

# Math, Grade 3 (IMRA)

Subject: Mathematics

Grade: 03

Expectations: 53

Breakouts: 233

## (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, 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 3 are expected to perform their work without the use of calculators.
4. The primary focal areas in Grade 3 are place value, operations of whole numbers, and understanding fractional units. These focal areas are supported throughout the mathematical strands of number and operations, algebraic reasoning, geometry and measurement, and data analysis. In Grades 3-5, the number set is limited to positive rational numbers. In number and operations, students will focus on applying place value, comparing and ordering whole numbers, connecting multiplication and division, and understanding and representing fractions as numbers and equivalent fractions. In algebraic reasoning, students will use multiple representations of problem situations, determine missing values in number sentences, and represent real-world relationships using number pairs in a table and verbal descriptions. In geometry and measurement, students will identify and classify two-dimensional figures according to common attributes, decompose composite figures formed by rectangles to determine area, determine the perimeter of polygons, solve problems involving time, and measure liquid volume (capacity) or weight. In data analysis, students will represent and interpret data.
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 Statements

- (1) Mathematical process standards. 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;
    - (i) apply mathematics to problems arising in everyday life
    - (ii) apply mathematics to problems arising in society
    - (iii) apply mathematics to problems arising in 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;
    - (i) 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
    - (ii) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating 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;
    - (i) select tools, including real objects as appropriate, to solve problems
    - (ii) select tools, including manipulatives as appropriate, to solve problems
    - (iii) select tools, including paper and pencil as appropriate, to solve problems
    - (iv) select tools, including technology as appropriate, to solve problems
    - (v) select techniques, including mental math as appropriate, to solve problems
    - (vi) select techniques, including estimation as appropriate, to solve problems
    - (vii) select techniques, including 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;
    - (i) communicate mathematical ideas using multiple representations, including symbols as appropriate
    - (ii) communicate mathematical ideas using multiple representations, including diagrams as appropriate
    - (iii) communicate mathematical ideas using multiple representations, including graphs as appropriate
    - (iv) communicate mathematical ideas using multiple representations, including language as appropriate
    - (v) communicate mathematical reasoning using multiple representations, including symbols as appropriate
    - (vi) communicate mathematical reasoning using multiple representations, including diagrams as appropriate
    - (vii) communicate mathematical reasoning using multiple representations, including graphs as appropriate
    - (viii) communicate mathematical reasoning using multiple representations, including language as appropriate
    - (ix) communicate [mathematical ideas'] implications using multiple representations, including symbols as appropriate
    - (x) communicate [mathematical ideas'] implications using multiple representations, including diagrams as appropriate

- (xi) communicate [mathematical ideas'] implications using multiple representations, including graphs as appropriate
- (xii) communicate [mathematical ideas'] implications using multiple representations, including language as appropriate
- (xiii) communicate [mathematical reasoning's] implications using multiple representations, including symbols as appropriate
- (xiv) communicate [mathematical reasoning's] implications using multiple representations, including diagrams as appropriate
- (xv) communicate [mathematical reasoning's] implications using multiple representations, including graphs as appropriate
- (xvi) communicate [mathematical reasoning's] implications using multiple representations, including language as appropriate

(E) create and use representations to organize, record, and communicate mathematical ideas;

- (i) create representations to organize mathematical ideas
- (ii) use representations to organize mathematical ideas
- (iii) create representations to record mathematical ideas
- (iv) use representations to record mathematical ideas
- (v) create representations to communicate mathematical ideas
- (vi) use representations to communicate mathematical ideas

(F) analyze mathematical relationships to connect and communicate mathematical ideas; and

- (i) analyze mathematical relationships to connect mathematical ideas
- (ii) analyze mathematical relationships to communicate mathematical ideas

(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

- (i) display mathematical ideas using precise mathematical language in written or oral communication
- (ii) display mathematical arguments using precise mathematical language in written or oral communication
- (iii) explain mathematical ideas using precise mathematical language in written or oral communication
- (iv) explain mathematical arguments using precise mathematical language in written or oral communication
- (v) justify mathematical ideas using precise mathematical language in written or oral communication
- (vi) justify mathematical arguments using precise mathematical language in written or oral communication

