# KANSAS EXTENDED MATHEMATICS STANDARDS

Special Education Services
Kansas State Department of Education
July 2009

# Kansas State Board of Education

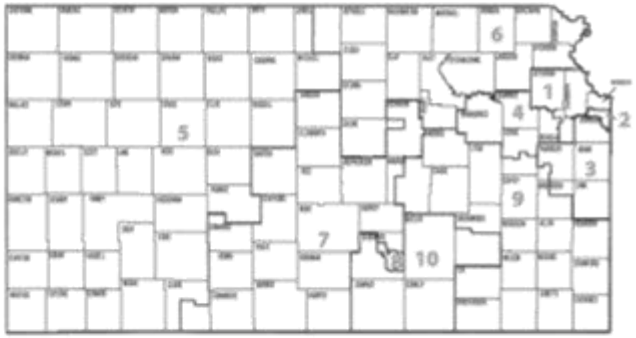
120 S.E. 10th Avenue • Topeka, Kansas 66612-1182

## Education Priorities of the Kansas State Board of Education

Ensure that all students meet or exceed high academic standards and are prepared for their next steps (e.g., the world of work and/or post-secondary education) by:

- **redesigning the delivery system to meet our students' changing needs;**
- **providing an effective educator in every classroom;**
- **ensuring a visionary and effective leader in every school; and**
- **improving communication with all constituent groups and policy partners.**

**Kansas State Board of Education**
**Adopted 9/2007**

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# Introduction

This document is the revised edition of the Kansas Extended Mathematics Standards that align with the grade level Kansas Curricular Mathematics Standards. These revised standards were developed by a number of educators, administrators, and education consultants during the 2008-2009 school year. The focus of the group was to revise the clarifying examples in support of the general education mathematics standards at the student's grade level. The new clarifying examples have been taken out of this document and are posted in the clarifying example document at www.ksde.org.

The Kansas Extended Mathematics Standards guide the direction of instruction and the development of Individualized Education Program (IEP) goals for students Grades 3 – 8 and High School who are eligible to take the Kansas Alternate Assessment (KAA). These extended standards are designed for students who require substantial adjustments in the general education mathematics curriculum in order to participate with their nondisabled peers. When using this document, it is important for students' IEP teams to remember the extended mathematics standards, benchmarks, and indicators are taught at the appropriate grade level using chronologically age appropriate contexts and materials in academic settings.

## Individuals with Disabilities Education Improvement Act (IDEA, 2004) Background

> Section 614(d)(VI)(bb): "if the IEP Team determines that the child shall take an alternate assessment on a particular State or district wide assessment of student achievement, a statement of why – (AA) the child cannot participate in the regular assessment; and (BB) the particular alternate assessment selected is appropriate for the child;"

Accordingly, the Kansas Extended Mathematics Standards were developed to be consistent with the general mathematics standards for the purpose of ensuring that the education of all students, including those with the most significant disabilities, is uniform with goals and standards for students without disabilities as established by the Kansas State Board of Education (KSBE). Furthermore, Kansas is required to develop an alternate assessment for students with disabilities who are unable to participate in regular state and district assessments. In keeping with this requirement, the extended standards serve as the basis for the development of the Kansas Alternate Assessment (KAA).

> Section 611(1)(16)(A): In general – All children with disabilities are included in all general State and district-wide assessment programs, including assessments described under section 111 of the Elementary and Secondary Education Act of 1965, with appropriate accommodations and alternate assessments where necessary and as indicted in their respective individualized education programs.
> (C)(i) In general – The state (or, in the case of a district wide assessment the local education agency) has developed and implemented guidelines for the participation of children with disabilities in alternate assessments for those children who cannot participate in regular assessments.
> (ii) Requirements for Alternate Assessments – The guidelines under this clause (i) shall provide for alternate assessments that – (I) are aligned with the State's challenging academic content standards and challenging student academic achievement standards;
> (iii) Conduct of alternate Assessments – The state conducts the alternate assessments described in the subparagraph.

## Title 1 – No Child Left Behind Act (NCLB, 2001) Background

> 34 C.F.R. 200 1(d): Alternative academic achievement standards. For students under section 602(3) of the Individuals with Disabilities Education Act with the most significant cognitive disabilities who take an alternate assessment, a State may through a documented and validated standards setting process, define alternate academic achievement standards, provided those standards—
> (1) Are aligned with the State's academic content standards;
> (2) Promote access to the general curriculum; and
> (3)Reflect professional judgment of the highest achievement standards possible.

Kansas is required to hold all students to the same standards except that these regulations permit States to measure the achievement of students with the most significant cognitive disabilities based on alternate achievement standards. For the content area of math, these standards are titled, The Kansas Extended Mathematics Standards. Alternate achievement standards are acceptable only for the small number of students with the most significant cognitive disabilities. The use of ''highest learning standards possible'' is intended to reflect the alternate achievement standards should be no less challenging for students with the most significant cognitive disabilities than for their peers without disabilities.

## Definitions

The following definitions clarify the four levels of the Kansas Extended Mathematics Standards document. These definitions are very closely aligned with the definitions that are used in the Kansas Curricular Mathematics Standards.

**Standard:**
A curricular standard is a general statement of what a student should know and be able to do in academic subjects.

**Example of a Standard:** Numbers and computation - The student uses numerical and computational concepts and procedures in a variety of situations.

**Benchmark**
A benchmark is a specific statement of what a student should know and be able to do. Benchmarks are used to measure a student's progress toward meeting a standard. Benchmarks are listed in hierarchical order under a standard.

**Example of a Benchmark:** The student demonstrates understanding of numbers in a variety of situations.

**Indicator**
An indicator is a statement of the knowledge or skills that a student demonstrates in order to meet a benchmark. Indicators are important in understanding the benchmarks and standards. Where possible, the indicators are listed in hierarchical order under a benchmark that progress from lower-level to higher-level indicators.

**Example of an Indicator:** The student counts by rote.

**Clarifying Examples (not in this document moved to separate document at www.ksde.org**
Clarifying examples propose how a student might demonstrate a skill listed in the indicator that is academic or school based. Clarifying math examples are not listed in hierarchical order. The clarifying math examples are closely related to the Present Levels of Academic Achievement and Functional Performance [PLAAFP (IDEA, 2004)]. These general areas are those in which the student receives instruction to practice, maintain, and generalize skills. The clarifying examples provide a clear connection between the standards and instructional practice.

**Example of a Clarifying Example:** Academic: The student counts math manipulatives.

**Abbreviations for General and Extended Mathematics Indicators**
General: M.3.1.1. K2a means (M) Mathematics, (3) 3rd Grade, (1) Standard 1, (1) Benchmark 1, (K2a) Indicator K2a
Extended: EM.1.1.2 means (EM) Extended Mathematics, (1) Standard 1, (1) Benchmark 1, (2) Indicator 2. The extended benchmarks and indicators are hierarchical or increase in skill complexity. For example, Extended Indicator 10 is a more complex skill than Extended Indictor 4.

## Use of This Document

This document may be used for a variety of purposes to assist Kansas' teachers in planning local curriculum and assessments for students with significant cognitive disabilities in mathematics. The Kansas Extended Mathematics Standards document is intended to provide a curricular focus; it is not a state-mandated curriculum. In addition, the document provides a resource that can be used in developing the student's IEP.

Educators should use this document to:

- serve as a guide for instruction,
- use as a guide for developing IEP goals,
- select extended mathematics indicators to be assessed on *The Kansas Alternate Assessment*; and
- understand what is assessed in each grade level on *The Kansas State General Assessments*.

# Kansas
# General and Extended Mathematics Standards
## Grade Level Alignment

## 3rd Grade - Mathematics

**Standard 1 - Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| **M.3.1.1.K2a**<br>Compares and orders:<br>▲ whole numbers from 0 through 10,000 with and without the use of concrete objects | EM.1.1.1 demonstrates understanding of the concept of more<br>EM.1.1.2 demonstrates understanding of the concept of one<br>EM.1.1.3 counts by rote<br>EM.1.1.5 recognizes and/or identifies numerals<br>EM.1.1.6 generates and/or produces numerals<br>EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.1.11 demonstrates understanding of ordinal sequence<br>EM.1.1.12 demonstrates understanding of the values of coins and/or currency<br>EM.1.2.1 matches like numerals<br>EM.1.2.2 counts manipulatives<br>EM.1.2.3 demonstrates understanding of numerical correspondence |
| **M.3.1.1.K3a-c**<br>▲knows, explains, and uses equivalent representations including the use of mathematical models for:<br>a. addition and subtraction of whole numbers from 0 through 1,000 | EM.1.1.1 demonstrates understanding of the concept of more<br>EM.1.1.2 demonstrates understanding of the concept of one<br>EM.1.1.3 counts by rote<br>EM.1.1.4 demonstrates understanding of one to one correspondence<br>EM.1.1.5 recognizes and/or identifies numerals<br>EM.1.1.6 generates and/or produces numerals<br>EM.1.1.13 demonstrates understanding of the equivalencies of coins and/or currency<br>EM.1.2.1 matches like numerals<br>EM.1.2.5 identifies place value<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =) |
| b. multiplication using the basic facts through the 5s and the multiplication facts of the 10s | EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.2.4 identifies subsets<br>EM.1.2.5 identifies place value<br>EM.1.4.4 skip counts by 2, 5, 10, and/or 25<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =) |

**Standard 1 - Number and Computation**: The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| **M.3.1.1.K3a-c, continued**<br>c. addition and subtraction of money | EM.1.1.1 demonstrates understanding of the concept of more<br>EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.1.8 recognizes and/or identifies a whole and/or parts of a whole<br>EM.1.1.9 recognizes coins and/or currency<br>EM.1.1.10 identifies symbols for dollar and cents notations<br>EM.1.1.12 demonstrates understanding of the values of coins and/or currency<br>EM.1.1.13 demonstrates understanding of the equivalencies of coins and/or currency<br>EM.1.2.5 identifies place value<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take-away<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers<br>EM.1.4.8 performs addition and subtraction on monetary values |
| **M.3.1.1.K4**<br>▲N determines the value of mixed coins and bills with a total value of $50 or less | EM.1.1.1 demonstrates understanding of the concept of more<br>EM.1.1.4 demonstrates understanding of one to one correspondence<br>EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.1.8 recognizes and/or identifies a whole and/or parts of a whole<br>EM.1.1.9 recognizes coins and/or currency<br>EM.1.1.10 identifies symbols for dollar and cents notations<br>EM.1.1.12 demonstrates understanding of the values of coins and/or currency<br>EM.1.1.13 demonstrates understanding of the equivalencies of coins and/or currency<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take-away<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.8 performs addition and subtraction on monetary values |

