Newman Catholic Schools
Elementary Math Curriculum

2019-2020

TABLE OF CONTENTS:

Kindergarten Math Curriculum

I. Counting and Cardinality / Numbers and Operations in Base Ten

A. **Concepts**: By the end of the unit, students will...
1. Know number names and the count sequence.
2. Count and model numbers to 20
3. Use whole numbers from 1-100 to count, record, and identify.
4. Compare numbers

B. **Skills:** By the end of the unit, students will be able to...
1. count to 100 by ones and tens.
2. recognize numbers from 0-20 in written and model forms in real world situations.
3. count forward from a given number within the known sequence (instead of having to begin at 1).
4. represent a number of objects with a written numeral 0-20.
5. recognize numbers from 0-20 in written and model forms in real world situations.
6. orally count from 1-100.
7. correctly write a given number from 1-100.
8. correctly identify a shown number from 1-100.
9. identify whether the number of objects in one group is greater, less or equal to the objects in another group.
10. compare two numbers between 1-10 presented as written numerals.

C. **Possible Assessments:**
1. Students will be asked to orally count to 100 by ones and by 10's
2. When randomly shown numbers 1-30 the student will correctly identify the numbers.
3. When given a number between 1-100 the student will form numbers correctly and with correct place value placement.
4. When given a number the student will be able to count out the given number of manipulatives
5. When shown two sets of objects the student will be able to state with set has more, less or is equal
6. When given 2 numerals between 1-10 the student will be able to identify the correct numeral of which is more or less

II. Operations and Algebraic Thinking

A. **Concept:** By the end of the unit, students will be able to represent objects with numbers so

B. **Skills**: By the end of the unit, be able to
1. Represent addition and subtraction with objects and/or verbal explanations or equations.
2. Solve addition and subtraction word problems and add and subtract within 10 by using objects or drawings.
3. Decompose numbers less than or equal to 10 into parts in more than one way. (E.g 5=2=3; 5=4+1).
4. Find the number with a number from 1-9 that makes 10 when added to the given number

C. **Possible Possible Assessments:**

1. Using manipulatives if necessary, the student will
2. Show the steps and outcome in addition and subtraction.
3. Solve addition and subtraction word problems.
4. Show two different pairs of numbers that when added, will equal the given outcome.
5. Show how much more is needed from a given number to add up to the desired given outcome.

III. Measurement and Data

A. **Concepts:** By the end of the unit, students will....

1. tell time to the hour on both analog and digital clocks in verbal and written form.
2. identify name and value for a penny, nickel, dime and quarter.
3. compare and describe measurable attributes of objects.
4. explain data observed on charts and graphs.

B. **Skills:** By the end of the unit, be able to...

1. tell time to the hour on digital and analog clocks.
2. use manipulative classroom analog clocks to gain practice moving the hands to a given time on the hour.
3. use manipulative digital clocks to gain practice moving the numbers to
4. a given time on the hour.
5. match given on the hour times from an analog clock to a digital clock.
6. orally name the time shown to them on both an analog clock and a digital clock.
7. identify the values of pennies, nickels, dimes and quarters.
8. Use of pictures of coins and play money coins, the students will learn the names of each coin.
9. use of coin pictures and coin manipulatives the students will learn the value of each coin.
10. compare weight, length, height, capacity and temperature using non-standard units.
11. order by length identifying longest, tallest, shortest.
12. measure lengths of objects.
13. compare and determine which objects are lighter and heavier and order the objects by weight.
14. compare and determine which holds more and less and put objects in order according to which holds the most and which holds the least.
15. identify a thermometer and explore its use.
16. sort items into appropriate categories of hot and cold.
17. collect data on e.g. favorite colors, favorite foods, etc. and make their own graphs and describe the results shown.

C. **Possible Assessments:**

1. When given pictures of analog and digital clocks the student will correctly state the time on the hour shown.
2. When given pictures of analog and digital clocks the student will correctly draw the hour hand to the correct given number or write the correct given numbers on the digital clock.
3. Students will state orally the name of a coin shown to them and state its value.
4. When shown pictures of objects the student will correctly identify the items that are the tallest and/or shortest; longest and/or shortest; heaviest and/or lightest; which items will have the largest and/or the least amount of capacity.

IV. Geometry

A. **Concept:** By the end of the unit, students will....
   1. describe a geometric shape and its attributes including whole and part

B. **Skills:** By the end of the unit, be able to
   1. Use 2 dimensional shape cards to correctly identify shape names (triangle, square, circle, rectangle, diamond, oval)
   2. Identify 3 dimensional shapes from actual 3-D objects (cube, cone, sphere, cylinder, rectangular prism)
   3. Identify surfaces of 3-D shapes (cube=square, cylinder=circle, cone=circle, rectangular prism=rectangle and square)
   4. Identify symmetry
      a) circle objects that show symmetry (matching parts)
   5. Identify and show halves

C. **Possible Assessments:**
   1. When shown a picture of the two dimensional shapes the students will correctly identify the shape
   2. When shown an actual three dimensional shape the student will correctly identify the shape
   3. When shown a group of pictures that correctly and incorrectly show lines of symmetry and halves the students will correctly circle the correct picture.

First Grade Math Curriculum

I. Operations and Algebraic Thinking

A. **Concept:** By the end of 1st grade, students will....
   1. recall addition and subtraction facts to 10 to solve a variety of word problems.
   2. identify strategies to add and subtract to 20.

B. **Skills:** By the end of 1st grade, students will be able to...
   1. Add and Subtract within 20
   2. Relate counting to addition and subtraction.
      a) Identify addends in an addition sentence.
      b) Identify the greater of 2 addends.
      c) Understand the number line. Find sums and differences using a number line,
   3. Add and subtract to 20, demonstrating fluency to 10.
      a) Use making a ten strategy.
      b) Decompose numbers.
      c) Demonstrate understanding of double facts.
      d) Demonstrate understanding of double plus one facts.
      e) Count forward and backward to add and subtract.
      f) Identify part, part, whole strategy while constructing a math mountain.
      g) Demonstrate an understanding of addition with numbers to 20 and their corresponding subtraction facts, concretely, pictorially, and symbolically.
   4. Understand and Apply the Properties of Operations and Their Relationship Between Addition and Subtraction
      a) Apply properties of operations as strategies to add and subtract.
      b) Demonstrate use of commutative property of addition.
      c) Understand subtraction as an unknown addend problem. Ex. (10-8=_, 8+_=10).
   5. Work with Addition and subtraction Equations
      a) Understand the meaning of equal sign and determine if equations involving addition and subtraction are true or false. Ex. (6=6, 7=8-1, 7+1=6+2).
      b) Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. Ex. (Find the missing number in addition and subtraction problems such as 8+_=10, 6=_-4).
   6. Represent and Solve Word Problems Involving Addition and Subtraction
      a) Use addition and subtraction within 20 to solve word problems.
      b) Solve word problems using 3 whole numbers whose sum is less than or equal to 20, with fluency to 10, using manipulatives, drawings and equations.

