Grade 2

Content Standard 1.0	**Numbers, Number Sense, and Computation:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will accurately calculate and use estimation techniques, number relationships, operation rules, and algorithms; they will determine the reasonableness of answers and the accuracy of solutions.
EXCEEDS **STANDARD**	• Immediately recall and use basic addition facts (sums through 18) and the corresponding subtraction facts. • Add and subtract multi-place numbers with and without regrouping. • Generate, write, and solve two-step addition and subtraction problems based on practical situations. • Add and subtract money amounts using decimals. • Use the patterns in numbers to skip count by 2s through 10s to 100 and beyond. • Read and write numerals and order and compare numbers from 0-999 and beyond. • Estimate, with reasonable results, the number of objects in a set of 20 or more. • Read and write number words to 20 and beyond and use the ordinal positions through the twentieth and beyond. • Use, model, and identify the place value positions of 1s, 10s, 100s, and 1,000s. • Identify, model, and label unit fractions as parts of a whole.
MEETS **STANDARD**	• Identify and model basic addition facts (sums to 18) and the corresponding subtraction facts and immediately recall the addition facts with sums through 10 and the corresponding subtraction facts. • Add and subtract multi-place numbers without regrouping. • Generate, write, and solve one step addition and subtraction problems based on practical situations. • Use decimals to show money amounts. • Use the patterns in numbers to skip count by 2s, 3s, 5s, and 10s to 100 and beyond. • Read and write numerals and order and compare numbers from 0-999. • Estimate, with reasonable results, the number of objects in a set to 20. • Read and write number words through 20 and use, model, and identify the ordinal positions first through the twentieth. • Use, model, and identify the place value positions of 1s, 10s, and 100s. • Identify, model, and label 1/2 and 1/4 as parts of a whole.
APPROACHES STANDARD	• Identify and model basic addition facts (sums through 18) and the corresponding subtraction facts and immediately recall the addition facts with sums through 10 and the corresponding subtraction facts, though not yet consistently. • Add and subtract multi-place numbers without regrouping, with inconsistent results. • Generate, write, and solve, with occasional errors, one step addition and subtraction problems, based on practical situations. • Use decimals, with some inconsistency, to show money amounts. • Use the patterns in numbers to skip count by 2s, 5s, and 10s to 100, missing an occasional number. • Read and write numerals and order and compare numbers from 0-999 with inconsistent results. • Estimate, with inconsistent results, the number of objects in a set to 20. • Read and write number words to 20 and use, model, and identify the ordinal positions first through the twentieth, though not yet consistently. • Use, model, and identify, with errors, the place value positions of 1s, 10s, and 100s. • Identify, model, and label 1/2 and 1/4 as parts of a whole, though not yet consistently.

Grade 2 (Standard 1.0 continued)

BELOW STANDARD	• Identify and model the addition facts with sums through 10 and the corresponding subtraction facts, with assistance. • Add multi-place numbers without regrouping. • Model, write, and solve one-step addition problems based on practical situations. • Use decimals to show money amounts, with assistance. • Use the patterns in numbers to skip count by 2s, 5s, and 10s through 100, with assistance. • Read and write numerals and order and compare numbers from 0-99, with assistance. • Estimate the number of objects in a set to 10. • Read and write number words through 10 and use, model, and identify the ordinal positions first through the tenth, with errors. • Use, model, and identify the place value positions of 1s and 10s and 100s, with assistance. • Identify, model, and label 1/2 and 1/4, with assistance.

Grade 2

Content Standard 2.0	**Patterns, Functions, and Algebra:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use various algebraic methods to analyze, illustrate, extend, and create numerous representations (words, numbers, tables, and graphs) of patterns, functions, and algebraic relations as modeled in practical situations.
EXCEEDS STANDARD	• Recognize, describe, extend, create, and use complex repeating and increasing patterns with symbols, objects, manipulatives, and numbers to solve problems, using calculators and computers when available. • Use variables and number relationships to identify missing terms in open sentences. • Create, model, explain, and solve addition and subtraction number sentences to describe situations involving equality and inequality.
MEETS STANDARD	• Recognize, describe, extend, create, and use repeating and increasing patterns using symbols, objects, and manipulatives to solve problems. • Use variables and open sentences to express relationships. • Create, model, explain, and solve problems using addition and subtraction.
APPROACHES STANDARD	• Recognize, describe, extend, create, and use simple repeating patterns, using symbols, objects, and manipulatives to solve problems, with inconsistent results. • Use variables and open sentences to express simple relationships. • Model, explain, and solve problems based on numerical sentences with inconsistent results,.
BELOW STANDARD	• Recognize, describe, extend, create, and use simple repeating patterns using symbols, objects, and manipulatives to solve problems, with assistance. • Use variables in open addition sentences to express relationships, with assistance. • Model and solve problems using manipulatives based on simple numerical sentences, with assistance.

Grade 2

Content Standard 3.0	**Measurement:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use appropriate tools and techniques of measurement to determine, estimate, record, and verify direct and indirect measurements.
EXCEEDS STANDARD	• Identify and use the correct unit of measure for time, temperature, length, weight, capacity, volume, and area and describe and define various attributes. • Identify and use the correct unit of measure to compare differences in objects that are greater than, less than, and /or equal to a given unit. • Create possible combinations of bills and coins to equal a given amount. • Use a calendar to identify days, weeks, months, year(s), and elapsed time to solve problems. • Read time to the nearest five minute interval.
MEETS STANDARD	• Compare and order objects by various measurable attributes, such as time, temperature, length, weight, capacity, volume, and area and describe and define these various attributes. • Compare objects that are greater than, less than, and /or equal to a given unit of measure such as inch, yard, centimeter, and meter. • Determine the value of any given set of coins and bills. • Recite and use the months of the year in order and use a calendar to identify days, weeks, months, and year. • Read time to the nearest quarter hour and distinguish between A.M. and P.M.
APPROACHES STANDARD	• Compare and order objects by various measurable attributes, such as time, temperature, length, weight, and area. • Compare objects that are greater than, less than, and /or equal to a given unit, with inconsistent results. • Determine the value of any given set of coins. • Recite the months of the year in order with a few errors, and use a calendar to identify days, weeks, months, and year, but not yet consistently. • Read time to the nearest half hour and distinguish between A.M. and P.M.
BELOW STANDARD	• Compare objects by simple measurable attributes, such as temperature, length, weight, and area, communicating their similarities and differences, with assistance. • Compare objects that are greater than, less than, and/or equal to a given unit, with assistance. • Determine the value of any given set of coins under one dollar. • Recite the months of the year in order, with assistance, and use a calendar to identify days, weeks and months, though not yet consistently. • Read time to the nearest half hour; distinguish between A.M. and P.M., with assistance.

Grade 2

Content Standard 4.0	**Spatial Relationships and Geometry:** To solve problems, communicate, and make connections within and beyond the field of mathematics, students will identify, represent, verify, and apply spatial relationships and geometric properties.
EXCEEDS STANDARD	• Identify, sort, sketch, describe, compare, and contrast plane geometric figures regardless of position. • Describe the location of objects and, when given directions, place objects in position relative to each other. • Identify and describe similar and congruent two-dimensional figures regardless of how they are positioned relative to each other. • Identify symmetry in figures in the environment and create figures and designs that have more than one line of symmetry. • Describe, sketch, model, and build two- and three- dimensional figures.
MEETS STANDARD	• Identify, name, sort, sketch, describe, and compare circles, triangles, and rectangles including squares, regardless of position. • Describe the location of objects and place objects in position using vocabulary such as before, far, below, and left. • Compare the size of similar two-dimensional figures and identify shapes that are congruent. • Identify symmetry in figures in the environment and create figures and designs that have a line of symmetry. • Identify, name, sort, describe, compare, and contrast two- and three-dimensional figures.
APPROACHES STANDARD	• Identify, name, sort, sketch, describe, and compare circles, triangles, and rectangles including squares, with errors. • Place objects in given positions using vocabulary such as near, below, right, and over. • Compare the size of similar two-dimensional figures and identify shapes that are congruent, when they are positioned the same way relative to each other. • Identify symmetry in figures in the environment and inconsistently create figures and designs that have a line of symmetry. • Identify, name, sort, describe, compare, and contrast two- or three-dimensional figures, though not yet consistently.
BELOW STANDARD	• Identify, name, and sort circles, triangles, and rectangles including squares, with assistance. • Place objects in position using vocabulary such as near, below, right, with inconsistent results. • Identify figures in the environment that have a line of symmetry. • Describe similar or congruent two-dimensional figures when they are positioned in the same way, with assistance. • Compare, contrast, and match circles, triangles, and rectangles including squares to their corresponding three-dimensional figures, with assistance.

