

Mathematics Curriculum Guide (2002)

K– 8

**Archdiocese of Oklahoma City
Department of Catholic Education**

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Introduction

This Mathematics Curriculum Guide is the fruit of labor of many hours of hard work by the following committee members:

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To them we express our thanks.

ARCHDIOCESAN POLICIES ON CURRICULUM (7150)

7150.1 Curriculum Goals

The primary goal of the instructional program in the Catholic schools is to provide those learning experiences which are best for developing the values, attitudes, knowledge, and skills necessary for the student’s moral and spiritual, intellectual, social, emotional, and physical development which best support the distinctive mission of Catholic schools.

7150.2 Objectives of the Instructional Program

The instructional program of each school shall be in accord with the local school’s educational mission statement and its objectives as well as with the Archdiocesan philosophy, mission statement, goals and curriculum guidelines.

The curriculum shall meet Oklahoma’s State Department of Education requirements, as well as those of the Archdiocese of Oklahoma City, and also any other accrediting agencies in which the school is a member.

We ask that those who use the curriculum and to whom the education of our children is entrusted be mindful, not only of our Archdiocesan Curriculum, but also familiar with the PASS documents from the Oklahoma State Department of Education.

We also advise instructors to incorporate the seven (7) Major Themes of Catholic Social Teaching in their lessons. We ask that teachers develop appropriate applications of mathematics (e.g. word problems) in light of the Themes of Catholic Social Teaching and apply the appropriate theme(s) to their instructional material.

The Seven Major Themes of Catholic Social Teaching

1. LIFE AND DIGNITY OF THE HUMAN PERSON
2. CALL TO FAMILY, COMMUNITY, AND PARTICIPATION
3. RIGHTS AND RESPONSIBILITIES
4. OPTION FOR THE POOR AND VULNERABLE
5. THE DIGNITY OF WORK AND THE RIGHTS OF WORKERS
6. SOLIDARITY
7. CARE FOR GOD'S CREATION

Kindergarten

Classification and Comparisons

- Classify objects/pictures by color, size, shape, use and other qualities
- Compare concrete objects using terms as to size: larger, smaller, shorter, longer, and taller
- Identify and reproduce a sequential pattern
- Demonstrate the ability to continue a given pattern using concrete objects
- Understand and locate objects according to position: top, bottom, inside, outside, before, after, first, last, next, middle, left, and right

Numbers and Numeration

- Compare sets using one-to-one correspondence
- Compare sets by “more”, “less”, or “same”
- Demonstrate the ability to group sets of objects (0-30) corresponding to a given numeral
- Count without prompting from 0-100
- Count and write numbers from 0-100
 - By 1s
 - By 5s
 - By 10s
- Compare whole numbers using manipulatives
- Order whole numbers
 - 0-30
 - Identify 1st, 2nd, 3rd
- Model and count objects
 - By 1s
 - By 5's
 - By 10's

Addition

- Recognize that addition means increasing
- Solve problems using pictures, models, and manipulatives
- Demonstrate awareness of basic facts of addition through 10
- Add one
- Add two
- View sums horizontally and vertically
- Using coins, demonstrate adding money
- Use symbols “+” and “=”

Subtraction

- Recognize subtraction as “taking away”
- Solve subtraction problems using pictures and manipulatives
- Demonstrate understanding of the basic facts of subtraction to 10
- Subtract money with the use of coins
- Recognize one less than
- View differences horizontally and vertically
- Recognize symbols (- and =)

Fractions

- Identify equal parts and halves

Measurement

- Identify and compare the tallest (longest) and shortest of 2 or more objects
- Identify and compare the largest and smallest of 2 or more objects
- Determine length, weight, and height using non-standard units
- Compare/Identify heavier and lighter of 2 or more objects
- Order items by length/height
- Identify which object hold more or less
- Identify measuring tools: cups, rulers, scales
- Recognize a thermometer and identify its purpose
- Estimate temperature
- Identify cold, cool, warm, and hot temperatures

Time

- Calendar concepts
- Days in a week
 - Name
 - Order
 - Yesterday, today, tomorrow
- Months of the year
- Read a calendar
- Use a calendar
- Recognizes elapsed time: a few minutes ago, an hour ago
- Identifies morning, afternoon, evening, and night
- Recognizes hour and minute
 - On a clock

- Sense of time elapsed
- Clocks
 - Analog vs. digital
 - Tells time to nearest hour

Money

- Identify penny, nickel, dime, quarter
- Recognize and know the value of a penny, nickel, dime, and quarter
- Add and subtract money
- Use symbol in writing cents
- Count coins
- Use coins to make purchases
- Estimate the value of a given collection of coins including pennies, nickels, dimes, and quarters

Geometry

- Recognize a rectangle, square, circle, and triangle from a set of pictures
- Identify objects that have lines of symmetry
- Recognize two-dimensional shapes: line, point, and angle
- Recognize three-dimensional shapes: cube, cylinder, and cone
- Know position words:
 - Before, after, between
 - Inside, outside
 - Right, left
 - Top, middle, bottom
- Sort figures by shape, by sides, by corners

Graphing

- Make, read, and interpret a simple picture graph
- Make, read, and interpret real object graphs
- Answer real life questions based on information on simple graphs

Statistics

- Explore concepts of probability and/or make predictions

Problem Solving

- Check the reasonableness of answers
- Classify and sort by color, number, shape, size, or same and different

- Choose the appropriate operation to solve a problem (= or -)

Patterns

- Identify patterns
- Complete or continue patterns: color patterns, numerical patterns, position patterns, rhythmic patterns, shape patterns, size patterns
- Use patterns to solve problems

Algebra

- Sort objects by multiple attributes
- Use the symbol = to indicate relationships in an equation
- Identify the missing number in a sequence
- Compare and classify objects

FIRST GRADE

Classification and Comparisons

- Classify objects/pictures by color, size, shape, use and other qualities
- Compare concrete objects using terms as to size: larger, smaller, shorter, longer, and taller
- Identify and reproduce a sequential pattern
- Demonstrate the ability to continue a given pattern using concrete objects
- Understand and locate objects according to position: top, bottom, inside, outside, before, after, first, last, next, middle, left, and right

Numbers and Numeration

- Compare sets using one-to-one correspondence
- Compare sets by “more”, “less”, or “same”
- Demonstrate the ability to group sets of objects corresponding to a given numeral

Numbers

- Count without prompting from 0-100 and beyond
- Count and write numbers for groups of 1-10
- Identify and write numbers 0-100
- Understand use of ordinal numbers: 1st – 10th (first – tenth)
- Read, write and use numbers to describe real world situations

Explore the concept of place value

- Identify ones, tens, hundreds, thousands
- Use concrete models of hundreds, tens and ones to develop the concepts of place value

Compare whole numbers

- Using greater than ($>$), less than ($<$), equal ($=$)
- Using manipulatives

Order whole numbers

- 0-100
- 100-999 and beyond

Model and count objects

- Ones, twos, fives and tens
- Identifies odd and even numbers
- Identifies dozen and half dozen
- Identifies pairs