C. **Possible Assessments:**
   1. Identify addends in an addition sentence
   2. Demonstrate orally the "count all" strategy to find a sum
   3. Identify the greater of 2 addends
   4. Demonstrate the "making a ten" strategy on a ten frame (1+9=10, 2+8=10, 3+7=10)
   5. Find sums and differences from numbers up to 20 using a number line
   6. Add using doubles facts strategy using sums to ten.
   7. Add using doubles facts strategy using sums to twenty.
   8. Add using doubles + 1 facts (4+4 = 8, 4+5=9)

9. Count orally forward and backward to add and subtract
10. Identify part, part, whole strategy while constructing a math mountain
11. Demonstrate an understanding of addition and subtraction with numbers to 20 and their corresponding subtraction facts, concretely, pictorially or symbolically
12. Demonstrate the Commutative Property of Addition by combining 2 addends in any order to solve addition problems (8+3=11, then 3+8=11)
13. Demonstrate the meaning of an equal sign to determine if equations involving addition and subtraction are true or false (6=6, 7=8-1, 7+1=6+2)
14. Determine the unknown whole number in an addition or subtraction equation relating three whole numbers (Find the missing number in addition and subtraction problems such as 8+_ = 10, 6=_-4)
15. Use addition and subtraction within 20 to solve word problems
16. Solve word problems using 3 whole numbers whose sum is less than or equal to 20, using manipulatives, drawings, or written equations.
17. Add and subtract within 10

II. Numbers and Operations in Base Ten

A. **Concept**: By the end of 1st grade, students will....
   1. use whole numbers from 0-120 to count, identify, and record.
   2. explain place value as 1s, 10s, and 100s.

B. **Skills:** By the end of 1st grade, students will be able to...
   1. Extend the Counting Sequence
   2. Count to 120 starting at any number less than 120.
   3. Read and write numerals from 0-120.
   4. Identify repeating and growing patterns.
   5. Compare and order whole numbers up to 120 (less than, greater than, or equal to) using sets of concrete objects and pictorial models.
   6. Practice counting sets of objects on number lines or on hundred charts.
   7. Use +10 and -10 window frames to identify 10 more or 10 less of a given number less than 120.
   8. Compare two two-digit numbers based on the meaning of the tens and ones digits, recording the results of comparison with the symbols >, =, and <.
   9. Skip count by 5s and 10s to 120.
   10. Use Pairs of Whole Numbers to Describe Fractional Parts of Whole Objects or Sets of Objects
       a) Separate a whole into equal parts and use appropriate language to describe the parts such as three out of four equal parts.
       b) Describe part of a set such as three out of eight crayons are red.
   11. Understand Place Value
   12. Compose and decompose numbers from 11-120 into tens and ones.
       a) Record each composition or decomposition by a drawing or equation (Ex. 18=10+8)
   13. Understand that numbers are composed of 10 ones and one, two, three, four, five, six, seven, eight, or nine ones.
   14. Understand a two-digit number as represented by amounts of tens and ones.
   15. Understand that 10 can be thought of as a bundle of 10 ones -called a “ten.”
   16. Use standard notation to write a number with one digit in each place value.
   17. Use expanded notation to write a number and show the place value of each digit (200+30+4=234)
   18. Use Place Value Understanding and Properties of Operations to Add and Subtract

19. Model and solve addition and subtraction problems with concrete objects and write corresponding number sentences.
20. Apply basic addition and subtraction facts (sums and differences to 18) using concrete models.
21. Given a two-digit number, find 10 more and explain the reasoning used.
    a) Subtract multiples of 10 in the range 10-120 using concrete models, drawings and strategies based on place value.

C. **Possible Assessments:**
1. Count to 120 starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeralIdentify and create a repeating pattern
2. Using sets of concrete objects or pictorial models, compare and order whole numbers up to 120 using the terms, less than, greater than, and equal to
3. Using +10 and -10 window frames, identify 10 more or 10 less of a given number less than 120
4. Orally skip count by 5's and 10's to 120
5. Given a set of 10 or less objects, divide this set into 2 equal sets
6. Compare parts of a whole and identify equal parts
7. Given a two digit number, represent that number amount using a place value chart and ten sticks and ones cubes
8. Add within 100, including adding a two-digit number and a one digit number

III. Measurement and Data

A. **Concept:** By the end of 1st grade, students will....
1. Compare and contrast measurable attributes using standard and non-standard units.
2. Demonstrate knowledge of time and money concepts.
3. Identify the value of a given combination of coins up to $1.00.

B. **Skills:** By the end of 1st grade, be able to...
1. Compare length.
    a) Compare objects according to length using the terms longer, longest, taller, tallest, shorter, and shortest.
    b) Estimate and measure length in nonstandard units (such as cubes or paper clips.)
    c) Measure length to the nearest inch or centimeter using a ruler.
2. Compare weight.
    a) Compare the weight of two objects using a balance, using the terms heavier and lighter.
    b) Estimate the weight of an object using one pound for direct comparison (more than a pound or less than a pound.)
3. Compare volume.
    a) Use cups, pints, quarts, and gallons to measure volume.
    b) Compare capacities of various containers and determine which hold less.
    c) Compare capacities of containers to a liter.
4. Measure temperature.
    a) Recognize temperatures such as a hot or cold day.
    b) Read a thermometer, introducing the measurement of degrees Fahrenheit.
5. Measure time.
    a) State time to the hour and half hour using analog and digital clocks.

b) Match analog clocks and times.
c) Match digital clocks and times.
d) Find elapsed time to the hour and half hour.
e) Read a calendar, identifying months, dates, and the days of the week.

