ST. JOHN'S LUTHERAN SCHOOL

COURSE OF STUDY

SUBJECT: MATH   GRADE: Preschool

STATEMENT OF BELIEF

It Is the belief of St. John's Lutheran School that all students should be provided the opportunity to develop a foundation of mathematical concepts and skills. This shall be accomplished through a well-structured mathematics program. This program includes the development of self confident students who will acquire mastery of basic math skills, problem solving skills, and the ability to think critically.   Students will be encouraged to reflect on the orderliness and dependability of God as they apply mathematics to daily life.

Preschool students are given rich and age-appropriate mathematical experiences so they can conceptualize the symbols, structures, and shapes of mathematics later in life. Through a wide variety of materials and experiences, young children can discover how mathematics relates to them as part of God's creation.

COMPONENTS

Students will learn skills and concepts in:

> + Patterns and Classification
> + Geometry
> + Measurement
> + Numbers and Number Sense
> + Addition and Subtraction with Concrete Objects
> + Money
> + Orientation in Time and Space

ESLRs ADDRESSED

II. Students will become **confident individuals** as they identify, develop, and use their God-given gifts and abilities.

III. Students will become **academically capable individuals** by obtaining the knowledge and skills needed to reach their potential and finding effective ways to apply what they learn to real life situations and challenges.

IV. Students will celebrate God's love by **serving Christ, His Church, and His world.**

PROCESS OUTCOMES

- Students will apply math skills in every day living.

- Students will learn and use math vocabulary.
- Students will know basic math facts.
- Students will develop a variety of strategies to solve problems.
- Students will verbalize math processes and properties.
- Students will recognize and appreciate the orderliness of God's creation.
- Students will develop and maintain a feeling of confidence of their God-given abilities in math.
- Students will develop perseverance in solving problems.

GRADE LEVEL OBJECTIVES

Patterns and Classification Objectives
- Identify pairs of objects as same or different (ESLR 2&3)
- Sort objects by certain criteria…ie. color,shape, size, etc (ESLR 2&3)
- Duplicate patterns (ESLR 2&3)

Geometry Objectives
- Complete puzzles (ESLR 2&3)
- Recognize shapes (ESLR 2&3)

Measurement Objectives
- Use simple measurement skills and tools to make comparisons ie. longer, shorter,heavier, lighter,etc. (tools such as rulers, scales, blocks, hands, string, etc.) (ESLR 2&3)

Numbers and Number Sense
- Demonstrate one-to-one correspondence (ESLR 2&3)
- Recite numbers 1-10 (ESLR 2&3)
- Count groups of objects 1-6 (ESLR 2&3)
- Match numerals with correct number of objects (ESLR 2&3)
- Compare numerals to determine more/less and greater than/less than (ESLR 2&3)

Addition and Subtraction with Concrete Objects
- Understand "put together" and "take away: with 1-6 objects (ESLR 2&3)

Money
- Identify pennies, quarters, dollar bills (ESLR 2&3)
- Indicate the value of pennies, quarters, dollar bills (ESLR 2&3)

Orientation in Time and Space
- Understand and use vocabulary to describe day-to-day occurrences ie. yesterday, today, tomorrow (ESLR 2,3&4)
- Use past, present and future tense correctly (ESLR 2,3&4)
- Sequence 3-5 events or phrases (ESLR 2,3&4)
- Name the days of the week in sequence (ESLR 2,3,&4)
- Name the months of the year and the current year (ESLR 2,3&4)

- Name his/her own birthday (ESLR 2,3&4)
- Use a monthly calendar (ESLR 2,3,&4)
- Identify holidays and special events (ESLR 2,3,&4)
- Use a timeline with photos to sequence events (ESLR 2,3,&4)
- Understand the passage of time (ESLR 2,3&4)
- Understand language related to their relationship of their body to space (ESLR 2,3,&4)
- Duplicate patterns of concrete objects onto paper (ESLR 2,3&4)
- Complete simple mazes (ESLR 2,3,&4)
- Understand and use simple maps of familiar places (ESLR 2,3,&4)
- Name the city, state, and country where they live (ESLR 2,3&4)
- Identify a map of the United States (ESLR 2,3&4)
- Locate their state on a map of the US (ESLR 2,3,&4)
- Identify land and ocean areas on a map (ESLR 2,3,&4)
- Identify and name a globe, indicating land and water masses (ESLR 2,3&4)

