimensional shapes and their related parts, and classify and compare 2- and 3- dimensional shapes on the basis of their properties.

**2.9.6.B:** Predict and describe the result of a translation (slide), rotation (turn), or reflection (flip) of a 2- dimensional shape.

**2.9.6.C:** Identify on a 2-dimensional coordinate system the location of points with non-negative fractional or decimal coordinates; plot in a two-dimensional coordinate system a point represented by an ordered pair of non-negative fractions, mixed numbers, or decimals.

**2.8.6.D:** Determine a functional rule from a table or graph.

**2.8.6.E:** Use combinations of symbols and numbers to create expressions, equations, and inequalities that model mathematical situations.

**2.8.6.F:** Interpret the results of solving equations in one variable in the context of the situation that motivated the model.

### GEOMETRY: ANCHORS

*\*M6.D.1: Demonstrate an understanding of patterns, relations and functions.*

*\*M6.D.1.1: Create or extend patterns.*

*\*M6.D.1.1.1: Create, extend or find a missing element in a pattern displayed in a table, chart or graph (pattern must show at least 3 repetitions – may use up to 2 operations with whole numbers.)*

*\*M6.D.1.2: Analyze patterns.*

*\*M6.D.1.2.1: Determine a rule based on a pattern or illustrate a pattern based on a given rule (displayed on a table, chart or graph; pattern must show 3 repetitions.)*

*\*M6.C.1: Analyze characteristics and properties of two- and three- dimensional geometric shapes and demonstrate understanding of geometric relationships.*

*\*M6.C.1.1: Define and/or use basic properties of triangles, quadrilaterals, pentagons, hexagons, heptagons, octagons, nonagons, decagons and circles.*

*\*M6.C.1.1.1: Identify, classify and/or compare polygons (up to ten sides.)*

*\*M6.C.1.2: Represent and/or use concepts and relationships of lines and line segments.*

*\*M6.C.1.2.1: Identify, describe and/or label parallel, perpendicular or intersection lines.*

*\*M6.C.1.2.2: Identify, draw and/or label points, plains, lines, line segments, rays, angles, and vertices.*

## Standard Area - 2.8: Algebra and Functions

### Grade Level - 2.8.5: GRADE 6

- 2.8.6.A:** Use the concept of equality to demonstrate understanding of the distributive property.
- 2.8.6.B:** Select and use strategies to solve number sentences (and inequalities) and explain the method of solution.
- 2.8.6.C:** Recognize, describe, extend, create, replicate, and form a rule, and/or find a missing element of whole number patterns, sequences, and relationships verbally, numerically, symbolically, and graphically.
- 2.8.6.D:** Determine a functional rule from a table or graph.
- 2.8.6.E:** Use combinations of symbols and numbers to create expressions, equations, and inequalities that model mathematical situations.
- 2.8.6.F:** Interpret the results of solving equations in one variable in the context of the situation that motivated the model.

### ALGABREC CONCEPTS: ANCHORS

*\*M6.D.1: Demonstrate an understanding of patterns, relations and functions.*

*\*M6.D.1.1: Create or extend patterns.*

*\*M6.D.1.1.1: Create, extend or find a missing element in a pattern displayed in a table, chart, or graph (pattern must show at least 3 repetitions – may use up to 2 operations with whole numbers)*

*\*M6.D.1.2: Analyze patterns.*

*\*M6.D.1.2.1: Determine a rule based on a pattern or illustrate a pattern based on a given rule (displayed on a table, chart or graph; pattern must show at least 3 repetitions.*

*\*M6.D.2: Represent and/or analyze mathematical situations and structures using algebraic symbols, words, tables and graphs*

*\*M6.D.2.1: Select and/or use appropriate strategies to solve number sentences*

*\*M6.D.2.1.1: Identify the inverse operation needed to solve a one-step equation*

*\*M5.D.2.1.2: Solve a one-step equation (i.e., using the inverse operation-whole number sentences*

## Standard Area - 2.3: Measurement and Estimation

### Grade Level - 2.3.6: GRADE 6

- 2.3.6.A:** Use models to illustrate the meaning of perimeter, area, and volume.
- 2.3.6.B:** Use appropriate units to measure perimeter, area, and volume; use a protractor to measure angles between 0 and 180 degrees.
- 2.3.6.C:** Use given measurements to calculate a missing length, perimeter, area, and/or volume; calculate elapsed time across am/pm and across days.