6. Count money.
   a) Identify the value of a penny, nickel, dime, and quarter.
   b) Count a combination of quarters, dimes, nickels, and pennies with a value up to $1.00.
7. Compare numbers.
   a) Demonstrate an understanding of the concepts of less than, equal to, or greater than by comparing and ordering whole numbers to 100 using the symbols for those concepts (<, =,>).
   b) Identify one more than, one less than, 10 more than, and ten less than a given number.

C. **Possible Assessments:**

1. Measure the length of an object to the nearest inch using a ruler.
2. Measure the length of an object to the nearest centimeter using a ruler.
3. Estimate and measure the length of an object using nonstandard units such as cubes or paper clips.
4. Compare objects according to length using the terms longer, longest, tall, taller, tallest, shorter and shortest
5. Compare the weight of two objects using a balance, using the terms heavier and lighter
6. Estimate the weight of an object using one pound for direct comparison (more than a pound or less than a pound)
7. Measure volume of liquids using cups, pints, quarts and gallons
8. Compare capacities of various containers and determine which hold less
9. Recognize and state the temperature of a day as hot or cold
10. Read and record temperature from a thermometer using degrees Fahrenheit
11. Match analog clocks and times
12. Match digital clocks and times
13. State the time to the hour and half hour using analog and digital clocks
14. Find elapsed time to the hour and half hour
15. Identify the months, dates, and days of the week
16. Identify the value of a penny, nickel, dime and quarter
17. Count a combination of quarters, dimes, nickels, and pennies with a value of up to $1.00

IV. Geometry

A. **Concept:** By the end of 1st grade, students will...

1. Recognize attributes of basic geometric shapes, equal parts, and fractions as part of a whole group

B. **Skills:** By the end of 1st grade, students will be able to...

1. Identify solid shapes as 2 or 3 dimensional, as having a certain number of sides, and as having certain attributes.
2. Identify and describe a two dimensional shape as one of the following: square, circle, triangle, rectangle, hexagon.
3. Identify and describe a three dimensional shape as one of the following: cube, cone, cylinder, sphere, rectangular prism, pyramid.

4. Identify faces of three-dimensional shapes (Ex. Rectangular prism has faces that are rectangles and squares.
5. Compose simple shapes to form larger shapes.
    a) Model with pattern blocks.
    b) Use triangles to make squares. Use squares to make rectangles.
    c) Compare geoboard figures.
6. Describe positions of object:above, below, beside, in front of, behind, next to, etc...
7. Distinguish between parts and wholes.
8. Understand that shapes can be divided into equal parts to create fractions.
    a) Halves
    b) Fourths (quarters)
    c) Thirds
9. Identify symmetry in shapes and in nature.
    a) Divide a shape into equal pieces.
10. Identify transformations
    a) a diamond as a rotated square.

C. Possible Assessments:

1. Identify two-dimensional shapes (square, circle, triangle, rectangle, hexagon)
2. Use defining attributes to describe the above shapes (Triangles are closed shapes with three sides.)
3. Build/draw the above shapes to possess these defining attributes
4. Identify three-dimensional shapes (cube, cone, cylinder, sphere, rectangular prism)
5. Create a square and a triangle on a geoboard Explain their defining attributes (Triangle has three sides and three angles. Square has four equal sides.)
6. Compose simple shapes to form larger shapes Use triangle pattern blocks to make a square.
7. Use squares to make a rectangle.
8. Identify positions - above, below, beside, in front of, behind, and next to
9. Partition circles and squares into two, three, and four equal parts
10. Describe the above equal parts using the words halves, thirds, fourths, and quarters
11. Identify symmetry in shapes Divide a shape into two equal parts to create symmetry.
12. Identify a diamond as a rotated square

Second Grade Math Curriculum

I. Measurement and Data

A. **Concepts:** By the end of the unit, students will ...
1. select appropriate units and tools to measure length, weight, height, and volume.
2. tell time to five minute intervals, including AM and PM, using analog and digital clocks.
3. demonstrate making change using dollars and coins.
4. produce bar graphs, picture graphs, and line plots using data.
5. determine probability of an event.

B. **Skills:** By the end of the unit, students will be able to...
1. measure objects using a variety of tools and compare them to other units of measure.
    a) Measure using nonstandard units
    b) Measure using inches, feet, and yards.
    c) Measure using metric measurement of centimeters and meters.
2. use measurement to find the area and perimeter of a figure.
3. measure the volume of an object and compare the units of volume.
    a) compare the volume of objects
    b) Students will measure volume using metric forms of measurement: liters.
    c) Students will measure volume using standard forms of measurement: cups, pints, quarts, and gallons..
4. measure temperature.
    a) Students will measure temperature using Fahrenheit and Celsius.
5. measure the weight of objects.
    a) Students will measure the weight of objects using standard measurement of pounds and ounces.
    b) Students will measure the weight of objects using metric measurement: grams and kilograms.
6. tell time.
    a) Students will be able to tell time to the hour, half hour and time to five minutes.
    b) Students will be able to tell time to the quarter hour.
    c) Students will be able to tell time using a digital and analog clock.
    d) Students will be able to tell how much time has passed using elapsed time.
    e) Students will learn about periods of time using a calendar.
    f) Students will compare time using: hours, days, weeks, and months.
7. count money.
    a) Students will be able to write the value of a group of coins: half dollars, quarters, nickels, and pennies.
    b) Students will be able to show equal amounts of money using different coins.
    c) Students will be able to compare amounts of money using greater than, less than, and equal to.
    d) Students will be able to identify coins that equal a dollar.
    e) Students will be able to count on to make change.
8. interpret data using various graphs and compare data in graphs.
9. Students will interpret and compare data in tally, pictograph, bar, and line graphs.
    a) Students will locate and identify points on a coordinate grid.

b) Students will be able to read and make a Venn diagram.

10. determine probability of an event.
    a) Students will be able to tell if an event is more, less, or equally likely to happen.
    b) Students will be able to predict and record the outcome of an event.