INSTRUCTIONAL RESOURCES
- Books
- Manipulatives
- Puzzles
- Scales,rulers, blocks
- Geo-boards
- Unifix cubes
- Calendar
- Music (songs)
- Sensory Materials
- Graphs, charts, maps, globe
- Games

ASSESSMENT TECHNIQUES
- Teacher Observation
- "This I Know"…four and five year olds……

ST. JOHN'S LUTHERAN SCHOOL

COURSE OF STUDY

SUBJECT: MATH	GRADE: Kindergarten

STATEMENT OF BELIEF

It Is the belief of St. John's Lutheran School that all students should be provided the opportunity to develop a foundation of mathematical concepts and skills. This shall be accomplished through a well-structured mathematics program. This program includes the development of self confident students who will acquire mastery of basic math skills, problem solving skills, and the ability to think critically. Students will be encouraged to reflect on the orderliness and dependability of God as they apply mathematics to daily life.

The Kindergarten math curriculum approaches problems from a variety of concepts including patterning and classifications, numbers and number sense, money, computation, measurement, and geometry. Concepts are introduced on a hands-on level and move to a more abstract level. These concepts lead students to have a sound grasp of basic facts and fundamental operations which lead to a higher order of problem solving skills. Students will recognize God's orderliness in the mathematical world.

COMPONENTS

Students will learn skills and concepts in:

+ Patterns and Classification
+ Numbers and Number Sense
+ Money
+ Computation
+ Measurement
+ Geometry

ESLRs ADDRESSED

II. Students will become **confident individuals** as they identify, develop, and use their God-given gifts and abilities.

III. Students will become **academically capable individuals** by obtaining the knowledge and skills needed to reach their potential and finding effective ways to apply what they learn to real life situations and challenges.

IV. Students will celebrate God's love by **serving Christ, His Church, and His world.**

PROCESS OUTCOMES

- Students will develop perseverance in solving problems.
- Students will apply math skills in everyday living.
- Students will learn and use math vocabulary.
- Students will model and verbalize math processes and properties.
- Students will develop a variety of strategies to solve problems.
- Students will know basic math facts.
- Students will identify math processes and concepts as a part to whole and whole to part.
- Students will recognize and apply mathematical patterns.
- Students will recognize and appreciate the orderliness of God's creation.
- Students will develop and maintain a level of confidence in their God-given abilities in math.

GRADE LEVEL OBJECTIVES

PATTERNS AND CLASSIFICATIONS

+ Students will sort and classify objects. (II and III)
+ Students will define a set by the common property. (II and III)
+ Students will copy and extent a pattern. (II and III)

NUMBERS AND NUMBER SENSE

+ Students will compare sets using concrete objects and/or pictorial representations (same as, more than, less than, most, least.) (II and III)
+ Students will count…
    forward from 1-100, first beginning with 1 and later from any given number
    backward from 25
    from 1-10 by 2's
    by 5's to 100 and by 10's to 100 (II and III)
+ Students will recognize and write the numbers 1-100. (II and III)
+ Students will count and write the number of objects in a set. (II and III)
+ Students will identify one more and/or one less than a given number. (II and III)
+ Students will identify ordinal position 1st– $6^{th.}$ (II and III)
+ Students will identify pairs. (II and III)
+ Students will create and interpret simple pictorial graphs. (II and III)
+ Students will identify ½ as one of 2 equal parts and find ½ of a set of concrete objects. (II and III)
+ Students will use estimation to predict reasonable whole number quantities. (II and III)
+ Students will develop a foundation for problem solving (II and III)
+ Students will make decisions about how to set up a problem. (II and III)

MONEY

+ Students will identify pennies, nickels, dimes, and quarters. (II and III)
+ Students will identify a one-dollar bill. (II and III)
+ Students will identify the symbols $ and c. (II and III)
+ Students will write money amounts using c. (II and III)
+ Students will role play paying for items to 10c using pennies; $1.00 using dimes: 50c using nickels. (II and III)

COMPUTATION

+ Students will add and subtract to 10, using concrete objects. (II and III)
+ Students will recognize the meaning of the symbol "+". (II and III)
+ Students will recognize the meaning of the symbol "-".(II and III)

MEASUREMENT

+ Students will identify ruler, scale, and thermometer. (II and III)
+ Students will compare objects according to…
      linear measure
      weight (mass)
      capacity(volume)
      temperature (II and III)
+ Students will develop a sense of time sequence and duration. (II and III)
+ Students will tell time to the hour. (II and III)
+ Students will know days of the week and months of the year. (II and III)
+ Students will have an orientation in time: today, yesterday, tomorrow; morning, afternoon; this morning vs. yesterday morning, etc. (II and III)

