

Grade 3 Mathematics Knowledge and Skills.

(3.1) **Number, operation, and quantitative reasoning.** The student uses place value to communicate about increasingly large whole numbers in verbal and written form, including money.

The student is expected to:

- (A) use place value to read, write (in symbols and words), and describe the value of whole numbers through 999,999;
- (B) use place value to compare and order whole numbers through 9,999; and (C) determine the value of a collection of coins and bills.

(3.2) **Number, operation, and quantitative reasoning.** The student uses fraction names and symbols (with denominators of 12 or less) to describe fractional parts of whole objects or sets of objects.

The student is expected to:

- (A) construct concrete models of fractions;
- (B) compare fractional parts of whole objects or sets of objects in a problem situation using concrete models;
- (C) use fraction names and symbols to describe fractional parts of whole objects or sets of objects; and
- (D) construct concrete models of equivalent fractions for fractional parts of whole objects.

(3.3) **Number, operation, and quantitative reasoning.** The student adds and subtracts to solve meaningful problems involving whole numbers.

The student is expected to:

- (A) model addition and subtraction using pictures, words, and numbers; and
- (B) select addition or subtraction and use the operation to solve problems involving whole numbers through 999.

(3.4) **Number, operation, and quantitative reasoning.** The student recognizes and solves problems in multiplication and division situations.

The student is expected to:

- (A) learn and apply multiplication facts through 12 by 12 using concrete models and objects;
- (B) solve and record multiplication problems (up to two digits times one digit); and
- (C) use models to solve division problems and use number sentences to record the solutions.

(3.5) **Number, operation, and quantitative reasoning.** The student estimates to determine reasonable results.

The student is expected to:

- (A) round whole numbers to the nearest ten or hundred to approximate reasonable results in problem situations; and
- (B) use strategies including rounding and compatible numbers to estimate solutions to addition and subtraction problems.

(3.6) **Patterns, relationships, and algebraic thinking.** The student uses patterns to solve problems.

The student is expected to:

- (A) identify and extend whole-number and geometric patterns to make predictions and solve problems;
- (B) identify patterns in multiplication facts using concrete objects, pictorial models, or technology; and
- (C) identify patterns in related multiplication and division sentences (fact families) such as $2 \times 3 = 6$, $3 \times 2 = 6$, $6 \div 2 = 3$, $6 \div 3 = 2$.

(3.7) **Patterns, relationships, and algebraic thinking.** The student uses lists, tables, and charts to express patterns and relationships.

The student is expected to:

- (A) generate a table of paired numbers based on a real-life situation such as insects and legs; and

(B) identify and describe patterns in a table of related number pairs based on a meaningful problem and extend the table.

(3.8) **Geometry and spatial reasoning.** The student uses formal geometric vocabulary.

The student is expected to:

- (A) identify, classify, and describe two- and three-dimensional geometric figures by their attributes. The student compares two- dimensional figures, three-dimensional figures, or both by their attributes using formal geometry vocabulary.

(3.9) **Geometry and spatial reasoning.** The student recognizes congruence and symmetry.

The student is expected to:

- (A) identify congruent two-dimensional figures;
- (B) create two-dimensional figures with lines of symmetry using concrete models and technology;
- and
- (C) identify lines of symmetry in two dimensional geometric figures.

(3.10) **Geometry and spatial reasoning.** The student recognizes that a line can be used to represent numbers and fractions and their properties and relationships.

The student is expected to:

- (A) locate and name points on a number line using whole numbers and fractions, including halves and fourths.

(3.11) **Measurement.** The student directly compares the attributes of length, area, weight/mass, and capacity, and uses comparative language to solve problems and answer questions. The student selects and uses standard units to describe length, area, capacity/volume, and weight/mass.

The student is expected to:

- (A) use linear measurement tools to estimate and measure lengths using standard units;
- (B) use standard units to find the perimeter of a shape;
- (C) use concrete and pictorial models of square units to determine the area of two dimensional surfaces;
- (D) identify concrete models that approximate standard units of weight/mass and use them to measure weight/mass;
- (E) identify concrete models that approximate standard units for capacity and use them to measure capacity; and
- (F) use concrete models that approximate cubic units to determine the volume of a given container or other three-dimensional geometric figure.

(3.12) **Measurement.** The student reads and writes time and measures temperature in degrees Fahrenheit to solve problems.

The student is expected to:

- (A) use a thermometer to measure temperature; and
- (B) tell and write time shown on analog and digital clocks.

(3.13) **Probability and statistics.** The student solves problems by collecting, organizing, displaying, and interpreting sets of data.

The student is expected to:

- (A) collect, organize, record, and display data in pictographs and bar graphs where each picture or cell might represent more than one piece of data;
- (B) interpret information from pictographs and bar graphs; and
- (C) use data to describe events as more likely than, less likely than, or equally likely as.

(3.14) **Underlying processes and mathematical tools.** The student applies Grade 3 mathematics to solve problems connected to everyday experiences and activities in and outside of school.

The student is expected to:

- (A) identify the mathematics in everyday situations;

- (B) solve problems that incorporate understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;
- (C) select or develop an appropriate problem solving plan or strategy, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem; and
- (D) use tools such as real objects, manipulatives, and technology to solve problems.

(3.15) **Underlying processes and mathematical tools.** The student communicates about Grade 3 mathematics using informal language.

The student is expected to:

- (A) explain and record observations using objects, words, pictures, numbers, and technology; and
- (B) relate informal language to mathematical language and symbols.

(3.16) **Underlying processes and mathematical tools.** The student uses logical reasoning.

The student is expected to:

- (A) make generalizations from patterns or sets of examples and nonexamples; and
- (B) justify why an answer is reasonable and explain the solution process.