**Standard 1 - Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicator | Extended Indicator |
|---|---|
| **M.3.1.4.K7**<br>▲N identifies multiplication and division fact families through the 5s and the multiplication and division fact families of the 10s | EM.1.1.1 demonstrates understanding of the concept of more<br>EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.2.4 identifies subsets<br>EM.1.4.4 skip counts by 2, 5, 10, and/or 25<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |
| **M.3.1.4.A1a-b**<br>▲N solves one-step real-world addition or subtraction problems with<br>a. whole numbers from 0 through 10,000 | EM.1.1.1 demonstrates understanding of the concept of more<br>EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.2.5 identifies place value<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take-away<br>EM.1.4.2 adds one more to a set<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.9 performs one-step, real-world problems |
| b. monetary amounts using dollar and cents notation through $500.00 | EM.1.1.9 recognizes coins and/or currency<br>EM.1.1.10 identifies symbols for dollar and cents notations<br>EM.1.1.12 demonstrates understanding of the values of coins and/or currency<br>EM.1.1.13 demonstrates understanding of the equivalencies of coins and/or currency<br>EM.1.2.5 identifies place value<br>EM.1.4.8 performs addition and subtraction on monetary values |

**Standard 2 - Algebra:** The student uses algebraic concepts and procedures in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| **M.3.2.1.A2**<br>▲ recognizes multiple representations of the same pattern | EM.2.1.1 recognizes and/or identifies a pattern presented in a variety of formats: numerical, visual, auditory, tactile, pictorial, tables, graphs, or lists<br>EM.2.1.2 matches or generalizes patterns<br>EM.2.1.3 generates and/or produces a pattern |
| **M.3.2.3.K3**<br>▲ generalizes numerical patterns using whole numbers from 0 through 200 with one operation (addition, subtraction) by stating the rule using words | EM.2.1.1 recognizes and/or identifies a pattern presented in a variety of formats: numerical, visual, auditory, tactile, pictorial, tables, graphs, or lists<br>EM.2.1.2 matches or generalizes patterns<br>EM.2.1.3 generates and/or produces a pattern<br>EM.2.1.4 generalizes repeating patterns |

**Standard 3 – Geometry:** The student uses geometric concepts and procedures in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| **M.3.3.1.K4**<br>Recognizes and describes the square, triangle, rhombus, hexagon, parallelogram and trapezoid from a pattern block set | EM.3.1.1 matches three-dimensional shapes and/or manipulatives<br>EM.3.1.2 sorts by specific attributes, three dimensional shapes, and/or manipulatives<br>EM.3.1.3 orders by an attribute<br>EM.3.1.4 recognizes and/or identifies shapes<br>EM.3.1.5 combines and/or separates shapes into different configurations |
| **M.3.3.2.K2**<br>▲ reads and tells time to the minute using analog and digital clocks | EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.3 tells analog and/or digital time |
| **M.3.3.2.A1a, b, e**<br>▲ solves real-world problems by applying appropriate measurements:<br>a. length to the nearest inch, foot, or yard | EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.4 converts within the same measurement system<br>EM.3.2.5 uses estimation to check whether or not results are reasonable |
| b. length to the nearest centimeter or meter | EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.4 converts within the same measurement system<br>EM.3.2.5 uses estimation to check whether or not results are reasonable |
| e. number of days in a week | EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.2 demonstrates understanding of calendar use<br>EM.3.2.4 converts within the same measurement system |

**Standard 4 – Data:** The student uses concepts and procedures of data analysis in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| **M.3.4.1.K2**<br>▲ lists some of the possible outcomes of a simple event in an experiment or simulation including the use of concrete objects | EM.4.1.1 recognizes whether an outcome of an event is impossible (probability=zero) or possible (probability>zero)<br>EM.4.1.2 recognizes the likelihood of possible results or outcomes of a simple event |
| **M.3.4.2.K3 a-d**<br>▲ finds these statistical measures of a data set using whole numbers from 0 through 1,000 with less than ten whole number data points<br>a. minimum and maximum data values, (2) | EM.4.2.1 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc., appropriate for the situation<br>EM.4.2.2 records numerical relationships in tables<br>EM.4.2.3 answers questions based on the results of data collection<br>EM.4.2.6 recognizes appropriate conclusion(s) based upon results of data collection |
| b. range, (1) | EM.4.2.1 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc., appropriate for the situation<br>EM.4.2.2 records numerical relationships in tables<br>EM.4.2.3 answers questions based on the results of data collection<br>EM.4.2.6 recognizes appropriate conclusion(s) based upon results of data collection |
| c. mode, (1) | EM.4.2.1 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc., appropriate for the situation<br>EM.4.2.2 records numerical relationships in tables<br>EM.4.2.3 answers questions based on the results of data collection<br>EM.4.2.6 recognizes appropriate conclusion(s) based upon results of data collection |
| d. median when data set has an odd number of data points. | EM.4.2.1 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc., appropriate for the situation<br>EM.4.2.2 records numerical relationships in tables<br>EM.4.2.3 answers questions based on the results of data collection<br>EM.4.2.6 recognizes appropriate conclusion(s) based upon results of data collection |

**Standard 1 – Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| **M.4.1.2.K1**<br>▲ identifies, models, reads, and writes numbers using numerals, words, and expanded notation from hundredths place through one-hundred thousand's place (2.4.K1b,d) | EM.1.1.1 demonstrates understanding of the concept of more<br>EM.1.1.3 counts by rote<br>EM.1.1.5 recognizes and/or identifies numerals<br>EM.1.1.6 generates and/or produces numerals<br>EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.1.11 demonstrates understanding of ordinal sequence<br>EM.1.2.2 counts manipulatives<br>EM.1.2.3 demonstrates understanding of numerical correspondence<br>EM.1.2.5 identifies place value |
| **M.4.1.2.K5 a-d**<br>▲ uses the concepts of these properties with the whole number system and demonstrates their meaning including the use of concrete objects (2.4.K1a)<br>a. commutative properties of addition and multiplication | EM.1.2.3 demonstrates understanding of numerical correspondence<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |
| **M.4.1.2.K5 a-d, continued**<br>b. zero property of addition (additive identity) and property of one for multiplication (multiplicative identity) | EM.1.2.3 demonstrates understanding of numerical correspondence<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |
| c. associative properties of addition and multiplication | EM.1.2.3 demonstrates understanding of numerical correspondence<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |
| d. symmetric property of equality applied to addition and multiplication | EM.1.2.3 demonstrates understanding of numerical correspondence<br>EM.1.2.4 identifies subsets<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |

**Standard 1– Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| **M.4.1.4.K6 a-d**<br>▲ **N** shows the relationship including the use of mathematical models between these operations with the basic fact families [limited to 2 - 5, 10 for multiplication and division]<br>a. addition and subtraction, | EM.1.1.1 demonstrates understanding of the concept of more<br>EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take-away<br>EM.1.4.2 adds one more to a set<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |
| b. addition and multiplication, | EM.1.1.1 demonstrates understanding of the concept of more<br>EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take-away<br>EM.1.4.2 adds one more to a set<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =) |
| c. multiplication and division, | EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.4.5 demonstrates understanding of multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |
| d. subtraction and division. | EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take-away<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =) |

## 4th Grade - Mathematics

**Standard 1– Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| **M.4.1.4.A1 a-e**<br>▲**N** solves one- and two-step [one step only, with calculator] real-world problems with one or two [one] operations using these computational procedures<br>a. adds and subtracts whole numbers from 0 through 10,000 and when used as monetary amounts | EM.1.1.9 recognizes coins and/or currency<br>EM.1.1.10 identifies symbols for dollar and cents notations<br>EM.1.1.12 demonstrates understanding of the values of coins and/or currency<br>EM.1.2.5 identifies place value<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take-away<br>EM.1.4.2 adds one more to a set<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers<br>EM.1.4.8 performs addition and subtraction on monetary values<br>EM.1.4.9 performs one-step, real-world problems |
| b. multiplies through a two-digit whole number by a two-digit whole number | EM.1.1.5 recognizes and/or identifies numerals<br>EM.1.1.6 generates and/ or produces numerals<br>EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.2.5 identifies place value<br>EM.1.4.4 skip counts by 2, 5, 10, and/or 25<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, -, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers<br>EM.1.4.9 performs one-step, real-world problems |
| c. multiplies whole dollar monetary amounts (up through three-digit) by a one- or two-digit whole number | EM.1.1.6 generates and/or produces numerals<br>EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.1.9 recognizes coins and/or currency<br>EM.1.1.10 identifies symbols for dollar and cents notations<br>EM.1.1.12 demonstrates understanding of the values of coins and/or currency<br>EM.1.1.13 demonstrates understanding of the equivalencies of coins and/or currency<br>EM.1.2.5 identifies place value<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |

**Standard 1– Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| **M.4.1.4.A1 a-e, continued**<br>d. multiplies monetary amounts less than $100 by whole numbers less than ten | EM.1.1.6 generates and/or produces numerals<br>EM.1.1.9 recognizes coins and/or currency<br>EM.1.1.10 identifies symbols for dollar and cents notations<br>EM.1.1.12 demonstrates understanding of the values of coins and/or currency<br>EM.1.1.13 demonstrates understanding of the equivalencies of coins and/or currency<br>EM.1.2.5 identifies place value<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |
| e. figures correct change through $20.00 | EM.1.1.9 recognizes coins and/or currency<br>EM.1.1.10 identifies symbols for dollar and cents notations<br>EM.1.1.12 demonstrates understanding of the values of coins and/or currency<br>EM.1.1.13 demonstrates understanding of the equivalencies of coins and/or currency<br>EM.1.2.5 identifies place value<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers<br>EM.1.4.8 performs addition and subtraction on monetary values |

**Standard 2 – Algebra:** The student uses algebraic concepts and procedures in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| **M.4.2.2.K2 a-c**<br>▲ solves one-step equations using whole numbers with one variable and a whole number solution that:<br>a. find the unknown in a multiplication or division equation based on the multiplication and division facts for numbers from 1X1 through 12X12 | EM.2.2.1 demonstrates understanding that a constant represents a quantity that remains the same<br>EM.2.2.2 demonstrates understanding of none (empty set), is less than, is more than, is equal to, and/or is not equal to (∅, <, >, =, ≠)<br>EM.2.2.3 generates and/or solves one-step equations with one unknown using addition, subtraction, multiplication, and/or division |
| b. find the unknown in a money equation using multiplication and division based upon the facts and addition and subtraction with values through $10 | EM.2.2.1 demonstrates understanding that a constant represents a quantity that remains the same<br>EM 2.2.2 demonstrates understanding of none (empty set), is less than, is more than, is equal to, and/or is not equal to (⦸, <, >, =, ≠)<br>EM.2.2.3 generates and/or solves one-step equations with one unknown using addition, subtraction, multiplication, and/or division |
| c. find the unknown in a time equation involving whole minutes | EM.2.2.1 demonstrates understanding that a constant represents a quantity that remains the same<br>EM 2.2.2 demonstrates understanding of none (empty set), is less than, is more than, is equal to, and/or is not equal to ( ∅, <, >, =, ≠)<br>EM.2.2.3 generates and/or solves one-step equations with one unknown using addition, subtraction, multiplication, and/or division |
| **M.4.2.3.A1**<br>▲ represents and describes mathematical relationships between whole numbers from 0 through 1,000 using concrete objects, pictures, written descriptions, symbols, equations, tables, and graphs. | EM.2.3.1 identifies same and/or different<br>EM.2.3.2 matches equivalent sets<br>EM.2.3.3 recognizes relationships involving two or more changes<br>EM.2.3.4 locates, matches, and/or plots distinct variables in sequence along a continuum |
| **M.4.2.3.K2**<br>▲ find the values, determines the rule, and states the rule using symbolic notation with one operation of whole numbers from 0 through 200 using a horizontal or vertical function table (input and/or output machine, T-table) | EM.2.1.3 generates and/or produces a pattern<br>EM.2.2.3 generates and/or solves one-step equations with one unknown using addition, subtraction, multiplication, and/or division<br>EM.2.3.1 identifies same and/or different<br>EM.2.3.3 recognizes relationships involving two or more changes<br>EM.2.3.4 locates, matches, and/or plots distinct variables in sequence along a continuum |