Addition

- Solve problems using pictures, models, and manipulatives
- Demonstrate understanding of basic facts of addition
- Add one and two-digit numbers with or without regrouping
- Add 2, 3, and four single-digit numbers
- Compute sums horizontally and vertically
- Using coins demonstrate adding money
- Use estimation to determine the reasonableness of results
- Applies knowledge of the commutative property

Subtraction

- Solve subtraction problems using pictures and manipulatives
- Demonstrate understanding of the basic facts of subtraction
- Compute one and two-digit numbers without regrouping
- Subtract money with or without the use of coins
- Use estimation to determine the reasonableness of a solution
- Computes differences horizontally and vertically

Fractions

- Identify fractional parts of a whole or of a set
- Compare fractional parts
- Identify equal parts, halves, thirds, fourths of objects

Measurement

- Identify and compare the tallest (longest) and shortest of 2 or more objects
- Identify and compare the largest and smallest of 2 or more objects
- Determine length and height using non-standard units
- Compare/Identify heavier and lighter of 2 or more objects
- Identify which object hold more or less
- Identify measuring tools: cups, rulers, scales

- Measure and compare using customary units: inch, cup, pint, and quart
- Measure and compare using customary units: gallon, ounce, foot, and yard
- Measure and compare using metric units: centimeter, liter
- Measure and compare using metric units: meter, kilometer, gram, and kilogram
- Read a thermometer in degrees Fahrenheit and Celsius
- Identifies cold, cool, warm, and hot temperatures

Time

- Put events and times of day into proper sequence
- Tell time to the hour and half-hour
- Calculate elapsed time: a few minutes ago, an hour ago
- Identifies morning afternoon, evening, and night
- Identifies days of the week and months of the year
- Solves problems using a calendar

Money

- Identify penny, nickel, dime, quarter, half-dollar and dollar
- Recognize and know the value of a penny, nickel, dime, and quarter, half-dollar and dollar
- Compare value of two sets of coins
- Add and subtract money
- Use symbols in writing dollars, cents, and decimals
- Estimate the value of a given collection of coins including pennies, nickels, dimes, and quarters

Geometry

- Recognize a rectangle, square, circle, triangle oval and diamond from a set of pictures
- Use concrete materials to construct simple geometric patterns and combine shapes to form new patterns
- Identify objects that have lines of symmetry
- Recognize two dimensional shapes: circle, triangle, square, rectangle, open and closed figures
- Recognize two-dimensional shapes: line, segment, point, angle and right angle
- Recognize three-dimensional shapes: cube, sphere, cylinder, and cone
- Use basic tools to measure perimeter, area, and volume

Graphing

- Read a simple bar and picture graph
- Collect, organize and interpret data with graphs, charts and tables
- Construct and/or interpret line graphs

Statistics

- Explore concepts of probability and/or make predictions

Problem Solving

- Formulate the solution of a word problem by writing a number sentence
- Role play to find a solution to a problem
- Look for a pattern (objects or pictures) to predict a solution to a problem
- Integrate geometric concepts to solve life-type problems

Patterns

- Investigate patterns of addition and subtraction operations
- Identify the missing shape or design in a repeating pattern

Algebra

- Sort objects by multiple attributes
- Use the symbols $>$, $<$, $=$ to indicate relationships in equations
- Identify the missing number in a sequence
- Compare and classify objects

Second Grade

Classification and Comparisons

- Classify objects/pictures by color, size, shape, use and other qualities
- Compare concrete objects using terms as to size: larger, smaller, shorter, longer, and taller
- Understand and locate objects according to position: top, bottom, inside, outside, before, after, first, last, next, middle, left, and right

Numbers and Numeration

- Compare sets using one-to-one correspondence
- Compare sets by “more”, “less”, or “same”
- Demonstrate the ability to group sets of objects corresponding to a given numeral
- Identify groups of 0-10
- Count without prompting from 0-1000 and beyond
- Count and write numbers for groups of 1-10
- Reads and writes numbers 0-999
- Writes numbers in expanded form
- Read and write word names for whole numbers through one hundred
- Identifies ordinal position
- Read, write, and use numbers to describe real world situations
- Count by 1's, 2's, 3', 4's, 5's, 10's, 25's, and 100's
- Understand place value (one, tens, hundreds)
- Use concrete models of hundreds, tens, and ones to develop the concepts of place value
- Compare whole numbers using greater than ($>$), less than ($<$), equal to ($=$)
- Compare whole numbers using manipulatives
- Order whole numbers (0-999)
- Identifies even and odd numbers
- Identifies addends and sums
- Read and write the Roman numerals (I-V)
- Round numbers to the nearest ten
- Identifies dozen and half dozen

Addition

- Solve problems using pictures, models, and manipulatives

- Demonstrate understanding of basic facts of addition
- Master addition facts to 18
- Demonstrate understanding of adding with or without regrouping by the use of manipulatives
- Add 2, 3, and 4 single-digit numbers
- Add 2 and 3 digit numbers with or without regrouping
- Make estimates in addition using front-end digits
- Identifies and uses the commutative and associative properties
- Identifies missing addends by performing the inverse operation (subtraction)
- Compute sums horizontally and vertically

Subtraction

- Solve subtraction problems using pictures and manipulatives
- Demonstrate understanding of the basic facts of subtraction
- Masters subtraction facts to 18
- Subtract one and two digit numbers with/without regrouping
- Use inverse operations to check subtraction
- Demonstrate ability to subtract numbers of several digits with regrouping ones, tens, and/or hundreds
- Subtract with or without regrouping when one or more digits is zero
- Make estimates in subtraction using front-end digits
- Computes subtraction sentences when one of the numbers is missing
- Compute difference horizontally and vertically

Multiplication

- Introduce the basic facts with factors 0, 1, 2, 3, 4, 5,
- Explore the concept of multiplication by joining equivalent sets of objects using manipulatives
- Solve multiplication problems involving 0's, 1's, 2's, 5's

Division

- Explore the concept of division by separating objects into equivalent sets using manipulatives.
- Divide by 2

Fractions

- Identify a fraction as a part of a whole
- Write and illustrate a fraction to show a part of a whole
- Identify a fractional part of a set
- Write and illustrate a fraction to show a part of a set
- Find half of a set of objects
- Identify equivalent fractions using concrete objects

Measurement

- Identify and compare the tallest (longest) and shortest of two or more objects
- Identify and compare the largest and smallest of two or more objects
- Determine length and height using non-standard units
- Compare/Identify heavier and lighter of two or more objects
- Identify which object holds more or less
- Identify measuring tools: cups, rulers, scales
- Measure and compare using customary units: (inch, cup, pint, quart, gallon, ounce, pound, foot, yard, mile, degree Fahrenheit)
- Measure and compare using metric units: (centimeter, liter, meter, kilometer, gram, kilogram, degree Celsius)
- Choose the best measuring tool
- Measure to the nearest inch and half inch

Time

- Put events and times of day into proper sequence
- Tell time using digital and analog clocks for hour, half hour, quarter hour, and five minute intervals
- Write time using colon notation
- Calculate elapsed time
- Know when to use a.m. and p.m.
- Read a calendar: day, month, year

