MATHEMATICS OUTCOMES

AND

PERFORMANCE INDICATORS

PHILOSOPHY

In 1 Corinthians 10:31, the Lord instructs: "So whether you eat or drink or whatever you do, do it for all the glory of God." Therefore, we can be assured that there is a Christian approach to teaching and learning mathematics. As stewards of God's gifts, it is our responsibility to maximize the basic skills, in mathematics, which will assist in the wise use of His material blessings upon our lives.

PROGRAM OUTCOMES

1. Appreciate the order in nature, as revealed through mathematics, which partially reveals the wonder of God's creation.
2. Appreciate that God helps man to serve Him better through mathematics and the scientific achievements to which mathematics has contributed.
3. Understand math skills and concepts at a level appropriate for the child.
4. Develop skills and concepts from the concrete to the abstract, from the known to the unknown.
5. Foster mental skills that will facilitate the use of mathematics in everyday situations.

(Updated 2010)

KINDERGARTEN
Number & Operation

1. Count by memory to 100.
    1.1. Identify numbers 0 - 10
    1.2. Recognize numbers 10 - 100
    1.3. Recognize that the number order repeats in a sequential pattern.
    1.4. Reproduce number order forward and backward to 10
2. Count movable items accurately to 31
    2.1. Count to 31 by rote
    2.2. Touch and count each item in number order.
3. Recognize numerals 1 – 20, in random order
    3.1. Recognize numbers 1 - 20
    3.2. Recognize number patterns.
    3.3. Locate and identify numbers in random order
4. Write the numerals 0 - 20
    4.1. Visualize the stroke pattern of each numeral.
    4.2. Reproduce recognized numbers from 0 -20
5. Recognize time and money
    5.1. Recognize time of day by hour, and half-hour.
    5.2. Recognize analog and digital clocks.
    5.3. Identify penny, nickel, and dime.
6. Identify a calendar
    6.1. Determine day of the week and month
    6.2. Determine the month, date, and year.
7. Understand the concept of simple addition and subtraction using objects
    7.1. Relate the vocabulary of quantity to numbers
    7.2. Capable of joining sets using the plus sign.
    7.3. Capable of separating sets using the minus sign.
    7.4. Recognize vertical addition and subtraction.
    7.5. Recognize number combinations.

Geometry & Measurement

8. Develop the vocabulary of size, quantity, and spatial relationships.
    8.1. More/less, most/least, few/many
    8.2. Large/small, big/little
    8.3. Heavy/light, thick/thin
    8.4. Over/under, above/ below, top/bottom
    8.5. Right/left/middle
    8.6. Beside/in front of/ behind
    8.7. Ordinal positions; i.e. first, second, third, etc. to tenth
9. Recognize and name the following basic shapes:
    9.1. Square
    9.2. Circle
    9.3. Triangle
    9.4. Rectangle.
10. Identify related two and three dimensional shapes
    10.1. Spheres/ cones
    10.2. Squares/cubes
    10.3. Triangles/prism

10.4. Quadrilateral/rectangle
11. Organize and display data
    11.1. Create a graph
    11.2. Estimate and check estimates
    11.3. Identify equal parts
    11.4. Analyze data, draw conclusions and communicate results verbally.

Algebra
12. Sort and describe objects by the following common characteristics:
    12.1. Color
    12.2. Shape
    12.3. Size
    12.4. Weight
    12.5. Length.
13. Understand a two-part pattern
    13.1. Predict what comes next
    13.2. Reproduce pattern from picture or model
    13.3. Add to patterns (extend)
    13.4. Create your own pattern.