**Standard 3 – Geometry:** The student uses geometric concepts and procedures in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| **M.4.3.1.A2**<br>▲identifies the plane figures (circles, squares, rectangles, triangles, ellipses, rhombi, octagons, hexagons, pentagons, trapezoids) used to form a composite figure | EM.3.1.1 matches three-dimensional shapes and/or manipulatives<br>EM.3.1.2 sorts by specific attributes, three-dimensional shapes, and/or manipulatives<br>EM.3.1.3 orders by an attribute<br>EM.3.1.4 recognizes and/or identifies shapes<br>EM.3.1.5 combines and/or separates shapes into different configurations |
| **M.4.3.2.K2 a-e**<br>▲selects, explains the selection of, and uses measurement tools, units of measure, and degree of accuracy appropriate for a given situation to measure:<br>a. length, width, and height to the nearest fourth of an inch or to the nearest centimeter; | EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.4 converts within the same measurement system<br>EM.3.2.5 uses estimation to check whether or not results are reasonable |
| b. volume to the nearest cup, pint, quart, or gallon; to the nearest liter; or to the nearest whole unit of a nonstandard unit; | EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.4 converts within the same measurement system<br>EM.3.2.5 uses estimation to check whether or not results are reasonable |
| c. weight to the nearest ounce or pound or to the nearest whole unit of a nonstandard unit of measure | EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.4 converts within the same measurement system<br>EM.3.2.5 uses estimation to check whether or not results are reasonable |
| d. temperature to the nearest degree | EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.5 uses estimation to check whether or not results are reasonable |
| e. time including elapsed time | EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.3 tells analog and/or digital time<br>EM.3.2.4 converts within the same measurement system<br>EM.3.2.5 uses estimation to check whether or not results are reasonable |
| **M.4.3.2.A2**<br>▲estimates to check whether or not measurements and calculations for length, width, weight, volume, temperature, time, and perimeter in real-world problems are reasonable | EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.5 uses estimation to check whether or not results are reasonable |

**Standard 3 – Geometry:** The student uses geometric concepts and procedures in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| **M.4.3.3.K2**<br>▲recognizes, performs, and describes one transformation (reflection and/or flip, rotation and/or turn, translation and/or slide) on a two dimensional figure or concrete object | EM.3.3.1 demonstrates understanding of appropriate vocabulary for spatial relationships<br>EM.3.3.2 demonstrates ability to make necessary transformations in real-life situations<br>EM.3.3.3 recognizes two or three-dimensional objects as they would appear from nearby, far away, or different angles<br>EM.3.3.4 gives or follows directions from one location to another |
| **M.4.3.4.K3**<br>▲identifies and plots points as ordered pairs in the first quadrant of a coordinate plane (coordinate grid) | EM.3.3.1 demonstrates understanding of appropriate vocabulary for spatial relationships<br>EM.3.3.4 gives or follows directions from one location to another<br>EM.3.3.5 uses a map to find a location<br>EM.3.3.6 traces a route on a map |
| **M.4.4.2.K1 b-i**<br>▲organizes, displays, and reads numerical (quantitative) and non-numerical (qualitative) data in a clear, organized, and accurate manner including<br>a. title, labels, categories, and whole number intervals using these data displays:<br>b. pictographs with a symbol or picture representing one, two, five, ten, twenty-five,[one, five, ten and whole symbols] or one-hundred including partial symbols when the symbol represents an even amount<br>c. frequency tables (tally marks)<br>d. horizontal and vertical bar graphs<br>e. Venn diagrams or other pictorial displays, glyphs<br>f. line plots<br>g. charts and tables<br>h. line graphs<br>i. circle graphs | EM.4.2.1 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc., appropriate for the situation<br>EM.4.2.2 records numerical relationships in tables<br>EM.4.2.3 answers questions based on the results of data collection<br>EM.4.2.4 describes data by constructing a graph, chart, or physical display |

**Standard 4 – Data:** The student uses concepts and procedures of data analysis in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| **M.4.4.2.A2 a-e**<br>▲uses these statistical measures of a data set using whole numbers from 0 through 1,000 with less than ten whole number data points to make reasonable inferences and predictions, answer questions, and make decisions:<br>a. minimum and maximum values<br>b. range<br>c. mode<br>d. median when the data set has an odd number of data points<br>e. mean when the data set has a whole number mean | EM.4.2.1 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc., appropriate for the situation<br>EM.4.2.2 records numerical relationships in tables<br>EM.4.2.3 answers questions based on the results of data collection<br>EM.4.2.6 recognizes appropriate conclusion based on results of data collection |

## 5th Grade - Mathematics

**Standard 1 – Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| **M.5.1.1.K1a-c**<br>▲knows, explains, and uses equivalent representations for:<br>a. whole numbers from 0 through 1,000,000 | EM.1.1.3 counts by rote<br>EM.1.1.6 generates and/or produces numerals<br>EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.1.11 demonstrates understanding of ordinal sequence<br>EM.1.2.2 counts manipulatives<br>EM.1.2.3 demonstrates understanding of numerical correspondence |
| b. fractions greater than or equal to zero (including mixed numbers) | EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.1.8 recognizes and/or identifies a whole and/or parts of a whole |
| c. decimals greater than or equal to zero through hundredths place and when used as monetary amounts | EM.1.1.3 counts by rote<br>EM.1.1.6 generates and/or produces numerals<br>EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.1.10 identifies symbols for dollar and cents notation<br>EM.1.1.11 demonstrates understanding of ordinal sequence<br>EM.1.1.12 demonstrates understanding of the values of coins and/or currency<br>EM.1.1.13 demonstrates understanding of the equivalencies of coins and/or currency<br>EM.1.2.2 counts manipulatives |
| **M.5.1.3.K2**<br>▲uses various estimation strategies to estimate whole number quantities from 0 through 100,000; fractions greater than or equal to zero (including mixed numbers) decimals greater than or equal to zero through hundredths place; and monetary amounts to $10,000 and explains the process used. | EM.1.1.10 identifies symbols for dollar and cents notations<br>EM.1.1.12 demonstrates understanding of the value of coins and/or currency<br>EM.1.1.13 demonstrates understanding of the equivalencies of coins and/or currency<br>EM.1.3.1 identifies and/or estimates a little more, a little less, or about the same<br>EM.1.3.2 rounds whole numbers<br>EM.1.3.3 estimates amount of purchase<br>EM.1.3.4 estimates quantities and checks whether or not results are reasonable |
| **M.5.1.3.A4**<br>▲determines if a real-world problem calls for an exact or approximate answer and performs the appropriate computation using various computational methods including mental math, paper and pencil, concrete materials, and appropriate technology | EM.1.1.10 identifies symbols for dollar and cents notations<br>EM.1.1.12 demonstrates understanding of the value of coins and/or currency<br>EM.1.1.13 demonstrates understanding of the equivalencies of coins and/or currency<br>EM.1.3.1 identifies and/or estimates a little more, a little less, or about the same<br>EM.1.3.2 rounds whole numbers<br>EM.1.3.3 estimates amount of purchase<br>EM.1.3.4 estimates quantities and checks whether or not results are reasonable |

## 5th Grade - Mathematics

**Standard 1 – Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| **M.5.1.4.K4**<br>▲identifies, explains, and finds the greatest common factor and least common multiple of two or more whole numbers through the basic multiplication facts (2.4.K1) | EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take-away<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |
| **M.5.1.4.A1 a-f**<br>▲ solves one and two step real-world problems using these computational procedures : [can use a calculator]<br>a. adds and subtracts whole numbers from 0 through 100,000 | EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.2.5 identifies place value<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together and/or subtract means take-away<br>EM.1.4.2 adds one more to a set<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers<br>EM.1.4.8 performs addition and subtraction on monetary values<br>EM.1.4.9 performs one-step, real-world problems |
| b. multiplies through a four-digit whole number by a two-digit whole number | EM.1.1.5 recognizes and/or identifies numerals<br>EM.1.1.6 generates and/or produces numerals<br>EM.1.2.5 identifies place value<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers<br>EM.1.4.9 performs one-step, real-world problems |

**Standard 1 – Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| **M.5.1.4.A1 a-f** (continued)<br>c. multiplies monetary amounts by a one- or two-digit whole number | EM.1.1.5 recognizes and/or identifies numerals<br>EM.1.1.6 generates and/or produces numerals<br>EM.1.1.10 identifies symbols for dollar and cents notations<br>EM.1.1.12 demonstrates understanding of the values of coins and/or currency<br>EM.1.2.5 identifies place value<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers<br>EM.1.4.9 performs one-step, real-world problems |
| d. divides whole numbers through a 2-digit divisor and a 4-digit dividend with the remainder as a whole number or a fraction | EM.1.1.5 recognizes and/or identifies numerals<br>EM.1.1.6 generates and/or produces numerals<br>EM.1.1.8 recognizes and/or identifies a whole and/or parts of a whole<br>EM.1.2.5 identifies place value<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers<br>EM.1.4.9 performs one-step, real-world problems |
| e. adds and subtracts decimals from thousands place through hundredths place (The set of decimal numbers includes whole numbers.) | EM.1.1.8 recognizes and/or identifies a whole and/or parts of a whole<br>EM.1.2.5 identifies place value<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take-away<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.8 performs addition and subtraction on monetary values<br>EM.1.4.9 performs one-step, real-world problems |

**Standard 1 – Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| M.5.1.4.A1 a-f (continued)<br>f. multiplies and divides by 10, 100, and 1,000 and single digit multiples of each | EM.1.1.5 recognizes and/or identifies numerals<br>EM.1.1.6 generates and/or produces numerals<br>EM.1.2.5 identifies place value<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers<br>EM.1.4.9 performs one-step, real-world problems |