(2) Number and operations. The student applies mathematical process standards to represent and compare whole numbers and understand relationships related to place value. The student is expected to:

(A) compose and decompose numbers up to 100,000 as a sum of so many ten thousands, so many thousands, so many hundreds, so many tens, and so many ones using objects, pictorial models, and numbers, including expanded notation as appropriate;

- (i) compose numbers up to 100,000 as a sum of so many ten thousands, so many thousands, so many hundreds, so many tens, and so many ones using objects

- (ii) compose numbers up to 100,000 as a sum of so many ten thousands, so many thousands, so many hundreds, so many tens, and so many ones using pictorial models
  - (iii) compose numbers up to 100,000 as a sum of so many ten thousands, so many thousands, so many hundreds, so many tens, and so many ones using numbers, including expanded notation as appropriate
  - (iv) decompose numbers up to 100,000 as a sum of so many ten thousands, so many thousands, so many hundreds, so many tens, and so many ones using objects
  - (v) decompose numbers up to 100,000 as a sum of so many ten thousands, so many thousands, so many hundreds, so many tens, and so many ones using pictorial models
  - (vi) decompose numbers up to 100,000 as a sum of so many ten thousands, so many thousands, so many hundreds, so many tens, and so many ones using numbers, including expanded notation as appropriate
- (B) describe the mathematical relationships found in the base-10 place value system through the hundred thousands place;
- (i) describe the mathematical relationships found in the base-10 place value system through the hundred thousands place
- (C) represent a number on a number line as being between two consecutive multiples of 10; 100; 1,000; or 10,000 and use words to describe relative size of numbers in order to round whole numbers; and
- (i) represent a number on a number line as being between two consecutive multiples of 10; 100; 1,000; or 10,000
  - (ii) use words to describe relative size of numbers in order to round whole numbers
- (D) compare and order whole numbers up to 100,000 and represent comparisons using the symbols  $>$ ,
- (i) compare whole numbers up to 100,000
  - (ii) order whole numbers up to 100,000
  - (iii) represent comparisons using the symbols  $>$ ,  $<$ , or  $=$
- (3) Number and operations. The student applies mathematical process standards to represent and explain fractional units. The student is expected to:
- (A) represent fractions greater than zero and less than or equal to one with denominators of 2, 3, 4, 6, and 8 using concrete objects and pictorial models, including strip diagrams and number lines;
- (i) represent fractions greater than zero and less than or equal to one with denominators of 2 using concrete objects
  - (ii) represent fractions greater than zero and less than or equal to one with denominators of 3 using concrete objects
  - (iii) represent fractions greater than zero and less than or equal to one with denominators of 4 using concrete objects
  - (iv) represent fractions greater than zero and less than or equal to one with denominators of 6 using concrete objects
  - (v) represent fractions greater than zero and less than or equal to one with denominators of 8 using concrete objects
  - (vi) represent fractions greater than zero and less than or equal to one with denominators of 2 using pictorial models, including strip diagrams

