

Texas Essential Knowledge and Skills for Mathematics
Linked to the *Fantasy Sports and Mathematics*' Series
(Grades 5 and up)

Note: The portion of any standard that is in italics is not covered.

Grade 5

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

The student is expected to:

(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.

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

(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:

(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

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

The student is expected to:

- (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;
- (D) use tools such as real objects, manipulatives, and technology to solve problems.

Grade 6

(6.1) **Number, operation, and quantitative reasoning.** The student represents and uses rational numbers in a variety of equivalent forms.

The student is expected to:

- (A) compare and order non-negative rational numbers;
- (B) generate equivalent forms of rational numbers including whole numbers, fractions, and decimals;
- (C) use integers to represent real-life situations;
- (D) write prime factorizations using exponents;

(E) identify factors of a positive integer, common factors, and the greatest common factor of a set of positive integers; and

(F) identify multiples of a positive integer and common multiples and the least common multiple of a set of positive integers.

(6.2) Number, operation, and quantitative reasoning. The student adds, subtracts, multiplies, and divides to solve problems and *justify solutions*.

The student is expected to:

(A) model addition and subtraction situations involving fractions with *objects, pictures, words*, and numbers;

(B) use addition and subtraction to solve problems involving fractions and decimals;

(C) use multiplication and division of whole numbers to solve problems including situations involving equivalent ratios and rates;

(6.3) Patterns, relationships, and algebraic thinking. The student solves problems involving direct proportional relationships.

The student is expected to:

(A) use ratios to describe proportional situations;

(B) represent ratios and percents with concrete models, fractions, and decimals; and

(6.8) Measurement. The student solves application problems involving *estimation* and measurement of length, area, time, *temperature, volume*, weight, and angles.

The student is expected to:

(B) select and use appropriate units, tools, or formulas to measure and to solve problems involving length (including perimeter), area, time, temperature, volume, and weight;

(C) measure angles; and

(D) convert measures within the same measurement system (customary and metric) based on relationships between units.

(6.9) Probability and statistics. The student uses experimental and *theoretical* probability to make predictions.

The student is expected to:

(B) find the probabilities of a simple event and its complement and *describe the relationship between the two*.

(6.10) **Probability and statistics.** The student uses statistical representations to analyze data.

The student is expected to:

(A) select and use an appropriate representation for presenting and displaying different graphical representations of the same data including line plot, line graph, bar graph, and stem and leaf plot;

(B) identify mean (*using concrete objects and pictorial models*), median, mode, and range of a set of data;

(C) sketch circle graphs to display data; and

(D) solve problems by collecting, organizing, displaying, and interpreting data.

(6.11) **Underlying processes and mathematical tools.** The student applies Grade 6 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school.

The student is expected to:

(A) identify and apply mathematics to everyday experiences, to activities in and outside of school, *with other disciplines, and with other mathematical topics*;

(D) select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.

(6.12) **Underlying processes and mathematical tools.** The student communicates about Grade 6 mathematics through informal and mathematical language, representations, and models.

The student is expected to:

(A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models; and

Grade 7

(7.1) **Number, operation, and quantitative reasoning.** The student represents and uses numbers in a variety of equivalent forms.

The student is expected to:

(A) compare and order integers and positive rational numbers;

(B) convert between fractions, decimals, whole numbers, and percents *mentally*, on paper, or with a calculator; and

(7.2) Number, operation, and quantitative reasoning. The student adds, subtracts, multiplies, or divides to solve problems and justify solutions.

The student is expected to:

(A) represent multiplication and division situations involving fractions and decimals with models, including *concrete objects, pictures, words, and numbers*;

(B) use addition, subtraction, multiplication, and division to solve problems involving fractions and decimals;

(D) use division to find unit rates and ratios in proportional relationships such as speed, *density, price, recipes, and student-teacher ratio*;

(F) select and use appropriate operations to solve problems and *justify the selections; and*

(7.3) Patterns, relationships, and algebraic thinking. The student solves problems involving direct proportional relationships.

The student is expected to:

(A) *estimate* and find solutions to application problems involving percent; and

(B) estimate and find solutions to application problems involving proportional relationships such as *similarity, scaling, unit costs, and related measurement units*.

(7.5) Patterns, relationships, and algebraic thinking. The student uses equations to solve problems.

(7.9) Measurement. The student solves application problems involving *estimation* and measurement.

The student is expected to:

(A) *estimate measurements* and solve application problems involving length (including perimeter and circumference) and area of polygons and other shapes;

(7.10) Probability and statistics. The student recognizes that a physical or mathematical model can be used to describe the experimental and *theoretical* probability of real-life events.

The student is expected to:

(B) find the probability of independent events.

