§111.2. Kindergarten, 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 Kindergarten are expected to perform their work without the use of calculators.

(4) The **_primary focal areas_** in Kindergarten are
- understanding counting and cardinality,
- understanding addition as joining and subtraction as separating,
- and comparing objects by measureable attributes.

(A) Students develop number and operations through several fundamental concepts. Students know number names and the counting sequence. Counting and cardinality lay a solid foundation for number. Students apply the principles of counting to make the connection between numbers and quantities.

(B) Students use meanings of numbers to create strategies for solving problems and responding to practical situations involving addition and subtraction.

(C) Students identify characteristics of objects that can be measured and directly compare objects according to these measureable attributes.

(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
K.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.	**K.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. The student is expected to: (A) **_count_** forward and backward to at least 20 with and without objects; (B) **_read, write, and represent_** whole numbers from 0 to at least 20 with and without objects or pictures; (C) **_count_** a set of objects up to at least 20 and **_demonstrate_** that the last number said tells the number of objects in the set regardless of their arrangement or order; (D) **_recognize instantly_** the quantity of a small group of objects in organized and random arrangements; (E) **_generate_** a set using concrete and pictorial models that represents a number that is more than, less than, and equal to a given number up to 20; (F) **_generate_** a number that is one more than or one less than another number up to at least 20; (G) **_compare_** sets of objects up to at least 20 in each set using comparative language; (H) **_use_** comparative language to describe two numbers up to 20 presented as written numerals; and (I) **_compose and decompose_** numbers up to 10 with objects and pictures. **K.3** The student applies mathematical process standards to develop an understanding of addition and subtraction situations in order to solve problems. The student is expected to: (A) **_model_** the action of joining to represent addition and the action of separating to represent subtraction; (B) **_solve_** word problems using objects and drawings to find sums up to 10 and differences within 10; and (C) **_explain_** the strategies used to solve problems involving adding and subtracting within 10 using spoken words, concrete and pictorial models, and number sentences. **K.4** The student applies mathematical process standards to **_identify_** coins in order to recognize the need for monetary transactions. The student is expected to: (A) **_identify_** U.S. coins by name, including pennies, nickels, dimes, and quarters.	**K.5** The student applies mathematical process standards to identify the pattern in the number word list. The student is expected to: (A) **_recite_** numbers up to at least 100 by ones and tens beginning with any given number.	**K.6** 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)**_identify_** two-dimensional shapes, including circles, triangles, rectangles, and squares as special rectangles; (B) **_identify_** three-dimensional solids, including cylinders, cones, spheres, and cubes, in the real world; (C) **_identify_** two-dimensional components of three-dimensional objects (D) **_identify_** attributes of two-dimensional shapes using informal and formal geometric language interchangeably (E) **_classify and sort_** a variety of regular and irregular two- and three-dimensional figures regardless of orientation or size; and (F) **_create_** two-dimensional shapes using a variety of materials and drawings. **K.7** The student applies mathematical process standards to directly compare measureable attributes. The student is expected to: (A) **_give an example_** of a measurable attribute of a given object, including length, capacity, and weight; and (B) **_compare_** two objects with a common measureable attribute to see which object has more of/less of the attribute and describe the difference.	**K.8** The student applies mathematical process standards to collect and organize data to make it useful for interpreting information. The student is expected to: (A) **_collect, sort, and organize_** data into two or three categories; (B) **_use_** data **_to create_** real-object and picture graphs; and (C) **_draw conclusions_** from real-object and picture graphs.	**K.9** The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to: (A) **_identify_** ways to earn income; (B) **_differentiate_** between money received as income and money received as gifts; (C) **_list_** simple skills required for jobs; and (D) **_distinguish_** between wants and needs and identify income as a source to meet one's wants and needs.

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