Chapter 111. Texas Essential Knowledge and Skills for Mathematics
Subchapter A. Elementary

§111.4. Grade 2, Adopted 2012.

(a) Introduction.

(1) The ***desire to achieve educational excellence*** is the driving force behind the Texas essential knowledge and skills for mathematics, guided by the college and career readiness standards. By embedding statistics, probability, and finance, while focusing on computational thinking, mathematical fluency and solid understanding, Texas will lead the way in mathematics education and prepare all Texas students for the challenges they will face in the 21st century.

(2) The ***process standards*** describe ways in which students are expected to engage in the content. The placement of the process standards at the beginning of the knowledge and skills listed for each grade and course is intentional. The process standards weave the other knowledge and skills together so that students may be successful problem solvers and use mathematics efficiently and effectively in daily life. The process standards are integrated at every grade level and course. When possible,

- students will apply mathematics to problems arising in everyday life, society, and the workplace.
- Students will use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
- Students will select appropriate tools such as real objects, manipulatives, algorithms, paper and pencil, and technology and techniques such as mental math, estimation, and number sense, and generalization and abstraction to solve problems.
- Students will effectively communicate mathematical ideas, reasoning, and their implications using multiple representations such as symbols, diagrams, graphs, computer programs, and language.
- Students will use mathematical relationships to generate solutions and make connections and predictions.
- Students will analyze mathematical relationships to connect and communicate mathematical ideas.
- Students will display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

(3) For students to become ***fluent in mathematics***, students must develop a robust sense of number. The National Research Council's report, "Adding It Up," defines procedural fluency as "skill in carrying out procedures flexibly, accurately, efficiently, and appropriately." As students develop procedural fluency, they must also realize that true problem solving may take time, effort, and perseverance. Students in Grade 2 are expected to perform their work without the use of calculators.

(4) The ***primary focal areas*** in Grade 2 are

- making comparisons within the base-10 place value system,
- solving problems with addition and subtraction within 100,and composing and decomposing two-dimensional shapes
- and building foundations for multiplication.

(A) Students develop an understanding of the base-10 place value system and place value concepts. The students' understanding of base-10 place value includes ideas of counting in units and multiples of thousands, hundreds, tens, and ones and a grasp of number relationships, which students demonstrate in a variety of ways.

(B) Students identify situations in which addition and subtraction are useful to solve problems. Students develop a variety of strategies to use efficient, accurate, and generalizable methods to add and subtract multi-digit whole numbers.

(C) Students use the relationship between skip counting and equal groups of objects to represent the addition or subtraction of equivalent sets, which builds a strong foundation for multiplication and division.

(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(b) Knowledge and skills.