Money

- Identify penny, nickel, dime, quarter, half dollar, and dollar
- Know the value of a penny, nickel, dime, quarter, half-dollar, and dollar
- Compare the value of two sets of coins
- Add and subtract money

- Use coins to demonstrate adding/subtracting money
- Use cent sign and dollar sign correctly
- Use word names for money amounts
- Make change from \$1.00

Geometry

- Recognize a rectangle, square, circle, triangle, oval, and diamond from a set of pictures
- Identify and draw a line of symmetry
- Recognize two dimensional shapes such as circle, triangle, square, rectangle, open and closed figures
- Recognize three dimensional shapes such as cube, sphere, cylinder, cone
- Find area using nonstandard units
- Find perimeter of a polygon
- Identifies horizontal lines, vertical lines, oblique lines, parallel lines, and intersecting lines
- Identifies number of sides and corners of a square, triangle, and rectangle
- Identify and draw simple congruent figures

Graphing

- Read a simple bar and picture graph
- Collect, organize, and interpret data with graphs, charts, and tables
- Construct and/or interpret simple and double bar graphs
- Construct and/or interpret line graphs
- Construct and/or interpret Venn Diagrams

Probability

- Explore concepts of probability and/or make predictions

Problem Solving

- Select and justify appropriate operation in solving a word problem
- Apply basic operations on whole numbers in problem-solving applications using appropriate technology
- Integrate geometric concepts to solve life-type problems
- Write addition and subtraction word problems using whole numbers

Patterns and Functions

- Investigate patterns of four basic operations
- Use the calculator and computer to explore patterns to continue to develop early function concepts
- Identify the missing number in a sequence
- Identify the missing shape or design in a repeating pattern
- Locate points on a number line
- Locate and graph points on a coordinate graph

THIRD GRADE

Classification and Comparisons

- Classify objects/pictures by color, size, shape, use, and other qualities
- Compare concrete objects using terms as to size: larger, smaller, shorter, longer, and taller
- Identify and reproduce a sequential pattern
- Understand and locate objects according to position: top, bottom, inside, outside, before, after, first, last, next, middle, left, and right

Numbers and Numeration

One-to-one correspondence

- Compare sets using one-to-one correspondence
- Compare sets by “more,” “less,” or “same”
- Demonstrate the ability to group sets of objects corresponding to a given numeral
- Identify groups of 0 – 10

Numbers

- Develop counting without prompting from 0 – 1000 and beyond
- Count and write numbers for groups of 1 – 10
- Develop identifying and writing numbers 0 – 999
- Develop writing numbers in expanded form
- Introduce and develop reading and writing whole numbers through thousands and beyond
- Understand use of ordinal numbers: 1st – 10th(first – tenth)
- Understand use of ordinal numbers 10th and beyond
- Develop reading, writing, and using numbers to describe real world situations

Explore the concept of place value

- Ones, tens, hundreds
- Develop thousands through hundred thousands
- Introduce millions through billions
- Develop the use of concrete models of hundreds, tens, and ones

Compare whole numbers

- Using greater than ($>$), less than ($<$), and equal ($=$)
- Develop using manipulatives

Order whole numbers

- 0 – 100
- Develop 100-999 and beyond
- Develop and interpret meaning through real world experiences

Model and count objects

- Ones, twos, fives, and tens
- Introduce threes, fours, and hundreds

Round to the nearest

- Tens and hundreds

Introduce determining properties of odd and even numbers with number patterns**Addition**

- Solve problems using pictures, models, and manipulatives
- Demonstrate understanding of basic facts of addition
- Know basic facts of addition
- Add one and two-digit numbers with or without regrouping
- Develop demonstrating understanding of adding with or without regrouping by the use of manipulatives
- Develop adding 2, 3, and 4 single-digit numbers
- Develop adding 2-, 3-, and 4-digit numbers with or without regrouping
- Develop using coins to demonstrate adding money
- Introduce and develop using estimation to determine the reasonableness of a solution
- Develop understanding the use of the commutative, associative, and identity properties to facilitate the solution
- Develop computing sentences when one of the numbers is missing

Subtraction

- Solve subtraction problems using pictures and manipulatives
- Demonstrate understanding of the basic facts of subtraction
- Demonstrate knowledge of the basic facts of subtraction
- Compute one and two-digit numbers with/without regrouping
- Develop the ability to subtract numbers of several digits with regrouping ones, tens, and/or hundreds
- Develop subtraction with/without regrouping when one or more digits is zero
- Develop subtraction of money with/without the use of coins
- Introduce and develop using estimation to determine the reasonableness of a solution
- Develop computing sentences when one of the numbers is missing

Multiplication

- Develop knowing the basic facts with factors of 2, 3, 4, 5, 6, 7, 8, 9
- Introduce and develop multiplication by 10, 100, and 1,000
- Introduce and develop multiplying 1-, 2-, or 3-digit numbers including money
- Introduce exploring techniques for estimation and mental computation

Division

- Introduce and develop knowing basic facts when divisor or quotient is 2, 3, 4, 5, 6, 7, 8, 9, 0, or 1
- Introduce and develop understanding of dividing by 1-digit number when the quotient is 1, 2, or 3-digits
- Introduce checking and averaging when divisor is a 1-digit number
- Introduce money when divisor is a 1-digit number
- Introduce demonstrating an understanding of dividing by 2-digit numbers when using multiples of 10
- Understand what remainders are

Decimals

- Introduce the use of place value to tenths and hundredths
- Introduce comparing and ordering decimals to hundredths

Fractions and Mixed Numbers

- Recognize fractional parts as parts of a whole or of a set
- Recognize $\frac{1}{2}$
- Develop recognizing all fractional numbers
- Introduce and develop recognizing and writing any proper fraction with 1-digit numerator or denominator
- Introduce equivalent fractions
- Identify and define proper fraction, mixed number, and improper fraction

Measurement

- Identify and compare the tallest (longest) and shortest of 2 or more objects
- Identify and compare the largest and smallest of 2 or more objects
- Identify and compare heavier and lighter of 2 or more objects
- Determine length and height using non-standard units
- Identify which object holds more or less
- Identify measuring tools: cups, rulers, scales
- Measure and compare using: inch, cup, pint, quart
- Develop measuring and comparing using: gallon, ounce, pound, foot, yard, and mile
- Introduce degree (Fahrenheit)
- Introduce the ability to estimate measures in customary and metric units

Metric Measurement Measure and compare using metric units of:

- Centimeter, liter
- Develop meter, kilometer, gram, kilogram
- Introduce milliliter
- Introduce degree (Celsius)

Time

- Put events and times of day in proper sequence
- Tell time to the hour, half hour, and quarter hour
- Write time using colon notation
- Introduce and develop time to the minute, 5 minute, or to the second
- Introduce calculating elapsed time
- Introduce the use of time zones
- Determine when to use a.m. and p.m.
- Read a calendar: day, month, year