C. **Possible Assessments:**

1. Given an object students will be able to measure an object using a variety of tools and compare the units of measure on a written test.
2. Given an object students will be able to find the area and perimeter of an object using measurement on a written test.
3. Given an object students will be able to measure the volume of an object and compare the units of volume on a written test.
4. Given a thermometer students will be able to tell the temperature on a written test.
5. Given an object students will be able to measure the weight of an object on a written test.
6. Given an analog or digital clock students will be able to tell the time on a written test.

II. Number and Operations in Base Ten

A. **Concepts:** By the end of the unit, students will ...

1. Understand that the four digits of a four digit number represents thousands, hundreds, tens, and ones. Ex. 2, 386 equals 2 thousands, 3 hundreds, 8 tens, and 6 ones.
2. Use place value understanding and properties of operations to add and subtract.

B. **Skills:** By the end of the unit, students will be able to...

1. Count within 1,000, skip count by 5's, 10's and 100's.
2. Read and write numbers to 10,000 using base ten numerals, number names and expanded form.
3. Compare two and three digit numbers based on meaning of hundreds, tens, and ones digits using >, =, and < symbols to record the results of comparisons.
4. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or relationship between addition and subtraction.
5. Add up to four two-digit numbers using strategies based on place value and properties of operations.
6. Add and subtract within 1,000 using concrete models or drawings and strategies based on place value, properties of operations, and/or relationships between addition and subtraction, relate the strategy to a written method. Understand that in adding and subtracting three digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones sometimes it is necessary to borrow or regroup tens or hundreds.
7. Mentally add 10 or 100 to a given number 100-900 and mentally subtract 10 or 100 from a given number 100-900.
8. Explain why addition and subtraction strategies work, using place value and properties of operations.

C. **Possible Assessments:**

1. Given a four digit number students will be able to identify the place value of a given number using thousands, hundreds, tens, and ones on a written test.

2. Given an addition or subtraction problem students will be able to add or subtract within 100 using place value understanding and properties of operation on a written test.

III. Operations and Algebraic Thinking

A. **Concept:** By the end of the unit, students will..
Solve addition and subtraction problems with regrouping within 100.

B. **Skills:** By the end of the unit, students will be able to...
1. know from memory all sums of two, one-digit numbers.
2. solve addition and subtraction problems with regrouping within 100.
3. use addition and subtraction within 100 to solve one and two step word problems.
4. create arrays using grouping or repeated addition to explain multiplication and division facts.
5. explain repeating and growing patterns.
6. fluently add and subtract within 20, decide when to regroup 10 ones as 10.
7. estimate the sum of two numbers by rounding.
8. to add three two digit numbers.
9. decide when to regroup 1 ten as 10 ones to subtract.
10. subtract one digit number from a two digit numbers with and without regrouping.
11. use repeated addition to skip count to multiply.
12. use arrays to multiply in any order.
13. use repeated subtraction to divide.
14. make equal groups to divide. identify and order numbers through 100.
15. identify even and odd numbers.
16. skip count by 2's, 3's, 4's, 5's and 10's.
17. put whole numbers in order using just before, between, and just after.
18. use ordinal numbers.
19. extend, describe, and create repeating and growing patterns.
20. use addition to find the total number of objects arranged in an array with up to 5 rows and 5 columns

C. **Possible Assessments:**
1. Given an addition or subtraction problem be able to solve a problem with and without regrouping within 100 on a written test.
2. Given a multiplication or division problem use arrays or repeated addition to solve the problem on a written test.
3. Given a pattern be able to explain and continue repeated and growing patterns on a written test.

IV. Geometry

A. **Concept:** By the end of the unit, students will ...
1. classify geometric shapes according to their attributes
2. divide shapes into equal parts

B. **Skills:** By the end of the unit, students will be able to...
1. Identify solid shapes
    a) Use everyday objects that have the same solid shape.

2. Identify faces, edges, and vertices on geometric shapes.
    a) Count the faces, edges, and vertices of geometric shapes.
3. Make a plane shape from a solid geometric shape
    a) trace a solid shape to make a plane shape.
    b) understand that a plane shape is a flat shape.
4. Classify and compare solid shapes.
    a) compare shapes using faces, sides, and vertices.
5. Divide a given shape into equal parts

C. Possible Assessments:

1. Given geometric shapes students will be able to classify the shapes according to their attributes on a written test.
2. Given a shape students with be able to divide them into equal parts on a written test.

Third Grade Math Curriculum

I. Measurement and Data

A. **Concept:** By the end of the unit, students will..
   1. solve problems involving measurement of time, liquid, volume, mass, and length as well as representing data using graphs.

B. **Skills:** By the end of the unit, students will be able to...
   1. **Data**
      a) Draw conclusions about the kinds of information for which certain graphs are appropriate
      b) Read and make pictographs, horizontal and vertical bar graphs
      c) Explore chance and probability and learn how to make predictions
   2. **Measurement**
      a) Using standard measurements to measure to the inch, half inch, foot, and yard
      b) Use customary units (ounce /pound) to choose appropriate unit for measuring weight
      c) Using metric measurements to measure centimeters, meters, milliliters, liters, grams and kilograms
      d) Read Fahrenheit and Celsius thermometers
   3. **Time**
      a) Read and write time to the second, minute, hour, and day
      b) Find elapsed time
      c) Find time between dates on a calendar
      d) Interpret information on a schedule or an ad to solve problems using time and dates
      e) Introduce time zones to determine differences between them

C. **Assessment:** Given a set of data students will be able to solve problems involving measurement of time, liquid, volume, mass, and length as well as representing data using graphs using both standard and metric units

II. Number and Operations--Fractions

A. **Concepts:** By the end of the unit, students will..
   1. Illustrate fractions as equal parts of a whole represented on a number line
   2. Understand fractions as numbers

B. **Skills:** By the end of the unit, students will be able to...
   1. Investigate fractions
      a) Identify common fractional parts, such as numerators and denominators, using pattern blocks, number line, models, fraction bars
      b) Identify fractions in relationship to time (fractions of an hour)
   2. Explain equivalence of fractions in special cases and compare fractions
      a) Practice equivalent fractions using fraction bars
   3. Recognize and generate simple equivalent fractions by using models and fraction bars (¼, ½, ¾)
      a) Express and write whole numbers and mixed numbers using pictures and models

4. Solve problems using addition and subtraction of fractions with like denominators.

C. **Assessment:**
   1. Given a set of fractions students will be able to illustrate them as equal parts of a whole, represent them on a number line, and illustrate equivalent fractions. They will also add and subtract fractions. Students will perform these skills .