FIRST GRADE
Number & Operation
1. Read, write and, compare numbers to 120.
    1.1. Count orally to 120
    1.2. Write numbers to 120 in order.
    1.3. Identify and write non-sequential numbers to 120.
    1.4. Order 2-digit numbers.
    1.5. Compare numbers as to whether they are greater than, less than, or equal.
    1.6. Use comparison symbols (<, >, =).
    1.7. Creates problem situations for addition and subtraction number sentences.
    1.8. Writes and solves number sentences for problems involving addition and subtraction.
2. Understand counting by 1's, 2's, 5's, 10's, and 100's.
    2.1. Recognize the pattern of numbers.
    2.2. Count and write by 2's to 100 (both even and odds).
    2.3. Count and write by 5's to 100.
    2.4. Count and write by 10's to 100.
    2.5. Count by 100's to 1,000.
3. Understand place values of tens and ones.
    3.1. Group objects by 10's and 1's.
    3.2. Identify the 10's place and the 1's place with a two-digit number.
4. Solve addition and subtraction process to 18.
    4.1. Identify the meaning of symbols (+, -, =).
    4.2. Use manipulatives to demonstrate the concept of addition and subtraction.
    4.3. Add or subtract, using numerals vertically and horizontally.
    4.4. Master addition and subtraction facts to 18.
5. Add and subtract two-digit numbers.
    5.1. Solve 2-digit addition and subtraction problems using manipulatives.
    5.2. Start process in the one's column.
    5.3. Correctly line up the addition and subtraction problems in a 2-digit process.

5.4. Adds two-digit numbers with and without regrouping.
5.5. Subtracts two-digit numbers without regrouping.
5.6. Find a number that is 10 more or 10 less than a given number.
6. Explore fractions
    6.1. Separates wholes into fractional parts, identifies fractional parts.
    6.2. Identifies fractional parts of sets.
    6.3. Finds half of a set of objects.
7. Be able to verbally communicate how to get an answer.
    7.1. Use verbal language to explain strategies used to solve problems.
    7.2. Name key words involved in a problem.
    7.3. State which process to use (addition or subtraction).
    7.4. State, write, and solve the number sentence.

Geometry & Measurement
8. Tell time to the hour and the half-hour relating to daily living.
    8.1. Name the parts of the clock: hour hand, minute hand, second hand, face and number markings.
    8.2. Identify the order of the numbers on a clock (1-12).
    8.3. Tell time to the hour and the half-hour, using both a dial and digital clock.
    8.4. Identify dates on a calendar.
    8.5. Identify morning, afternoon, evening, yesterday, today, and tomorrow.
    8.6. Identifies days of the week and months of the year.
    8.7. Orders events by time.
    8.8. Identifies which of two events takes more or less time.
9. Identify and count a collection of pennies, nickels, and dimes to $1.00.
    9.1. Identifies, knows the value of, and counts pennies, nickels, dimes, and quarters.
    9.2. Identifies one, five, ten, and twenty – dollar bills
    9.3. Writes money amounts using dollar and cent symbols.
    9.4. Reads and writes money amounts to $1.00.
    9.5. Selects coins for a given amount.
10. Describe characteristics of basic shapes.
    10.1. Describe characteristics of two- and three- dimensional objects.
    10.2. Combines geometric shapes to make new shapes.
    10.3. Explores transformations: translations, rotations, and reflections
11. Understand the concepts of size, quantity, and special relationships.
    11.1. Know the concepts of more/less, most/least, few/many.
    11.2. Identifies first, last, between, and middle.
    11.3. Identifies right/left, top/bottom
    11.4. Know the concepts of ordinal positions; i.e. first, second, third.

Algebra
12. Estimate, sort, pattern, classify, graph, and measure for problem solving.
    12.1. Estimate the answer before solving.
    12.2. Solve problems that require sorting.
    12.3. Solve problems that involve patterns.
    12.4. Solve problems that involve classifying.
    12.5. Solve problems that require measurements (standard and non-standard measure).

Data Analysis
13. Use simple graphs
    13.1. Make simple graphs (bar, circle, pictograph) in the problem-solving process.
    13.2. Tallies and makes a tally chart.
    13.3. Graphs a picture on a pictograph.
    13.4. Graphs organized data on a bar graph.
    13.5. Identifies most and fewest on a graph.
    13.6. Reads and draws conclusions from a bar graph.
    13.7. Writes observations about a graph.