Grade 2

Content Standard 5.0	**Data Analysis:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will collect, organize, display, interpret, and analyze data to determine statistical relationships and probability projections.
EXCEEDS STANDARDS	• Collect, organize, record, explain, and analyze data using concrete materials and surveys.
MEETS STANDARD	• Collect, organize, record, and explain classification of data using concrete materials.
APPROACHES STANDARD	• Collect, organize, record, and explain classification of data using concrete materials, with occasional errors and/or weak explanations.
BELOW STANDARD	• Collect, organize, record, and explain classification of data using concrete materials, with assistance.

Grade 3

Content Standard 1.0	**Numbers, Number Sense, and Computation:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will accurately calculate and use estimation techniques, number relationships, operation rules, and algorithms; they will determine the reasonableness of answers and the accuracy of solutions.
EXCEEDS STANDARD	• Immediately recall and use addition and subtraction facts and multiplication facts with products greater than 81. • Add and subtract multi-place decimals with regrouping. • Use pencil and paper, mental computation, and estimation to generate and solve complex two-step addition and subtraction problems based on practical situations. • Generate and solve two-step multiplication problems based on practical situations, using paper and pencil, mental computation, and estimation. • Create problems that require the addition and subtraction of decimals that represent money amounts. • Explain multiplication using a variety of models. • Read and write numerals and compare and order numbers from 0-9,999 and beyond. • Determine the reasonableness of answers by rounding to the nearest ten, hundred, and beyond. • Use, model, and identify place value positions beyond 10,000. • Model, sketch, and label fractions with denominators to 10 and beyond. • Write fractions using both numerals and number words.
MEETS	• Immediately recall and use addition and subtraction facts and multiplication facts with products through 81.

STANDARD	Add and subtract multi-place numbers with regrouping. • Use pencil and paper, mental computation, and estimation to generate and solve two-step addition and subtraction problems based on practical situations. • Generate and solve one-step multiplication problems based on practical situations using paper and pencil, mental computation, and estimation. • Add and subtract decimals that represent money amounts. • Use addition to model and explain multiplication. • Read and write numerals and compare and order numbers from 0-9,999. • Determine the reasonableness of answers by rounding to the nearest ten and hundred. • Use, model, and identify place value positions through 10,000. • Model, sketch, and label fractions with denominators to 10. • Write commonly used fractions using both numerals and number words.
APPROACHES **STANDARD**	• Immediately recall and use addition and subtraction facts and multiplication facts with products through 81, though not yet consistently. • Add and subtract multi-place numbers with regrouping with some errors. • Use pen and paper, mental computation, and estimation to generate and solve simple two-step addition and subtraction problems based on practical situations, though not yet consistently. • Generate and solve, with some degree of inconsistency, one-step multiplication problems based on practical situations using paper and pencil, mental computation, and estimation. • Add and subtract decimals that represent money amounts, with occasional errors. • Use addition to model multiplication. • Read and write numerals and compare and order numbers from 0-9,999, with inconsistent results. • Round to the nearest ten and hundred. • Use, model, and identify place value positions to 10,000 with some success. • Model, sketch, and label fractions with denominators to 10, though not yet consistently. • Write commonly used fractions using numerals.

Grade 3(Standard 1.0 continued)

BELOW **STANDARD**	• Recall and use addition and subtraction and multiplication facts with products through 81, with errors. • Add and subtract multi-place numbers without regrouping. • Use pencil and paper, mental computation, and estimation to generate and solve simple one-step addition and subtraction problems based on practical situations. • Solve one-step multiplication problems, with assistance, based on practical situations using paper and pencil, mental computation, and estimation. • Add decimals that represent money amounts. • Use addition to model and multiplication, with assistance. • Read and write numerals and compare and order numbers from 0-9,999 with assistance. • Round to the nearest ten. • Use, model and identify place value positions of 1s, 10s, and 100s. • Model, sketch, and label unit fractions with denominators to 10. • Write commonly used fractions using numerals, with inconsistent results.

Grade 3

Content Standard 2.0	**Patterns, Functions, and Algebra:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use various algebraic methods to analyze,

	illustrate, extend, and create numerous representations (words, numbers, tables, and graphs) of patterns, functions, and algebraic relations as modeled in practical situations.
EXCEEDS STANDARD	• Recognize, describe, extend, and create repeating, increasing and decreasing patterns using numbers; use number patterns and their extensions to solve complex problems using complicated patterns. • Identify missing symbols (+, -, X, >, <, =) and missing numbers in open number sentences involving number facts in addition, subtraction, and multiplication.
MEETS STANDARD	• Recognize, describe, extend, and create repeating and increasing patterns using numbers; use number patterns and their extensions to solve problems. • Identify missing symbols (+, -, >, <, =) and missing numbers in open number sentences involving number facts in addition and subtraction.
APPROACHES STANDARD	• Recognize, describe, extend, and create repeating and increasing patterns using numbers; use number patterns and their extensions to solve simple problems, with assistance. • Identify missing symbols (+, -, >, <, =) and missing numbers in open number sentences involving number facts in addition and subtraction, with some errors.
BELOW STANDARD	• Recognize, describe, extend, and create repeating and increasing patterns using numbers. • Identify missing symbols (+, -, >, <, =) and missing numbers in open number sentences involving number facts in addition and subtraction, though not yet independently.

Grade 3

Content Standard 3.0	**Measurement:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use appropriate tools and techniques of measurement to determine, estimate, record, and verify direct and indirect measurements.
EXCEEDS STANDARD	• Measure to a required degree of accuracy and record the measurements, evaluating for error and describing the appropriateness of self-selected units of measure. • Estimate measurements and select and use appropriate measuring devices with standard units to measure length, surface area, liquid volume, capacity, temperature, and weight. • Read, write, and use money notation and determine possible combinations of coins and bills to equal given amounts, and apply to practical situations. • Read time to the nearest minute using analog and digital clocks and determine elapsed time, applying it to practical situations.
MEETS STANDARD	• Measure to a required degree of accuracy, record the measurement, and evaluate it for error, describing the appropriateness of selected units of measure. • Estimate measurements and use measuring devices with standard and non-standard units to measure length, area of a region, liquid volume, capacity, temperature, and weight, communicating the concepts of more, less, and equivalent. • Read, write, and use money notation and determine possible combinations of coins and bills to

	equal given amounts. • Read time to the nearest minute using analog and digital clocks and determine elapsed time.
APPROACHES STANDARD	• Measure, with inconsistent accuracy, and record the measurement, identifying the appropriate unit of measure, though not always correctly. • Estimate measurements, with assistance, and use measuring devices with non-standard units to measure length, liquid volume, capacity, temperature, and weight, communicating the concepts of more, less, and equivalent. • Read, write, and use money notation, and determine a possible combination of coins and bills to equal given amounts, with inconsistent results. • Read time to the nearest minute, using analog and digital clocks, and determine elapsed time, though not yet consistently.
BELOW STANDARD	• Measure objects, with inconsistent accuracy, and record the measurements. • Use measuring devices with non-standard units to measure length, temperature, and weight, communicating the concepts of more, less, and equivalent. • Read, write, and use money notation and determine a possible combination of coins and bills to equal given amounts, with assistance. • Read time to the nearest minute using analog and digital clocks.