III. Operations and Algebraic Thinking

A. **Concepts:** By the end of the unit, students will..
   1. Perform operations with multi digit numbers to 1000.
   2. Use logical reasoning to solve multi step real –world problems using grade level number sense.

B. **Skills:** By the end of the unit, students will be able to...
   1. Use Place Value Understanding & Properties of Operations to Perform Multi-Digit Arithmetic
      a) Use place value understanding to round whole numbers to the nearest 10 or 100
      b) Fluently add / subtract within 1000 using strategies and algorithms based on place value
      c) Multiply one-digit whole numbers by multiples of 10 in the range of 10-90 (e.g. 3 X 50, 8 X 70) using strategies based on place value and properties of operations.
      d) Operations of Operations in Base Ten
   2. Represent and Solve Problems Involving Multiplication and Division
      a) Interpret products of whole numbers (eg. 3 X6 as the total number of objects in 3 groups of 6 each)
      b) Interpret whole number quotients of whole numbers (eg. 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares.)
      c) Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities
      d) Determine the unknown whole number in a multiplication or division equation relating three whole numbers. (Families ☺ eg. 8 X? = 56, ?=6 X 6, 5=?÷3)
   3. Understand Properties of Multiplication and the Relationship between Multiplication and Division
      a) Apply properties of operations as strategies to multiply and divide (Commutative property of multiplication, Associative property of multiplication and Distributive property)
   4. Understand division as an unknown factor problem. (Eg. 32 ÷8=by finding the number that makes 32 when multiplied by (families)
   5. Multiply and Divide within 100
   6. Fluently multiply and divide within 100, using strategies such as relationships between multiplication and division (Families eg. 8x5=40, one knows that 40÷5=8) or properties of operations. By the end of Grade 3, know from memory all products of two one digit numbers.
   7. Solve Problems Involving the Four Operations and Identify and Explain Patterns in Arithmetic
   8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity.

Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

9. Identify arithmetic patterns (including patterns in the addition or multiplication table), and explain them using properties of operations. (Eg. Observe that 4 times a number is always even and explain why 4 times a number can be decomposed into 2 equal addends.)

C. **Possible Assessments:**
   1. Given a set of problems students will demonstrate knowledge by fluently adding and subtracting within 1000 using strategies and algorithms based on place value.
   2. Given a set of multiplication and division problems within 100 students will be accurate .
   3. Given a set of two step real- world problems using the four operations students will be able to represent the problem using an equation .

IV. Geometry

A. **Concepts:** By the end of the unit, students will be able to classify shapes and their attributes.

B. **Skills:** By the end of the unit, students will be able to...
   1. Shapes
      a) Explore 2-D and 3-D geometric shapes
      b) Identify the attributes of a shape, such as sides, angles, and length
   2. Spatial Sense
      a) Explore geometric patterns
      b) Identify congruence and symmetry
   3. Transformations
      a) Identify and draw flips, turns, and slides
   4. Plane figures
      a) Name and classify angles as obtuse, acute and right angle
      b) Identify and classify lines, line segments, parallel, intersecting, or perpendicular
   5. Measurement Ideas
      a) Measure perimeter and area

C. **Assessments:** Given a set of geometric shapes, students will be able to classify the shapes and their attributes . They will also be able to define and solve basic problems with perimeter and area.

Fourth Grade Math Curriculum

I. Operations and Algebraic Thinking - Number Sense

A. **Concepts:** By the end of the unit, students will....
   1. Calculate Addition and Subtraction fluency to solve multi-step, multi-digit problem and number sense
   2. Use Multiplication and Division fluency to solve multi-step, multi-digit problems and articulate them in various models.

B. **Skills:** By the end of the unit, students will be able to...
   1. Use the properties of addition: Order, Zero, and Grouping properties to apply the rules of subtraction.
   2. Make a diagram to solve addition and subtraction problems. Determine appropriate labels.
   3. Estimate sums and differences of whole numbers including money using front end-estimation with and without adjustments.
   4. Add up to five 5 digit addends including money.
   5. Subtract up to five digit number from five digit numbers including those with zeros.
   6. Estimate products using front-end estimation.
   7. Use intermediate logarithms to multiply 2 digit numbers.
   8. Multiply 4 digit numbers by a 1 digit number including money with and without regrouping.
   9. Multiply up to 3 by 2 digit numbers by using an array and regular multiplication with and without regrouping.
   10. Multiply money amounts to $9.99 by 2 digit numbers adding dollar sign and decimal point.
   11. Use the grouping property to multiply 3 factors
   12. Divide by 1 digit divisors by 4 digit dividends resulting in 3 digit quotients with or without regrouping.
   13. Divide money by 1 digit divisors without remainders
   14. Introduce the concept of finding averages.
   15. Investigate the rules of divisibility.
   16. Solve challenging word problems using any method that works including using diagrams and being able to interpret remainders usage.
   17. Divide up to 4 digit dividends by 2 digit divisors resulting in 2 digit quotients with and without remainders.

C. **Possible Assessments:**
   1. Given a set of problems students will demonstrate knowledge of addition and subtraction fluency to solve multi-step multi-digit problems and number sense within the following performance inventory areas through a formal written assessment:
      a) Extending and the goal outcome understanding of the properties of addition and subtraction
      b) Extending and the goal outcome understanding of estimation
      c) Solve addition problems up to 5 digits including money
      d) Solve subtraction problems up to 5 digits including zeros
   2. Given a set of problems students will demonstrate knowledge of multiplication and division fluency to solve multi-step, multi-digit problems using various models within the following performance inventory areas through a formal written assessment:

a) Extending and the goal outcome understanding of estimation as it relates to multiplication
b) Solve the goal outcome understanding of multiplication as it relates to multi digit problems
c) Solve the goal outcome understanding of division as relates to multi digit problems with and without remainders
d) Solve problems relating to finding averages
e) Show an understanding of division divisibility rules

II. Operations and Algebraic Thinking - Logical Reasoning

A. **Concept:** By the end of the unit, students will....
   1. Use logical reasoning to solve multi step real – world problems using grade level

B. **Skills:** By the end of the unit, students will be able to...
   1. Solve problems using mathematical operations:
      a) Solve multi-step word problems using addition, subtraction,
      b) multiplication and division.
      c) Solve word problems in which remainders must be interpreted
      d) Assess the reasonableness of answers using mental computation
      e) and estimation strategies including rounding.
      f) Multiply and divide to solve word problems

C. **Possible Assessment:** Given a set of problems students will demonstrate knowledge of logical reasoning to solve multi step real-world problems using grade level number sense outcomes within the following performance inventory areas through a formal written assessment:
   1. solve multi-step problems using addition, subtraction, multiplication and division
   2. solve division word problems interpreting remainder usage
      a) assess the reasonableness of answers using remainders

III. Number and Operations in Base Ten - Place Value

A. **Concept:** By the end of the unit, students will....
   1. Apply place value understanding and relationships of values for multi-digit whole numbers through millions.