Money

- Identify and understand the value of: penny, nickel, dime, quarter, half dollar, and dollar
- Compare value of two sets of coins
- Add and subtract money
- Use symbols in writing dollars, cents, decimals
- Develop writing word names for money amounts
- Develop making change up to \$1.00: up to \$5.00 with least number of coins

Geometry

- Recognize a: rectangle, square, circle, triangle, oval, and diamond from a set of pictures
- Use concrete materials to construct simple geometric patterns and combine shapes to form new patterns
- Develop identifying objects that have lines of symmetry
- Recognize two dimensional shapes: circle, triangle, square, rectangle, open and closed figures
- Introduce recognizing two dimensional shapes: line, segment, point, angle, and right angles

Graphing

Interpret meaning of graphs

- Read a simple bar and picture graph
- Collect, organize, and interpret data with graphs, charts, and tables
- Introduce constructing and/or interpreting simple and double bar graphs and interpret data
- Construct and/or interpret line graphs and broken line graphs
- Introduce constructing and interpreting line graphs and broken line graphs

Probability

- Introduce exploring concepts of probability and/or make predictions

Problem Solving

- Introduce and develop selecting and justifying appropriate operation in solving a word problem
- Apply basic operations on whole numbers in problem solving applications using appropriate technology
- Use patterns and functions to represent and solve patterns
- Introduce integrating geometric concepts to solve life-type problems

Patterns and Functions

- Introduce and develop investigating patterns of four basic operations
- Introduce and develop discovering, describing, extending, and creating a wide variety of patterns using tables, graphs, rules, models, and geometric shapes

Developing Word Problems

- Write simple addition, subtraction, multiplication, and division problems using whole numbers
- Write multi-step addition, subtraction, multiplication, and division problems using whole numbers

FOURTH GRADE

Number Sense

Numbers

- Develop identifying and writing numbers 0 – 999
- Introduce writing numbers in expanded form
- Introduce and develop reading and writing whole numbers through thousands and beyond
- Understand use of ordinal numbers 10th and beyond
- Develop reading, writing, and using numbers to describe real world situation

Explore the concept of place value

- Correct use of comma in addition, multiplication, and subtraction
- Standard form
- Whole numbers
 - Through millions
 - Through billions
- Decimals
 - Hundredths
 - Tenths

Develop determining properties of odd and even numbers with number patterns

Addition

- Solve for missing addends
- Understand number sentences
- Add three- and four-digit numbers
- Estimate sums
- Practice checking subtraction by using addition
- Add fractions with like and unlike denominators
- Add mixed numbers
- Add money
- Add decimals
- Introduce correct use of parentheses
- Be familiar with the properties of addition
 - Associative
 - Commutative
 - Identity

- Use strategies for Adding
 - Basic facts
 - Properties of numbers

Subtraction

- Solve subtraction problems using addition
- Practice estimating differences
- Subtract three- and four-digit numbers with/without regrouping
- Practice the ability to subtract numbers of several digits with regrouping ones, tens, and/or hundreds
- Practice subtracting across zeros
- Practice subtraction of money
- Practice using estimation to determine the reasonableness of a solution
- Practice computing sentences when one of the numbers is missing
- Introduce subtracting
 - Fractions with like and unlike denominators
 - Mixed numbers
 - Decimals

Multiplication

- Know the basic facts
- Recognize and use equation form
- Practice estimating to check for reasonableness
- Solve for missing factors
- Introduce and develop multiples of 10 and 100
- Introduce multiplying money
- Multiply two-, three-, and four-digit numbers by one-, and two-digit numbers
- Multiply with regrouping
- Introduce and develop multiplication properties
 - Associative property
 - Commutative property
 - Identity property
 - Zero property

Division

- Develop and use divisibility rules
- Introduce and develop basic division facts from 0 to 9
- Check division with multiplication
- Introduce and develop understanding of the term: dividend

- Practice dividing by multiples of 10
- Introduce and practice dividing money amounts
- Divide whole numbers up to and including four-digit dividends (introduce) and four-digit quotients
- Divide whole numbers using one- and two-digit divisors
- Divide with and without remainders
- Introduce and practice quotients containing zeros
- Practice both long and short division
- Introduce and practice rounding of quotients
- Practice keeping place value in division
- Introduce averaging

Decimals

- Introduce ordering decimals
 - From greatest to least
 - From least to greatest
 - With the same number of places
 - With a different number of places
- Know place values of decimals
 - Hundredths
 - Tenths
- Read decimals
 - Symbolic form
 - Word form
- Round decimals
 - To estimate sums and differences
 - To the nearest tenth
 - To the nearest whole number
- Add and Subtract decimals
- Write decimals
 - Greater than 1
 - Hundredths
 - Tenths
- Compare decimals
 - With a different number of places
 - With the same number of places
 - Using a number line
 - Using models
 - Using place values

- Introduce decimals as fractions and as mixed numbers
- Dividing decimals as money
- Use decimals in measurement
- Multiply money in decimal notation

Fractions and Mixed Numbers

- Add and subtract fractions
 - With like and unlike denominators using models
- Compare fractions
 - Greater than
 - Less than
 - By using a number line
 - Equivalent
- Model mixed numbers
- Find fractions using
 - A number line
 - Models
 - Patterns
- Write fractions in simplest form
- Use fractions in measurement
- Order fractions
 - From greatest to least
 - From least to greatest
 - With like and unlike denominators
- Introduce and practice Greatest Common Factor
- Introduce and practice Least Common Multiple
- Introduce and practice adding mixed numbers
- Introduce and practice subtracting mixed numbers
- Introduce and practice writing mixed numbers

Measurement

- Develop use of customary measurements: capacity, length, and weight
- Introduce and develop finding area
 - Of complex figures
 - Of polygons
 - Of rectangles
- Introduce and use square units
- Introduce formula for area

- Introduce determining and converting length and distance in both customary and metric system
 - Centimeters
 - Millimeters
 - Decimeters
 - Meter
 - Kilometer
 - Foot
 - Yard
 - Mile
 - Inch
- Introduce equivalencies
- Practice choosing appropriate units
- Practice measuring
 - To the nearest half-inch
 - To the nearest inch
 - To the nearest quarter inch
- Develop and practice using decimals and fractions in measurements
- Practice determining mass
 - In grams
 - In kilograms
- Compare weights
- Introduce the concept of perimeter
 - For complex figures
 - For rectangles
 - For squares
- Introduce the formula for determining perimeter of rectangles
- Introduce the concept of surface area
 - Of cubes
 - Of rectangular prisms
- Introduce the meaning of volume
 - In a rectangular prism
 - In a cube
- Practice using a thermometer
 - Celsius
 - Fahrenheit
 - Use of negative numbers with
 - Reading temperatures
 - Using a vertical number line

- Telling differences in degrees
 - Interpret on a line graph
- Time
 - Introduce calculating elapsed time
 - Introduce the use of time zones

Money

- Introduce and practice making change
 - Counting
 - Subtracting to find
 - Using the fewest coins and bills
- Introduce multiplying and dividing money
- Practice writing money amounts
- Use symbols in writing dollars, cents, decimals