Grade 3

Content Standard 4.0	**Spatial Relationships and Geometry:** To solve problems, communicate, and make connections within and beyond the field of mathematics, students will identify, represent, verify, and apply spatial relationships and geometric properties.
EXCEEDS STANDARD	• Describe, sketch, compare, and contrast plane geometric figures in great detail. • Demonstrate and describe a sequence of transformations (motions) of geometric figures as slides, rotations, and/or flips. • Describe, sketch, model, build, compare, and contrast two- and three-dimensional geometric figures, with great detail.
MEETS STANDARD	• Describe, sketch, compare, and contrast plane geometric figures. • Demonstrate and describe the transformation (motion) of a geometric figure as a slide, rotation, or a flip. • Describe, sketch, model, build, compare, and contrast two- and three-dimensional geometric figures.

APPROACHES STANDARD	• Describe, sketch, and compare plane geometric figures. • Demonstrate and describe with some errors, the motion (transformation) of a geometric figure as a slide, rotation, or a flip. • Describe, sketch, model, build, compare, and contrast two- and three-dimensional geometric figures, with assistance.
BELOW STANDARD	• Describe, draw, and compare plane geometric figures, with assistance. • Demonstrate sliding, rotating, and flipping a geometric figure. • Describe, draw, model, build, and compare two- and three-dimensional geometric figures, with assistance.

Grade 3

Content Standard 5.0	**Data Analysis:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will collect, organize, display, interpret, and analyze data to determine statistical relationships and probability projections.
EXCEEDS STANDARD	• Collect, organize, display, describe, and interpret simple data using number lines, pictographs, bar graphs, and frequency tables, by hand and with computers when they are available. • Use concepts of probability to make predictions about future events.
MEETS STANDARD	• Collect, organize, display, and describe simple data using number lines, pictographs, bar graphs, and frequency tables, by hand and with computers when they are available. • Use concepts of probability such as impossible, unlikely, likely, and certain to make predictions about future events.
APPROACHES STANDARD	• Collect, organize, display, and describe simple data, with inconsistent results, using number lines, pictographs, bar graphs, and frequency tables, by hand and with computers when they are available. • Use concepts of probability such as impossible, unlikely, likely, and certain to make predictions about familiar events.
BELOW STANDARD	• Collect, organize, display, and describe, simple data, with assistance, in one or more ways, by hand and with computers when they are available. • Use concepts of probability such as impossible, unlikely, likely and certain to make predictions about familiar events, with inconsistent results.

Grade 5

Content Standard 1.0	**Numbers, Number Sense and Computation:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will accurately calculate and use estimation techniques, number relationships, operation rules, and algorithms; they will determine the

	reasonableness of answers and the accuracy of solutions.
EXCEEDS STANDARD	• Immediately recall and use multiplication and corresponding division facts. • Multiply and divide multi-place numbers. • Generate and solve complex addition, subtraction, multiplication, division problems involving whole numbers and order of operations in practical situations. • Compare and order negative numbers within the context of practical situations and plot rational numbers on a number line. • Estimate, using a variety of methods, to determine and justify the reasonableness of an answer. • Model, draw, identify, compare, add, and subtract decimals and fractions with like and unlike denominators to solve problems.
MEETS STANDARD	• Immediately recall and use multiplication and corresponding division facts using factors of 0 through 12. • Multiply and divide multi-place numbers by two-digit numbers including multiples of 10. • Generate and solve addition, subtraction, multiplication, and division problems involving whole numbers and order of operations in practical situations. • Compare and order negative numbers within the context of practical situations and plot integer values on a number line. • Estimate to determine the reasonableness of answer by identifying and using the correct place value position. • Model, draw, identify, compare, add, and subtract decimals and fractions with like denominators to solve problems.
APPROACHES STANDARD	• Immediately recall and use multiplication and corresponding division facts using factors 0 through 12, with inconsistent results. • Multiply and divide multi-place numbers by two-digit numbers including multiples of 10, with inconsistent results. • Generate addition, subtraction, multiplication, and division problems involving whole numbers and order of operations to solve problems, with errors. • Compare and order negative numbers within the context of practical situations and plot integers on a number line, with inconsistent results. • Use a given place value in rounding and estimating to determine the reasonableness of an answer. • Use models and drawings to identify, compare, add, and subtract decimals and fractions with like denominators, using both to solve problems, with inconsistent results.
BELOW STANDARD	• Immediately recall and use multiplication and corresponding division facts using factors of 0 through 10, though not yet consistently. • Use multiplication and corresponding division facts to multiply and divide multi-place numbers by single-digit numbers, with inconsistent results. • Solve addition, subtraction, multiplication, and division problems, though not yet consistently. • Use negative numbers to describe temperatures and plot negative and positive numbers on a number line. • Use rounding and estimation in specified situations, with inconsistent accuracy. • Use models and drawings to identify, compare, add, and subtract decimals and fractions with like denominators to solve problems, with assistance.

Grade 5

Content Standard 2.0	Patterns, Functions, and Algebra: **To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use various algebraic methods to analyze, illustrate, extend, and create numerous representations (words, numbers, tables, and graphs) of patterns, functions, and algebraic relations as modeled in practical situations.**
EXCEEDS STANDARD	• Create tables and charts to identify, describe, and extend number patterns and relationships. • Use variables in open sentences to describe a wide variety of functions and relationships. • Solve simple equations and inequalities using whole numbers, decimals, and common fractions. • Generate complex number sequences given the first term of the sequence and any computation rule.
MEETS STANDARD	• Identify, describe, and explain number patterns and relationships, including triangular numbers, perfect squares, arithmetic and geometric sequences, using concrete materials, paper and pencil, and calculators. • Use variables in open sentences to describe simple functions and relationships. • Solve simple whole numbers equations and inequalities using a variety of methods. • Generate number sequences given the first term of the sequence and any simple computation rule.
APPROACHES STANDARD	• Identify, describe, and explain simple number patterns and relationships, including arithmetic and geometric sequences, using concrete materials, paper and pencil, and calculators when available, though not yet consistently. • Use variables, though not yet consistently, in open sentences to describe simple functions and relationships. • Solve simple equations and inequalities, with inconsistent results, involving whole numbers using a variety of methods. • Generate simple number sequences given the first term of the sequence and any simple computation rule, with inconsistent results.
BELOW STANDARD	• Identify simple number patterns and relationships, including arithmetic and geometric sequences, using concrete materials, paper and pencil, and calculators when available, though not yet consistently. • Use open number sentences to represent simple functions and relationships, with assistance. • Solve simple whole number equations and some inequalities, though not yet consistently. • Generate simple number sequences given the first term of the sequence and any simple computation rule, with assistance.

Grade 5

Content Standard 3.0	**Measurement:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use appropriate tools and techniques of measurement to determine, estimate, record, and verify direct and indirect measurements.
EXCEEDS STANDARD	• Measure and compare lengths, masses, and capacities and convert those measurements within the same measurement system.