SECOND GRADE
Number & Operation
1. Read, write, and compare numbers up to 1,000 with an understanding of place value to the 100's place.
    1.1. Recognize that each place (hundreds, tens, and ones) can be any numeral (0-9).
    1.2. Recognize that each hundreds number must have three digits.
    1.3. Understand how to build a three-digit number.
    1.4. Identify $<$, $>$, $=$, and use them appropriately when comparing numbers up to 1,000.
    1.5. Identify the sequence of numbers to 1,000.
    1.6. Say "100" after the first numeral when reading a three-digit number.
    1.7. Counts by 2's, 3's, 4's, 5's, 10's, 25's, and 100's.
    1.8. Use place value to describe whole numbers between 10 and 1,000 in terms of hundreds, tens, and ones.
    1.9. Round numbers up to the nearest 10 and 100 and rounds numbers down to the nearest 10 and 100.
    1.10. Writes numbers in expanded form.
    1.11. Locates and graphs points on a coordinate graph.
2. Regroup to the 10's place.
    2.1. Recognize that a group of ten can be broken into ten ones.
    2.2. Identify that ten ones equal a group of ten.
    2.3. Regroup numbers to 99 (borrow, carry).
3. Identify addition and subtraction facts and processes to 18, and possess a basic understanding of the multiplication process.
    3.1. Recognize fact families.
    3.2. Solve a number sentence vertically and horizontally.
    3.3. Identify "doubles" facts.
    3.4. Use skip counting at any point.
    3.5. Use and relate addition to multiplication.
    3.6. Demonstrate fluency with basic addition facts and related subtraction facts.
    3.7. Estimate sums and differences up to 100.
    3.8. Writes and solves number sentences for problems involving addition, subtraction, multiplication, and division.
4. Explore multiplication and division
    4.1. Multiply by 0's, 1's, 2's, 3's, 4's, 5's, 10's, 100's, and 1,000.
    4.2. Divides by 2.
    4.3. Divides sets of objects into equal groups.

Geometry & Measurement

5. Tell time to the quarter hour in five-minute intervals.
    5.1. Recognize five-minute intervals on a clock face.
    5.2. Recognize fifteen-minute intervals on a clock face.
    5.3. Write five-minute time intervals in digital and in clock-face notation.
    5.4. Distinguish between a.m. and p.m.
6. Count and write coin values through $1.00, using penny, nickel, dime, and quarter.
    6.1. Recognize individual coin values through quarters
    6.2. Write coin values using proper money value.
    6.3. Writes money amounts using dollar and cent symbols.
    6.4. Reads and writes money amounts to $10.00.
    6.5. Makes change from $1.00, $5.00, and $10.00.
    6.6. Adds and subtracts money amounts (decimals).
7. Use standard measure of linear (inch, foot, yard, centimeter, meter) and liquid (cup, quart, gallon, liter).
    7.1. Use proper placement of ruler when measuring.
    7.2. Recognize an inch and centimeter and use rulers to measure up to the nearest inch or centimeter.
    7.3. Measure down to one-half inch and one centimeter.
    7.4. Measure out a given amount of liquid, using cup, quart, gallon and liter.
    7.5. Find the area of a rectangle.
    7.6. Find the perimeter of a polygon.
8. Recognize cubes, spheres, cylinders, cones, pyramids, and rectangle prisms.
    8.1. Identify the number of sides and corners.
    8.2. Understand that a solid figure is not flat.
    8.3. Differentiate between two or more shapes.
    8.4. Identifies, compares, and sorts common two- and three- dimensional geometric figures by attribute.

Algebra

9. Estimate and solve one-step problems pertaining to life situation.
    9.1. Estimate answers to problems and state strategies used.
    9.2. Use problem clues to decide on an operation.
    9.3. Write a problem sentence from available information.
    9.4. Label the solution.
    9.5. Add and subtract one- and two- digit numbers in real-world and mathematical problems.
10. Recognize, create, describe, and use patterns and rules to solve problems.
    10.1. Identifies, reads, and extends patterns in shapes, colors, designs, and numbers.
    10.2. Identifies the missing number in a sequence.
    10.3. Identifies the missing shape or design in a repeating pattern.
    10.4. Identifies and creates pairs.
11. Recognize and label fractions in halves, thirds, and fourths, sixths, and eighths.
    11.1. Know that a fraction is part of a whole.
    11.2. Writes fractions to show parts of wholes.
    11.3. Identifies fractional parts of sets.
    11.4. Writes fractions to show parts of sets.
    11.5. Names, writes, and compares unit fractions.
    11.6. Finds half of a set of objects.
    11.7. Represents and writes mixed numbers.