**Standard 2 – Algebra:** The student uses algebraic concepts and procedures in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| **M.5.2.2.K1**<br>▲explains and uses variables and symbols to represent unknown whole number quantities from 0 through 1,000 and variable relationships | EM.2.2.1 demonstrates understanding that a constant represents a quantity that remains the same<br>EM.2.2.2 demonstrates understanding of none (empty set), is less than, is more than, is equal to, and/or is not equal to (∅, <, >, =, ≠) |
| **M.5.2.2.K2**<br>▲solves one-step linear equations with one variable and a whole number solution using addition and subtraction with whole numbers from 0 through 100 and multiplication with the basic facts | EM.2.2.1 demonstrates understanding that a constant represents a quantity that remains the same<br>EM.2.2.2 demonstrates understanding of none (empty set), is less than, is more than, is equal to, and/or is not equal to (∅, <, >, =, ≠)<br>EM.2.2.3 generates and/or solves one-step equations with one unknown using addition, subtraction, multiplication, and/or division |
| **M.5.2.3.K4**<br>▲uses a function table (input and/or output machine, T-table) to identify, plot, and label the ordered pairs in the first quadrant of a coordinate plane | EM.2.1.3 generates and/or produces a pattern<br>EM.2.3.1 identifies same and/or different<br>EM.2.3.3 recognizes relationships involving two or more changes<br>EM.2.3.4 locates, matches, and/or plots distinct variables in sequence along a continuum |

**Standard 3 – Geometry:** The student uses geometric concepts and procedures in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.5.3.1.K3**<br>▲recognizes and describes the solids (cubes, rectangular prisms, cylinders, cones, spheres, triangular prisms, rectangular pyramids, triangular pyramids) using the terms faces, edges, and vertices (corners) | EM.3.1.1 matches three-dimensional shapes and/or manipulatives<br>EM.3.1.2 sorts by specific attributes, three-dimensional shapes, and/or manipulatives<br>EM.3.1.3 orders by an attribute<br>EM.3.1.4 recognizes and/or identifies shapes<br>EM.3.1.5 combines and/or separates shapes into different configurations |
| **M.5.3.1.A1a**<br>▲solves real-world problems by applying the properties of:<br>a. plane figures (circles, squares, rectangles, triangles, ellipses, rhombi, parallelograms, hexagons, pentagons) [exclude parallelograms], and the line(s) of symmetry | EM.3.1.1 matches three-dimensional shapes and/or manipulatives<br>EM.3.1.2 sorts by specific attributes, three-dimensional shapes, and/or manipulatives<br>EM.3.1.3 orders by an attribute<br>EM.3.1.4 recognizes and/or identifies shapes<br>EM.3.1.5 combines and/or separates shapes into different configurations |
| **M.5.3.2.K4a**<br>▲converts within the customary system:<br>a. inches and feet, feet and yards, inches and yards, cups and pints, pints and quarts, quarts and gallons, pounds and ounces | EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.4 converts within the same measurement system |
| **M.5.3.2.A1a,c,f-h**<br>▲solves real-world problems by applying appropriate measurements and measurement formulas:<br>a. length to the nearest eighth of an inch or to the nearest centimeter | EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.4 converts within the same measurement system<br>EM.3.2.5 uses estimation to check whether or not results are reasonable |
| c. weight to the nearest whole unit (pounds, grams, nonstandard units) | EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.4 converts within the same measurement system<br>EM.3.2.5 uses estimation to check whether or not results are reasonable |

**Standard 3 – Geometry:** The student uses geometric concepts and procedures in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.5.3.2.A1a,c,f-h** (continued)<br>f. months in a year and minutes in an hour | EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.2 demonstrates understanding of calendar use<br>EM.3.2.4 converts within the same measurement system<br>EM.3.2.5 uses estimation to check whether or not results are reasonable |
| g. perimeter of squares, rectangles, and triangles | EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.4 converts within the same measurement system<br>EM.3.2.5 uses estimation to check whether or not results are reasonable |
| h. area of squares and rectangles | EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.4 converts within the same measurement system<br>EM.3.2.5 uses estimation to check whether or not results are reasonable |
| **M.5.3.3.K3**<br>▲ recognizes three-dimensional figures (rectangular prisms, cylinders, cones, spheres, triangular prisms, rectangular pyramids) from various perspectives (top, bottom, side, corners) | EM.3.1.2 sorts by specific attributes, three-dimensional shapes, and/or manipulatives<br>EM.3.3.1 demonstrates understanding of appropriate vocabulary for spatial relationships<br>EM.3.3.2 demonstrates ability to make necessary transformations in real-life situations<br>EM.3.3.3 recognizes two or three-dimensional objects as they would appear from nearby, far away or different angles |

**Standard 4 –Data:** The student uses concepts and procedures of data analysis in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.5.4.1.A1**<br>▲ conducts an experiment or simulation with a simple event including the use of concrete materials; records the results in a chart, table, or graph; uses the results to draw conclusions about the event; and makes predictions about future events | EM.4.1.1 recognizes whether an outcome of an event is impossible (probability=zero) or possible (probability>zero)<br>EM.4.1.2 recognizes the likelihood of possible results or outcomes of a simple event<br>EM.4.1.3 makes a prediction about what should happen in a given situation. |
| **M.5.4.2.K3a-e**<br>▲identifies, explains, and calculates or finds these statistical measures of a whole number data set of up to twenty whole number data points 0 through 1,000 (2.4.K1a):<br>a. minimum and maximum values<br>b. range<br>c. mode<br>d. median (including answers expressed as a decimal or a fraction without reducing to simplest form)<br>e. mean (including answers expressed as a decimal or a fraction without reducing to simplest form) | EM.4.2.1 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc., appropriate for the situation<br>EM.4.2.2 records numerical relationships in tables<br>EM.4.2.3 answers questions based on the results of data collection<br>EM.4.2.6 recognizes appropriate conclusion based on results of data collection |

**Standard 4 –Data:** The student uses concepts and procedures of data analysis in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.5.4.2.A1b-h**<br>▲interprets and uses data to make reasonable inferences, predictions, and decisions, and to develop convincing arguments from these data displays:<br>b. pictographs<br>c. frequency tables<br>d. bar and line graphs<br>e. Venn diagrams and other pictorial displays<br>f. line plots<br>g. charts and tables<br>h. circle graphs | EM.4.2.1 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc., appropriate for the situation<br>EM.4.2.2 records numerical relationships in tables<br>EM.4.2.3 answers questions based on the results of data collection<br>EM.4.2.4 describes data by constructing a graph, chart, or physical display<br>EM 4.2.5 recognizes credible sources in contrast to misleading representations of information<br>EM.4.2.6 recognizes appropriate conclusion based on results of data collection |

## 6th Grade – Mathematics

**Standard 1 – Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.6.1.1.K2a-c**<br>▲ compares and orders<br>a. integers | EM.1.1.3 counts by rote<br>EM.1.1.5 recognizes and/or identifies numerals<br>EM.1.1.6 generates and/or produces numerals<br>EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.1.11 demonstrates understanding of ordinal sequence<br>EM.1.2.1 matches like numerals<br>EM.1.2.2 counts manipulatives<br>EM.1.2.3 demonstrates understanding of numerical correspondence |
| b. fractions greater than or equal to zero | EM.1.1.3 counts by rote<br>EM.1.1.5 recognizes and/or identifies numerals<br>EM.1.1.6 generates and/or produces numerals<br>EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.1.8 recognizes and/or identifies a whole and/or parts of a whole<br>EM.1.1.11 demonstrates understanding of ordinal sequence<br>EM.1.2.1 matches like numerals<br>EM.1.2.2 counts manipulatives<br>EM.1.2.3 demonstrates understanding of numerical correspondence |
| c. decimals greater than or equal to zero through thousandths place | EM.1.1.3 counts by rote<br>EM.1.1.5 recognizes and/or identifies numerals<br>EM.1.1.6 generates and/or produces numerals<br>EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.1.11 demonstrates understanding of ordinal sequence<br>EM.1.1.12 demonstrates understanding of the values of coins and/or currency<br>EM.1.2.1 matches like numerals<br>EM.1.2.2 counts manipulatives<br>EM.1.2.3 demonstrates understanding of numerical correspondence |

## 6th Grade – Mathematics

**Standard 1 – Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| **M.6.1.1.K4**<br>▲knows and explains numerical relationships between percents, decimals, and fractions between 0 and 1 | EM.1.1.5 recognizes and/or identifies numerals<br>EM.1.1.6 generates and/or produces numerals<br>EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.1.8 recognizes and/or identifies a whole and/or parts of a whole<br>EM.1.1.13 demonstrates understanding of the equivalencies of coins and/or currency |
| **M.6.1.3.A2**<br>▲**N** estimates to check whether or not the result of a real-world problem using rational numbers and/or the irrational number pi is reasonable and makes predictions based on the information. | EM.1.1.12 demonstrates understanding of the value of coins and/or currency<br>EM.1.3.1 identifies and/or estimates a little more, a little less, or about the same<br>EM.1.3.2 rounds whole numbers<br>EM.1.3.3 estimates amount of purchase<br>EM.1.3.4 estimates quantities and checks whether or not results are reasonable |
| **M.6.1.4.K2a & f**<br>▲Performs and explains these computational procedures :<br>a. **N** divides whole numbers through a 2-digit divisor and a 4-digit dividend and expresses the remainder as a whole number, fraction, or decimal | EM.1.2.2 counts manipulatives<br>EM.1.4.4 skip counts by 2, 5, 10, and/or 25<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |
| f. **N** adds, subtracts, and multiplies fractions (including mixed numbers) expressing answers in simplest form | EM.1.1.8 recognizes and/or identifies a whole and/or parts of a whole<br>EM.1.2.2 counts manipulatives<br>EM.1.2.3 demonstrates understanding of numerical correspondence<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take away<br>EM.1.4.2 adds one more to a set<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.4 skip counts by 2, 5, 10, and/or 25<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers<br>EM.1.4.8 performs addition and subtraction on monetary values |

## 6th Grade – Mathematics

**Standard 1 – Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicator | Extended Indicators |
|---|---|
| **M.6.1.4.A1b**<br>▲generates and/or solves one- and two-step real-world problems with rational numbers using these computational procedures:<br>b. addition, subtraction, multiplication, and division of decimals through hundredths place | EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.1.12 demonstrates understanding of the value of coins and/or currency<br>EM.1.1.13 demonstrates understanding of the equivalencies of coins and/or currency<br>EM.1.2.5 identifies place value<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take away<br>EM.1.4.2 adds one more to a set<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers<br>EM.1.4.8 performs addition and subtraction on monetary values<br>EM.1.4.9 performs one-step, real-world problems |

**Standard 2 – Algebra:** The student uses algebraic concepts and procedures in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.6.2.1.K4**<br>▲ states the rule to find the next number of a pattern with one operational change (addition, subtraction, multiplication, division) to move between consecutive terms | EM.2.1.1 recognizes and/or identifies a pattern presented in a variety of formats: numerical, visual, auditory, tactile, pictorial, tables, graphs, or lists<br>EM.2.1.2 matches or generalizes patterns<br>EM.2.1.3 generates and/or produces a pattern<br>EM.2.1.4 generalizes repeating patterns |
| **M.6.2.2.A1b**<br>▲ represents real-world problems using variables and symbols to:<br>b. write and/or solve one-step equations (addition, subtraction, multiplication, and division) | EM.2.2.1 demonstrates understanding that a constant represents a quantity that remains the same<br>EM.2.2.2 demonstrates understanding of none (empty set), is less than, is more than, is equal to, and/or is not equal to (∅, <, >, =,≠)<br>EM.2.2.3 generates and/or solves one-step equations with one unknown using addition, subtraction, multiplication, and/or division<br>EM.2.2.4 demonstrates understanding of how changes in one variable affect other variables |