B. **Skills:** By the end of the unit, students will be able to...
   1. Explain and use the place value system:
   2. Read and write words for numbers to millions place
   3. Read and write numbers to the millions place using base ten numbers, names, and expanded form
   4. Write whole numbers in expanded form
   5. Round whole numbers by 10, 100, 1000 up to millions place
   6. Use place value understanding and properties of operation to do arithmetic:
      a) Recognize that in a multi-digit number, a digit in the ones place represents ten times what it represents in the place to its right
      b) Explain patterns in the number of zeros of the product when multiplying or dividing a number by powers of ten
      c) Read, write, and compare decimals to the thousandths using whole numbers and number names

d) Demonstrate when adding or subtracting up to three digit numbers, adding or subtracting hundreds with hundreds, tens with tens, and ones with ones that it is sometimes necessary to carry or borrow
e) Mentally add or subtract 10 or 100 to a given number up to the millions place
f) Multiply one digit number by multiples of 10
g) Use and explain problem solving strategies based on place value and properties of operation

C. **Assessment:** Given a set of problems students will demonstrate knowledge of place value and relationships of values for multi-digit whole numbers through millions within the following performance inventory areas through a formal written assessment:
1. Extending and understanding the place value system by reading and writing number to the millions place
2. Extending and understanding the use of place value when adding, subtracting, multiplying, and dividing

IV. Number and Operations - Fractions

A. **Concept:** By the end of the unit, students will....
1. Apply past knowledge of whole number operations to fractions and decimals

B. **Skills:** By the end of the unit, students will be able to...
1. Extend an Understanding of Fraction Equivalence and Ordering:
2. Write common fractions to describe parts of a whole using the terms numerator and denominator
3. Represent a fraction as a number on a number line
4. Recognize fractions in simplest terms
5. Recognize and generate equivalent fractions with a given numerator or denominator
6. Compare fractions using symbols for greater than, less than and equal to and justify using models
7. Write and convert improper fractions and mixed number
8. Extend and understanding of Decimal Equivalence and Ordering:
    a) Explore the value of decimal numbers to the hundredths place using decimal squares and place value chart.
    b) Write whole numbers and decimal numbers less than one to the hundredths place.
    c) Compare and order decimals to the hundredths place.
9. Solve fraction problems involving addition and subtraction of mixed numbers and multiplication of fractions by a fraction and a whole number.
    a) Add and subtraction fractions with like denominators
    b) Add and subtract fractions with unlike denominators by finding compatible fractions
    c) Add and subtract mixed numbers with the same denominator, renaming the sums and differences in simplest form.
    d) Use fractions to solve word problems
10. Solve decimal problems involving addition and subtraction
    a) Add up to three decimals through hundredths
    b) Subtract decimals through hundredths
    c) Use decimals to solve word problems

C. **Possible Assessment**: Given a set of problems students will demonstrate knowledge of whole number operations to fractions and decimals within the following performance inventory areas through a formal written assessment:

1. Extending and the goal outcome understanding of fraction equivalence and ordering
2. Extending and the goal outcome understanding of decimal equivalence and ordering
3. Solve fractional problems involving addition and subtraction of mixed numbers and multiplication of fractions by a fraction and a whole number
4. Solve decimal problems involving addition and subtraction of decimals through hundredths

V. Measurement and Data

A. **Concept:** By the end of the unit, students will....

1. Solve problems with measurement and conversions of measurement as well as

B. **Skills:** By the end of the unit, students will be able to...

1. Measure and Estimate:
    a) Know the relative size or capacity of an object with a given unit of measure
    b) Measure the length of an object using appropriate tools: ruler, yardstick, etc.
    c) Estimate lengths using units of inches, feet, centimeters and meters
    d) Measure objects to describe how much longer one object is than another
    e) Recognize and identify temperature in Celsius and Fahrenheit
    f) Measure and estimate liquid volumes and masses: grams, kilograms, liters
2. Use addition, subtraction, multiplication and division to solve problems involving
    a) Measurement:
        (1) Convert from one standard measurement unit to another within a given measurement system.
        (2) Use conversions to solve multi-step word problems
        (3) Apply area and perimeter formulas to one step word problems
    b) Time
        (1) Write and tell time using both analog and digital clocks: to the nearest five minutes
        (2) Using terms of quarter to, half past, minutes before or after, etc.
        (3) using a.m. and p.m.
        (4) Measure and write time to the nearest minute
        (5) Identify time measurement in seconds
    c) Money
        (1) Identify and recognize the value of penny, dime, quarter, half dollar
        (2) Use the dollar and cent sign correctly
        (3) Show different combinations of coins equally the same amount of money
        (4) Know how to make change
        (5) Solve word problems using money sense.

C. **Assessment:** Given a set of problems students will demonstrate knowledge of problem solving using measurement and conversions of measurement within the following performance inventory areas through a formal written assessment:

1. Extending and the goal outcome understanding of
2. measurement and estimation
3. Extending and the goal outcome understanding of time
4. Extending and the goal outcome understanding money

VI. Geometry

A. **Concept:** By the end of the unit, students will....
   1. Classify properties of lines and angles with whole degrees and shapes.