Data Analysis
12. Use pictographs, bar graphs, and calendars.
    12.1. Understand labels and units on horizontal and vertical picture graphs.
    12.2. Understand labels and units on a bar graph.
    12.3. Solve one-step problems using a graph.
    12.4. Recognize that a calendar is divided into days, weeks, and months.
    12.5. Construct simple graphs and calendars to solve problems.
    12.6. Writes the date using words and digits.
    12.7. Identifies weekdays and days of the weekend.

THIRD GRADE
Number & Operation
1. Read, write, and compare whole numbers through 7-digits and round 2 and 3-digit numbers to the nearest tens and hundreds.
    A. Read and write 1 to 999,999.
    B. Compare $<$, $>$, $+$ for whole numbers.
    C. Find 10's, 100's, 1,000s, 10,000s, and 1,000,000 places.
2. Know basic addition & subtraction facts through 18 and multiplication & division 0-10.
    A. Use manipulatives to understand facts.
    B. Use strategies to understand and memorize facts.
    C. Use basic facts in life situations.
    D. Check work by using inverse operations.
    E. Compute the mean, medium, mode, and range of a set of numbers.
3. Be able to rename numerals up to five digits in addition and subtraction.
    A. Line up five-digit numbers to add and subtract.
    B. Numbers greater than ten are renamed to the next column in addition.
    C. Add and subtraction, each column must be completed before moving onto the next.
    D. Subtract, if the top digit is smaller than the digit below, renaming is necessary.
    E. Use manipulatives to understanding renaming.
4. Tell time to the nearest minute after the hour and count various amounts of money to $5.00.
    A. Functions of the minute hand and the minute markings on the clock.
    B. Read correct time on standard and digital clocks.
    C. Choose coins that are equivalent to a given amount of money up to $5.00.
5. Read, write, illustrate, add, subtract, and compare factions with like denominators.
    A. Place numerator and denominator.
    B. Identify denominator as the whole and the numerator as the parts of the whole.
    C. Use manipulatives and pictures to compare size of fractions.
    D. Say fractions correctly.

Geometry & Measurement
6. Identify, measure, and describe plane and geometric figures.
    A. Identify, measure, label, and draw a square, circle, triangle, rectangle, pentagon, hexagon, and an octagon.
    B. Identify and label cubes, spheres, cylinders, cones, pyramids, and rectangular prisms.
    C. Describe plane and geometric figures in terms of shape, sides, perimeter, area, with examples of each.
    D. Match congruent similar figures.

E. Draw a line of symmetry.

Algebra
7. Use the following five-step problem-solving process:
   A. Read carefully to find the facts.
   B. Identify the question of the problem.
   C. Decide what operation to use.
   D. Solve and label the answer.
   E. Read problem again to see if answer makes sense.

Data Analysis
8. Perform basic operations using calculators.
   A. Use basic functions of calculators (+, -, =, x, ÷).
   B. Check answers with a calculator when adding, subtracting, and multiplying.
   C. Use calculators for problem solving.
9. Use charts, graphs, tables, manipulatives, and other resources to solve real-life problems.
   A. Use models to explain thinking.
   B. Use picture, pie, and bar graphs.
   C. Use tables and schedules.

FOURTH GRADE
Number & Operation
1. Read, write, and compare whole numbers (7-digits) and decimals (hundredths).
   1.1.   Read and write to the millionth place.
   1.2.   Compare <, >, +, for whole numbers.
   1.3.   Know each place value to million.
   1.4.   Read and write decimals to hundredths.
   1.5.   Compare <, >, = to hundredths.
2. Round four-digit numbers to the nearest thousand and estimate sums and difference.
   2.1.   Identify place values to round (10's, 100's and 1,000's).
   2.2.   Find digit to the right.
   2.3.   Round down with four or less and up with five or greater.
   2.4.   Look at and estimate what a sum or difference will be.
   2.5.   Solve sum or difference and determine why the estimate was close or far away.
3. Add and subtract whole numbers to seven places.
   3.1.   Line up seven-digit numbers (according to place value) to add and subtract.
   3.2.   Carry in addition.
   3.3.   Correctly use commas.
   3.4.   Rename in subtraction.
   3.5.   Check work with addition and subtraction.
4. Know multiplication and division facts.
   4.1.   Demonstrate multiplication through the use of manipulatives.
   4.2.   Demonstrate division facts through the use of manipulatives.
   4.3.   Recite basic multiplication facts through 10.
   4.4.   Identify division numbers through 100.
5. Multiply using one and two-digit multipliers, and divide up to the thousands by a one-digit divisor.
   5.1.   Line up numbers.
   5.2.   Regroup numbers.