Geometry

- Introduce and classify angles
 - Acute
 - Obtuse
 - Right
- Practice identifying angles
- Introduce the term degree
- Develop understanding of the circle
 - Introduce Diameter
 - Draw
 - Introduce meaning of
 - Be able to identify and name
- Identify points on a circle
 - Radius
 - Draw
 - Introduce meaning of
- Explain symmetry in a circle
- Develop classifying geometric figures
 - Polygons
 - Hexagon
 - Pentagon
 - Square
 - Triangle
 - Octagon

- Quadrilaterals
 - Parallelogram
 - Rectangle
 - Rhombus
 - Square
 - Trapezoid
- Triangles
 - Isosceles
 - Equilateral
- Introduce and identify congruent figures
- Develop understanding of parallel, perpendicular, and intersecting lines
- Develop understanding of rays
 - Endpoint of
 - Identify a ray
- Introduce concept of plane figures and space figures
 - Plane figures: Circle, rectangle, square, and triangle
 - Space figures: cone, cube, cylinder, rectangular prism, sphere, square pyramid, and triangular prism
- Introduce terms
 - Face
 - Edge
 - Vertex
- Introduce and develop symmetry
 - Line symmetry
 - Draw
 - Identify
 - Rotational symmetry
- Identify symmetrical symmetry
- Introduce transformations
 - Slides
 - Flips
 - Turns

Graphing

Interpret meaning of graphs

- Collect and organize data with graphs, charts, and tables
- Develop ability to read and interpret; introduce construction of:
 - A bar graph
 - A circle graph

- A line graph
- A line plot
- A pictograph
- Tables and charts

Probability/Statistics

- Introduce and develop areas of probability
 - Chance
 - Likely, unlikely, certain, and impossible
- Introduce and develop understanding of probability by working with
 - Cubes
 - Spinners
- Introduce the concept of a survey
- Develop creating and using tally charts

Problem Solving

- Develop selecting and justifying appropriate operation in solving a word problem
- Evaluate and check reasonableness of answers
- Justify and explain reasoning
- Introduce generalizing
- Practice making predictions
- Practice making mathematical decisions
 - Choose a strategy
 - Choose an operation
 - Use estimate or exact answer
- Develop real world math skills
 - Practice determining best buy
 - Practice calculating earning money, income, and savings
 - Practice costs involved with making purchases
- Practice calculations involving recipes
- Introduce and develop problems using sports examples

Patterns and Functions

- Introduce investigating patterns of four basic operations
- Introduce and develop discovering, describing, extending, and creating a wide variety of patterns using tables, graphs, rules, models, and geometric shapes

Developing Word Problems

- Write simple addition, subtraction, multiplication, and division problems using whole numbers
- Write multi-step addition, subtraction, multiplication, and division problems using whole numbers

GRADE FIVE

Numbers and Numeration

- Write numbers in expanded form
- Read and write word names for whole numbers through thousands and beyond
- Explore the concepts of place value through billions
- Compare whole numbers using greater than, less than, equal
- Order whole numbers 100-999 and beyond
- Round to the nearest tens, hundreds, thousands, and millions
- Determine properties of odd and even numbers with number patterns
- Read and write the Roman numerals I – L with understanding
- Write numbers in exponential form
- Discover properties of prime and composite numbers
- Understand prime factorization and how to use it

Addition

- Add one and two-digit numbers with or without regrouping
- Add 2, 3, and 4 single-digit numbers
- Add 2-, 3-, and 4-digit numbers with or without regrouping
- Use estimation to determine the reasonableness of results
- Understand the use of the commutative, associative, and identity properties to facilitate the solution

Subtraction

- Know basic facts of subtraction
- Compute one and two-digit numbers with or without regrouping
- Demonstrate ability to subtract numbers of several digits with regrouping ones, tens, and/or hundreds
- Subtract with or without regrouping when one or more digits is zero
- Use estimation to determine the reasonableness of a solution
- Compute addition and subtraction sentences when one of the numbers is missing

Multiplication

- Understand multiplication by 10
- Multiply 1, 2, or 3 digit numbers correctly, including money

Demonstrate with models the use of the commutative, associative and distributive properties

Division

- Understand dividing by 1-digit number
- Zeros in quotients
- Checking and averaging
- Money
- Demonstrate understanding of dividing by 2-digit numbers
- Multiples of 10
- 1-, 2-, 3-, and 4-digit quotients
- Zeros in quotients
- Understand what remainders are
- Write in fractional form

Demonstrate understanding of decimals

- Use place value to thousandths
- Know how to round decimals
- Demonstrate comparing and ordering of decimals
- Show how to change fractions to decimals and decimals to fractions

Decimal Computation

- Understand value of each digit in a decimal
- Add and subtract any combination of decimals to 4 places
- Understand multiplying of decimals
- Demonstrate knowledge of dividing decimals
 - By a whole number and a decimal
 - With zeros in quotient or in dividend
 - By rounding quotients
- Demonstrate efficiency in estimating sums, differences, products, and quotients

Fractions and Mixed Numbers

- Recognize fractional parts as parts of a whole or of a set
- Recognize and write any proper fraction with 1 digit numerator or denominator
- Identify equivalent fractions
- Compare and order fractions with same and different denominators

- Convert to equivalent fractions
- Identify and know meaning of proper fractions, mixed number and improper fractions
- Write fractions in lowest terms
- Find greatest common factor and least common multiple

Fractions and Mixed Number Computations

- Add or subtract fractions and mixed numbers with like or unlike denominators
- Multiply a whole number or fraction by a fraction
- Multiply mixed numbers
- Divide fractions by a fraction, whole number or mixed number
- Understand use of reciprocals

Measurement, Time And Money

- Measure and compare using customary units of capacity, length, and weight
- Square measure, cubic measure
- Compare units of measure
- Develop ability to estimate measures in customary and metric units
- Measure and compare using metric units of capacity, length, and mass
- Understand and solve for perimeter and area of triangles, quadrilaterals, circles
- Understand and solve for surface area and volume of rectangular prisms
- Calculate elapsed time
- Add and subtract money
- Multiply and divide money

Geometry

- Recognize one-dimensional shapes
 - Line, segment, point, angle, and right angle
- Recognize two-dimensional shapes
 - Circle, triangle, square, rectangle, open and closed figures
 - Recognize three dimensional shapes
 - Cube, sphere, cylinder, cone
 - Use basic tools to measure perimeter, area, and volume
 - Identify and describe kinds of angles

- Right, acute, obtuse, and straight
- Construct congruent segments and angles
- Classify and name triangles by sides and angles measure
- Know diameter, radius, and chord as related to circles
- Recognize and name polygons
- Quadrilateral (all), pentagon, hexagon, octagon, heptagon, nonagon, decagon
- Name and define lines
- Intersecting, parallel, perpendicular
- Segments and rays