**Standard 3 – Geometry:** The student uses geometric concepts and procedures in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.6.3.1.K7a-b**<br>▲classifies:<br>a. angles as right, obtuse, acute, or straight<br>b. triangles as right, obtuse, acute, scalene, isosceles, or equilateral | EM.3.1.1 matches three-dimensional shapes and/or manipulatives<br>EM.3.1.2 sorts by specific attributes, three-dimensional shapes, and/or manipulatives<br>EM.3.1.3 orders by an attribute<br>EM.3.1.4 recognizes and/or identifies shapes |
| **M.6.3.2.K3b**<br>▲converts:<br>b. within the metric system using the prefixes: kilo, hector, deka, deci, centi, milli | EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.4 converts within the same measurement system<br>EM.3.2.5 uses estimation to check whether or not results are reasonable |
| **M.6.3.2.A1a-b**<br>▲solves real-world problems by applying measurement formulas<br>a. perimeter of polygons using the same unit of measurement formulas | EM.3.1.4 recognizes and/or identifies shapes<br>EM.3.1.5 combines and/or separates shapes into different configurations<br>EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.4 converts within the same measurement system<br>EM.3.2.5 uses estimation to check whether or not results are reasonable |
| b. area of squares, rectangles, and triangles, using the same unit of measurement formulas | EM.3.1.4 recognizes and/or identifies shapes<br>EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.4 converts within the same measurement system<br>EM.3.2.5 uses estimation to check whether or not results are reasonable |
| **M.6.3.3.K1**<br>▲identifies, describes, and performs one or two transformations (reflection, rotation, translation) on a two-dimensional figure | EM.3.3.1 demonstrates understanding of appropriate vocabulary for spatial relationships<br>EM.3.3.2 demonstrates ability to make necessary transformations in real-life situations<br>EM.3.3.3 recognizes two or three-dimensional objects as they would appear from nearby, far away or different angles<br>EM.3.3.4 gives or follows directions from one location to another<br>EM.3.3.5 uses a map to find a location<br>EM.3.3.6 traces a route on a map |
| **M.6.3.4.K3a-b**<br>▲uses all four quadrants of the coordinate plane to:<br>a. identify ordered pairs of integer values on a given graph<br>b. graph ordered pairs of integer values | EM.3.3.1 demonstrates understanding of appropriate vocabulary for spatial relationships<br>EM.3.3.4 gives or follows directions from one location to another<br>EM.3.3.5 uses a map to find a location<br>EM.3.3.6 traces a route on a map |

**Standard 4 – Data:** The student knows and uses concepts and procedures of data analysis in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.6.4.1.K2**<br>▲lists all possible outcomes of an experiment or simulation with a compound event composed of two independent events in a clear and organized way | EM.4.1.1 recognizes whether an outcome of an event is impossible (probability=zero) or possible (probability>zero)<br>EM.4.1.2 recognizes the likelihood of possible results or outcomes of a simple event<br>EM.4.1.3 makes a prediction about what should happen in a given situation. |
| **M.6.4.1.K4**<br>▲represents the probability of a simple event in an experiment or simulation using fractions and decimals | EM.4.1.1 recognizes whether an outcome of an event is impossible (probability=zero) or possible (probability≠zero)<br>EM.4.1.2 recognizes the likelihood of possible results or outcomes of a simple event |

## 7th Grade - Mathematics

**Standard 1 – Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicators | Extended Indicators | |
|---|---|---|
| **M.7.1.1.A1a**<br>▲generates and/or solves real-world problems using<br>a. equivalent representations of rational numbers and simple algebraic expressions | EM.1.1.1<br>EM.1.1.3<br>EM.1.1.4<br>EM.1.1.6<br>EM.1.1.7<br>EM.1.1.11<br>EM.1.1.12<br>EM.1.1.13<br>EM.1.2.2<br>EM.1.2.3 | demonstrates understanding of the concept of more<br>counts by rote<br>demonstrates understanding of one to one correspondence<br>generates and/or produces numerals<br>demonstrates understanding of numbers greater than one<br>demonstrates understanding of ordinal sequence<br>demonstrates understanding of the values of coins and/or currency<br>demonstrates understanding of the equivalencies of coins and/or currency<br>counts manipulatives<br>demonstrates understanding of numerical correspondence |
| **M.7.1.4.K2a-d**<br>▲ performs and explains these computational procedures:<br>a. **N** adds and subtracts decimals from ten millions place through hundred thousandths place; | EM.1.2.2<br>EM.1.4.1<br>EM.1.4.2<br>EM.1.4.3<br>EM.1.4.4<br>EM.1.4.6<br>EM.1.4.7<br>EM.1.4.8 | counts manipulatives<br>demonstrates understanding that add means combine and/or put together; and/or subtract means take away<br>adds one more to a set<br>adds or subtracts to create a new set<br>skip counts by 2, 5, 10, and/or 25<br>demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers<br>performs addition and subtraction on monetary values |
| **M.7.1.4.K2a-d**<br>b. **N** multiplies and divides a four-digit number by a two-digit number using numbers from thousands place through thousandths place; | EM.1.2.2<br>EM.1.4.4<br>EM.1.4.5<br>EM.1.4.6<br>EM.1.4.7 | counts manipulatives<br>skip counts by 2, 5, 10, and/or 25<br>demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |
| **M.7.1.4.K2a-d,** continued<br>c. **N** multiplies and divides using numbers from thousands place through thousandths place by 10; 100; 1,000; .1; .01; .001; or single-digit multiples of each | EM.1.2.2<br>EM.1.4.4<br>EM.1.4.5<br>EM.1.4.6<br>EM.1.4.7 | counts manipulatives<br>skip counts by 2, 5, 10, and/or 25<br>demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |

**Standard 1 – Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.7.1.4.K2a-d,** continued<br>d. N adds, subtracts, multiplies, and divides fractions and expresses answers in simplest form | EM.1.2.2 counts manipulatives<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take away<br>EM 1.4.2 adds one more to a set<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.4 skip counts by 2, 5, 10, and/or 25<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |
| **M.7.1.4.K5**<br>▲ finds percentages of rational numbers | EM.1.4.4 skip counts by 2, 5, 10, and/or 25<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |
| **M.7.1.4.A1a**<br>▲ generates and/or solves one- and two-step real-world problems using these computational procedures and mathematical concepts:<br>a. addition, subtraction, multiplication, and division of rational numbers with a special emphasis on fractions and expressing answers in simplest form | EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.1.8 recognizes and/or identifies a whole and/or parts of a whole<br>EM.1.1.12 demonstrates understanding of the value of coins and/or currency<br>EM.1.1.13 demonstrates understanding of the equivalencies of coins and/or currency<br>EM.1.2.5 identifies place value<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take away<br>EM.1.4.2 adds one more to a set<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers<br>EM.1.4.8 performs addition and subtraction on monetary values<br>EM.1.4.9 performs one-step, real-world problems |

**Standard 2 – Algebra:** The student uses algebraic concepts and procedures in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.7.2.1.K1a-b**<br>▲identifies, states, and continues a pattern presented in various formats including numeric (list or table), algebraic (symbolic notation), visual (picture, table, or graph), verbal (oral description), kinesthetic (action), and written using these attributes:<br>a. counting numbers including perfect squares, cubes, and factors and multiples (number theory)<br>b. positive rational numbers including arithmetic and geometric sequences; | EM.2.1.1 recognizes and/or identifies a pattern presented in a variety of formats: numerical, visual, auditory, tactile, pictorial, tables, graphs, or lists<br>EM.2.1.2 matches or generalizes patterns<br>EM.2.1.3 generates and/or produces a pattern<br>EM.2.1.4 generalizes repeating patterns |
| **M.7.2.1.K4**<br>▲ ■ states the rule to find the $n^{th}$ term of a pattern with one operational change (addition or sub-traction) between consecutive terms | EM.2.1.1 recognizes and/or identifies a pattern presented in a variety of formats: numerical, visual, auditory, tactile, pictorial, tables, graphs, or lists<br>EM.2.1.2 matches or generalizes patterns<br>EM.2.1.3 generates and/or produces a pattern<br>EM.2.1.4 generalizes repeating patterns |
| **M.7.2.2.A1**<br>▲ represents real-world problems using variables and symbols to write linear expressions, one- or two-step equations | EM.2.2.1 demonstrates understanding that a constant represents a quantity that remains the same<br>EM.2.2.2 demonstrates understanding of none (empty set), is less than, is more than, is equal to, and/or is not equal to (∅, <, >, =,≠)<br>EM.2.2.3 generates and/or solves one-step equations with one unknown using addition, subtraction, multiplication, and/or division<br>EM.2.2.4 demonstrates understanding of how changes in one variable affect other variables<br>EM.2.4.3 recognizes the same situation can be represented in more than one way |
| **M.7.2.2.K7**<br>▲ knows the mathematical relationship between ratios, proportions, and percents and how to solve for a missing term in a proportion with positive rational number solutions and monomials | EM.2.2.1 demonstrates understanding that a constant represents a quantity that remains the same<br>EM.2.2.2 demonstrates understanding of none (empty set), is less than, is more than, is equal to, and/or is not equal to (∅, <, >, =,≠)<br>EM.2.2.3 generates and/or solves one-step equations with one unknown using addition, subtraction, multiplication, and/or division |
| **M.7.2.2.K8**<br>▲ evaluates simple algebraic expressions using positive rational numbers | EM.2.2.1 demonstrates understanding that a constant represents a quantity that remains the same<br>EM.2.2.4 demonstrates understanding of how changes in one variable affect other variables<br>EM.2.4.3 recognizes the same situation can be represented in more than one way |

**Standard 3 – Geometry:** The student uses geometric concepts and procedures in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.7.3.1.K3a-g**<br>▲identifies angle and side properties of triangles and quadrilaterals:<br>a. sum of the interior angles of any triangle is 180°<br>b. sum of the interior angles of any quadrilateral is 360°<br>c. parallelograms have opposite sides that are parallel and congruent<br>d. rectangles have angles of 90°, opposite sides are congruent<br>e. rhombi have all sides the same length, opposite angles are congruent<br>f. squares have angles of 90°, all sides congruent<br>g. trapezoids have one pair of opposite sides parallel and the other pair of opposite sides are not parallel | EM.3.1.1 matches three-dimensional shapes and/or manipulatives<br>EM.3.1.2 sorts by specific attributes, three-dimensional shapes, and/or manipulatives<br>EM.3.1.3 orders by an attribute<br>EM.3.1.4 recognizes and/or identifies shapes |
| **M.7.3.2.K4**<br>▲knows and uses perimeter and area formulas for circles, squares, rectangles, triangles, and parallelograms | EM.3.1.1 matches three-dimensional shapes and/or manipulatives<br>EM.3.1.4 recognizes and/or identifies shapes<br>EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.4 converts within the same measurement system<br>EM.3.2.5 use estimation to check whether or not results are reasonable |
| **M.7.3.2.A1c**<br>▲solves real-world problems by:<br>c. finding perimeter and area of two-dimensional composite figures of squares, rectangles, and triangles | EM.3.1.4 recognizes and/or identifies shapes<br>EM.3.1.5 combines and/or separates shapes into different configurations<br>EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.4 converts within the same measurement system<br>EM.3.2.5 use estimation to check whether or not results are reasonable |