	• Estimate measures of length, volume, capacity, quantity, and weight justifying the reasonableness of the estimates. • Select the method of measurement and justify the use of estimation or direct measurement. • Determine several different combinations of bills and coins that would provide correct change in practical situations. • Determine the perimeter and area of given polygons, and describe how changes in dimensions affect changes in area. • Convert units of time to equivalent units.
MEETS STANDARD	• Measure, compare, and convert units of length, within the same measurement system, to the nearest fractional/decimal part. • Estimate and directly measure length, volume, capacity, and quantity. • Select and justify the use of estimation or direct measurement and weight in a given situation. • Determine the total cost of purchases and the amount of change in practical situations. • Describe the difference between perimeter and area and determine the perimeter of any polygon and the area of right triangles and rectangles, including squares. • Identify equivalent periods of time using relationships between and among seconds, minutes, hours, days, months, and years.
APPROACHES STANDARD	• Measure and compare lengths within the same measurement system to the nearest fraction/decimal part. • Estimate measures of length, quantity, and weight. • Explain why estimation or direct measurements are preferred or required in specific situations. • Determine correct change when given total cost and amount tendered. • Determine the perimeter of any polygon and area of given right triangles and rectangles, including squares. • Identify equivalent periods of time using relationships between and among seconds, minutes, hours, days, months, and years.
BELOW STANDARD	• Measure and compare lengths. • Estimate and compare measures of length. • Explain why estimation or precise measurements are preferred or required in specific situations, with assistance. • Determine correct change given total cost of a purchase and amount tendered, with inconsistent results. • Determine the perimeter of any polygon and the area, with errors, of given right triangles and rectangles, including squares. • Identify some equivalent periods of time, using relationships between and among seconds, minutes, hours, days, months, and years, with assistance.

Grade 5

Content Standard 4.0	**Spatial Relationships and Geometry:** To solve problems, communicate, and make connections within and beyond the field of mathematics, students will identify, represent, verify, and apply spatial relationships and geometric properties.
EXCEEDS STANDARD	• Draw and classify angles and triangles according to given measurements. • Identify, draw, and label circles and elements of circles, describing the relationships between the various elements. • Identify transformations as a translation, rotation, reflection, enlargement, or reduction using the formal vocabulary for shapes that have congruence, similarity, and symmetry. • Identify and draw shapes that have congruence, similarity, and symmetry using a wide variety of methods. • Graph ordered pairs and identify coordinates for a given point in any quadrant. • Draw and classify complex two- and three-dimensional figures by their properties including the number of vertices, and edges and the number and shape of the faces. • Identify, describe, classify, and construct one- and two dimensional geometric figures including intersecting, perpendicular and parallel lines, line segments, rays, and angles when given measurements and describe the relationships among various elements.
MEETS STANDARD	• Draw and classify angles and triangles as right, acute, or obtuse. • Identify and draw circles and elements of circles, describing the relationships between the various elements. • Identify a transformation as translation, rotation, reflection, enlargement, or reduction. • Identify shapes that have congruence, similarity, and/or symmetry using a variety of methods, including transformational motions and models, drawings, and measurement tools. • Graph ordered pairs and identify coordinates for a given point in the first quadrant. • Identify, describe, compare and classify two- and three-dimensional figures by their properties including the number of vertices, and edges and the number and shape of the faces. • Identify, describe, classify and draw one- and two-dimensional geometric figures including intersecting, perpendicular and parallel lines, line segments, rays, and angles with given measurements.
APPROACHES STANDARD	• Draw, with errors, and classify angles and triangles as right, acute, or obtuse. • Identify and draw circles and elements of circles, displaying some understanding of the relationships between the various elements. • Identify transformations as slides, turns, flips, larger, or smaller, with errors. • Identify shapes that have congruence, similarity, and/or symmetry using visual comparisons. • Graph ordered pairs and identify coordinates for a given point in the first quadrant, with inconsistent accuracy. • Identify, describe, compare and classify, with inconsistent results, common three-dimensional figures by their properties including the number of vertices, edges, and shape of their faces.

	• Identify, describe, draw and classify one- and two dimensional geometric figures including intersecting, perpendicular and parallel lines, line segments, rays, and angles using given measurements, with inconsistent results.
BELOW STANDARD	• Classify angles and triangles as right, acute, or obtuse, with errors. • Identify and draw circles and elements of circles. • Identify transformations as slides, turns, flips, larger, or smaller, with assistance. • Identify shapes that have congruence and symmetry, with assistance. • Graph ordered pairs and identify coordinates for a given point in the first quadrant, with assistance. • Identify, describe, compare, and classify common two-and three-dimensional figures, with errors. • Identify, describe, and classify one- and two- dimensional geometric figures including intersecting, perpendicular and parallel lines, line segments, rays, and angles, with assistance.

Grade 5

Content Standard 5.0	**Data Analysis:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will collect, organize, display, interpret, and analyze data to determine statistical relationships and probability projections.
EXCEEDS STANDARD	• Collect, organize, and interpret data using a variety of graphic representations. • Use data and graphs to draw conclusions and/or make predictions using data in a variety of written and oral forms, with and without technology. • Conduct simple and compound probability experiments using concrete materials and represent the results in fractional forms. • Solve and analyze probability problems using a variety of methods. • Use measures of central tendency in practical problem situations. • Select a type of graph to represent a given set of data and provide written and oral justification of selection, including discussion of limitations of graphs not selected.
MEETS STANDARD	• Collect, organize, read, and interpret data using graphic representations including tables, line plots, stem and leaf plots, scatter plots, and histograms. • Use data and graphs to formulate and explain conclusions and predictions with and without technology. • Conduct simple probability experiments using concrete materials and represent the results in fractional form. • Solve probability problems using a variety of methods including constructing sample spaces and tree diagrams. • Model and compute measures of central tendency including mean, median, and mode. • Describe the limitations of various graph formats and select a type of graph to accurately represent the given data; justify the selection.
APPROACHES STANDARD	• Read and interpret data using a variety of graphic representations. • Use data to make conjectures and predictions that are sometimes erroneous.

	Conduct simple probability experiments using concrete materials and summarize the results. • Solve probability problems primarily using sample spaces and tree diagrams. • Identify the mode and compute the mean and median for a given set of data, with inconsistent results. • Select a type of graph to represent data and identify inconsistently the reasons for the selection.
BELOW STANDARD	• Read and interpret data using simple graphic representations, with assistance. • Use data to make predictions, with inconsistent logic. • Conduct simple probability experiments using concrete materials and tally the results. • Solve simple probability problems primarily using tree diagrams. • Identify the mode and compute the mean and median for a given set of data, with assistance. • Select a type of graph to represent data and identify some of the reasons for the selection, with assistance.

Grade 8

Content Standard 1.0	**Numbers, Number Sense, and Computation:** To solve problems, communications, reason, and make connections within and beyond the field of mathematics, students will accurately calculate and use estimation techniques, number relationships, operation rules, and algorithms: they will determine the reasonableness of answers and the accuracy of solutions.
EXCEEDS STANDARD	• Read, write, apply, and compute with real numbers including radicals, exponentials, scientific notation, and irrationals and use them to solve multi-step problems. • Solve multi-step proportion problems involving addition, subtraction, multiplication, and division. • Explain, connect, and apply concepts of number theory and properties of real numbers to solve problems and justify solutions. • Explain, connect, and apply properties of real numbers to solve problems and justify solutions. • Estimate in appropriate practical applications and explain the validity of the estimation method. • Explain and apply the relationships among fractions, decimals, and percents and translate among various representations.
MEETS STANDARD	• Read, write, apply, and compute with real numbers in various forms including radicals, exponentials, and scientific notation. • Determine, write, and use ratios and proportions to solve problems. • Explain and use concepts of number theory such as factors and multiples, and properties of real numbers such as the commutative property and associative property, to solve problems. • Explain and use properties of real numbers such as the associative, commutative, and distributive properties and order of operations to solve problems. • Estimate in problem solving situations and practical applications to determine the reasonableness of answers and verify the results. • Explain the relationship among fractions, decimals, and percents and translate among representations.