Graphing, Statistics, Probability

- Interpret meaning of graphs
- Read a simple bar and picture graph
- Collect, organize, and interpret data with graphs, charts, and tables
- Construct and/or interpret simple and double bar graphs and interpret data
- Construct and/or interpret line and broken line graphs
- Construct and/or interpret circle graphs
- Demonstrate correct use of averaging techniques (mean, median, mode) and range

Ratio, Proportions, Percent

- Write and express ratios as a fraction
- Apply concept of proportions
- Understand meaning of percent
- Relate to decimals and fractions
- Find a percent of a number by using a decimal or fraction
- Introduce use of percents with sales tax and discount

Problem Solving

- Select and justify appropriate operation in solving a word problem
- Apply basic operations on whole numbers in problem-solving applications using appropriate technology
- Use patterns and function to represent and solve patterns

Patterns and Functions

- Investigate patterns of four basic operations
- Discover, describe, extend, and create a wide variety of patterns using tables
- Experiment with number patterns to devise divisibility rules for 2, 3, 5, 10

Algebraic Concepts

- Introduce concept of positive and negative numbers on a number line

Developing word Problems

- Write addition and subtraction problems using whole numbers
- Write multiplication and division problems using whole numbers

GRADE SIX

Numbers and Numeration

- Write numbers in expanded form
- Explore the concepts of place value through billions, trillions and beyond
- Identify and write whole numbers 0-999 and beyond
- Order whole numbers 0-999 and beyond
- Compare whole numbers using inequality
- Round to the nearest thousands, millions, and beyond
- Determine properties of odd and even numbers with number patterns
- Read and write the Roman numerals I – M with understanding
- Write numbers in exponential form
 - Know meaning and use of positive and negative exponents
 - Write and interpret numbers in scientific notation
- Discover properties of prime and composite numbers
- Understand prime factorization and how to use it
- Find square roots by approximation, table, and calculation
- Interpret the meaning of numbers through real world experiences

Addition

- Add 2-, 3-, and 4-digit numbers with or without regrouping
- Know how to use the distributive property
- Use estimation to determine the reasonableness of results
- Understand the use of the commutative, associative, and identity properties to facilitate the solution
- Add money with or without the use of coins

Subtraction

- Demonstrate ability to subtract numbers of several digits with regrouping ones, tens, and/or hundreds
- Subtract with or without regrouping when one or more digits is zero
- Use estimation to determine the reasonableness of a solution
- Compute addition and subtraction sentences when one of the numbers is missing
- Subtract money with or without the use of coins

Multiplication

- Know the basic facts with factors of 2, 3, 4, 5, 6, 6, 8, 9
- Understand multiplication by 10, 100, 1000
- Multiply 1, 2, or 3 digit numbers correctly, including money
- Explore techniques for estimation and mental computation
- Demonstrate with models the use of the commutative, associative, and distributive properties

Demonstrate with models the use of the commutative, associative and distributive properties

Division

- Know basic facts when divisor or quotient is 1, 2, 3, 4, 5, 6, 7, 8, 9, or 0
- Understand dividing by a 1-digit number
- Zeros in quotients
- Checking and averaging
- Money
- Demonstrate understanding of dividing by 2-digit numbers
- Multiples of 10
- 1-, 2-, 3-, and 4-digit quotients
- Know how to divide by 3- or more digit numbers
- Understand what remainders are
- Write in fractional form

Demonstrate understanding of decimals

- Use place value to thousandths and millionths
- Know how to round decimals
- Demonstrate comparing and ordering of decimals
- Explain decimals related to fractions through the use of technology and modeling
- Show how to change fractions to decimals and decimals to fractions
- Relate decimals to base ten number system

Decimal Computation

- Understand value of each digit in a decimal
- Add and subtract any combination of decimals to 4 places

- Understand multiplying of decimals
- Demonstrate knowledge of dividing decimals
 - By a whole number and a decimal
 - With zeros in quotient or in dividend
 - By rounding quotients
- Demonstrate efficiency in estimating sums, differences, products, and quotients
- Estimate reasonableness of a solution

Fractions and Mixed Numbers

- Recognize fractional parts as parts of a whole or of a set
- Recognize and write any proper fraction with 1 digit numerator or denominator
- Identify equivalent fractions
- Compare and order fractions with same and different denominators
- Convert to equivalent fractions
- Identify and know meaning of proper fractions, mixed number and improper fractions
- Write fractions in lowest terms
- Find greatest common factor and least common multiple

Fractions and Mixed Number Computations

- Add or subtract fractions and mixed numbers with like or unlike denominators
- Multiply a whole number or fraction by a fraction
- Multiply mixed numbers
- Divide fractions by a fraction, whole number, or mixed number
- Understand use of reciprocals
- Add and subtract fractions by using concrete models
- Multiply and divide fractions using concrete models
- Estimate for reasonable solutions using fractions or mixed numbers

Measurement, Time and Money

- Measure and compare using customary units of capacity, length, and weight
 - inch, foot, yard, mile
 - cup, pint, quart, gallon,
 - ounce, pound, ton

- degree (Fahrenheit)
- Determine length and height using non-standard units
- Square measure, cubic measure
- Compare units of measure
- Develop ability to estimate measures in customary and metric units
- Identify equivalent measures in customary and metric units
- Measure and compare using metric units of capacity, length, and mass
 - Centimeter, meter, kilometer, decimeter, millimeter
 - Liter, milliliter
 - Gram, kilogram
 - Square and cubic in metric
 - Degrees Celsius
- Understand and solve for perimeter, area, and volume of triangles, quadrilaterals, circles
- Understand and solve for surface area and volume of rectangular prisms
- Write time using colon notation
- Calculate elapsed time
- Understand time zones
- Know when to use a.m. and p.m.
- Use symbols to write dollars, cents, and decimals

Geometry

- Use concrete materials to construct simple geometric shapes and combine shapes or form new shapes
- Recognize one-dimensional shapes
 - Line, segment, point, angle, and right angle
- Recognize two-dimensional shapes
 - Circle, triangle, square, rectangle, open and closed figures
- Recognize and build models of three dimensional shapes
 - Cube, sphere, cylinder, cone
- Use basic tools to measure perimeter, area, and volume
- Analyze and perform transformations, point symmetries, and line symmetries on
- Describe relationships between geometric figures using congruency, similarity, and the basic transformations of slide, turn, and flip
- Identify and describe kinds of angles
 - Right, acute, obtuse, and straight

- Central and inscribed
- Perform geometric constructions
 - Construct congruent segments and angles
 - Bisect segments and angles
 - Construct perpendicular and parallel lines
- Know and apply terms as related to circles
 - Diameter and radius
 - Chord, arc, sector
- Recognize and name polygons
 - Quadrilateral (all), pentagon, hexagon, heptagon, octagon, nonagon, decagon
- Name and define lines and parts of lines
 - Intersecting, parallel, perpendicular
 - Segments and rays

Graphing, Statistics, Probability

- Interpret meaning of graphs
- Read a simple bar and picture graph
- Collect, organize, and interpret data with graphs, charts, and tables
- Construct and/or interpret simple and double bar graphs and interpret data
- Construct and/or interpret line and broken line graphs
- Construct and/or interpret circle graphs
- Construct appropriate statistical instrument for information given
- Statistics
 - Demonstrate correct use of averaging techniques: mean, median, mode, and range
 - Explore probability and make predictions
 - Devise and conduct experiments or simulations to determine probabilities, utilizing appropriate technology