**Standard 3 – Geometry:** The student uses geometric concepts and procedures in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.7.3.2.K6**<br>▲uses given measurement formulas to find<br>a. surface area of cubes<br>b. volume of rectangular prisms | EM.3.1.4 recognizes and/or identifies shapes<br>EM.3.2.1 selects and uses appropriate measurement tool(s) and/or vocabulary<br>EM.3.2.4 converts within the same measurement system<br>EM.3.2.5 uses estimation to check whether or not results are reasonable |
| **M.7.3.3.A3**<br>▲determines the actual dimensions and/or measurements of a two-dimensional figure represented in a scale drawing | EM.3.1.4 recognizes and/or identifies shapes<br>EM.3.3.1 demonstrates understanding of appropriate vocabulary for spatial relationships<br>EM.3.3.2 demonstrates ability to make necessary transformations in real-life situations<br>EM.3.3.3 recognizes two or three-dimensional objects as they would appear from nearby, far away, or different angles<br>EM.3.3.5 uses a map to find a location<br>EM.3.3.6 traces a route on a map |

**Standard 4 – Data:** The student uses concepts and procedures of data analysis in a variety of situations.

| General Indicators | Extended Indicators in appropriate-level context |
|---|---|
| **M.7.4.2.K1a-g**<br>▲ organizes, displays, and reads quantitative (numerical) and qualitative (non-numerical) data in a clear, organized, and accurate manner including a title, labels, categories, and rational number intervals using these data displays<br>a. frequency tables<br>b. bar, line, and circle graphs<br>c. Venn diagrams or other pictorial displays<br>d. charts and tables;<br>e. stem-and-leaf plots (single)<br>f. scatter plots<br>g. box-and-whiskers plots | EM.4.2.1 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc., appropriate for the situation<br>EM.4.2.2 records numerical relationships in tables<br>EM.4.2.3 answers questions based on the results of data collection<br>EM.4.2.4 describes data by constructing a graph, chart, or other physical display<br>EM.4.2.6 recognizes appropriate conclusion based on results of data collection |
| **M.7.4.2.A3a-b**<br>▲ recognizes and explains<br>a. misleading representations of data<br>b. the effects of scale or interval changes on graphs of data sets | EM.4.2.1 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc., appropriate for the situation<br>EM.4.2.2 records numerical relationships in tables<br>EM.4.2.3 answers questions based on the results of data collection<br>EM.4.2.4 describes data by constructing a graph, chart, or other physical display<br>EM.4.2.5 recognizes credible sources in contrast to misleading representations of information<br>EM.4.2.6 recognizes appropriate conclusion based on results of data collection |

**Standard 1 – Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.8.1.1.K5a-c**<br>▲knows and explains what happens to the product or quotient when:<br>a. positive number is multiplied or divided by a rational number greater than zero and less than one<br>b. a positive number is multiplied or divided by a rational number greater than one<br>c. a nonzero real number is multiplied or divided by zero | EM.1.1.5 recognizes and/or identifies numerals<br>EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.2.4 identifies subsets<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |
| **M.8.1.2.K2**<br>▲identifies all the subsets of the real number system [natural (counting) numbers, whole numbers, integers, rational numbers, irrational numbers] to which a given number belongs. | EM.1.1.5 recognizes and/or identifies numerals<br>EM.1.1.6 generates and/or produces numerals<br>EM.1.2.1 matches like numerals<br>EM.1.2.4 identifies subsets |
| **M.8.1.2.A1a-b**<br>▲generates and/or solves real-world problems with rational numbers using the concepts of these properties to explain reasoning:<br>a. commutative, associative, distributive, and substitution properties<br>b. identity and inverse properties of addition and multiplication | EM.1.2.3 demonstrates understanding of numerical correspondence<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take-away<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+,-,÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |

**Standard 1 – Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicators | Extended Indicators in appropriate-level context |
|---|---|
| **M.8.1.4.A1a-c**<br>▲ generates and/or solves one- and two-step real-world problems using computational procedures and mathematical concepts with:<br>a. rational numbers | EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.1.8 recognizes and/or identifies a whole and/or parts of a whole<br>EM.1.1.12 demonstrates understanding of the value of coins and/or currency<br>EM.1.1.13 demonstrates understanding of the equivalencies of coins and/or currency<br>EM.1.2.5 identifies place value<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take away<br>EM.1.4.2 adds one more to a set<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, -, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers<br>EM.1.4.8 performs addition and subtraction on monetary values<br>EM.1.4.9 performs one-step, real-world problems |
| b. The irrational number pi as an approximation | EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.2.5 identifies place value<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, -, ÷, ×, =)<br>EM.1.4.9 performs one-step, real-world problems |
| c. applications of percents | EM.1.1.8 recognizes and/or identifies a whole and/or parts of a whole<br>EM.1.1.12 demonstrates understanding of the value of coins and/or currency<br>EM.1.1.13 demonstrates understanding of the equivalencies of coins and/or currency<br>EM.1.2.5 identifies place value<br>EM.1.3.3 estimates amount of purchase<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups |

**Standard 1 – Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M8.1.4.K2a-b**<br>▲ performs and explains these computational procedures with rational numbers :<br>a. **N** addition, subtraction, multiplication, and division of integers | EM.1.1.5 recognizes and/or identifies numerals<br>EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.2.5 identifies place value<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take away<br>EM.1.4.2 adds one more to a set<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.4 skip counts by 2, 5, 10, or 25<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, -, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers<br>EM.1.4.9 performs one-step, real-world problems |
| b. **N** order of operations (evaluates within grouping symbols, evaluates powers to the second or third power, multiplies or divides in order from left to right, then adds or subtracts in order from left to right); | EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take-away<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |

## 8th Grade - Mathematics

**Standard 2 – Algebra:** The student uses algebraic concepts and procedures in a variety of situation.

| General Indicators | Extended Indicators |
|---|---|
| **M.8.2.2.A1a**<br>▲represents real-world problems using<br>a. variables, symbols, expressions, one- or two-step equations with rational number coefficients and constants | EM.2.2.1 demonstrates understanding that a constant represents a quantity that remains the same<br>EM.2.2.2 demonstrates understanding of none (empty set), is less than, is more than, is equal to, and/or is not equal to (∅, <, >, =, ≠)<br>EM.2.2.3 generates and/or solves one-step equations with one unknown using addition, subtraction, multiplication, and/or division<br>EM.2.2.4 demonstrates understanding of how changes in one variable affect other variables<br>EM.2.4.3 recognizes the same situation can be represented in more than one way |
| **M.8.2.2.K3a**<br>▲solves<br>a. one and two step linear equations in one variable with rational number coefficients and constants intuitively and/or analytically; | EM.2.2.1 demonstrates understanding that a constant represents a quantity that remains the same<br>EM.2.2.2 demonstrates understanding of none (empty set), is less than, is more than, is equal to, and/or is not equal to (∅, <, >, =, ≠)<br>EM.2.2.3 generates and/or solves one-step equations with one unknown using addition, subtraction, multiplication, and/or division<br>EM.2.2.4 demonstrates understanding of how changes in one variable affect other variables<br>EM.2.4.3 recognizes the same situation can be represented in more than one way |
| **M.8.2.3.A3**<br>▲translates between the numerical, tabular, graphical, and symbolic representations of linear relationships with integer coefficients and constants | EM.2.1.1 recognizes and/or identifies a pattern presented in a variety of formats: numerical, visual, auditory, tactile, pictorial, tables, graphs, or lists<br>EM.2.2.1 demonstrates understanding that a constant represents a quantity that remains the same<br>EM.2.3.1 identifies same and/or different<br>EM.2.3.2 matches equivalent sets<br>EM.2.3.3 recognizes relationships involving two or more changes<br>EM.2.3.4 locates, matches, and/or plots distinct variables in sequence along a continuum<br>EM.2.4.1 demonstrates understanding of attributes which are the same and/or different<br>EM.2.4.2 demonstrates understanding of categorization according to attributes |
| **M.8.2.4.A2**<br>▲determines if a given graphical, algebraic, or geometric model is an accurate representation of a given real-world situation. | EM.2.1.1 recognizes and/or identifies a pattern presented in a variety of formats: numerical, visual, auditory, tactile, pictorial, tables, graphs, or lists<br>EM.2.3.1 identifies same and/or different<br>EM.2.3.4 locates, matches, and/or plots distinct variables in sequence along a continuum<br>EM.2.4.1 demonstrates understanding of attributes which are the same and/or different<br>EM.2.4.2 demonstrates understanding of categorization according to attributes<br>EM.2.4.3 recognizes the same situation can be represented in more than one way |

**Standard 3 – Geometry:** The student uses geometric concepts and procedures in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.8.3.1.A1**<br>▲solves real-world problems by:<br>a. using the properties of corresponding parts of similar and congruent figures | EM.3.1.1 matches three-dimensional shapes and/or manipulatives<br>EM.3.1.2 sorts by specific attributes, three-dimensional shapes, and/or manipulatives<br>EM.3.1.3 orders by an attribute<br>EM.3.3.1 demonstrates understanding of appropriate vocabulary for spatial relationships<br>EM.3.3.5 uses a map to find a location<br>EM.3.3.6 traces a route on a map |
| **M.8.3.1.K6**<br>▲uses the Pythagorean theorem to:<br>a. determine if a triangle is a right triangle<br>b. find a missing side of a right triangle where the lengths of all three sides are whole numbers | EM.3.1.4 recognizes and/or identifies shapes<br>EM.3.1.5 combines and/or separates shapes into different configurations<br>EM.3.3.1 demonstrates understanding of appropriate vocabulary for spatial relationships |
| **M.8.3.4.K1a-c**<br>▲uses the coordinate plane to (2.4.K1a):<br>a. list several ordered pairs on the graph of a line and find the slope of the line<br>b. recognize that ordered pairs that lie on the graph of an equation are solutions to that equation<br>c. determine the length of a side of a figure drawn on a coordinate plane with vertices having the same x- or y-coordinates | EM.3.3.1 demonstrates understanding of appropriate vocabulary for spatial relationships<br>EM.3.3.4 gives or follows directions from one location to another<br>EM.3.3.5 uses a map to find a location<br>EM.3.3.6 traces a route on a map |