REINFORCEMENT OF GEOMETRY

+ Students will identify left and right. (II and III)
+ Students will identify top, bottom, and middle. (II and III)
+ Students will know and use terms of orientation and relative position. (II and III)
+ Students will identify and sort squares, rectangles, circles, and triangles. (II and III)
+ Students will identify basic shapes in their surroundings. (II and III)
+ Students will make congruent shapes and designs. (II and III)
+ Students will compare size. (II and III)

ASSESSMENT TECHNIQUES
Observation
Formal individual assessment interviews
Games
Iowa Test of Basic Skills

INSTRUCTIONAL RESOURCES

Assorted classroom manipulatives
Saxon Math Series and Program

ST. JOHN'S LUTHERAN SCHOOL

COURSE OF STUDY

SUBJECT: MATH	GRADE: First

STATEMENT OF BELIEF

It Is the belief of St. John's Lutheran School that all students should be provided the opportunity to develop a foundation of mathematical concepts and skills. This shall be accomplished through a well-structured mathematics program. This program includes the development of self confident students who will acquire mastery of basic math skills, problem solving skills, and the ability to think critically. Students will be encouraged to reflect on the orderliness and dependability of God as they apply mathematics to daily life.

The first grade mathematics approaches problems from a variety of concepts including patterning and classification, number sense, money, computation, problem solving, measurement, and geometry. These concepts lead children to have a sound grasp of basic facts and fundamental operations which lead to a higher order of problem solving skills. Students will recognize God's orderliness in the mathematical world.

COMPONENTS

Students will learn skills and concepts in:

+ Patterns and Classification
+ Numbers and Number Sense
+ Money
+ Computation
+ Measurement
+ Geometry

ESLRs ADDRESSED

II. Students will become **confident individuals** as they identify, develop, and use their God-given gifts and abilities.

III. Students will become **academically capable individuals** by obtaining the knowledge and skills needed to reach their potential and finding effective ways to apply what they learn to real life situations and challenges.

IV. Students will celebrate God's love by **serving Christ, His Church, and His world.**

PROCESS OUTCOMES

- Students will develop perseverance in solving problems.
- Students will apply math skills in everyday living.
- Students will learn and use math vocabulary.
- Students will model and verbalize math processes and properties.
- Students will develop a variety of strategies to solve problems.
- Students will know basic math facts.
- Students will identify math processes and concepts as a part to whole and whole to part.
- Students will recognize and apply mathematical patterns.
- Students will recognize and appreciate the orderliness of God's creation.
- Students will develop and maintain a feeling of confidence of the their God-given abilities in math.

GRADE LEVEL OBJECTIVES

PATTERNS AND CLASSIFICATIONS

+ Students will establish concepts of likeness and difference by sorting and classifying objects according to various attributes, such as size, shape, color, amount, function, etc. (ll. lll)
+ Students will define a set by common properties. (ll. lll)
+ Students will indicate which item in a given set does not belong. (ll, lll)

NUMBERS AND NUMBER SENSE

+ Students will recognize and write numbers 0-100. (ll. lll)
+ Students will count from 0-100 by ones, twos, fives, and tens. (ll. lll)
+ Students will count by 10's from a given single digit number. (ll. lll)
+ Students will count forward and backwards. (ll. lll)
+ Students will use tally marks. (ll. lll)
+ Students will identify ordinal position 1st –10th. (ll. lll)
+ Students will identify dozen, half-dozen, and pair. (ll. lll)
+ Students will recognize place value; ones, tens, and hundreds. (ll. lll)
+ Students will identify more and less; counting how many more or less. (ll. lll)
+ Given a number, students will identify one more and one less; ten more and ten less. (ll. lll)
+ Students will compare quantities using the signs <,>, and =.(ll. lll)
+ Students will recognize fractions as parts of a whole: ½,1/3, ¼.(ll. lll)
+ Students will create and interpret simple pictorial graphs and bar graphs. (ll. lll)
+ Students will make reasonable estimates when comparing larger or smaller numbers. (ll. lll)

MONEY

+ Students will identify and recognize relative value of penny, nickel, dime and quarter. (ll. lll)
+ Students will recognize and use dollar ($) and cents(c) signs. (ll. lll)
+ Students will show how different combinations of coins equal the same amounts of money. (ll. lll)