- (vii) represent fractions greater than zero and less than or equal to one with denominators of 3 using pictorial models, including strip diagrams
  - (viii) represent fractions greater than zero and less than or equal to one with denominators of 4 using pictorial models, including strip diagrams
  - (ix) represent fractions greater than zero and less than or equal to one with denominators of 6 using pictorial models, including strip diagrams
  - (x) represent fractions greater than zero and less than or equal to one with denominators of 8 using pictorial models, including strip diagrams
  - (xi) represent fractions greater than zero and less than or equal to one with denominators of 2 using pictorial models, including number lines
  - (xii) represent fractions greater than zero and less than or equal to one with denominators of 3 using pictorial models, including number lines
  - (xiii) represent fractions greater than zero and less than or equal to one with denominators of 4 using pictorial models, including number lines
  - (xiv) represent fractions greater than zero and less than or equal to one with denominators of 6 using pictorial models, including number lines
  - (xv) represent fractions greater than zero and less than or equal to one with denominators of 8 using pictorial models, including number lines
- (B) determine the corresponding fraction greater than zero and less than or equal to one with denominators of 2, 3, 4, 6, and 8 given a specified point on a number line;
- (i) determine the corresponding fraction greater than zero and less than or equal to one with [a] denominator of 2 given a specified point on a number line
  - (ii) determine the corresponding fraction greater than zero and less than or equal to one with [a] denominator of 3 given a specified point on a number line
  - (iii) determine the corresponding fraction greater than zero and less than or equal to one with [a] denominator of 4 given a specified point on a number line
  - (iv) determine the corresponding fraction greater than zero and less than or equal to one with [a] denominator of 6 given a specified point on a number line
  - (v) determine the corresponding fraction greater than zero and less than or equal to one with [a] denominator of 8 given a specified point on a number line
- (C) explain that the unit fraction  $\frac{1}{b}$  represents the quantity formed by one part of a whole that has been partitioned into  $b$  equal parts where  $b$  is a non-zero whole number;
- (i) explain that the unit fraction  $\frac{1}{b}$  represents the quantity formed by one part of a whole that has been partitioned into  $b$  equal parts where  $b$  is a non-zero whole number
- (D) compose and decompose a fraction  $\frac{a}{b}$  with a numerator greater than zero and less than or equal to  $b$  as a sum of parts  $\frac{1}{b}$ ;
- (i) compose a fraction  $\frac{a}{b}$  with a numerator greater than zero and less than or equal to  $b$  as a sum of parts  $\frac{1}{b}$
  - (ii) decompose a fraction  $\frac{a}{b}$  with a numerator greater than zero and less than or equal to  $b$  as a sum of parts  $\frac{1}{b}$

- (E) solve problems involving partitioning an object or a set of objects among two or more recipients using pictorial representations of fractions with denominators of 2, 3, 4, 6, and 8;
  - (i) solve problems involving partitioning an object or a set of objects among two or more recipients using pictorial representations of fractions with denominators of 2
  - (ii) solve problems involving partitioning an object or a set of objects among two or more recipients using pictorial representations of fractions with denominators of 3
  - (iii) solve problems involving partitioning an object or a set of objects among two or more recipients using pictorial representations of fractions with denominators of 4
  - (iv) solve problems involving partitioning an object or a set of objects among two or more recipients using pictorial representations of fractions with denominators of 6
  - (v) solve problems involving partitioning an object or a set of objects among two or more recipients using pictorial representations of fractions with denominators of 8
- (F) represent equivalent fractions with denominators of 2, 3, 4, 6, and 8 using a variety of objects and pictorial models, including number lines;
  - (i) represent equivalent fractions with denominators of 2 using a variety of objects
  - (ii) represent equivalent fractions with denominators of 3 using a variety of objects
  - (iii) represent equivalent fractions with denominators of 4 using a variety of objects
  - (iv) represent equivalent fractions with denominators of 6 using a variety of objects
  - (v) represent equivalent fractions with denominators of 8 using a variety of objects
  - (vi) represent equivalent fractions with denominators of 2 using a variety of pictorial models, including number lines
  - (vii) represent equivalent fractions with denominators of 3 using a variety of pictorial models, including number lines
  - (viii) represent equivalent fractions with denominators of 4 using a variety of pictorial models, including number lines
  - (ix) represent equivalent fractions with denominators of 6 using a variety of pictorial models, including number lines
  - (x) represent equivalent fractions with denominators of 8 using a variety of pictorial models, including number lines
- (G) explain that two fractions are equivalent if and only if they are both represented by the same point on the number line or represent the same portion of a same size whole for an area model; and
  - (i) explain that two fractions are equivalent if and only if they are both represented by the same point on the number line or represent the same portion of a same size whole for an area model
- (H) compare two fractions having the same numerator or denominator in problems by reasoning about their sizes and justifying the conclusion using symbols, words, objects, and pictorial models.
  - (i) compare two fractions having the same numerator or denominator in problems by reasoning about their sizes and justifying the conclusion using symbols
  - (ii) compare two fractions having the same numerator or denominator in problems by reasoning about their sizes and justifying the conclusion using words