(7.11) **Probability and statistics.** The student understands that the way a set of data is displayed influences its interpretation.

The student is expected to:

(A) select and use an appropriate representation for presenting and displaying relationships among collected data, including line plot, line graph, bar graph, stem and leaf plot, circle graph, *and Venn diagrams, and justify the selection*; and

(7.12) **Probability and statistics.** The student uses measures of *central tendency* and range to describe a set of data.

The student is expected to:

(A) describe a set of data using mean, median, mode, and range; and

(7.13) **Underlying processes and mathematical tools.** The student applies Grade 7 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school.

The student is expected to:

(A) identify and apply mathematics to everyday experiences, to activities in and outside of school, *with other disciplines, and with other mathematical topics*;

(D) select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.

(7.14) **Underlying processes and mathematical tools.** The student communicates about Grade 7 mathematics through informal and mathematical language, representations, and models.

The student is expected to:

(A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models; and

Grade 8

(8.1) **Number, operation, and quantitative reasoning.** The student understands that different forms of numbers are appropriate for different situations.

The student is expected to:

- (A) compare and order rational numbers in various forms including integers, percents, and positive and negative fractions and decimals;
- (B) select and use appropriate forms of rational numbers to solve real-life problems including those involving proportional relationships;
- (D) express numbers in scientific notation, including negative exponents, in appropriate problem situations.

(8.2) Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and *justify solutions*.

The student is expected to:

- (A) select appropriate operations to solve problems involving rational numbers and justify the selections;
- (B) use appropriate operations to solve problems involving rational numbers in problem situations;

(8.3) Patterns, relationships, and algebraic thinking. The student identifies proportional or *non-proportional* linear relationships in problem situations and solves problems.

The student is expected to:

- (A) compare and contrast proportional and non-proportional linear relationships; and
- (B) *estimate* and find solutions to application problems involving percents and other proportional relationships such as *similarity* and rates.

(8.4) Patterns, relationships, and algebraic thinking. The student makes connections among various representations of a numerical relationship.

The student is expected to generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description).

(8.5) Patterns, relationships, and algebraic thinking. The student uses graphs, tables, and algebraic representations to *make predictions* and solve problems.

The student is expected to:

- (A) *predict*, find, and *justify* solutions to application problems using appropriate tables, graphs, and algebraic equations; and

(8.9) **Measurement.** The student uses indirect measurement to solve problems.

The student is expected to:

(A) use the Pythagorean Theorem to solve real-life problems; and

(8.11) **Probability and statistics.** The student applies concepts of *theoretical* and experimental probability to make predictions.

The student is expected to:

(A) find the probabilities of dependent and independent events;

(8.12) **Probability and statistics.** The student uses statistical procedures to describe data.

The student is expected to:

(B) draw conclusions and *make predictions* by analyzing trends in scatterplots; and

(C) select and use an appropriate representation for presenting and displaying relationships among collected data, including line plots, line graphs, stem and leaf plots, circle graphs, bar graphs, box and whisker plots, histograms, and *Venn diagrams*, with and without the use of technology.

(8.14) **Underlying processes and mathematical tools.** The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school.

The student is expected to:

(A) identify and apply mathematics to everyday experiences, to activities in and outside of school, *with other disciplines, and with other mathematical topics*;

(D) select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.

(8.15) **Underlying processes and mathematical tools.** The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models.

The student is expected to:

(A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models; and

Algebra I

(A.2D) collect and organize data, make and interpret scatter-plots (including recognizing positive, negative, or no correlation for data approximating linear situations), and *model, predict, and make decisions and critical judgments in problem situations.*

(A.4) **Foundations for functions.** The student *understands the importance of the skills required to manipulate symbols in order to solve problems* and uses the necessary algebraic skills required to simplify algebraic expressions and solve equations and *inequalities* in problem situations.

The student is expected to:

(A) find specific function values, *simplify polynomial expressions, transform and solve equations, and factor as necessary in problem situations;*

(B) use the *commutative, associative, and distributive* properties to simplify algebraic expressions; and

Algebra II

(2A.1B) collect and organize data, make and interpret scatter-plots, *fit the graph of a function to the data, interpret the results, and proceed to model, predict, and make decisions and critical judgments.*

Geometry

(G.8) **Congruence and the geometry of size.** The student uses tools to determine measurements of geometric figures and extends measurement concepts to find perimeter, area, and *volume* in problem situations.

The student is expected to:

(A) find areas of regular polygons, circles, and *composite figures;*

(C) *derive, extend,* and use the Pythagorean Theorem; and

(A) interpret information from various graphs, including line graphs, bar graphs, circle graphs, histograms, scatter-plots, line plots, stem and leaf plots, and box and whisker plots to draw conclusions from the data;