Mathematical Process Standards	Number and Operations	Algebraic Reasoning	Geometry and Measurement	Data Analysis	Personal Financial Literacy
2.1 The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to: (A) ***apply*** mathematics to problems arising in everyday life, society, and the workplace; (B) ***use*** a problem-solving model that incorporates ***analyzing*** given information, ***formulating*** a plan or strategy, ***determining*** a solution, ***justifying*** the solution, and ***evaluating*** the problem-solving process and the reasonableness of the solution; (C) ***select*** tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to ***solve*** problems; (D) ***communicate*** mathematical ideas, reasoning, and their implications ***using*** multiple representations, including symbols, diagrams, graphs, and language as appropriate; (E) ***create and use*** representations to organize, record, and communicate mathematical ideas; (F) ***analyze*** mathematical relationships to connect and communicate mathematical ideas; and (G) ***display, explain, and justify*** mathematical ideas and arguments ***using*** precise mathematical language in written or oral communication.	**2.2** The student applies mathematical process standards to understand how to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value. The student is expected to: (A) ***use*** concrete and pictorial models to ***compose and decompose*** numbers up to 1,200 in more than one way as a sum of so many thousands, hundreds, tens, and ones; (B) ***use*** standard, word, and expanded forms to ***represent*** numbers up to 1,200; (C) ***generate*** a number that is greater than or less than a given whole number up to 1,200; (D) ***use*** place value to ***compare and order*** whole numbers up to 1,200 using comparative language, numbers, and symbols (>, <, or =); (E) ***locate*** the position of a given whole number on an open number line; and (F) ***name*** the whole number that corresponds to a specific point on a number line. **2.3** The student applies mathematical process standards to recognize and represent fractional units and communicates how they are used to name parts of a whole. The student is expected to: (A) ***partition*** objects into equal parts and ***name*** the parts, including halves, fourths, and eighths, using words; (B) ***explain*** that the more fractional parts used to make a whole, the smaller the part; and the fewer the fractional parts, the larger the part; (C) ***use*** concrete models to ***count*** fractional parts beyond one whole using words and recognize how many parts it takes to equal one whole; and (D) ***identify*** examples and non-examples of halves, fourths, and eighths. **2.4** The student applies mathematical process standards to develop and use strategies and methods for whole number computations in order to solve addition and subtraction problems with efficiency and accuracy. The student is expected to: (A) ***recall*** basic facts to add and subtract within 20 with automaticity; (B) ***add*** up to four two-digit numbers and ***subtract*** two-digit numbers using mental strategies and algorithms based on knowledge of place value and properties of operations; (C) ***solve*** one-step and multi-step word problems involving addition and subtraction within 1000 using a variety of strategies based on place value, including algorithms; and (D) ***generate and solve*** problem situations for a given mathematical number sentence involving addition and subtraction of whole numbers within 100. **2.5** The student applies mathematical process standards to determine the value of coins in order to solve monetary transactions. The student is expected to: (A) ***determine*** the value of a collection of coins up to one dollar; and (B) ***use*** the cent symbol, dollar sign, and the decimal point to name the value of a collection of coins. **2.6** The student applies mathematical process standards to connect repeated addition and subtraction to multiplication and division situations that involve equal groupings and shares. The student is expected to: (A) ***model, create, and describe*** contextual multiplication situations in which equivalent sets of concrete objects are joined; and (B) ***model, create, and describe*** contextual division situations in which a set of concrete objects is separated into equivalent sets.	**2.7** The student applies mathematical process standards to identify and apply number patterns within properties of numbers and operations in order to describe relationships. The student is expected to: (A) ***determine*** whether a number up to 40 is even or odd ***using*** pairings of objects to represent the number; (B) ***use*** an understanding of place value to ***determine*** the number that is 10 or 100 more or less than a given number up to 1,200; and (C) ***represent and solve*** addition and subtraction word problems where unknowns may be any one of the terms in the problem.	**2.8** The student applies mathematical process standards to analyze attributes of two-dimensional shapes and three-dimensional solids to develop generalizations about their properties. The student is expected to: (A) ***create*** two-dimensional shapes based on given attributes, including number of sides and vertices; (B) ***classify and sort*** three-dimensional solids, including spheres, cones, cylinders, rectangular prisms (including cubes as special rectangular prisms) based on attributes ***using*** formal geometric language; (C) ***classify and sort*** polygons with 12 or fewer sides according to attributes, including ***identifying*** the number of sides and number of vertices; (D) ***compose*** two-dimensional shapes and three-dimensional solids with given properties or attributes; and (E) ***decompose*** two-dimensional shapes such as cutting out a square from a rectangle, dividing a shape in half, or partitioning a rectangle into identical triangles and ***identify*** the resulting geometric parts. **2.9** The student applies mathematical process standards to select and use units to describe length, area, and time. The student is expected to: (A) ***find*** the length of objects using concrete models for standard units of length; (B) ***describe*** the inverse relationship between the size of the unit and the number of units needed to equal the length of an object; (C) ***represent*** whole numbers as distances from any given location on a number line; (D) ***determine*** the length of an object to the nearest marked unit using rulers, yardsticks, meter sticks, or measuring tapes; (E) ***determine*** a solution to a problem involving length, including estimating lengths; (F) ***use*** concrete models of square units to ***find*** the area of a rectangle by covering it with no gaps or overlaps, ***counting*** to find the total number of square units, and ***describing*** the measurement using a number and the unit; and (G) ***read and write*** time to the nearest one-minute increments using analog and digital clocks and ***distinguish between*** a.m. and p.m.	**2.10** The student applies mathematical process standards to organize data to make it useful for interpreting information and solving problems. The student is expected to: (A) ***explain*** that the length of a bar in a bar graph or the number of pictures in a pictograph represents the number of data points for a given category; (B) ***organize*** a collection of data with up to four categories using pictographs and bar graphs with intervals of one or more; (C) ***write and solve*** one-step word problems involving addition or subtraction using data represented within pictographs and bar graphs with intervals of one; and (D) ***draw conclusions*** and ***make predictions*** from information in a graph.	**2.11** The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to: (A) ***calculate*** how money saved can accumulate into a larger amount over time; (B) ***explain*** that saving is an alternative to spending; (C) ***distinguish*** between a deposit and a withdrawal; (D) ***identify*** examples of borrowing and ***distinguish*** between responsible and irresponsible borrowing; (E) ***identify*** examples of lending and use concepts of benefits and costs to evaluate lending decisions; and (F) ***differentiate*** between producers and consumers and calculate the cost to produce a simple item.