- (iii) compare two fractions having the same numerator or denominator in problems by reasoning about their sizes and justifying the conclusion using objects
  - (iv) compare two fractions having the same numerator or denominator in problems by reasoning about their sizes and justifying the conclusion using pictorial models
- (4) Number and operations. The student applies mathematical process standards to develop and use strategies and methods for whole number computations in order to solve problems with efficiency and accuracy. The student is expected to:
- (A) solve with fluency one-step and two-step problems involving addition and subtraction within 1,000 using strategies based on place value, properties of operations, and the relationship between addition and subtraction;
    - (i) solve with fluency one-step problems involving addition within 1,000 using strategies based on place value
    - (ii) solve with fluency one-step problems involving addition within 1,000 using strategies based properties of operations
    - (iii) solve with fluency one-step problems involving addition within 1,000 using strategies based on the relationship between addition and subtraction
    - (iv) solve with fluency one-step problems involving subtraction within 1,000 using strategies based on place value
    - (v) solve with fluency one-step problems involving subtraction within 1,000 using strategies based on properties of operations
    - (vi) solve with fluency one-step problems involving subtraction within 1,000 using strategies based on the relationship between addition and subtraction
    - (vii) solve with fluency two-step problems involving addition within 1,000 using strategies based on place value
    - (viii) solve with fluency two-step problems involving addition within 1,000 using strategies based on properties of operations
    - (ix) solve with fluency two-step problems involving addition within 1,000 using strategies based on the relationship between addition and subtraction
    - (x) solve with fluency two-step problems involving subtraction within 1,000 using strategies based on place value
    - (xi) solve with fluency two-step problems involving subtraction within 1,000 using strategies based on properties of operations
    - (xii) solve with fluency two-step problems involving subtraction within 1,000 using strategies based on the relationship between addition and subtraction
    - (xiii) solve with fluency two-step problems involving addition and subtraction within 1,000 using strategies based on place value
    - (xiv) solve with fluency two-step problems involving addition and subtraction within 1,000 using strategies based on properties of operations
    - (xv) solve with fluency two-step problems involving addition and subtraction within 1,000 using strategies based on the relationship between addition and subtraction
  - (B) round to the nearest 10 or 100 or use compatible numbers to estimate solutions to addition and subtraction problems;

- (i) round to the nearest 10 or 100 or use compatible numbers to estimate solutions to addition problems
  - (ii) round to the nearest 10 or 100 or use compatible numbers to estimate solutions to subtraction problems
- (C) determine the value of a collection of coins and bills;
- (i) determine the value of a collection of coins
  - (ii) determine the value of a collection of bills
  - (iii) determine the value of a collection of coins and bills
- (D) determine the total number of objects when equally-sized groups of objects are combined or arranged in arrays up to 10 by 10;
- (i) determine the total number of objects when equally-sized groups of objects are combined or arranged in arrays up to 10 by 10
- (E) represent multiplication facts by using a variety of approaches such as repeated addition, equal-sized groups, arrays, area models, equal jumps on a number line, and skip counting;
- (i) represent multiplication facts by using a variety of approaches
- (F) recall facts to multiply up to 10 by 10 with automaticity and recall the corresponding division facts;
- (i) recall facts to multiply up to 10 by 10 with automaticity
  - (ii) recall the corresponding division facts
- (G) use strategies and algorithms, including the standard algorithm, to multiply a two-digit number by a one-digit number. Strategies may include mental math, partial products, and the commutative, associative, and distributive properties;
- (i) use strategies to multiply a two-digit number by a one-digit number
  - (ii) use algorithms, including the standard algorithm, to multiply a two-digit number by a one-digit number
- (H) determine the number of objects in each group when a set of objects is partitioned into equal shares or a set of objects is shared equally;
- (i) determine the number of objects in each group when a set of objects is partitioned into equal shares or a set of objects is shared equally
- (I) determine if a number is even or odd using divisibility rules;
- (i) determine if a number is even or odd using divisibility rules
- (J) determine a quotient using the relationship between multiplication and division; and
- (i) determine a quotient using the relationship between multiplication and division
- (K) solve one-step and two-step problems involving multiplication and division within 100 using strategies based on objects; pictorial models, including arrays, area models, and equal groups; properties of operations; or recall of facts.
- (i) solve one-step problems involving multiplication within 100 using strategies based on objects; pictorial models, including arrays, area models, and equal groups; properties of operations; or recall of facts
  - (ii) solve one-step problems involving division within 100 using strategies based on objects; pictorial models, including arrays, area models, and equal groups; properties of operations; or recall of facts