B. **Skills:** By the end of the unit, students will be able to...
   1. Properties of lines:
      a) Name segments and lines
      b) Introduce parallel lines
      c) Introduce perpendicular lines
      d) Name lines on a grid as ordered pairs
   2. Angles with whole number degrees:
      a) Identify an angle as a geometric shape formed when two rays meet at a common endpoint.
      b) Describe and use concepts to measure angles as a quarter, half and three quarter turns as 90, 180, 360 degrees.
      c) Introduce the concepts of angle measurement of a quarter turn as a right angle
      d) Introduce measuring and sketching angles in whole number degrees using a protractor
   3. Figure transformations:
      a) Identify and draw flip images and their congruence
      b) Identify and draw turn images
      c) Identify and draw slide images
      d) Introduce a figure having a line of symmetry and if it has half turn symmetry
      e) Identify and draw congruent and similar figures - Introduce
   4. Shapes:
      a) Identify solid shapes – square, circle, triangle, rectangle, prisms, pyramids, cones, cylinders, spheres, cubes, parallelogram, hexagon, pentagon, and octagon.
      b) Identify and draw polygons: hexagon, parallelogram, pentagon,
      c) quadrilateral,
      d) Identify a pentomino and construct a 3D pentacube
      e) Identify the attributes of a given shape - face, edge, and vertex
      f) Identify the diameter and radius of a circle
   5. Capacity and Measurement:
      a) Find the area of a given shape by counting unit squares.
      b) Introduce finding the area of a given figure with whole number side lengths
      c) Find the volume of a given shape
      d) Introduce finding the perimeter of a polygon with whole number side lengths

C. **Assessment:** Given a set of problems students will demonstrate knowledge of geometry in classification of lines, and angles with whole number degrees and shapes within the following performance inventory areas through a formal written assessment:
   1. Extending and the goal outcome understanding of properties and lines

2. Extending and the goal outcome understanding of angles with whole number degrees
3. Extending and the goal outcome understanding of figure transformations
4. Extending and the goal outcome understanding of shapes
5. Extending and the goal outcome understanding of capacity and measurement

Fifth Grade Math Curriculum

I. Numbers and Operations in Base Ten

A. **Concept:** By the end of the unit, students will be able to perform operations to the thousandths, & Whole Numbers to the Billions.

B. **Skills**: During the unit, students will learn to
1. Read and write whole numbers through hundred billions in short word form, expanded form, and standard form
2. Review mental math strategies for adding and subtracting multiples of 10, 100, and 1,000
3. Add and subtract numbers up to 6 digits; to check sums and differences for reasonableness by estimation
4. Explore relationships between decimals and fractions to hundredths
5. Use decimal squares to understand thousandths
6. Read and write decimals through thousandths in standard and word form
7. Compare and order whole numbers and decimals, up to 4 numbers
8. Round decimals to the greatest place or nearest whole number
9. Estimate sums and differences of whole numbers and decimals by rounding
10. Add decimals to thousandths and use additional properties to solve problems
11. Subtract decimals through thousandths
12. Explore multiplication of decimals and whole numbers
13. Use mental math to investigate multiplying decimals by 10, 100, and 1,000 with factors to thousandths
14. Estimate the product of a whole number and a decimal
15. Multiply decimals in tenths, and 1-digit whole numbers
16. Use multiplication properties to multiply whole numbers by decimals with products to thousandths
17. Multiply decimals by decimals, with products to thousandths; to round money products to the nearest cent
    a) Divide a decimal by a 1-digit whole number, with quotients to hundredths, and check by multiplying
18. Investigate the mental math strategy for dividing decimals by 10, 100, and 1,000

C. **Assessment**: Given a set of problems students will demonstrate knowledge of place value and the ability to write, read, & compare decimals to the thousandths and whole numbers to the billionth within the following inventory areas through formal and written assessment:
1. Extending and understanding place value reading, writing, and comparing numbers up to the billionth place.
2. Extending and understanding the usage of decimals when adding, subtracting, multiplying and dividing numbers.
3. Use multiplication to solve problems involving single or multi-digit whole numbers by decimals with products to thousandths
4. Solve problems requiring rounding decimals to the greatest place or greatest whole number

II. Number and Operations: Fractions

A. **Concept:** By the end of the unit, students will..

1. Perform all four operations of unit fractions by applying past knowledge of whole number operations.

B. **Skills:** By the end of the unit, students will be able to...
   1. Find the greatest common factor (GCF) and use it to write fractions in simplest form
   2. Estimate fractions as closer to 0, 1/2, or 1
   3. Write mixed numbers and whole numbers as fractions greater than 1
   4. Rename fractions greater than 1 as whole numbers or mixed numbers in simplest form
   5. Use the LCM of the denominators to compare and order like & unlike fractions and mixed numbers
   6. Use benchmarks of 0, ½, and 1 to estimate sums and differences of fractions; to realize that an estimate may be enough to solve a problem
   7. Add or subtract two fractions with like denominators
   8. Write equivalent fractions by multiplying or dividing
   9. Add or subtract unlike fractions by writing equivalent fractions using the LCD
   10. Add or subtract mixed numbers with like denominators
   11. Add mixed numbers with and without renaming
   12. Subtract mixed numbers without regrouping
   13. Rename like and unlike mixed numbers before subtraction
   14. Write equivalent fractions by multiplying or dividing
   15. Multiply fractions by whole numbers and whole numbers by fractions
   16. Multiply fractions by fractions, and fractions by whole numbers, writing the products in simplest form
   17. Solve problems by dividing whole numbers by fractions
   18. Find the reciprocal of a whole number, fraction, or mixed number and discover the pattern of the products of the reciprocal
   19. Solve problems by dividing by a fraction is the same as multiplying by its reciprocal

C. **Assessments:**
Given a set of problems students will perform all four operations of unit fractions by applying past knowledge of whole number operations
   1. Extending the goal outcome understanding of fraction equivalence and ordering.
   2. Solve problems that require adding, subtracting, multiplying, and dividing fractions by fractions and whole numbers.
   3. Solve problems that require renaming like and unlike mixed numbers before calculation.
   4. Solve problems that require estimation fractions as closer to 0, 1/2, or 1

III. Geometry

A. **Concept:** By the end of the unit, students will....
   1. Classify Two Dimensional Figures Based on Their Properties.