COMPUTATION

A. Addition
+ Students will know the meaning of the plus (+) sign. (ll. lll)
+ Students will know what a "sum" is. (ll. lll)
+ Students will know additions facts to 20. (ll. lll)
+ Students will add in any order. (ll. lll)
+ Students will know what happens when you add zero. (ll. lll)
+ Students will know how to write addition problems horizontally and vertically. (ll. lll)
+ Students will know that when you add 3 numbers, you get the same sum regardless of grouping of addends. (ll. lll)
+ Students will solve two-digit addition problems without regrouping. (ll. lll)

B. Subtraction
+ Students will know the relation between addition and subtraction. (ll. lll)
+ Students will understand subtraction as "taking away." (ll. lll)
+ Students will know the meaning of the minus (-) sign. (ll. lll)
+ Students will know what a "difference" is. (ll. lll)
+ Students will know subtraction facts to 20. (ll. lll)
+ Students will know how to write subtraction problems horizontally and vertically. (ll. lll)
+ Students will solve two-digit subtraction facts without regrouping. (ll. lll)
+ Students will mentally subtract 10 from a two-digit number.(ll. lll)

C. Problem Solving and Equations

+ Students will solve basic one-step story and picture problems. (ll. lll)
+ Students will solve simple equations in the form of __-2=7; 5+__=7. (ll. lll)
+ Students will differentiate between necessary and unnecessary information. (ll. lll)
+ Students will identify the steps necessary to solve problems. (ll. lll)
+ Students will understand the difference between certain and uncertain events. (ll. lll)

MEASUREMENT

+ Students will identify familiar instruments of measurement, such as a ruler, scale, and thermometer. (ll. lll)
+ Students will compare objects according to:
    Linear measure
    + Students will measure length using non-standard units. (ll. lll)

+ Students will measure length using inches and feet, and in centimeters. (ll. lll)

Weight (Mass)
+ Students will compare weights of objects using a balance scale. (ll. lll)
+ Students will measure weight in non-standard units and in pound.

Capacity (Volume) (ll. lll)
+ Students will estimate and measure capacity in cups. (ll. lll)
+ Students will identify quart and gallon. (ll. lll)

Temperature
+Students will associate temperature in degrees Fahrenheit with weather. (ll. lll)

Time
+ Students will sequence events: before and after: first, next, last. (ll. lll)
+ Students will compare duration of events: which takes more or less time. (ll. lll)

+ Students will read a clock face and tell time to the half-hour. (ll. lll)
+ Students will know the day of the week and the months of the year, both in order and out of sequence. (ll. lll)
+ Students will orient in time: today, yesterday, tomorrow, morning, afternoon, evening, night; this morning vs. yesterday morning, etc. (ll. lll)

GEOMETRY

+ Students will identify left and right hand. (ll. lll)
+ Students will identify top, bottom and middle. (ll. lll)
+ Students will know and use terms of orientation and relative position, such as:
  closed, open   around
  on, under over   far from, near
  in front, in back(behind)   above, below
  between, in the middle of   to the right of, to the left of
  next to, beside   here, there
  inside, outside. (ll. lll)
+ Students will identify and draw basic plane figures: square, rectangle, triangle, circle. (ll. lll)
+ Students will describe square, rectangle triangle according to number of sides. (ll. lll)
+ Students will identify basic solid figures: sphere, cube, cone. (ll. lll)
+ Students will identify basic shapes in a variety of common objects and artifacts (balls, cans, windows, pictures, books, buildings, cars, etc.) (ll. lll)
+ Students will make congruent shapes and designs. (ll. lll)

ASSESSMENT TECHNIQUES
Teacher observation
Iowa Tests of Basic Skills
Saxon Written Assessments
Saxon Individual Oral Assessments
Games

INSTRUCTIONAL RESOURCES

Saxon Math Program and Series
Assorted math manipulatives

ST. JOHN'S LUTHERAN SCHOOL

COURSE OF STUDY

SUBJECT: MATH	GRADE: Second

STATEMENT OF BELIEF

It Is the belief of St. John's Lutheran School that all students should be provided the opportunity to develop a foundation of mathematical concepts and skills. This shall be accomplished through a well-structured mathematics program. This program includes the development of self confident students who will acquire mastery of basic math skills, problem solving skills, and the ability to think critically. Students will be encouraged to reflect on the orderliness and dependability of God as they apply mathematics to daily life.