- (iii) solve two-step problems involving multiplication within 100 using strategies based on objects; pictorial models, including arrays, area models, and equal groups; properties of operations; or recall of facts
  - (iv) solve two-step problems involving division within 100 using strategies based on objects; pictorial models, including arrays, area models, and equal groups; properties of operations; or recall of facts
  - (v) solve two-step problems involving multiplication and division within 100 using strategies based on objects; pictorial models, including arrays, area models, and equal groups; properties of operations; or recall of facts
- (5) Algebraic reasoning. The student applies mathematical process standards to analyze and create patterns and relationships. The student is expected to:
- (A) represent one- and two-step problems involving addition and subtraction of whole numbers to 1,000 using pictorial models, number lines, and equations;
    - (i) represent one-step problems involving addition of whole numbers to 1,000 using pictorial models
    - (ii) represent one-step problems involving addition of whole numbers to 1,000 using number lines
    - (iii) represent one-step problems involving addition of whole numbers to 1,000 using equations
    - (iv) represent one-step problems involving subtraction of whole numbers to 1,000 using pictorial models
    - (v) represent one-step problems involving subtraction of whole numbers to 1,000 using number lines
    - (vi) represent one-step problems involving subtraction of whole numbers to 1,000 using equations
    - (vii) represent two-step problems involving addition of whole numbers to 1,000 using pictorial models
    - (viii) represent two-step problems involving addition of whole numbers to 1,000 using number lines
    - (ix) represent two-step problems involving addition of whole numbers to 1,000 using equations
    - (x) represent two-step problems involving subtraction of whole numbers to 1,000 using pictorial models
    - (xi) represent two-step problems involving subtraction of whole numbers to 1,000 using number lines
    - (xii) represent two-step problems involving subtraction of whole numbers to 1,000 using equations
    - (xiii) represent two-step problems involving addition and subtraction of whole numbers to 1,000 using pictorial models
    - (xiv) represent two-step problems involving addition and subtraction of whole numbers to 1,000 using number lines
    - (xv) represent two-step problems involving addition and subtraction of whole numbers to 1,000 using equations
  - (B) represent and solve one- and two-step multiplication and division problems within 100 using arrays, strip diagrams, and equations;
    - (i) represent one-step multiplication problems within 100 using arrays
    - (ii) represent one-step multiplication problems within 100 using strip diagrams
    - (iii) represent one-step multiplication problems within 100 using equations
    - (iv) represent one-step division problems within 100 using arrays
    - (v) represent one-step division problems within 100 using strip diagrams
    - (vi) represent one-step division problems within 100 using equations

