

Grade 5 Mathematics Knowledge and Skills.

(5.1) **Number, operation, and quantitative reasoning.** The student uses place value to represent whole numbers and decimals.

The student is expected to:

- (A) use place value to read, write, compare, and order whole numbers through the 999,999,999,999; and
- (B) use place value to read, write, compare, and order decimals through the thousandths place.

(5.2) **Number, operation, and quantitative reasoning.** The student uses fractions in problem-solving situations.

The student is expected to:

- (A) generate a fraction equivalent to a given fraction such as $\frac{1}{2}$ and $\frac{3}{6}$ or $\frac{4}{12}$ and $\frac{1}{3}$;
- (B) generate a mixed number equivalent to a given improper fraction or generate an improper fraction equivalent to a given mixed number;
- (C) compare two fractional quantities in problem-solving situations using a variety of methods, including common denominators; and
- (D) use models to relate decimals to fractions that name tenths, hundredths, and thousandths.

(5.3) **Number, operation, and quantitative reasoning.** The student adds, subtracts, multiplies, and divides to solve meaningful problems.

The student is expected to:

- (A) use addition and subtraction to solve problems involving whole numbers and decimals;
- (B) use multiplication to solve problems involving whole numbers (no more than three digits times two digits without technology);
- (C) use division to solve problems involving whole numbers (no more than two-digit divisors and three-digit dividends without technology), including interpreting the remainder within a given context;
- (D) identify common factors of a set of whole numbers; and
- (E) model situations using addition and/or subtraction involving fractions with like denominators using concrete objects, pictures, words, and numbers.

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

The student is expected to:

- (A) use strategies, including rounding and compatible numbers to estimate solutions to addition, subtraction, multiplication, and division problems.

(5.5) **Patterns, relationships, and algebraic thinking.** The student makes generalizations based on observed patterns and relationships.

The student is expected to:

- (A) describe the relationship between sets of data in graphic organizers such as lists, tables, charts, and diagrams; and
- (B) identify prime and composite numbers using concrete objects, pictorial models, and patterns in factor pairs.

(5.6) **Patterns, relationships, and algebraic thinking.** The student describes relationships mathematically.

The student is expected to:

- (A) select from and use diagrams and equations such as $y = 5 + 3$ to represent meaningful problem situations.

(5.7) **Geometry and spatial reasoning.** The student generates geometric definitions using critical attributes.

The student is expected to:

- (A) identify essential attributes including parallel, perpendicular, and congruent parts of two- and three-dimensional geometric figures.

(5.8) **Geometry and spatial reasoning.** The student models transformations. The student is expected to:

- (A) sketch the results of translations, rotations, and reflections on a Quadrant I coordinate grid; and
- (B) identify the transformation that generates one figure from the other when given two congruent figures on a Quadrant I coordinate grid.

(5.9) **Geometry and spatial reasoning.** The student recognizes the connection between ordered pairs of numbers and locations of points on a plane.

The student is expected to:

- (A) locate and name points on a coordinate grid using ordered pairs of whole numbers.

(5.10) **Measurement.** The student applies measurement concepts involving length (including perimeter), area, capacity/volume, and weight/mass to solve problems.

The student is expected to:

- (A) perform simple conversions within the same measurement system (SI (metric) or customary);
- (B) connect models for perimeter, area, and volume with their respective formulas; and
- (C) select and use appropriate units and formulas to measure length, perimeter, area, and volume.

(5.11) **Measurement.** The student applies measurement concepts. The student measures time and temperature (in degrees Fahrenheit and Celsius).

The student is expected to:

- (A) solve problems involving changes in temperature; and
- (B) solve problems involving elapsed time.

(5.12) **Probability and statistics.** The student describes and predicts the results of a probability experiment.

The student is expected to:

- (A) use fractions to describe the results of an experiment;
- (B) use experimental results to make predictions; and
- (C) list all possible outcomes of a probability experiment such as tossing a coin.

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

The student is expected to:

- (A) use tables of related number pairs to make line graphs;
- (B) describe characteristics of data presented in tables and graphs including median, mode, and range; and
- (C) graph a given set of data using an appropriate graphical representation such as a picture or line graph.

(5.14) **Underlying processes and mathematical tools.** The student applies Grade 5 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.

(5.15) **Underlying processes and mathematical tools.** The student communicates about Grade 5 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.

(5.16) **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.