The second grade mathematics program, enables each student to develop a solid foundation in the language and basic concepts of all areas of mathematics. Each week four lessons, each with in-class guided practice and independent homework, and student fact practice with fact homework sheets are completed. Written assessments are given weekly, with oral assessments given as needed.
A multi-sensory approach is used to ensure success. New learning is presented in increments, with practice time between increments. Mathematical strands are integrated throughout the year rather than taught in isolated units. The program progresses at a pace that allows the children to develop competence and confidence.

COMPONENTS

Students will learn skills and concepts in:

+ Patterns and Classification
+ Geometry
+ Measurement
+ Numbers and Number Sense
+ Addition and Subtraction with Concrete Objects
+ Money
+ Orientation in Time and Space

ESLRs ADDRESSED

II. Students will become **confident individuals** as they identify, develop, and use their God-given gifts and abilities.

III. Students will become **academically capable individuals** by obtaining the knowledge and skills needed to reach their potential and finding effective ways to apply what they learn to real life situations and challenges.

IV. Students will celebrate God's love by **serving Christ, His Church, and His world.**

PROCESS OUTCOMES

- Students will develop perseverance in solving problems.
- Students will apply math skills in everyday living.
- Students will learn and use math vocabulary.
- Students will model and verbalize math processes and properties.
- Students will develop a variety of strategies to solve problems.
- Students will know basic math facts.
- Students will identify math processes and concepts as a part to whole and whole to part.
- Students will recognize and apply mathematical patterns.
- Students will recognize and appreciate the orderliness of God's creation.
- Students will develop and maintain a feeling of confidence of the their God-given abilities in math.

GRADE LEVEL OBJECTIVES

NUMBERS AND NUMBER SENSE

+ Students will recognize and write numbers to 1,000. (II and III)
+ Students will read and write words for numbers from one to one-hundred. (II and III)
+ Students will order and compare numbers to 1,000 using the signs <,>,and =. (II and III)
+ Students will count by twos, threes, fives, and tens; by tens from any given number, by hundreds to 1,000 and by fifties to 1,000; forward and backward . (II and III)
+ Students will use a number line. (II and III)
+ Students will use tally marks. (II and III)
+ Students will identify ordinal position, 1st- 20th, and write words for ordinal numbers first to twentieth. (II and III)
+ Students will identify even and odd numbers. (II and III)
+ Students will identify dozen, half dozen, pair. (II and III)
+ Students will recognize place value: ones, tens, hundreds. (II and III)
+ Students will write numbers up to hundreds in expanded form (for example, 64=60+4; 367=300+60+7) (II and III)
+ Students will identify one more or one less than a given number. (II and III)
+ Students will round to the nearest ten. (II and III)
+ Students will create and interpret simple bar graphs. (II and III)
+ Students will identify and extend numerical and symbolic patterns. (II and III)

FRACTIONS

+ Students will recognize fractions as part of a whole set or region: ½,1/3,1/4,1/5,1/6,1/8,1/10. (II and III)
+ Students will recognize equivalent fractions. (II and III)

+ Students will know that when all fractional parts are included, such as four-fourths, the result is equal to the whole and to one. (II and III)

MONEY

+ Students will recognize relative values of a penny, nickel, dime, quarter, and dollar. (II and III)
+ Students will write amounts of money using $ and c, and the decimal point. (II and III)
+ Students will show how different combinations of coins equal the same amounts of money. (II and III)

COMPUTATION

A. Addition
+ Students will know addition facts to 18. (II and III)
+ Students will recognize what an addend is. (II and III)
+ Students will know how to write addition problems horizontally and vertically. (II and III)
+ Students will know how to add in any order and check a sum by changing the order of the addends. (II and III)
+ Students will estimate the sum.
+ Students will solve two-digit and three digit numbers with and without trading. (II and III)
+ Students will add three two-digit numbers. (II and III)
+ Students will practice doubling (adding a number to itself.) (II and III)

B. Subtraction
+ Students will understand the inverse relation between addition and subtraction; use addition to check subtraction. (II and III)
+ Students will know addition and subtraction "fact families." (II and III)
+ Students will know subtraction facts to 18. (II and III)
+ Students will estimate the difference. (II and III)
+ Students will know how to write subtraction problems horizontally and vertically. (II and III)
+ Students will solve two-digit and three-digit subtraction problems with and without trading. (II and III)
+ Given two whole numbers of 999 or less, students will find the difference. (II and III)