**Standard 4 – Data:** The student uses concepts and procedures of data analysis in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.8.4.1.K3**<br>▲finds the probability of a com-pound event composed of two independent events in an experiment, simulation, or situation | EM.4.1.1 recognizes whether an outcome of an event is impossible (probability=zero) or possible (probability≠zero)<br>EM.4.1.2 recognizes the likelihood of possible results or outcomes of a simple event |
| **M.8.4.1.A4**<br>▲makes predictions based on the theoretical probability of :<br>a. a simple event in an experiment or simulation | EM.4.1.1 recognizes whether an outcome of an event is impossible (probability=zero) or possible (probability≠zero)<br>EM.4.1.2 recognizes the likelihood of possible results or outcomes of a simple event<br>EM.4.1.3 makes a prediction about what should happen in a given situation. |
| **M.8.4.2.K3**<br>▲determines and explains the measures of central tendency (mode, median, mean) for a rational number data set | EM.4.2.1 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc., appropriate for the situation<br>EM.4.2.2 records numerical relationships in tables<br>EM.4.2.3 answers questions based on the results of data collection<br>EM.4.2.6 recognizes appropriate conclusion based on results of data collection |

**Standard 1 – Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.HS.1.2.K3a-d**<br>▲names uses, and describes these properties with the real number system and demonstrates their meaning including the use of concrete objects:<br>a. commutative (a+b = b+a and ab = ba), associative a+(b+c)=(a+b+c and a(bc)=(ab)c, distributive [a(b+c)=ab+ac], and substitution properties (if a=2, then 3a=3x2=6) | EM.1.1.4 demonstrates understanding of one to one correspondence<br>EM.1.2.1 matches like numerals<br>EM.1.2.3 demonstrates understanding of numerical correspondence<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take-away<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, -, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |
| b. identity properties for addition and multiplication and inverse properties of addition and multiplication (additive identity: a+0 = a, multiplicative identity: a•1 = a, additive inverse: $^{+}$5+5 = 0, multiplicative inverse: 8x1 and/or 8=1) | EM.1.1.4 demonstrates understanding of one to one correspondence<br>EM.1.2.1 matches like numerals<br>EM.1.2.3 demonstrates understanding of numerical correspondence<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take-away<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, -, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |
| c. addition and multiplication properties of equality (if a = b, then a+c = b+c and if a = b, then ac = bc) and inequalities (if a > b, then a+c > b + c and if a > b, and c > 0 then ac > bc) | EM.1.1.4 demonstrates understanding of one to one correspondence<br>EM.1.2.1 matches like numerals<br>EM.1.2.3 demonstrates understanding of numerical correspondence<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take-away<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, -, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |
| d. zero product property (if ab = 0, then a = 0 and/or = 0) | EM.1.2.3 demonstrates understanding of numerical correspondence<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, -, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |

**Standard 1 – Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.HS.1.3.A1**<br>▲adjusts original rational number estimate of a real-world problem based on additional information (a frame of reference) | EM.1.3.1 identifies and/or estimates a little more, a little less, or about the same<br>EM.1.3.2 rounds whole numbers<br>EM.1.3.3 estimates amount of purchase<br>EM.1.3.4 estimates quantities and checks whether or not results are reasonable |
| **M.HS.1.4.A1a-c**<br>▲generates and/or solves multi-step real-world problems with real numbers and algebraic expressions using computational procedures (addition)<br>a. involve addition, subtraction, multiplication, division, squares, and square roots when the formulae are given as part of the problem and variables are defined | EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.1.12 demonstrates understanding of the value of coins and/or currency<br>EM.1.1.13 demonstrates understanding of the equivalencies of coins and/or currency<br>EM.1.2.5 identifies place value<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take-away<br>EM.1.4.2 adds one more to a set<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers |
| b. ▲volume and surface area given the measurement formulas of rectangular solids and cylinders | EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.2.5 identifies place value<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers<br>EM.1.4.9 performs one-step, real-world problems |

**Standard 1 – Number and Computation:** The student uses numerical and computational concepts and procedures in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| c. ▲application of percents | EM.1.1.7 demonstrates understanding of numbers greater than one<br>EM.1.1.12 demonstrates understanding of the value of coins and/or currency<br>EM.1.1.13 demonstrates understanding of the equivalencies of coins and/or currency<br>EM.1.2.5 identifies place value<br>EM.1.3.3 estimates amount of purchase<br>EM.1.4.1 demonstrates understanding that add means combine and/or put together; and/or subtract means take away<br>EM.1.4.3 adds or subtracts to create a new set<br>EM.1.4.5 demonstrates understanding that multiply means adding equal groups; divide means separating into equal groups<br>EM.1.4.6 demonstrates understanding of mathematical symbols (+, –, ÷, ×, =)<br>EM.1.4.7 uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers<br>EM.1.4.8 performs addition and subtraction on monetary values<br>EM.1.4.9 performs one-step, real-world problems |

**Standard 2 – Algebra:** The student uses algebraic concepts and procedures in a variety of situation.

| General Indicators | Extended Indicators |
|---|---|
| **M.HS.2.2.A2a**<br>▲represents and/or solves real-world problems with<br>a. **N** linear equations and inequalities both analytically and graphically | EM.2.2.1 demonstrates understanding that a constant represents a quantity that remains the same<br>EM.2.2.2 demonstrates understanding of none (empty set), is less than, is more than, is equal to, and/or is not equal to (∅, <, >, =, ≠)<br>EM.2.2.3 generates and/or solves one-step equations with one unknown using addition, subtraction, multiplication, and/or division<br>EM.2.2.4 demonstrates understanding of how changes in one variable affect other variables<br>EM.2.3.4 locates, matches, and/or plots distinct variables in sequence along a continuum<br>EM.2.4.3 recognizes the same situation can be represented in more than one way |
| **M.HS.2.2.K3**<br>▲**N** systems of linear equations with two unknowns using integer coefficients and constants | EM.2.2.1 demonstrates understanding that a constant represents a quantity that remains the same<br>EM.2.2.2 demonstrates understanding of none (empty set), is less than, is more than, is equal to, and/or is not equal to (∅, <, >, =,≠)<br>EM.2.2.3 generates and/or solves one-step equations with one unknown using addition, subtraction, multiplication, and/or division<br>EM.2.2.4 demonstrates understanding of how changes in one variable affect other variables<br>EM.2.3.4 locates, matches, and/or plots distinct variables in sequence along a continuum<br>EM.2.4.3 recognizes the same situation can be represented in more than one way |
| **M.HS.2.3.A2**<br>▲interprets the meaning of the x- and y-intercepts, slope, and/or points on and off the line on a graph in the context of a real-world situation | EM.2.1.1 recognizes and/or identifies a pattern presented in a variety of formats: numerical, visual, auditory, tactile, pictorial, tables, graphs, or lists<br>EM.2.3.1 identifies same and/or different<br>EM.2.3.2 matches equivalent sets<br>EM.2.3.3 recognizes relationships involving two or more changes<br>EM.2.3.4 locates, matches, and/or plots distinct variables in sequence along a continuum<br>EM.2.4.1 demonstrates understanding of attributes which are the same and/or different<br>EM.2.4.2 demonstrates understanding of categorization according to attributes |

**Standard 2 – Algebra:** The student uses algebraic concepts and procedures in a variety of situation.

| General Indicators | Extended Indicators |
|---|---|
| **M.HS.2.3.K6**<br>▲ recognizes how changes in the constant and/or slope within a linear function changes the appearance of a graph | EM.2.1.1 recognizes and/or identifies a pattern presented in a variety of formats: numerical, visual, auditory, tactile, pictorial, tables, graphs, or lists<br>EM.2.3.1 identifies same and/or different<br>EM.2.3.2 matches equivalent sets<br>EM.2.3.3 recognizes relationships involving two or more changes<br>EM.2.3.4 locates, matches, and/or plots distinct variables in sequence along a continuum<br>EM.2.4.1 demonstrates understanding of attributes which are the same and/or different<br>EM.2.4.2 demonstrates understanding of categorization according to attributes |

**Standard 3 – Geometry:** The student uses geometric concepts and procedures in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.HS.3.1.A1**<br>▲solves real-world problems by: applying the Pythagorean Theorem | EM.3.1.4 recognizes and/or identifies shapes<br>EM.3.1.5 combines and/or separates shapes into different configurations<br>EM.3.3.1 demonstrates understanding of appropriate vocabulary for spatial relationships |
| **M.HS.3.3.A1**<br>▲analyzes the impact of transformations on the perimeter and area of circles, rectangles, and triangles and volume of rectangular prisms and cylinders | EM.3.3.1 demonstrates understanding of appropriate vocabulary for spatial relationships<br>EM.3.3.2 demonstrates ability to make necessary transformations in real-life situations<br>EM.3.3.3 recognizes two or three-dimensional objects as they would appear from nearby, far away or different angles |
| **M.HS.3.4.K4**<br>▲finds and explains the relationship between the slopes of parallel and perpendicular lines | EM.3.3.1 demonstrates understanding of appropriate vocabulary for spatial relationships<br>EM.3.3.4 gives or follows directions from one location to another<br>EM.3.3.5 uses a map to find a location<br>EM.3.3.6 traces a route on a map |
| **M.HS.3.4.K6**<br>▲recognizes the equation of a line and transforms the equation into slope-intercept form in order to identify the slope and y-intercept and uses this information to graph the line | EM.3.3.1 demonstrates understanding of appropriate vocabulary for spatial relationships<br>EM.3.3.4 gives or follows directions from one location to another<br>EM.3.3.5 uses a map to find a location<br>EM.3.3.6 traces a route on a map |

**Standard 4 – Data:** The student uses concepts and procedures of data analysis in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.HS.4.1.K3**<br>▲ explains the relationship between probability and odds and computes one given the other | EM.4.1.1 recognizes whether an outcome of an event is impossible (probability=zero) or possible (probability≠zero)<br>EM.4.1.2 recognizes the likelihood of possible results or outcomes of a simple event<br>EM.4.1.3 makes a prediction about what should happen in a given situation. |
| **M.HS.4.2.A1a-h**<br>▲uses data analysis (mean, median, mode, range, quartile, inter-quartile range) in real-world problems with rational number data sets to compare and contrast two sets of data, to make accurate inferences and predictions, to analyze decisions, and to develop convincing arguments from these data displays<br>a. frequency tables<br>b. bar, line, and circle graphs<br>c. Venn diagrams or other pictorial displays<br>d. charts and tables<br>e. stem-and-leaf plots<br>f. scatter plots<br>g. box-and-whiskers plots<br>h. histograms (single and double) | EM.4.2.1 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc., appropriate for the situation<br>EM.4.2.2 records numerical relationships in tables<br>EM.4.2.3 answers questions based on the results of data collection<br>EM 4.2.4 describes data by constructing a graph, chart, or physical display<br>EM 4.2.5 recognizes credible sources in contrast to misleading representations of information<br>EM.4.2.6 recognizes appropriate conclusion based on results of data collection |