APPROACHES **STANDARD**	• Read, write, and compute with real numbers, including exponentials, with inconsistent results. • Solve proportions using given ratios. • Use factors, multiples, and divisibility rules to solve problems. • Identify and apply some properties of real numbers. • Estimate in practical applications with errors. • Convert among fractions, decimals, and percents, with inconsistent results.
BELOW **STANDARD**	• Read, write, and accurately compute with whole numbers and add and subtract decimals and fractions, with inconsistent results. • Describe situations as a ratio. • Use factors, multiples, and divisibility rules to solve problems, though with inconsistent results. • Identify and use properties of real numbers, with assistance. • Estimate in problem solving situations and practical applications, with assistance. • Convert between two of the following—common fractions, decimals, and percents—with assistance.

Grade 8

Content Standard 2.0	**Patterns, Functions, and Algebra:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use various algebraic methods to analyze, illustrate, extend, and create numerous representations (words, numbers, tables, and graphs) of patterns, functions, and algebraic relations as modeled in practical situations.
EXCEEDS **STANDARD**	• Use inductive reasoning to find a missing term in numeric, arithmetic, and geometric sequences and to generalize basic patterns and formulas to the nth term, with and without calculators. • Identify, model, describe, and evaluate complex relationships including functions using diagrams, written, oral, graphic, and symbolic language. • Solve a complex equation or formula for any variable. • Describe and demonstrate how a change in one variable of a complex mathematical relationship affects the remaining variables. • Solve complex linear equations and inequalities. • Add and subtract polynomials describing the connection between the algebraic and arithmetic processes.
MEETS **STANDARD**	• Use inductive reasoning to find a missing term in numeric, arithmetic, and geometric sequences and to generalize basic patterns to the nth term, with and without calculators. • Identify, describe, model, and evaluate relationships including patterns, sequences, and functions using oral, written, and symbolic language, with and without technology. • Solve an equation or a formula for any variable. • Describe how a change in one variable of a mathematical relationship affects the remaining variables using various tools and methods. • Model, identify, and solve simple linear equations and inequalities and relate that process to the

	order of operations, using formal and informal methods. • Add and subtract binomials describing the connection between the algebraic process and the arithmetic process.
APPROACHES STANDARD	• Find a missing term of arithmetic and geometric sequences. • Identify, model, and describe relationships, with inconsistent results, including patterns, sequences, and functions using oral and written language, with and without technology. • Solve an equation or a formula for any variable, with errors. • Describe, in an incomplete or confusing way, how a change in one variable of a mathematical relationship affects the remaining variables. • Identify and solve simple linear equations, with errors. • Add and subtract binomials.
BELOW STANDARD	• Find a missing term in an increasing arithmetic or geometric sequence. • Identify, model, describe, and evaluate simple relationships, including functions, with assistance, with and without technology. • Read and substitute values in an algebraic expression. • Describe, with assistance, how a change in one variable of a mathematical relationship affects the remaining variables. • Solve simple linear equations, though not yet independently. • Add binomials.

Grade 8

Content Standard 3.0	**Measurement:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use appropriate tools and techniques of measurement to determine, estimate, record, and verify direct and indirect measurements.
EXCEEDS STANDARD	• Use conversion factors to compare and convert units of measure for length, weight/mass, and volume within the same measurement system (customary or metric); estimate conversions between like units of the two systems to solve problems. • Describe the distinction between precision, error of measure, and tolerance in measurement when using an appropriate measurement tool. • Determine an appropriate degree of accuracy and measure to that degree of accuracy for a specified measurement situation. • Recall and apply formulas to find perimeter, circumference, and area of plane figures and volume and surface area of solid figures; identify the relationship between changes in area and volume and changes in linear measures of figures. • Evaluate formulas and algebraic expressions for given values of a variable, using various tools and methods. • Apply ratios and proportions in multi-step problems.
MEETS STANDARD	• Compare and convert units of measure for length, weight/mass, and volume within the same measurement system (customary or metric); estimate conversions between like units of the two systems to solve problems. • Identify the range of precision, error of measure, and tolerance in measurement when using the appropriate measurement tool and measuring to the required degree of accuracy.

	Estimate and measure length, weight/mass, and volume to the required degree of accuracy. • Derive and apply formulas to find perimeter, circumference, and area of plane figures and volume and surface area of solid figures; identify the relationship between changes in area and volume and changes in linear measures of figures. • Evaluate formulas and algebraic expressions for given values of a variable. • Apply ratio and proportion to calculate rates and as a method of indirect measure.
APPROACHES STANDARD	• Compare and convert units of measure for length and weight/mass within the same measurement system (customary and metric); estimate conversions between like units of the two systems to solve problems. • Determine the precision of measure for a given measurement tool. • Estimate and measure to a required degree of accuracy, though not yet consistently. • Apply formulas to find perimeter, circumference, and area of plane figures and identify the relationship between changes in area and changes in linear measures, with inconsistent results. • Substitute for given values in an algebraic expression. • Apply ratio and proportion to calculate rates and as a method of indirect measure, with inconsistent results.
BELOW STANDARD	• Convert units of linear, weight, time, and liquid measure within the customary system, with inconsistent accuracy. • Explain how the size of the unit used affects the precision of measurement. • Measure to the nearest whole unit. • Find the area, perimeter, and circumference of common plane figures, with assistance. • Substitute values to evaluate algebraic expressions. • Set up and solve proportions, with assistance.

Grade 8

Content Standard 4.0	**Spatial Relationships and Geometry:** To solve problems, communicate, and make connections within and beyond the field of mathematics, students will identify, represent, verify and apply spatial relationships and geometric properties.
EXCEEDS STANDARD	• Identify, classify, compare, and draw regular and complicated irregular polygons, with given specifications and determine the sum of the interior angles of convex polygons, developing a rule to describe the sum. • Apply the properties of equality and proportionality to solve complex problems involving congruent or similar shapes. • Use coordinate geometry and graphs to show multiple-step geometric transformations. • Create a variety of models of a three-dimensional figures from two-dimensional drawings and make two-dimensional proportional sketches of three-dimensional objects. • Represent, interpret, and generalize relationships defined by equations and formulas (including distance, midpoint, and slope) on a coordinate plane, with and without technology. • Form generalizations and validate conclusions about properties of geometric shapes including those associated with parallel lines, perpendicular lines, bisectors, triangles, and polygons and use these generalizations to solve problems. • Verify, explain and use both the Pythagorean Theorem and the Triangle Sum Theorem to determine

	missing sides and angles of triangles in practical situations. • Construct, draw, and sketch geometric figures, bisected angles and lines, accurately and efficiently using hand tools, technology, and models.
MEETS STANDARD	• Identify, classify, compare, and draw regular and irregular polygons, given specifications; determine the sum of the interior angles of convex polygons. • Apply the properties of equality and proportionally to solve problems involving congruent or similar shapes. • Use coordinate geometry and models to illustrate change in scale and other geometric transformations. • Create a model of a three-dimensional figure from two-dimensional drawings and make a two-dimensional drawing of a three-dimensional object. • Represent and interpret relationships defined by equations and formulas (including distance, midpoint, and slope) on a coordinate plane with and without technology. • Form generalizations and validate conclusions about properties of geometric shapes including those associated with parallel lines, perpendicular lines, bisectors, triangles, and quadrilaterals. • Verify, explain and use both the Pythagorean Theorem and the Triangle Sum Theorem to determine missing sides and angles of triangles. • Construct, draw, and sketch geometric figures, bisected angles and lines and line segments with given specifications, using hand tools and technology.
APPROACHES STANDARD	• Identify, classify, compare, and sketch regular polygons and use a protractor to determine the sum of the interior angles of polygons. • Apply the properties of equality and proportionality to solve simple problems involving congruent or similar shapes. • Identify and compare the ordered pairs for both an original and transformed figure on a coordinate plane, with inconsistent results. • Build a model of a simple three-dimensional figure from two-dimensional drawings and make a two-dimensional drawing of a simple three-dimensional object. • Represent relationships, with errors, defined by equations and formulas (including distance, midpoint, and slope) on a coordinate plane. • Identify and define parallel lines, perpendicular lines, bisectors, triangles and quadrilaterals. • Use both the Pythagorean Theorem and the Triangle Sum Theorem to determine missing sides and angles of triangles with inconsistent results. • Construct figures and bisect angles and line segments using hand tools, technology, and models.