C. Introduction to Multiplication
+ Students will recognize the "times" sign (x). (II and III)
+ Students will know what "factor" and "product" mean.
+ Students will understand that you can multiply numbers in any order. (II and III)
+ Students will know the product of any single-digit number x1,2,3,4,5. (II and III)
+ Students will know what happens when you multiply by 1, by 0, and by 10. (II and III)

+   Students will practice simple word problems involving multiplication. (II and III)

D. Introduction to Division
+   Students will use equal sharing, and forming equal groups with remainders to do division. (II and III)

E. Solving Problems and Equations

+   Students will solve basic word problems. (II and III)
+   Students will identify the steps necessary to solve problems. (II and III)
+   Students will differentiate between necessary and unnecessary information. (II and III)
+   Students will solve simple equations in the form of __-9=7; 7+__=16; 4x__(II and III)

MEASUREMENT

A. Linear Measurement
+   Students will make linear measurements in feet and inches, and in centimeters. (II and III)
+   Students will know that one foot = 12 inches. (II and III)
+   Students will know the abbreviations: ft., in., and cm. (II and III)
+   Students will measure and draw line segments in inches to ½ inch and in centimeters. (II and III)
+   Students will estimate linear measurements, then measure to check estimates. (II and III)

B. Weight (Mass)
+   Students will compare weights of objects using a balance scale. (II and III)
+   Students will estimate and measure weight in pounds and know the abbreviation: lb. (II and III)

C. Capacity (Volume)
+   Students will estimate and measure capacity in cups. (II and III)
+   Students will measure liquid volumes: cups, pints, quarts, gallons. (II and III)
+   Students will compare U.S. and metric liquid volumes: quart and liter. (II and III)

D. Temperature
+   Students will measure and record temperature in degrees Fahrenheit to the nearest 2 degrees. (II and III)
+   Students will know the degree sign: °(II and III)

E. Time
+   Students will read a clock face and tell time to five-minute intervals. (II and III)
+   Students will know how to distinguish time as A.M. or P.M. (II and III)
+   Students will understand noon and midnight. (II and III)
+   Students will solve problems on elapsed time. (II and III)
+   Students will use a calendar to identify the date, day of the week, month, and year. (II and III)
+   Students will write the date using words and numbers. (II and III)

GEOMETRY

+ Students will identify left and right hand. (II and III)
+ Students will identify and draw basic plane figures: square, rectangle, triangle, circle. (II and III)
+ Students will describe square, rectangle, triangle according to number of sides; distinguish between square and rectangle as regards length of sides (a square has sides of equal length.) (II and III)
+ Students will measure perimeter in inches of squares and rectangles. (II and III)
+ Students will identify solid figures - sphere, cube, pyramid, cone, cylinder – and associate solid figure with planar shapes; sphere (circle), cube (square), pyramid (triangle.) (II and III)
+ Students will make congruent shapes in designs. (II and III)
+ Students will identify lines as horizontal, vertical, perpendicular, parallel. (II and III)
+ Students will name lines and line segments (for example, line AB; segment CD.) (II and III)
+ Students will identify a line of symmetry, and create simple symmetric figures. (II and III)

ASSESSMENT TECHNIQUES
Teacher observation
Iowa Test of Basic Skills
Saxon written assessments
Saxon directed individual oral assessments

INSTRUCTIONAL RESOURCES
Saxon Math Program and Series
Assorted math manipulatives

ST. JOHN'S LUTHERAN SCHOOL

COURSE OF STUDY

SUBJECT: MATH	GRADE: Third

STATEMENT OF BELIEF

It Is the belief of St. John's Lutheran School that all students should be provided the opportunity to develop a foundation of mathematical concepts and skills. This shall be accomplished through a well-structured mathematics program. This program includes the development of self confident students who will acquire mastery of basic math skills, problem solving skills, and the ability to think critically. Students will be encouraged to reflect on the orderliness and dependability of God as they apply mathematics to daily life.

The third grade math program includes basic numbers and number sense, fractions and decimals, computation, measurement, and geometry. The program also includes the review of addition and subtraction facts, and mastering multiplication facts. Division facts are introduced. They also learn to identify and solve two-step problems, using more than one operation.

COMPONENTS

Students will learn skills and concepts in:

+ Numbers and Number Sense
+ Fractions and Decimals
+ Computation
+ Measurement
+ Geometry
+ Probability and Statistics

ESLRs ADDRESSED

II. Students will become **confident individuals** as they identify, develop, and use their God-given gifts and abilities.