B. **Skills:** By the end of the unit, be able to...
   1. Calculate areas of Irregular Figures
   2. Calculate the areas of Polygons
   3. Solve the circumference of circles
   4. Use formulas to solve an unknown variables

5. Write the rules for finding perimeter by multiplying
6. Students will be able to recognize appropriate units of measurement
7. Discover that a polygon must have congruent sides & congruent angles to be a regular polygon.
8. Find the perimeter of regular & irregular polygons
9. Identify & draw diagonals and recognize patterns in the number of diagonals in the polygon

C. **Assessment:** Given a set of problems students will classify two dimensional figures based on their properties through formal and written assessment:
   1. Extending the goal outcome understanding of calculating the area and perimeter of shapes and figures
   2. Extending the goal outcome understanding of using formulas to solve for an unknown

IV. Measurement and Data

A. **Concept:** By the end of the unit, students will....
   1. Convert Measurement within a system including volume.

B. **Skills:** By the end of the unit, be able to...
   1. Collect & organize data using a frequency table & a pictograph
   2. Find the mean and range of a set of data
   3. Find the median of a set of data; know when median is better than the mean for describing the average
   4. Use halfway points to estimate values on a bar graph
   5. To make, read, and interpret line graphs, double- line graphs, double-bar graphs, and circle graphs
   6. Use the formulas l X w = area of a rectangle and A= s X s = the area of a square
   7. Identify component parts of solids and construct models of solids
   8. Explore the surface area of solids
   9. Use volume= l X w X h to find the volume of rectangular prisms; to use exponents to write cubic units.
   10. Explore finding the volume of an irregular solid with cubes adding the volumes of the regular prisms that make up the solid
   11. To solve problems that involve area and volume

C. **Assessment:** Given a set of problems students will demonstrate knowledge of converting measurement in a system including volume through formal and written assessment:
   1. Solve problems using formulas to calculate for an unknown value of a shape
   2. Solve problems that require the interpretation of data on a graph to solve for an unknown value
   3. Solve problems to calculate the mean, median, and range of numbers

V. Operations and Algebraic Thinking - Number Sense and Logical Reasoning

A. **Concept:** By the end of the Unit, students will..
   1. Calculate all Mathematical Operations Involving Multi-Digit, Multi-Operational Whole Numbers.
   2. Use logical reasoning to solve multi-step real-world problems.

B. **Skills:** During the unit students will be able.....

1. To evaluate, define, and write addition, subtraction, and multiplication expressions with one variable; use the dot symbol for multiplying
2. To find common multiples and least common multiples of 2 or 3 numbers
3. Use mental math to find products when one or more of the factors is a multiple of 10, 100, or 1,000
4. To estimate using either rounding or front-end estimation
5. To multiply a 2 or 3 digit number by a 1 digit number
6. To multiply a 2 or 3 digit number by a 2 digit number
7. To multiply 3 digit numbers, money amounts, and units of measure by 3 digit numbers
8. To write and evaluate division expressions in one variable
9. To use compatible numbers to estimate quotients with 1 digit numbers
10. To divide 2 and 3 digit numbers by 1 digit divisors
11. To divide by 1 digit divisors with zeros in the quotient
12. To use any method that works to solve challenging problems
13. To divide multiples of 10, 100, and 1,000 mentally by multiples of 10
14. To use compatible numbers to estimate quotients with 2 digit divisors
15. To divide by 2 digit numbers with quotients to 2 digits, with and without remainders
16. To divide by 2 digit divisors with quotients to 4 digits, with and without remainders
17. To use the rules for order of operations
18. To determine the rules for divisibility of numbers by: 2, 3, 4, 5, 6, 9, and 10
19. To find the greatest common factor of 2 numbers
20. To explore the concept of prime and composite numbers
21. To identify the prime factorization of a number using a factor tree
22. To decide to use mental math or a calculator to solve a problem

C. **Assessment:** Given a set of problems students will demonstrate knowledge of calculation of all mathematical operations involving multi-digit, multi operational whole numbers within the following inventory areas through formal and written assessment:
   1. Solve single or multi-digit problems using adding, subtracting, multiplying or dividing
   2. Solve problems using compatible numbers to estimate quotients with 1 or 2 digit numbers
   3. Solve problems to identify the prime factorization of a number using a number tree
   4. Solve problems to find the greatest common factor of 2 numbers

VI. Numbers and Operations in Base Ten

A. **Concept**: By the end of the unit, students will be able to perform operations to the thousandths, & Whole Numbers to the Billions.

B. **Skills:** During the unit, students will be able to...
   1. Read and write whole numbers through hundred billions in short word form, expanded form, and standard form
   2. Review mental math strategies for adding and subtracting multiples of 10, 100, and 1,000
   3. Add and subtract numbers up to 6 digits; to check sums and differences for reasonableness by estimation
   4. Explore relationships between decimals and fractions to hundredths
   5. Use decimal squares to understand thousandths

6. Read and write decimals through thousandths in standard and word form
7. Compare and order whole numbers and decimals, up to 4 numbers
8. Round decimals to the greatest place or nearest whole number
9. Estimate sums and differences of whole numbers and decimals by rounding
10. Add decimals to thousandths and use additional properties to solve problems
11. Subtract decimals through thousandths
12. Explore multiplication of decimals and whole numbers
13. Use mental math to investigate multiplying decimals by 10, 100, and 1,000 with factors to thousandths
14. Estimate the product of a whole number and a decimal
15. Multiply decimals in tenths, and 1-digit whole numbers
16. Use multiplication properties to multiply whole numbers by decimals with products to thousandths
17. Multiply decimals by decimals, with products to thousandths; to round money products to the nearest cent
18. To divide a decimal by a 1-digit whole number, with quotients to hundredths, and check by multiplying
19. Investigate the mental math strategy for dividing decimals by 10, 100, and 1,000

C. **Assessment:** Given a set of problems students will demonstrate knowledge of place value and the ability to write, read, & compare decimals to the thousandths and whole numbers to the billionth within the following inventory areas through formal and written assessment:
    1. Extending and understanding place value reading, writing, and comparing numbers up to the billionth place.
    2. Extending and understanding the usage of decimals when adding, subtracting, multiplying and dividing numbers.
    3. Use multiplication to solve problems involving single or multi-digit whole numbers by decimals with products to thousandths
    4. Solve problems requiring rounding decimals to the greatest place or greatest whole number