- (vii) represent two-step multiplication problems within 100 using arrays
  - (viii) represent two-step multiplication problems within 100 using strip diagrams
  - (ix) represent two-step multiplication problems within 100 using equations
  - (x) represent two-step division problems within 100 using arrays
  - (xi) represent two-step division problems within 100 using strip diagrams
  - (xii) represent two-step division problems within 100 using equations
  - (xiii) represent two-step multiplication and division problems within 100 using arrays
  - (xiv) represent two-step multiplication and division problems within 100 using strip diagrams
  - (xv) represent two-step multiplication and division problems within 100 using equations
  - (xvi) solve one-step multiplication problems within 100 using arrays
  - (xvii) solve one-step multiplication problems within 100 using strip diagrams
  - (xviii) solve one-step multiplication problems within 100 using equations
  - (xix) solve one-step division problems within 100 using arrays
  - (xx) solve one-step division problems within 100 using strip diagrams
  - (xxi) solve one-step division problems within 100 using equations
  - (xxii) solve two-step multiplication problems within 100 using arrays
  - (xxiii) solve two-step multiplication problems within 100 using strip diagrams
  - (xxiv) solve two-step multiplication problems within 100 using equations
  - (xxv) solve two-step division problems within 100 using arrays
  - (xxvi) solve two-step division problems within 100 using strip diagrams
  - (xxvii) solve two-step division problems within 100 using equations
  - (xxviii) solve two-step multiplication and division problems within 100 using arrays
  - (xxix) solve two-step multiplication and division problems within 100 using strip diagrams
  - (xxx) solve two-step multiplication and division problems within 100 using equations
- (C) describe a multiplication expression as a comparison such as  $3 \times 24$  represents 3 times as much as 24;
- (i) describe a multiplication expression as a comparison
- (D) determine the unknown whole number in a multiplication or division equation relating three whole numbers when the unknown is either a missing factor or product; and
- (i) determine the unknown whole number in a multiplication or division equation relating three whole numbers when the unknown is either a missing factor or product
- (E) represent real-world relationships using number pairs in a table and verbal descriptions.
- (i) represent real-world relationships using number pairs in a table
  - (ii) represent real-world relationships using verbal descriptions

- (6) Geometry and measurement. The student applies mathematical process standards to analyze attributes of two-dimensional geometric figures to develop generalizations about their properties. The student is expected to:
- (A) classify and sort two- and three-dimensional figures, including cones, cylinders, spheres, triangular and rectangular prisms, and cubes, based on attributes using formal geometric language;
    - (i) classify two-dimensional figures based on attributes using formal geometric language
    - (ii) classify three-dimensional figures, including cones, based on attributes using formal geometric language
    - (iii) classify three-dimensional figures, including cylinders, based on attributes using formal geometric language
    - (iv) classify three-dimensional figures, including spheres, based on attributes using formal geometric language
    - (v) classify three-dimensional figures, including triangular prisms, based on attributes using formal geometric language
    - (vi) classify three-dimensional figures, including rectangular prisms, based on attributes using formal geometric language
    - (vii) classify three-dimensional figures, including cubes, based on attributes using formal geometric language
    - (viii) sort two-dimensional figures based on attributes using formal geometric language
    - (ix) sort three-dimensional figures, including cones, based on attributes using formal geometric language
    - (x) sort three-dimensional figures, including cylinders, based on attributes using formal geometric language
    - (xi) sort three-dimensional figures, including spheres, based on attributes using formal geometric language
    - (xii) sort three-dimensional figures, including triangular prisms, based on attributes using formal geometric language
    - (xiii) sort three-dimensional figures, including rectangular prisms, based on attributes using formal geometric language
    - (xiv) sort three-dimensional figures, including cubes, based on attributes using formal geometric language
  - (B) use attributes to recognize rhombuses, parallelograms, trapezoids, rectangles, and squares as examples of quadrilaterals and draw examples of quadrilaterals that do not belong to any of these subcategories;
    - (i) use attributes to recognize rhombuses as examples of quadrilaterals
    - (ii) use attributes to recognize parallelograms as examples of quadrilaterals
    - (iii) use attributes to recognize trapezoids as examples of quadrilaterals
    - (iv) use attributes to recognize rectangles as examples of quadrilaterals
    - (v) use attributes to recognize squares as examples of quadrilaterals
    - (vi) draw examples of quadrilaterals that do not belong to any of these subcategories
  - (C) determine the area of rectangles with whole number side lengths in problems using multiplication related to the number of rows times the number of unit squares in each row;
    - (i) determine the area of rectangles with whole number side lengths in problems using multiplication related to the number of rows times the number of unit squares in each row
  - (D) decompose composite figures formed by rectangles into non-overlapping rectangles to determine the area of the original figure using the additive property of area; and