III. Students will become **academically capable individuals** by obtaining the knowledge and skills needed to reach their potential and finding effective ways to apply what they learn to real life situations and challenges.

IV. Students will celebrate God's love by **serving Christ, His Church, and His world.**

PROCESS OUTCOMES

- Students will develop perseverance in solving problems.

- Students will apply math skills in everyday living.
- Students will learn and use math vocabulary.
- Students will model and verbalize math processes and properties.
- Students will develop a variety of strategies to solve problems.
- Students will know basic math facts.
- Students will identify math processes and concepts as a part to whole and whole to part.
- Students will recognize and apply mathematical patterns.
- Students will recognize and appreciate the orderliness of God's creation.
- Students will develop and maintain a feeling of confidence of the their God-given abilities in math.

GRADE LEVEL OBJECTIVES

NUMBERS AND NUMBER SENSE

+ Students will read and write numbers (in digits and words) up to six digits. 3
+ Students will recognize place value up to hundred thousand. 3
+ Students will order and compare numbers up to 999,999, using the signs >, <, and =. 3
+ Students will count by 2's, 3's, 4's, 5's, 6's, 7's, 8's, 9's, 10's, 12's, 25's, 100's, ½'s, ¼'s. 3
+ Students will write numbers in expanded form. 3
+ Students will use a number line. 3
+ Students will identify ordinal position. 3
+ Students will review even and odd numbers; dozen; half dozen; pair. 3
+ Students will round to the nearest ten and hundred. 3
+ Students will identify perfect squares (and square roots) to 100 and recognize the square root sign. 3
+ Students will identify Roman numerals to 20. 3
+ Students will understand what negative numbers are in relation to familiar uses. 3
+ Students will locate positive and negative numbers on the number line. 3
+ Students will create and interpret bar and line graphs. 3
+ Students will identify a function rule. 3
+ Students will simplify an expression. 3
+ Students will identify missing information. 3

FRACTIONS AND DECIMALS

+ Students will recognize fractions to 1/10. 3
+ Students will identify numerator and denominator. 3
+ Students will write mixed numbers. 3
+ Students will recognize equivalent fractions. 3
+ Students will compare fractions with like denominators. 3
+ Students will read and write decimals to hundredths. 3
+ Students will write amounts of money using dollar sign and decimal point. 3
+ Students will make change using as few coins as possible. 3

COMPUTATION

A. Addition
+ Students will solve word problems, including two-step problems. 2,3
+ Students will mentally compute or estimate a sum. 3
+ Students will add with and without regrouping. 3
+ Students will identify unnecessary information. 3
+ Students will understand the terms addend, sum, and commutative and associative properties. 3

B. Subtraction
+ Students will solve word problems, including two-step problems. 2,3
+ Students will identify unnecessary information. 3
+ Students will understand the terms difference and associative property of addition and subtraction. 3
+ Students will mentally estimate differences and use mental computation. 3
+ Students will subtract with and without regrouping. 3
+ Students will check subtraction by adding. 3

C. Multiplication
+ Students will understand basic vocabulary. 3
+ Students will solve word problems, including two-step problems. 2,3
+ Students will understand the commutative property of multiplication. 3
+ Students will understand the associate and commutative properties of multiplication. 3
+ Students will know the multiplication facts to 12x12. 2,3
+ Students will know what happens when you multiply by 10, 100, 1,000. 3
+ Students will multiply two whole numbers with and without regrouping. 2,3
+ Students will estimate a product. 3
+ Students will write numbers in expanded form using multiplication. 3

D. Division
+ Students will solve word problems. 3
+ Students will understand the terms divisor, dividend, quotient, and associative property of division.   3
+ Students will know the basic division facts to 100÷10. 2,3
+ Students will solve division problems with remainders. 3
+ Students will check problems by multiplying. 3

MEASUREMENT
A. Linear
+ Students will measure in inches, feet, yards, millimeters, centimeters, and meters. 3
+ Students will know that 12 inches = 1 foot; 3 feet = 1 yard; 10 millimeters=1 centimeter; 100 centimeters = 1 meter. 3
+ Students will draw and measure line segments to ¼ inch and in millimeters. 3
+ Students will estimate and check linear measurement. 3

B. Weight
+ Students will estimate and measure weight in ounces, pounds, kilograms, and grams. 3

+ Students will know the abbreviations oz., lb., kg, g. 3

C. Volume
+ Students will estimate and measure volume in cups, quarts, pints, gallons, and liters. 3
+ Students will know 2 cups = 1 pint, 2 pints = 1 quart, 4 quarts = 1 gallon. 3
+ Students will compare U.S. and metric liquid volumes. 3