Grade 8 (Standard 4.0 continued)

BELOW STANDARD	• Classify, sketch, compare, and identify most regular polygons; determine the sum of the interior angles of polygons given the measurements of the angle. • Apply the properties of equality and proportionality to solve simple problems involving congruent or similar shapes, with inconsistent results. • Identify the ordered pairs that relate to the vertices of a geometric figure on a coordinate plane. • Build a model of a simple three-dimensional figure from a two-dimensional drawing or make a two-dimensional drawing of a simple three-dimensional object, with assistance. • Use a table and plot points in a coordinate plane. • Represent or describe the relationships meant by the terms parallel lines, perpendicular lines, bisectors, triangles, and quadrilaterals. • Use the Pythagorean Theorem to find the hypotenuse, and use the Triangle Sum Theorem with given angle measures to find missing angles. • Construct figures and bisect angles and line segments using hand tools, technology and models, with assistance.

Grade 8

Content Standard 5.0	**Data Analysis:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will collect, organize, display, interpret, and analyze data to determine statistical relationships and probability projections.
EXCEEDS STANDARD	• Organize, display, read, and analyze data with and without technology using a variety of displays. • Determine the theoretical probability of a compound or dependent event using different counting methods including tree diagrams, sample spaces, and organized lists and compare those results with the results of a simulation of an experiment. • Use the odds of an event to determine probability and use the probability of an event to determine the odds of the event. • Differentiate between a permutation and a combination and determine the number of arrangements possible with each situation. • Create graphs to illustrate the possible misleading effects of a scale change or a format change. • Formulate and justify inferences and projections based on interpolations and extrapolations of data to solve problems.
MEETS STANDARD	• Organize, display, read, and analyze data, with and without technology, using a variety of displays including circle graphs, frequency distributions, and box and whisker plots. • Determine the theoretical probability of a simple or independent event using different counting methods including tree diagrams, sample spaces, and organized lists and compare those results with the results of doing the experiment. • Differentiate between the probability of an event and the odds of an event. • Identify the number of combinations possible in given situations using a variety of counting methods. • Evaluate arguments based on data analysis for accuracy and validity and analyze the effect a change of scale or a change of format will have on statistical charts and graphs. • Formulate inferences and projections based on interpolations and extrapolations of data to solve problems.
APPROACHES STANDARD	• Organize, display, read, and analyze data in a variety of displays that contain errors. • Use tree diagrams to create a list to determine the probabilities of a simple event. • Identify when an event is described using odds or probability. • Find the number of combinations possible in given situations, with inconsistent results. • Analyze the effect a change of scale and change of format have on statistical charts and graphs. • Formulate projections based on interpolations or extrapolations of data.
BELOW STANDARD	• Read and analyze data using a variety of displays, with assistance. • Find the probability of an event from a sample space. • Distinguish between odds and probability, though not yet consistently. • Find the number of combinations possible in simple, given situations. • Analyze the effect a change of scale or a change of format has on statistical charts and graphs. • Formulate projections based on interpolations or extrapolations of data that are not always reasonably supported by the data.

Grade 12

Content Standard 1.0	**Numbers, Number Sense, and Computation:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will accurately calculate and use estimation techniques, number relationships, operation rules, and algorithms; they will determine the reasonableness of answers and the accuracy of solutions.
EXCEEDS STANDARD	• Calculate and estimate sums, differences, products, quotients, powers, and roots, using mental mathematics, applying complex formulas, and algorithms. • Apply the laws of exponents to perform operations on complex expressions with and without technology. • Apply properties and theories of the real number system to complex practical situations. • Perform complex operations on matrices, with and without technology.
MEETS STANDARD	• Calculate and estimate sums, differences, products, quotients, powers, and roots, applying formulas and algorithms. • Apply the laws of exponents to perform operations on expressions with integral exponents and scientific notation. • Apply properties and theories of the real number system to practical situations. • Add, subtract, and scalar multiply matrices.
APPROACHES STANDARD	• Calculate and estimate sums, differences, products, quotients, powers, and roots, applying simple formulas and algorithms. • Apply the laws of exponents to perform operations on expressions with integral exponents and scientific notation, with inconsistent results. • Solve simple, real practical problems using properties and theorems of the real number system, with some errors in the results. • Add, subtract, and scalar multiply matrices, though not yet consistently.
BELOW STANDARD	• Calculate with real numbers using given formulas or algorithms. • Use the laws of exponents and scientific notation for sums, differences, products, and quotients with numbers, though the results may contain errors. • Solve practical problems using properties and theorems of the real number system, with assistance. • Add and subtract using matrices.

Grade 12

Content Standard 2.0	**Patterns, Functions and Algebra Performance Standards:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use various algebraic methods

	to analyze, illustrate, extend, and create numerous representations (words, numbers, tables, and graphs) of pattern, functions, and algebraic relations as modeled in practical situations.
EXCEEDS STANDARD	• Represent, analyze, and solve complex problem situations using discrete models, with and without technology. • Develop and use different forms of a variety of equations, proportions, and/or formulas, solving for different variables in different situations. • Compute with polynomials and analyze the connections between the algebraic processes and arithmetic processes. • Use quadratic equations to solve practical and mathematical problems, with and without technology. • Model practical problems from everyday situations and translate them into numerous forms including matrices, tabular, symbolic, and graphical representations of functions, with and without technology. • Determine the domain and the range of linear relations given a graph or a set of ordered pairs and explain the importance of the domain and range in complex problem solving situations. • Solve systems of equations algebraically and graphically, using graphing calculators as a primary problem-solving tool and to verify solutions found by other methods.
MEETS STANDARD	• Represent, analyze, and solve problem situations using discrete models, including graphs and matrices, with and without technology. • Create and use different forms of a variety of equations, proportions, and/or formulas, solving for the needed variable as necessary in given situations. • Add, subtract and multiply polynomials, factor 1st and 2nd degree polynomials, and describe the process and connection between the algebraic process and arithmetic process. • Use simple quadratic equations with integer roots to solve practical and mathematical problems. • Model practical situations mathematically and translate a practical problem into a variety of mathematical forms including matrices and tabular, symbolic, and graphical representations of functions, with and without technology. • Determine the domain and the range of linear relations given a graph or a set of ordered pairs and explain the importance of the domain and range in problem solving situations. • Solve systems of two linear equations algebraically and graphically, using graphing calculators as a primary problem-solving tool and to verify solutions found by other methods.
APPROACHES STANDARD	• Represent, analyze, and solve problems, with inconsistent results, using discrete models, including graphs and matrices, with and without technology. • Create and use different forms of simple equations, proportions, and/or formulas, solving for the needed variable as necessary in given situations, though not yet consistently. • Add, subtract, and multiply polynomials, factor 1st and 2nd degree polynomials, though not yet consistently, and describe the process and connection between the algebraic process and arithmetic process. • Use simple quadratic equations with integer roots to solve practical and mathematical problems using a graphing calculator, with results that may contain errors. • Model practical problems from everyday situations and translate them into a variety of forms including matrices and tabular, symbolic, and graphical representations of functions, which may contain errors, with and without technology. • Determine the domain and the range of linear relations given a graph and a set of ordered pairs, with inconsistent results. • Solve systems of two linear equations both algebraically and graphically using graphing calculators, with inconsistent results.