**Standard 4 – Data:** The student uses concepts and procedures of data analysis in a variety of situations.

| General Indicators | Extended Indicators |
|---|---|
| **M.HS.4.2.K4**<br>▲ explains the effects of outliers on the measures of central tendency (mean, median, mode) and range and inter-quartile range of a real number data set . | EM.4.2.1 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc., appropriate for the situation<br>EM.4.2.2 records numerical relationships in tables<br>EM.4.2.3 answers questions based on the results of data collection<br>EM.4.2.4 describes data by constructing a graph, chart, or physical display<br>EM.4.2.5 recognizes credible sources in contrast to misleading representations of information<br>EM.4.2.6 recognizes appropriate conclusion based on results of data collection |
| **M.HS.4.2.K5**<br>▲approximates a line of best fit given a scatter plot and makes predictions using the equation of that line . | EM.4.2.1 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc., appropriate for the situation<br>EM.4.2.2 records numerical relationships in tables<br>EM.4.2.3 answers questions based on the results of data collection<br>EM 4.2.4 describes data by constructing a graph, chart, or other physical display<br>EM.4.2.5 recognizes credible sources in contrast to misleading representations of information<br>EM.4.2.6 recognizes appropriate conclusion based on results of data collection |

# Appendix A

# Glossary

# Appendix A

## Extended Mathematics Standards Glossary

**Attributes**
characteristics, such as shape, color, size, etc.

**Constants**
have fixed values that do not change

**Data**
a collection of information that includes measurements or numbers

**Digits**
symbols used for numbers

**Fractions**
parts of groups, numbers, or whole

**Graphs**
diagrams that represent information or are used to record information

**Integers**
can be a positive number, a negative number, or zero

**Likelihood**
is a chance that an outcome will occur

**Number Line**
is a line with numbers written underneath it

**Numbers**
are quantities or values

**Numerals**
are symbols that represent numbers

**Place Values**
are values of digits dependent on its place in a number

**Ordinal**
is a number that shows a place

**Set**
is a collection of items

**Variables**
are quantities that can change that assume different values

# Appendix B

# Indicator List with Changes

# Appendix B - Indicator List with Changes

## Mathematics Extended Standard Indicators

| Current Indicator Number | Extended Standard Indicator | Old Indicator Number |
|---|---|---|
| **Mathematics Standard 1: Numbers and Computations** | | |
| **Benchmark 1**: The student demonstrates number sense in a variety of situations. | | |
| EM.1.1.1 | demonstrates understanding of concept of more | EM.1.1.2 |
| EM.1.1.2 | demonstrates understanding of the concept of one | EM.1.1.3 |
| EM.1.1.3 | counts by rote | EM.1.1.4 |
| EM.1.1.4 | demonstrates understanding of one to one correspondence | EM.1.1.5 |
| EM.1.1.5 | recognizes and/or identifies numerals | EM.1.1.6 |
| EM.1.1.6 | generates and/or produces numerals | EM.1.1.7 |
| EM.1.1.7 | demonstrates understanding of numbers greater than one | EM.1.1.8 |
| EM.1.1.8 | recognizes and/or identifies whole and/or parts of a whole | EM.1.1.9 |
| EM. 1.1.9 | recognizes coins and/or currency | EM.1.1.10 |
| EM.1.1.10 | identifies symbols for dollar and cent notation | EM.1.1.11 |
| EM.1.1.11 | demonstrates an understanding of ordinal sequence | EM.1.1.12 |
| EM.1.1.12 | demonstrates understanding of the values of coins and/or currency | EM.1.1.13 |
| EM.1.1.13 | demonstrates understanding of the equivalencies of coins and/or currency | EM.1.1.14 |
| **Benchmark 2:** The student demonstrates an understanding of number systems and their properties in a variety of situations. | | |
| EM.1.2.1 | matches like numerals | EM.1.2.1 |
| EM.1.2.2 | counts manipulative | EM.1.2.2 |
| EM.1.2.3 | demonstrates understanding of numerical correspondence | EM.1.2.3 |
| EM.1.2.4 | identifies subsets | EM.1.2.4 |
| EM.1.2.5 | identifies place value | EM.1.2.5 |
| **Benchmark 3:** The student uses numerical estimation. | | |
| EM.1.3.1 | identifies and/or estimates a little more, a little less, or about the same | EM.1.3.1 |
| EM.1.3.2 | rounds whole numbers | EM.1.3.2 |
| EM.1.3.3 | estimates amount of purchase | EM.1.3.3 |
| EM.1.3.4 | estimates quantities and checks whether or not results are reasonable | EM.1.3.4 |

| | | |
|---|---|---|
| **Benchmark 4:** The student demonstrates an understanding of computation in a variety of situations. | | |
| EM.1.4.1 | demonstrates understanding that *add* means combine and/or put together; and/or s*ubtract* means take-away | EM.1.4.1 |
| EM.1.4.2 | adds one more to a set | EM.1.4.2 |
| EM.1.4.3 | adds or subtracts to create new set | EM.1.4.3 |
| EM.1.4.4 | skip counts by 2, 5, 10, and/or 25 | EM.1.4.4 |
| EM.1.4.5 | demonstrates understanding that *multiply* means adding equal groups; *divide* means separating into equal groups | EM.1.4.5 |
| EM.1.4.6 | demonstrates understanding of mathematical symbols (+, -, ÷, ×,=) | EM.1.4.6 |
| EM.1.4.7 | uses one or more computational methods to add, subtract, multiply, and/or divide whole numbers | EM.1.4.7 |
| EM.1.4.8 | performs addition and subtraction on monetary values | EM.1.4.8 |
| EM.1.4.9 | performs one-step, real-world problems | EM.1.4.9 |
| **Mathematics Standard 2: Algebra – The student uses algebraic concepts and procedures in a variety of situations.** | | |
| **Benchmark 1**: The student demonstrates an understanding of relationships in patterns in a variety of situations. | | |
| EM.2.1.1 | recognizes and/or identifies patterns presented in a variety of formats: numerical, visual, auditory, tactile, pictorial, tables, graphics, or lists | EM.2.1.2 |
| EM.2.1.2 | matches or generalizes patterns | EM.2.1.3 |
| EM.2.1.3 | generates and/or produces a pattern | EM.2.1.4 |
| EM.2.1.4 | generalizes repeating patterns | EM.2.1.5 |
| **Benchmark 2:** The student demonstrates understanding of variables, equations, and inequalities in a variety of situations. | | |
| EM.2.2.1 | demonstrates understanding that a constant represents quantity that remains the same | EM.2.2.2 |
| EM.2.2.2 | demonstrates understanding of none (empty set), is less than, is more then, is equal to, and/or is not equal to (∅, <, >, =, ≠) | EM.2.2.3 |
| EM 2.2.3 | generates and/or solves one-step equations with one unknown using addition, subtraction, multiplication, and/or division | EM.2.2.4 |
| EM.2.2.4 | demonstrates understanding of how changes in one variable affect other variables | EM.2.2.5 |
| **Benchmark 3:** The student recognizes, describes, and/or analyzes linear relationships in a variety of situations. | | |
| EM.2.3.1 | identifies same and/or different | EM.2.3.2 |
| EM.2.3.2 | matches equivalent sets | EM.2.3.3 |
| EM.2.3.3 | recognizes relationships involving two or more changes | EM.2.3.4 |
| EM.2.3.4 | locates, matches, and/or plots distinct variables in sequence along a continuum | EM.2.3.5 |
| **Mathematics Standard 2: Algebra – The student uses algebraic concepts and procedures in a variety of situations. continued** | | |
| **Benchmark 4:** The student demonstrates the use of models to show relationships in a variety of situations. | | |
| EM.2.4.1 | demonstrates understanding of attributes which are the same and/or different | EM.2.4.1 |
| EM.2.4.2 | demonstrates understanding of categorization according to attributes | EM.2.4.2 |
| EM.2.4.3 | recognizes the same situation can be represented in more than one way | EM.2.4.3 |

| | | |
|---|---|---|
| **Mathematics Standard 3: Geometry – The student knows and uses geometric concepts and procedures in a variety of situations.** | | |
| **Benchmark 1:** The student demonstrates an understanding of geometric figures and their properties. | | |
| EM.3.1.1 | matches three-dimensional shapes and/or manipulatives | EM.3.1.1 |
| EM.3.1.2 | sorts by specific attributes, three-dimensional shapes, and/or manipulatives | EM.3.1.2 |
| EM.3.1.3 | orders by an attribute | EM.3.1.3 |
| EM.3.1.4 | recognizes and/or identifies shapes | EM.3.1.4 |
| EM.3.1.5 | combines and/or separates shapes into different configurations | EM.3.1.5 |
| **Benchmark 2:** The student estimates and measures using standard and nonstandard units in a variety of situations. | | |
| EM.3.2.1 | selects and/or uses appropriate measurement tool(s) and/or vocabulary | EM.3.2.1 |
| EM.3.2.2 | demonstrates understanding of calendar use | EM.3.2.2 |
| EM.3.2.3 | tells analog and/or digital time | EM.3.2.3 |
| EM.3.2.4 | converts within the same measurement system | EM.3.2.4 |
| EM.3.2.5 | uses estimation to check whether or not results are reasonable | EM.3.2.5 |
| **Benchmark 3:** The student demonstrates an understanding of spatial properties and relationships in a variety of situations. | | |
| EM.3.3.1 | demonstrates an understanding of appropriate vocabulary for spatial relationships | EM.3.3.3 |
| EM.3.3.2 | demonstrates ability to make necessary transformations in real-life situations | EM.3.3.4 |
| EM.3.3.3 | recognizes two or three-dimensional objects as they would appear from nearby, far away, or different angles | EM.3.3.5 |
| EM.3.3.4 | gives or follows directions from one location to another | EM.3.3.6 |
| EM.3.3.5 | uses a map to find a location | EM.3.3.7 |
| EM.3.3.6 | traces a route on a map | EM.3.3.8 |
| **Mathematics Standard 4: Data - The student knows and uses concepts and procedures of data analysis in a variety of situations.** | | |
| **Benchmark 1:** The student uses probability to make predictions and decisions in a variety of situations. | | |
| EM.4.1.1 | recognizes whether an outcome of an event is impossible (probability = 0) or possible (probability ≠ 0) | EM.4.1.2 |
| EM.4.1.2 | recognizes the likelihood of possible results or outcomes of a simple event | EM.4.1.3 |
| EM.4.1.3 | makes a prediction about what should happen in a given situation | EM.4.1.4 |
| **Benchmark 2:** The student collects and uses data to make decisions to solve problems in a variety of situations. | | |
| EM.4.2.1 | collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc., appropriate for the situation | EM.4.2.2 |
| EM.4.2.2 | records numerical relationships in tables | EM.4.2.3 |
| EM.4.2.3 | answers questions based on the results of data collection | EM.4.2.4 |
| EM.4.2.4 | describes data by constructing a graph, chart, or physical display | EM.4.2.5 |
| EM.4.2.5 | recognizes credible sources in contrast to misleading representations of information | EM.4.2.6 |
| EM.4.2.6 | recognizes appropriate conclusion based on results of data collection | EM.4.2.7 |

# Appendix C

# References

# Appendix C
## References


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