- (i) decompose composite figures formed by rectangles into non-overlapping rectangles to determine the area of the original figure using the additive property of area
- (E) decompose two congruent two-dimensional figures into parts with equal areas and express the area of each part as a unit fraction of the whole and recognize that equal shares of identical wholes need not have the same shape.
  - (i) decompose two congruent two-dimensional figures into parts with equal areas
  - (ii) express the area of each part as a unit fraction of the whole
  - (iii) recognize that equal shares of identical wholes need not have the same shape
- (7) Geometry and measurement. The student applies mathematical process standards to select appropriate units, strategies, and tools to solve problems involving customary and metric measurement. The student is expected to:
  - (A) represent fractions of halves, fourths, and eighths as distances from zero on a number line;
    - (i) represent fractions of halves as distances from zero on a number line
    - (ii) represent fractions of fourths as distances from zero on a number line
    - (iii) represent fractions of eighths as distances from zero on a number line
  - (B) determine the perimeter of a polygon or a missing length when given perimeter and remaining side lengths in problems;
    - (i) determine the perimeter of a polygon or a missing length when given perimeter and remaining side lengths in problems
  - (C) determine the solutions to problems involving addition and subtraction of time intervals in minutes using pictorial models or tools such as a 15-minute event plus a 30-minute event equals 45 minutes;
    - (i) determine the solutions to problems involving addition of time intervals in minutes using pictorial models or tools
    - (ii) determine the solutions to problems involving subtraction of time intervals in minutes using pictorial models or tools
    - (iii) determine the solutions to problems involving addition and subtraction of time intervals in minutes using pictorial models or tools
  - (D) determine when it is appropriate to use measurements of liquid volume (capacity) or weight; and
    - (i) determine when it is appropriate to use measurements of liquid volume (capacity) or weight
  - (E) determine liquid volume (capacity) or weight using appropriate units and tools.
    - (i) determine liquid volume (capacity) or weight using appropriate units
    - (ii) determine liquid volume (capacity) or weight using appropriate tools
- (8) Data analysis. The student applies mathematical process standards to solve problems by collecting, organizing, displaying, and interpreting data. The student is expected to:
  - (A) summarize a data set with multiple categories using a frequency table, dot plot, pictograph, or bar graph with scaled intervals; and
    - (i) summarize a data set with multiple categories using a frequency table, dot plot, pictograph, or bar graph with scaled intervals
  - (B) solve one- and two-step problems using categorical data represented with a frequency table, dot plot, pictograph, or bar graph with scaled intervals.

- (i) solve one-step problems using categorical data represented with a frequency table, dot plot, pictograph, or bar graph with scaled intervals
  - (ii) solve two-step problems using categorical data represented with a frequency table, dot plot, pictograph, or bar graph with scaled intervals
- (9) Personal financial literacy. The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:
- (A) explain the connection between human capital/labor and income;
    - (i) explain the connection between human capital/labor and income
  - (B) describe the relationship between the availability or scarcity of resources and how that impacts cost;
    - (i) describe the relationship between the availability or scarcity of resources and how that impacts cost
  - (C) identify the costs and benefits of planned and unplanned spending decisions;
    - (i) identify the costs of planned spending decisions
    - (ii) identify the costs of unplanned spending decisions
    - (iii) identify the benefits of planned spending decisions
    - (iv) identify the benefits of unplanned spending decisions
  - (D) explain that credit is used when wants or needs exceed the ability to pay and that it is the borrower's responsibility to pay it back to the lender, usually with interest;
    - (i) explain that credit is used when wants or needs exceed the ability to pay
    - (ii) explain that it is the borrower's responsibility to pay it back to the lender, usually with interest
  - (E) list reasons to save and explain the benefit of a savings plan, including for college; and
    - (i) list reasons to save
    - (ii) explain the benefit of a savings plan, including for college
  - (F) identify decisions involving income, spending, saving, credit, and charitable giving.
    - (i) identify decisions involving income
    - (ii) identify decisions involving spending
    - (iii) identify decisions involving saving
    - (iv) identify decisions involving credit
    - (v) identify decisions involving charitable giving