Grade 12 (Standard 2.0 continued)

BELOW **STANDARD**	• Analyze and solve problems using discrete models, including simple graphs and tables, with and without technology with assistance. • Solve problems using simple equations, proportions, and/or formulas, though not yet independently. • Add, subtract, and multiply polynomials, with assistance. • Identify integer roots of simple quadratic equations using a graphing calculator, though not yet consistently. • Model practical problems of functions from everyday situations using tables and graphs and technology. • Determine the domain and the range of a given set of ordered pairs. • Solve systems of two linear equations, both algebraically and graphically, using graphing calculators, with assistance.

Grade 12

Content Standard 3.0	**Measurement:** To solve problems, communicate, reason and make connections within and beyond the field of mathematics, students will use appropriate tools and techniques of measurement to determine, estimate, record, and verify direct and indirect measurements.
EXCEEDS **STANDARD**	• Distinguish, differentiate, and convert units of measure among and between customary and metric systems, monetary systems and use the applications in other disciplines. • Select and use measurement tools, techniques, and formulas to calculate and compare rates, costs, distances, interests, temperatures, weights/masses, and other complex measures. • Justify and communicate the differences between accuracy, precision, error of measure, and tolerance in measurement and describe how each of these can affect solutions found in complex real world problems. • Use and interpret consumer data to make informed predictions and financial decisions. • Generate and use relationships and generate formulas to determine the measurement of unknowns to solve sophisticated problems.
MEETS **STANDARD**	• Distinguish, differentiate, and convert units of measure among and between customary and metric systems and between monetary systems. • Select and use measurement tools, techniques, and formulas to calculate and compare rates, costs, distances, interests, temperatures, and weights/masses. • Justify and communicate the differences between accuracy, precision, error of measure, and tolerance in measurement and describe how each of these can affect solutions found in problem situations. • Use and interpret consumer data such as amortization tables, tax tables, and compound interest charts to make informed financial decisions related to practical applications such as budget. • Use relationships and formulas to determine the measurement of unknown dimensions, angles, areas, and volumes to solve problems.
APPROACHES **STANDARD**	• Distinguish, differentiate, and convert units of measure among and between customary and metric systems and between monetary systems, though not yet consistently. • Select and use measurement tools, techniques, and formulas to calculate and compare rates, costs, distances, interests, temperatures, and weights/masses, though not yet consistently. • Identify and communicate the differences between accuracy, precision, error of measure, and tolerance in measurement and identify how they can affect solutions in problem situations with explanations that indicate incomplete understanding. • Use and interpret consumer data, with inconsistent results, such as amortization tables, tax tables, and compound interest charts. • Use relationships and formulas to determine the measurement of unknown dimensions, angles, areas,

	and volumes to solve simple problems, with inconsistent results.
BELOW STANDARD	• Distinguish between and convert units of measure within customary and metric systems and between monetary systems, with assistance. • Use given measurement tools, techniques, and formulas to calculate and compare rates, costs, distances, interests, temperatures, and weights/masses, with assistance. • Identify the differences between accuracy, precision, error of measure, and tolerance in measurement. • Read and interpret consumer data related to practical applications such as budget. • Use given formulas to determine the measurement of unknown dimensions, angles, areas, and volumes to solve simple problems, with assistance.

Grade 12

Content Standard 4.0	**Spatial Relationships and Geometry:** To solve problems, communicate, and make connections within and beyond the field of mathematics, students will identify, represent, verify, and apply spatial relationships and geometric properties.
EXCEEDS STANDARD	• Identify and use the properties of polygons, including determining measures of interior and exterior angles, and elements of circles to solve complex, practical problems. • Use coordinate geometry to graph linear equations, determine slopes of lines, identify parallel and perpendicular lines, find solutions to sets of equations, and apply algebraic techniques to solve problems determined by geometric relationships. • Use multi-step algebraic methods to solve problems involving geometric relationships. • Use angles, theorems, and relationships to solve practical problems. • Apply the Pythagorean Theorem, its converse, properties of special right triangles, and trigonometric functions to solve a variety of practical problems. • Use tools, technology, and models to sketch, draw, and construct geometric figures in order to solve problems and to demonstrate and verify geometric properties. • Construct, justify, and defend mathematical conclusions using alternative methods supported by established mathematical principles.
MEETS STANDARD	• Identify and use the properties of polygons, including determining measures of interior and exterior angles, and elements of circles to solve practical problems. • Use coordinate geometry to graph linear equations, determine slopes of lines, identify parallel and perpendicular lines, and find possible solutions to sets of linear equations. • Use algebraic techniques to solve problems involving geometric relationships. • Use complementary and supplementary angles, congruent angles, vertical angles, angles formed when parallel lines are cut by a transversal, and angles in polygons to solve practical problems. • Apply the Pythagorean Theorem, its converse, properties of special right triangles, and right triangle trigonometry (sine, cosine, and tangent) to solve practical problems. • Use tools, technology, and models to sketch, draw, and construct geometric figures in order to solve problems and to demonstrate the properties of geometric figures. • Construct, justify, and defend mathematical conclusions using logical, sequential, and deductive reasoning supported by established mathematical principles.
APPROACHES STANDARD	• Identify and use the properties of polygons, including determining measures of interior and exterior angles, and elements of circles to solve simple practical problems, though not yet consistently. • Use coordinate geometry to graph linear equations, determine slopes of lines, identify parallel and

	perpendicular lines, and find solution sets for simple linear equations, though not yet consistently. • Use algebraic techniques to solve problems involving simple geometric relationships. • Use complementary and supplementary angles, congruent angles, vertical angles, angles formed when parallel lines are cut by a transversal, and angles in polygons to solve simple problems, though not consistently. • Apply the Pythagorean Theorem, its converse, properties of special right triangles, and right triangle trigonometry to solve practical problems, with inconsistent results. • Use tools, technology, and models to sketch, draw, and construct geometric figures that may contain inaccuracies, sometimes using the constructions to solve problems or demonstrate properties of geometric figures. • Construct, justify, and defend mathematical conclusions using logical, sequential, deductive reasoning supported by established mathematical principles, though the logic is applied inconsistently.

Grade 12 (Standard 4.0 continued)

BELOW **STANDARD**	• Use given properties of polygons, including determining measures of interior and exterior angles, and elements of circles to solve simple practical problems, with assistance. • Use ordered pairs to graph linear equations, determine slopes of lines, identify parallel and perpendicular lines, and find possible solutions sets for simple linear equations, with assistance. • Use algebraic techniques to solve problems involving simple geometric relationships, with assistance. • Use complementary and supplementary angles, congruent angles, vertical angles, angles formed when parallel lines are cut by a transversal, and angles in polygons to solve simple problems, with assistance. • Apply the Pythagorean Theorem and the Triangle Sum Theorem to solve practical problems. • Use tools, technology, and models to sketch, draw, and construct simple geometric figures, with assistance. • Construct and explain mathematical methods and conclusions, but not necessarily using established mathematical principles.

Grade 12

Content Standard 5.0	**Data Analysis:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will collect, organize, display, interpret, and analyze data to determine statistical relationships and probability projections.
EXCEEDS **STANDARDS**	• Use calculators and computers to create, manipulate, and interchange among and between tables, graphs, and matrices when communicating statistical information. • Generate a bar graph or line graph that approximates normal distributions to compare and analyze information.