Ratio, Proportions, Percent

- Write and express ratios as a fraction
- Apply concept of proportions
- Understand meaning of percent
- Relate to decimals and fractions
- Find a percent of a number by using a decimal or fraction
- Find what percent one number is of another
- Know the meaning of percents $>100\%$ and $<1\%$
- Apply use of percents

- Sales tax
- Discount
- Problem solving

Problem Solving

- Select and justify appropriate operation in solving a word problem
- Apply basic operations on whole numbers in problem-solving applications using appropriate technology
- Apply basic operations on decimals in problem-solving applications
- Apply operations of addition and subtraction of fractions in problem-solving applications using appropriate technology
- Apply operations of multiplication and division of fractions and mixed numbers in problem-solving applications using appropriate technology
- Integrate geometric concepts to solve life-type problems

Patterns and Functions

- Investigate patterns of four basic operations
- Discover, describe, extend, and create a wide variety of patterns using tables, graphs, rules, models, and geometric shapes
- Use the calculator and computer to explore patterns to continue to develop early function concepts
- Experiment with number patterns to devise divisibility rules for 2, 3, 4, 5, 6, 10, and 11

Algebraic Concepts

- Demonstrate basic properties of arithmetic (commutative, associative, distributive, etc.) using concrete models, examples, mathematical notation and algebraic symbols to represent those rules
- Use concrete models to simulate algebraic problem solving techniques
- Solve simple linear equations and develop the basic concept of a variable and expression

Developing word Problems

- Write addition and subtraction problems using whole numbers
- Write multiplication and division problems using whole numbers

Seventh Grade

Numbers and Numeration

- Numbers
 - Read and write word names for whole numbers through thousands and beyond
 - Read, write, and use numbers to describe real world situations
- Explore the concept of place value
 - Thousands through millions
 - Billions through trillions and beyond
- Compare whole numbers
 - Develop using inequality (\neq , $<$, $>$, \leq , \geq)
 - Interpret meaning through real world experiences
- Model and count objects
 - Thousands, millions, and beyond
- Read and write the Roman numerals I-M with understanding
- Understand use of exponents
 - Develop writing numbers in exponential form
 - Identify and develop the meaning and use of positive and negative exponents
 - Identify writing and interpreting numbers in scientific notation
 - Identify and develop finding square roots by approximation, table and calculation
- Discover properties of prime and composite numbers
- Develop the understanding of prime factorization and how to use it

Addition

- Add two, three, and four single-digit numbers with or without regrouping
- Use estimation to determine the reasonableness of results
- Understand the use of the commutative, associative, and identity properties to facilitate the solution
- Develop knowing how to use the distributive property

Subtraction

- Use estimation to determine the reasonableness of a solution
- Compute addition and subtraction sentences when one of the numbers is missing

Multiplication

- Multiply one, two, or three digit numbers correctly, including money
- Explore techniques for estimation and mental computation
- Demonstrate the use of the commutative, associative and distributive properties

Division

- Understand dividing by one-digit number
 - Quotient is one-, two-, or three-digits
 - Zeros in quotient
 - Checking and averaging
 - Money
 - Four-digit quotients
- Demonstrate understanding of dividing by two-digit numbers
 - Multiples of ten
 - One, two, and three-digit quotients
 - Zeros in quotient
 - Four-digit quotients
- Understand how to estimate in division
- Know how to divide by three or more digit numbers
- Understand what remainders are
 - Write in fractional or decimal form
- Demonstrate understanding of decimals
 - Use place value to tenths and hundredths
 - Use place value to thousandths and millionths
 - Explain decimals as related to fractions through the use of technology and modeling
 - Know how to round decimals
 - Demonstrate comparing and ordering of decimals
 - Show how to change fractions to decimals and decimals to fractions

Decimal Computation

- Understand value of each digit in a decimal
- Add and subtract any combination of decimals to four places
- Understand multiplying of decimals
- Demonstrate knowledge of dividing decimals
 - By a whole number and a decimal

- With zeros in quotient or in dividend
 - By rounding quotients
- Develop the demonstration of efficiency in estimating sums, differences, products and quotients

Fractions and Mixed Numbers

- Recognize fractional parts as parts of a whole set
- Identify equivalent fractions
- Compare and order fractions with like and unlike denominators
- Convert to equivalent fractions
- Identify and know meaning of proper fraction, mixed number and improper fraction
- Write fractions in lowest terms
- Develop the recognition of terminating and non-terminating or repeating decimals
- Develop determining the greatest common factor and the least common multiple

Fraction and Mixed Number Computation

- Add and subtract fractions and mixed numbers with like and unlike denominators
- Multiply a whole number or fraction by a fraction
- Multiply mixed numbers
- Divide fractions
 - Understand use of reciprocals
 - By a fraction, whole number or mixed number
- Add and subtract fractions using concrete models
- Develop multiplying and dividing fractions using concrete models
- Identify estimations for reasonable solutions using fractions or mixed numbers

Measurement, Time and Money

- Measure and compare using customary units:
 - Inch, cup, pint, quart
 - Gallon, ounce, pound, foot, yard, mile
 - Degree (Fahrenheit)
 - Ton
 - Square measure cubic measure
- Compute units of measure

- Identify equivalent measures in customary and metric units
- Develop ability to estimate measures in customary and metric units
- Measure and compare using metric units:
 - Centimeter, liter
 - Meter, kilometer, gram, kilogram
 - Milliliter
 - Degrees Celsius
 - Develop square and cubic measure
- Understand and solve for perimeter, area and volume of: triangle, quadrilaterals, and circle
- Develop surface area and volume of cylinders and prisms
- Time
 - Calculate elapsed time
 - Understand use of time zones
- Money
 - Add and subtract money
 - Multiply and divide money
 - Use symbols in writing dollars, cents, and decimals
 - Develop writing checks and balancing a checkbook

Geometry

- Identify objects that have lines of symmetry
- Recognize two dimensional shapes
 - Circle, triangle, square, rectangle, open and closed figures
 - Line, segment, point, angle, and right angles
- Recognize three dimensional shapes: prism, sphere, cylinder, cone, and pyramid
- Use basic tools to measure perimeter, area, and volume
- Develop the description of relationships between geometric figures using congruency and similarity
- Develop building models of three-dimensional shapes (cube, cylinder, cone)
- Develop analyzing and performing transformations, rotations, reflections, point symmetries, and line symmetries on geometric figures
- Identify and describe kinds of angles
 - Right, acute obtuse, and straight
 - Central and inscribed angles
 - Supplementary, complementary, adjacent and vertical
 - Corresponding, alternate interior, and alternate exterior