     5.3.   Place the partial products.
     5.4.   Use zero as a placeholder.
     5.5.   Identify placement of quotient.
     5.6.   Find and place a remainder.
6. Rename, add, and subtract fractions with like denominators.
     6.1.   Add of numerators.
     6.2.   Subtract numerators.
     6.3.   Simplify to lowest terms, including creating a whole number if numerator is larger than the denominator.
     6.4.   Rename fractions if required.

Geometry & Measurement
7. Know and be able to use various intermediate geometric terms and shapes.
     7.1.   Identify, label, and draw figures up to eight sides.
     7.2.   Identify lines, rays, points, and line segments.
     7.3.   Identify lines of symmetry and congruence.
     7.4.   Label acute, obtuse, and right angles.
     7.5.   Label parallel, perpendicular, and intersecting lines.
     7.6.   Plot coordinates on a line graph.

Algebra
8. Solve one and two-step problems using a five-step problem-solving method with time, money, and measurement in daily life.
     8.1.   Use strategies to solve problems.
         8.1.1.   Determine the problem.
         8.1.2.   Decide what operation to use.
         8.1.3.   Estimate the solution.
         8.1.4.   Carry out each step up the problem.
         8.1.5.   Label the answer.
         8.1.6.   Compare estimation to solution to see if solution makes sense.
     8.2.   Use strategies to solve problems involving time and money.
     8.3.   Use strategies to solve problems involving standard and metric measure (length, weight, volume).

Data Analysis
9. Analyze data using graphs, charts, tables, and calculators.
     9.1.   Design a plan to solve problems through visual aides.
     9.2.   Develop graphs, charts, and tables to solve.
     9.3.   Use the basic functions of a calculator.
     9.4.   Compare the mean, median, mode, and range of a set of numbers.

<u>*FIFTH GRADE*</u>
Number & Operation
1. Read, write, and estimate whole numbers (9 digits) and decimals (thousandths).
     1.1.   Write whole numbers and decimals.
     1.2.   Estimate sums, differences, and products of whole numbers and decimals by rounding.
     1.3.   Compare and order whole numbers, fractions and decimals using $<, >, =$.
2. Multiply using three-digit numbers.

2.1. Use "0" (zero) as a place holder.
2.2. Estimate products by rounding.
3. Divide using two-digit divisors.
    3.1. Round to estimate quotient.
    3.2. Apply division skills to solve problems.
4. Compute decimals, operating to 1000ths.
    4.1. Write decimals as fractions.
    4.2. Identify correct place value after decimal point.
    4.3. Add decimals to 1000ths.
    4.4. Subtract decimals to 1000ths.
    4.5. Multiply decimals to 1000ths.
    4.6. Divide decimals to 1000ths.
5. Apply basic operations to fractions.
    5.1. Add and subtract numerator.
    5.2. Make an improper fraction.
    5.3. Cross-multiply.
    5.4. Invert the divisor.
    5.5. Reduce to lowest terms.

Geometry & Measurement
6. Work with metric units using manipulatives.
    6.1. Identify metric prefixes (kilo-, centi-, milli-) and their values.
    6.2. Measure length, width, and volume.
    6.3. Measure objects accurately to nearest unit of length, width, and volume.
7. Recognize, identify, and classify various geometric terms and shapes.
    7.1. Identify and measure acute, obtuse, and right angles.
    7.2. Identify basic and complex geometric shapes.
    7.3. Classify geometric shapes by attribute.

Algebra
8. Solve complex problems using the five-step problem-solving method, with whole numbers.
    8.1. Read the problem.
    8.2. Choose one of the four operations (+, -, x,÷).
    8.3. Estimate solution.
    8.4. Apply proper mathematical operations to solve the problem.
    8.5. Tell how and why the answer was determined.
    8.6. Label properly.

Data Analysis
9. Solve multi-step problems using graphs, charts, tables, and calculators.
    9.1. Read and understand graphs, charts, and tables.
    9.2. Use basic functions on a calculator.
    9.3. Check work with a calculator.
    9.4. Compute the mean, median, mode, and range of a set of numbers.