	• Design, conduct, analyze, and communicate the results of multi-stage probability and statistical experiments using graphical representations. • Identify and create a probability situation that is a permutation or a combination and find the number of possible outcomes using a variety of methods, with and without technology. • Apply the measures of central tendency appropriately in problem solving situations. • Apply and interpret measures of dispersion. • Analyze the validity of statistical conclusions noting various sources of bias such as misuse and abuse of data and recommend successful methods to remedy bias.
MEETS STANDARD	• Use calculators and computers to create and manipulate tables, graphs, and matrices to communicate statistical information. • Use the shape of graphs of normal distributions to compare and analyze information. • Design, conduct, analyze, and communicate the results of multi-stage probability and statistical experiments. • Identify a probability situation as a permutation or a combination and find the number of possible outcomes, with and without graphing calculators. • Select and use the measures of central tendency such as mean, median, and mode that are appropriate for given situations. • Select and use measures of dispersion including range, distribution, and possible outliers that are appropriate for given situations. • Analyze the validity of statistical conclusions noting various sources of bias and misuse and abuse of data caused by a variety of factors.
APPROACHES STANDARD	• Use calculators and computers to create and manipulate tables, graphs, and matrices to communicate statistical information, though not always clearly or accurately. • Use the shape of graphs of normal distributions to compare and analyze information, with inconsistent results. • Conduct, analyze, and communicate the results of multi-stage probability and statistical experiments. • Identify a probability situation as a permutation or a combination and find the possible outcomes, though not yet consistently, with or without a graphing calculator. • Select and use the measures of central tendency such as mean, median, and mode, with inconsistent results. • Select and use measures of dispersion including range and standard deviation, with inconsistent results. • Recognize statistical bias, misuse, and abuse of data, though not yet consistently.
BELOW STANDARD	• Use calculators and computers to create tables, graphs, and matrices to communicate statistical information that is incomplete or contains errors. • Identify the shape of normal distributions when given examples of graphs. • Conduct, analyze, and communicate the results, which may contain errors, of single-stage probability and statistical experiments. • Use a given algorithm for probability situations, and calculate the number of possible outcomes of permutations and combinations. • Calculate measures of central tendency such as mean, median, and mode with assistance. • Identify the range of a given set of data. • Recognize statistical bias, misuse, and abuse of data caused by a wide variety of factors, with assistance.

Process Standards

Grades K-12

Process Standard 6.0	**Problem Solving:** Students will develop their ability to solve problems by engaging in appropriate problem solving opportunities in which there is a need to use various approaches to investigate and understand mathematical concepts in order to: formulate their own problems; find solutions to problems from everyday situations; develop and apply strategies to solve a wide variety of problems; and integrate mathematical reasoning, communication, and connections.
EXCEEDS STANDARD	• Use rigorous, sophisticated strategies and techniques to solve traditional and related non-traditional problems. • Analyze and evaluate the validity of solutions and the effectiveness and efficiency of problem solving strategies and processes employed. • Experiment with tools and techniques to enhance problem solving ability.
MEETS STANDARD	• Use efficient approaches to investigate and understand mathematical concepts. • Formulate problems. • Find solutions to problems that occur in everyday situations. • Select, modify, develop, and apply strategies to solve a wide variety of problems. • Transfer and generalize previous experience to new problem solving situations. • Demonstrate persistence in problem solving. • Explain and verify results. • Use technology as a tool in problem solving.
APPROACHES STANDARD	• Use problem solving strategies and techniques, with inconsistent results. • Describe problem solving processes and solutions, with assistance. • Use basic tools and processes, with limited effectiveness.
BELOW STANDARD	• Require assistance to identify problem-solving strategies, and frequently employ processes incorrectly. • Describe solution processes, with assistance. • Use basic tools and processes, with minimal effectiveness.

Process Standards

Grades K-12

Process Standard 7.0	**Communication:** Students will develop their ability to communicate mathematically by solving problems in which there is a need to obtain information from the real world through reading, listening, and observing in order to: translate this information into a mathematical language and symbols; process this information mathematically; and present results in written, oral and visual formats.
EXCEEDS	• Use language, symbolism, and visual representations to clearly and concisely convey and justify

STANDARD	mathematical information, ideas, and arguments. • Employ a variety of sophisticated communication tools and techniques to examine, analyze, and synthesize mathematical information, ideas, and arguments. • Present original mathematical conjectures, arguments, and evaluations using sophisticated communication tools and techniques.
MEETS **STANDARD**	• Obtain information from the real world through reading, listening, observing, and inquiring and use this information to solve mathematical problems. • Use mathematical language and symbols to explain thinking and processes and translate those ideas into everyday language. • Present mathematical ideas and solutions in written, oral, and visual forms. • Discuss, explain, justify, and evaluate mathematical ideas and solutions. • Use physical, pictorial, and symbolic forms to represent mathematical ideas and relationships. • Make conjectures, present arguments, and evaluate discussions regarding mathematical ideas presented in various forms including written and oral.
APPROACHES **STANDARD**	• Use simple language, and graphic representations to describe mathematical information, strategies, and ideas. • Present mathematical ideas and information in oral, written, symbolic, and graphic form, with some assistance.
BELOW **STANDARD**	• Use simple language and graphic representations to describe and represent mathematical information and ideas, with regular assistance. • Present simple mathematical ideas and information in oral or pictorial form, with some assistance.

Process Standards

Grades K-12

Process Standard 8.0	**Reasoning:** Students will develop their ability to reason mathematically by solving problems in which there is a need to investigate significant mathematical ideas and construct their own learning in all content areas in order to justify their thinking; reinforce and extend their logical reasoning abilities; reflect on and clarify their own thinking; and ask questions to extend their thinking.
EXCEEDS **STANDARD**	• Demonstrate clear, coherent, and insightful understanding of problem situations. • Utilize creative strategies and sophisticated processes to resolve traditional and non-traditional problems. • Use strong mathematical arguments, clear diagrams, and appropriate examples and counterexamples

	to justify and support thinking and solutions.
MEETS STANDARD	• Construct meaning and justify thinking by investigating mathematical ideas, patterns, and relationships. • Reinforce and extend logical reasoning abilities. • Ask questions to reflect on, clarify, and extend thinking. • Review, refine, explain, and justify mathematical processes, arguments and solutions using manipulatives, physical models, and abstract ideas. • Determine relevant and/or sufficient information to solve mathematical problems. • Follow, create, and defend valid logical mathematical arguments. • Recognize and apply inductive and deductive reasoning in both concrete and abstract contexts.
APPROACHES STANDARD	• Interpret problem situations, with some assistance. • Utilize simple strategies and processes in problem situations. • Demonstrate understanding of mathematical ideas and processes, though occasionally with faulty or ambiguous explanations.
BELOW STANDARD	• Require significant assistance to recognize problem situations. • Use simple problem solving strategies and processes, though not yet consistently. • Describe situations or data that do not reflect the problem or which misrepresent the problem situation.

Process Standards

Grades K-12

Process Standard 9.0	**Connections:** Students will develop the ability to make mathematical connections by solving problems in which there is a need to view mathematics as an integrated whole, identifying relationships between content strands, and integrating mathematics with other disciplines, allowing the flexibility to approach problems in a variety of ways within and beyond the field of mathematics.
EXCEEDS STANDARD	• Recognize and use subtle implications of relationships which are common in everyday situations, mathematics, and across disciplines. • Apply existing knowledge and skills to new and unfamiliar problem situations. • Demonstrate and explain the relationship of concepts to procedures using sophisticated models and precise mathematical language.
MEETS STANDARD	• View mathematics as an integrated whole and identify relationships between content strands. • Identify practical applications of mathematical principles that can be applied to other disciplines. • Use and analyze the connections within and beyond the field of mathematics in a variety of ways to solve problems. • Link new concepts to prior knowledge. • Explain the relationship of concepts to procedures using models. • Apply mathematical thinking and modeling to solve problems that arise in other disciplines and in everyday life.
APPROACHES STANDARD	• Recognize mathematical relationships in everyday situations and between content strands within mathematics, with assistance. • Transfer existing knowledge and skills to similar problem situations.

	• Match concepts to procedures when using models.
BELOW **STANDARD**	• Use mathematics in everyday situations, with assistance. • Apply existing knowledge and skills to similar problem situations, with assistance. • Use models to recognize the relationship of concepts to procedures, with assistance.