- Perform geometric constructions
 - Identify and develop the construction of congruent segments and angles
 - Identify the bisection of segments and angles
 - Develop the construction of perpendicular and parallel lines
- Know and apply terms related to circles
 - Develop diameter and radius
 - Identify and develop chord, arc and sector
- Recognize and name polygons (plane figures)
 - Quadrilateral (all shapes), pentagon, hexagon, heptagon, octagon, nonagon, and decagon
- Name and define lines
 - Intersecting
 - Develop parallel and perpendicular
 - Develop segments and rays
- Perform operations with right triangle
 - Identify and apply use of Pythagorean theorem

Graphing, Statistics, Probability

- Interpret meaning of graphs
 - Read a simple bar, picture graph, histogram, scatter plot, stem and leaf plot, and bar and whiskers plot
 - Collect, organize and interpret data with graphs, charts and tables
 - Construct and/or interpret simple and double bar graphs and interpret data
 - Construct and/or interpret circle graphs
 - Develop constructing appropriate statistical instrument for information given
- Statistics
 - Develop the correct use of averaging techniques (mean, median, mode and range)
 - Introduce sampling
- Develop concepts of probability and/or make predictions
 - Devise and conduct experiments or simulations to determine probabilities, utilizing appropriate technology

Ratio, Proportion, Percent

- Develop writing and expressing ratios as a fraction
- Identify and develop illustrating the concept of proportion and ratio with concrete models
- Identify and develop applying the concept of proportions
- Understand meaning of percent
 - Relate to decimals and fractions
 - Find a percent of a number by using a decimal or fraction
 - Find what percent one number is of another
 - Find a number when a percent of it is known
 - Know meaning of percents $>100\%$ and $<1\%$
- Apply use of percents
 - Sales tax
 - Discount
 - Simple interest and commission

Problem solving

- Select and justify appropriate operation in solving a word problem
- Apply basic operations on whole numbers in problem-solving applications using appropriate technology
- Apply basic operations on decimals in problem-solving applications
- Apply operations of addition and subtraction of fractions in problem-solving applications using appropriate technology
- Apply operations of multiplication and division of fractions and mixed numbers in problem solving applications using appropriate technology
- Use patterns and function to represent and solve patterns
- Write and solve algebraic equations and in equations to solve problems
- Use set notation to represent problem situations and solutions
- Integrate geometric concepts to solve life-type problems

Patterns and Functions

- Develop investigating patterns of four basic operations
- Develop discovering, describing, extending, and creating a wide variety of patterns using tables, graphs, rules, models and geometric shapes
- Develop using the calculator and computer to explore patterns to continue to develop early function concepts
- Identify and develop experimenting with number patterns to devise divisibility rule for divisors: three, four, six, eight, nine, and eleven

Algebraic Concepts

- Understand concept of integers, comparing and ordering of integers
- Understand absolute value of integers
- Solve addition, subtraction, multiplication and division problems using integers
- Correctly use the order of operations
- Solve one-step equations involving integers
- Solve equations including expressions of exponents
- Graph ordered pairs and equations
- Demonstrate basic properties of arithmetic (commutative, associative, distributive, etc) using concrete models, examples, mathematical notation and algebraic symbols to represent those rules
- Use concrete models to simulate algebraic problem solving techniques
- Solve simple linear equations and develop the basic concept of a variable expression

Developing Word Problems

- Write multiplication and division problems using whole numbers
- Write multi-step word problems using whole numbers in all four operations
- Write real world problems using fractions, percents and decimals

MATHEMATICS 8TH GRADE

NUMBERS AND NUMERATION

The student will be able to:

- Read and write word names for whole numbers through thousand and beyond.
- Read, write and use numbers to describe real world situations.
- Demonstrate the irrational number (π)
- Explore the concept of place value, billions through trillions and beyond.
- Compare whole numbers using inequality.
- Read and write the Roman numerals I-M with understanding.
- Write numbers in exponential form.
- Know meaning and use of positive and negative exponents.
- Write and interpret numbers in scientific notations.
- Find square roots by approximation, table and calculation
- Discover properties of prime and composite numbers.
- Understand prime factorization and how to use it.
- Convert rational numbers to fractions, decimals, and/or percents.
- Solve and use proportions.

COMPUTATION AND ESTIMATION

The students will be able to:

- Understand the use of the commutative, associative and identity properties to facilitate the solution.
- Know how to use the distributive property.
- Use estimation to determine the reasonableness of a solution.
- Compute addition, subtraction, multiplication and division sentences when one of the numbers is missing.
- Multiply 1-, 2-, or 3-digit numbers correctly, including money.
- Explore techniques for estimation and mental computation.
- Quotient is 1, 2, 3 and 4 digits.
- Zero in quotient.
- Write remainders in fraction forms.

DECIMALS

The students will be able to:

- Use place value to tenths and hundredths.
- Use place value to thousandths and millionths.

- Explain relation with fractions.
- Round decimals.
- Compare and order decimals.
- Change fractions to decimals, and decimals to fractions.

FRACTION AND MIXED NUMBERS

The students will be able to:

- Recognize terminating and non-terminating or repeating decimals.

MEASUREMENT & MONEY

The students will be able to:

- Compute units of measure.
- Identify equivalent measures in customary and metric units.
- Measure and compare square and cubic in metric units.
- Identify and compare decimeter and millimeter.
- Solve for perimeter, area and volume of triangles, quadrilaterals and prisms.
- Compute the surface area and volume of a sphere.
- Write checks and balance a checkbook.

GEOMETRY

The students will be able to:

- Identify and describe right, acute, obtuse, and straight angles.
- Identify objects that have lines of symmetry.
- Know and apply terms related to circle's diameter and radius.
- Name and define lines: parallel, perpendicular, segments and rays.
- Use geometric formulas and/or work with geometric shapes.

GRAPHING, STATISTICS, PROBABILITY

The students will be able to:

- Construct appropriate statistical instrument for information given.
- Demonstrate correct use of averaging techniques (mean, median, mode, and range)
- Understand use of scattergrams, histograms, and sampling.

RATIO, PROPORTION, PERCENT

The students will be able to:

- Write and express ratios as a fraction.
- Illustrate concept of proportion and ratio with concrete models.
- Find what percent one number is of another.
- Apply knowledge of ratio and proportion to problem solving.
- Convert large and small percents into decimals and fractions.
- Solve problems involving percent of increase or decrease.

PROBLEM SOLVING

The students will be able to:

- Apply basic operations on whole numbers in problem-solving applications using appropriate technology.
- Apply operations of addition and subtraction of fractions in problem-solving applications using appropriate technology.
- Choose the correct operation.
- Identify necessary and sufficient information.
- Analyze conclusions for reasonableness.

PATTERNS AND FUNCTIONS

The students will be able to:

- Experiment with number patterns to devise divisibility rules for divisors 2, 3, 5, and 10.
- Experiment with number patterns to devise divisibility rules for divisors 4, 6, 9, and 11.
- Work with bar, line and circle graphs.

ALGEBRAIC CONCEPTS

The students will be able to:

- Solve equations with one variable.

DEVELOPING WORD PROBLEMS

The students will be able to:

- Write multi-step word problems using whole numbers in all four operations