SIXTH GRADE
Number & Operation
1. Compare and order integers.
   1.1. Compare <, >, = for positive and negative whole numbers.
   1.2. Place positive and negative whole numbers on a line graph.
   1.3. Record and write positive and negative numbers.
   1.4. List positive and negative numbers from least to greatest and greatest to least.
2. Integrate the use of the four operations of whole and decimal numbers, finding actual and estimated answers.
   2.1. Identify place value from hundred thousandths to billions.
   2.2. Write numbers from hundred thousandths to billions in standard from and words.
   2.3. Round whole numbers to millions.
   2.4. Read numbers from hundred thousandths to billions in standard form and words.
   2.5. Add whole numbers and decimal numbers from millionths to billions.
   2.6. Subtract numbers with decimals.
   2.7. Multiply up to three-digit places.
   2.8. Divide up to three-digit divisors.
   2.9. Perform estimating strategies.
3. Demonstrate the four operations with fractions and mixed numbers.
   3.1. Compute prime factorization.
   3.2. Determine a common denominator for fractions.
   3.3. Add and subtract fractions.
   3.4. Multiply and divide fractions.
   3.5. Reduce fractions to lowest terms.
   3.6. Convert improper fractions, and create whole and mixed numbers.

Geometry & Measurement
4. Solve problems using standard and metric units of measure.
   4.1. Perform unit conversion within and between systems.
   4.2. Choose which unit of measure is most appropriate.
   4.3. Estimate solutions involving measure.
   4.4. Add, subtract, multiply, and divide units of measurement.
5. Calculate the linear dimensions of any polygon, and the area of squares, rectangles, and triangles.
   5.1. Identify and illustrate basic geometric figures.
   5.2. Use formulas for perimeter, area, circumference, and volume of geometric figures.
   5.3. Measure and construct angles.

Algebra
6. Solve multi-step problems using the problem-solving method.
   6.1. Gather information.
   6.2. Plan use of information.
   6.3. Process information.
   6.4. Evaluate information.
   6.5. Identify and recognize a reasonable answer.
   6.6. Choose the correct operations to solve problems in daily life.

Data Analysis
7. Evaluate graphs, charts, and tables.
   7.1. Collect and interpret data.

7.2.   Determine the best type of graph to visually represent data.
8. Estimate and calculate averages and percents, and know about ratios and proportions.
    8.1.   Determine an average.
    8.2.   Estimate and find the percent of a number.
    8.3.   Convert decimals, percents, and fractions from one to another.
    8.4.   Recognize, write, and solve ratios in different formats.
    8.5.   Write and solve proportions.

SEVENTH GRADE
Number & Operation
1. Review and expand with operations with integers.
    1.1.   Understand positive and negative numbers on the number line.
    1.2.   Name opposite integers.
    1.3.   Add, subtract, multiply, and divide integers.
    1.4.   Apply appropriate operations.
    1.5.   Solve problems using operations with integers.
    1.6.   Use a calculator to solve problems related to integers.
2. Solve problems using rations, proportions, averages, and percentages.
    2.1.   Find equivalent ratios.
    2.2.   Use equivalent fractions and cross products to solve problems.
    2.3.   Calculate mean, median, mode and range
    2.4.   Recognize percents, fractions, and decimal equivalents.
    2.5.   Solve percentage problems.
    2.6.   Use a calculator to solve problems related to ratios, proportions, averages, and percentages.
3. Be able to apply fractions and decimals.
    3.1.   Define and calculate repeating and non-repeating decimals.
    3.2.   Write decimals in scientific notation.
    3.3.   Convert between fractions and decimals.
    3.4.   Use decimals for fractions in life situations.
    3.5.   Use operations (+, -, =, x,÷) with decimals and fractions to solve problems.
    3.6.   Use a calculator to solve problems related to fractions and decimals.