**2.3.6.D:** Perform basic conversions within the metric and within the customary systems.

**2.3.6.F:** Estimate and verify measurements of length, perimeter, area, volume, capacity, temperature, time, weight, and angles.

**2.11.6.B:** Describe the relationship between rates of change and another variable (e.g., time, temperature.)

**2.11.6.C:** Estimate areas and volumes of shapes and solids as the sums of areas of tiles and volumes of cubes.

### **MEASUREMENT: ANCHORS**

*\*M6.B.1: Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement*

*\*M6.B.1.1: Compare and/or determine elapsed time*

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

*\*M6.B.1.2: Solve problems using simple conversions and/or add and subtract measurements.*

*\*M6.B.2: Apply appropriate techniques, tools and formulas to determine measurements.*

*\*M6.B.2.1: Choose or use appropriate tools to determine measurements within the same system*

*\*M6.B.2.1.1: Use or read a ruler to measure to the nearest 1/16 inch or millimeter*

*\*M6.B.2.2: Solve problems involving length, time, perimeter, area and/or volume of geometric figures*

*\*M6.B.2.2.1: Find the perimeter of any polygon (may include regular polygons where only the measure of one side is given – same units throughout)*

### **Standard Area - 2.6: Statistics and Data Analysis**

#### **Grade Level - 2.6.6: GRADE 6**

**2.6.6.A:** Gather data from a variety of appropriate sources

**2.6.6.B:** Select an appropriate method to organize data; select an appropriate format to display data.

**2.6.6.C:** Select and use, as appropriate, the mean, median, mode, and/or range to describe sets of data.

**2.6.6.D:** Use measures of central tendency to compare two sets of data.

**2.6.6.E:** Interpret data displayed in a table, histogram, graph, or data summarized by numerical measures.

### **Standard Area - 2.7: Probability and Predictions**

#### **Grade Level - 2.7.6: GRADE 6**

**2.7.6.A:** Collect data and estimate the likelihood of outcomes of an event.

**2.7.6.B:** Organize data collected in a simulation and select an appropriate format to display the

data.

**2.7.6.C:** Express the probability of a simple event as a fraction, decimal, and percent.

**2.7.6.D:** List the possible outcomes for two independent events and compare the outcomes.

**2.7.6.E:** Find and interpret the experimental probability of an outcome of a simple event.

### **DATA AND ANALYSIS AND PROBABILITY: ANCHORS**

*\*M6.E.1: Formulate questions that can be addressed with data and/or collect, organize, display, and analyze data.*

*\*M6.E.1.1: Interpret data shown in frequency tables, histograms, circle, bar, or double bar graphs, line or double line graphs or line plots.*

*\*M6.E.1.1.1: Analyze data and/or answer questions pertaining to data represented in frequency tables, circle graphs, double bar graphs, double line graphs or line plots (for circle graphs, no computation with percents.)*

*\*M6.E.1.1.2: Choose the appropriate representation for a specific set of data (choices should be the same type of graph.)*

*\*M6.E.1.1.3: Display data in frequency tables, circle graphs, double-bar graphs, double line graphs or line plots using a title, appropriate scale, labels, and a key when needed. Circle graphs for open-ended items must show a center point and tic marks.*

*\*M6.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.*

*\*M5.E.2.1.1: Determine /calculate the mean, median, mode and/or range of displayed data (data can be displayed in a table or line plot – use whole numbers only up to 2 digits.*

*\*M5.E.3: Understand and apply basic concepts of probability.*

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

*\*M5.E.3.1.1: Define and/or find the probability of a simple event (express as a fraction in lowest terms.)*

*\*M5.E.3.1.2: Determine/show all possible combinations involving no more than 20 total arrangements (e.g., tree diagram, table, grid.)*

### **Standard Area - 2.10: Trigonometry**

#### **Grade Level - 2.10.6: GRADE 6**

**2.10.5.A:** Identify and compare parts of right triangles, including right angles, acute angles, hypotenuses, and legs.

### **Standard Area - 2.11: Concepts of Calculus**

#### **Grade Level - 2.11.6: GRADE 6**

**2.11.6A:** Make comparisons of numbers (e.g., more, less, same, least, most, greater than, less than.)

**2.11.6.B:** Describe the relationship between rates of change and another variable (e.g., time, temperature.)

**2.11.6. C:** Estimate areas and volumes of shapes and solids as the sums of areas of tiles and volumes of cubes.