Geometry & Measurement
4. Use the geometric principles to draw and compare lengths, area, and volume.
    4.1.   Draw perpendicular and parallel lines, congruent and similar figures.
    4.2.   Measure lengths and angles.
    4.3.   Use a compass and protractor to measure and construct angles and plane geometric figures.
    4.4.   Calculate and compare area, perimeter, and circumference of geometric figures.
    4.5.   Draw three-dimensional geometric figures.
5. Solve problems – standard & metric (time, money, temperature, linear, volume, area, and mass).
    5.1.   Apply the steps of the following problem-solving method:
        5.1.1.   Determine the problem.
        5.1.2.   Decide what operation to use.
        5.1.3.   Estimate the solution.
        5.1.4.   Carry out each step of the problem.
        5.1.5.   Label the answer.
        5.1.6.   Compare estimate to solutions to see if it makes sense.
    5.2.   Determine appropriate units for what is being measured.

5.3.   Use common measuring devices (i.e., ruler, scale, and protractor).
5.4.   Convert units to another within a system (time, linear, liquid, and mass).
5.5.   Use steps to solve problems involving time, money, temperature, linear, volume, area, and mass.
5.6.   Use a calculator to solve problems relating to measurement.

Algebra
6. Use a variety of strategies in the problem-solving process.
    6.1.   Choose the appropriate problem solving strategy for a given situation:
        6.1.1.   Patterns
        6.1.2.   Tables
        6.1.3.   Diagrams
        6.1.4.   Work backwards
        6.1.5.   Simplify
        6.1.6.   Brainstorm
        6.1.7.   Guess
        6.1.8.   Check.
    6.2.   Understand the problem and choose the appropriate strategy.
    6.3.   Carry out the strategy.
    6.4.   Analyze the solution.
7. Solve basic algebraic problems.
    7.1.   Solve for unknown variables.
    7.2.   Construct inverse operations.
    7.3.   Know the properties of in/equality [=, (+ and -), (x and÷)].
    7.4.   Substitute the answer to check.

Data Analysis
8. Read, interpret, construct, and solve problems using graphs.
    8.1.   Determine the appropriate graph for given data/situation.
    8.2.   Read and interpret pictographs, bar, line, and circle graphs.
    8.3.   Construct various graphs.
    8.4.   Plot integer pairs on a coordinate graph.

EIGHTH GRADE
Number & Operation
1. Solve problems using operations with rational numbers.
    1.1.   (+, -, =, x, ÷) integers
    1.2.   (+, -, =, x, ÷) real numbers
    1.3.   Apply appropriate operations.
    1.4.   Determine square root and square on a calculator.
2. Solve consumer-related problems.
    2.1.   Determine profits and loss.
    2.2.   Determine commission and gratuity.
    2.3.   Determine discount, sale price, and original price.
    2.4.   Determine sales tax.
    2.5.   Determine unit cost.
    2.6.   Determine interest, principle, and new balance.

Geometry & Measurement
3. Solve problems using measurement, precision, and conversion.
    3.1. Measure lengths, volume, and weights in English and metric systems.
    3.2. Rounding off measurement and error.
    3.3. Calculate greatest possible error.
    3.4. Convert within the English and metric systems.
    3.5. Use scientific notations for very small numbers.
4. Draw conclusions and solve problems using geometric principles.
    4.1. Calculate areas of triangles, quadrilaterals, and other polygons.
    4.2. Calculate perimeters of triangles, quadrilaterals, and other polygons.
    4.3. Determine volumes of prisms, cones, pyramids, cylinders, and spheres.
    4.4. Calculate surface area of prisms, cones, pyramids, cylinders, and spheres.
    4.5. Define vocabulary of polygons.
    4.6. Draw conclusions and solve problems using geometric principles.

Algebra
5. Solve multi-step algebraic equations.
    5.1. Solve problem using correct order of operations.
    5.2. Solve algebraic equations by substitution.
    5.3. Know how to solve problems by trial and error.
    5.4. Solve one-step equations.
    5.5. Solve two-step equations.
    5.6. Know how to transform using grouping symbols.

Data Analysis
6. Solve and graph simple linear equations.
    6.1. Graph functions.
    6.2. Find the range and domain of equations.
    6.3. Make a table of solutions.
    6.4. Graph solutions from table.
7. Analyze and interpret statistics ad graphs.
    7.1. Determine range, mean, median, and mode.
    7.2. Construct line plots.
    7.3. Find data from a graph.
    7.4. Analyze and interpret statistics and graphs.
    7.5. Plot points on coordinate plane.
    7.6. Calculate odds and probability and make predictions based on them.