D. Temperature
+ Students will measure and record temperatures using the Fahrenheit and Celsius scales. 3
+ Students will know the degree sign. 3
+ Students will identify freezing and boiling temperatures using both scales. 3
+ Students will know normal body temperature is 98.6° F. 3

Time
+ Students will read a clock face and tell time to the minute as A.M. or P.M. 2,3
+ Students will tell time in terms of "minutes before" and "minutes after" the hour. 2,3
+ Students will solve elapsed time problems. 2,3
+ Students will use a calendar to identify the day of the week, date, month, and year. 2,3
+ Students will write the date using words and digits. 3

Geometry
+ Students will identify lines as horizontal, oblique, vertical, parallel, or perpendicular. 3
+ Students will name lines and line segments. 3
+ Students will recognize vertex, sides as line segments, and identify pentagon, hexagon, and octagon. 3
+ Students will identify angles by letter names; identify a right angle. 3
+ Students will compute area and volume. 3
+ Students will identify and draw congruent figures and identify a line of symmetry. 3
+ Students will identify solid figures. 3
+ Students will compute perimeter. 3
+ Students will locate and graph points on a coordinate graph. 3

Probability and Statistics
+ Students will read and graph data on bar, line, and pictographs graphs. 3
+ Students will make tally marks to count. 3
+ Students will predict the outcome of a probability experiment. 3
+ Students will conduct a probability experiment. 3
+ Students will determine the fairness of a game. 2,3,4

ASSESSMENT TECHNIQUES
Teacher observation

Saxon practice sheets
Saxon written assessment
Oral assessment
Iowa Test of Basic Skills

INSTRUCTIONAL RESOURCES
Saxon Math Program – 2012 Edition
Assorted manipulatives
Additional practice resources

ST. JOHN'S LUTHERAN SCHOOL

COURSE OF STUDY

SUBJECT: MATH	GRADE: Fourth

STATEMENT OF BELIEF

It Is the belief of St. John's Lutheran School that all students should be provided the opportunity to develop a foundation of mathematical concepts and skills. This shall be accomplished through a well-structured mathematics program. This program includes the development of self confident students who will acquire mastery of basic math skills, problem solving skills, and the ability to think critically. Students will be encouraged to reflect on the orderliness and dependability of God as they apply mathematics to daily life.

The fourth grade mathematics curriculum enables students to understand large numbers and addition, subtraction, multiplication, and division of whole numbers. The students describe and compare simple fractions and decimals. They understand the properties of, and the relationships between, plane geometric figures. They collect, represent, and analyze data to answer questions. They become proficient and fluent in computation. They develop strategies to solve word problems.

COMPONENTS

Students will learn skills and concepts in:

+ Numbers and Number Sense
+ Fractions and Decimals
+ Computation
+ Measurement
+ Geometry
+ Probability and Statistics
+ Pre-Algebra

ESLRs ADDRESSED

II. Students will become **confident individuals** as they identify, develop, and use their God-given gifts and abilities.

III. Students will become **academically capable individuals** by obtaining the knowledge and skills needed to reach their potential and finding effective ways to apply what they learn to real life situations and challenges.

IV. Students will celebrate God's love by **serving Christ, His Church, and His world.**

PROCESS OUTCOMES

- Students will develop perseverance in solving problems.
- Students will apply math skills in everyday living.
- Students will learn and use math vocabulary.
- Students will model and verbalize math processes and properties.
- Students will develop a variety of strategies to solve problems.
- Students will know basic math facts.
- Students will identify math processes and concepts as a part to whole and whole to part.
- Students will recognize and apply mathematical patterns.
- Students will recognize and appreciate the orderliness of God's creation.
- Students will develop and maintain a feeling of confidence of the their God-given abilities in math.

GRADE LEVEL OBJECTIVES

NUMBERS AND NUMBER SENSE
- Students will read and write numbers in digits and words up to nine digits. 2,3
- Students will recognize place value up to hundred millions. 2,3
- Students will order and compare numbers to 999,999,999. 2,3
- Students will write numbers in expanded form. 2.3
- Students will locate positive and negative numbers on a number line. 2,3
- Students will round to the nearest ten, hundred, and thousand. 2,3
- Students will identify squares and square roots. 2,3
- Students will identify Roman numerals from one to one thousand. 2,3
- Students will create and interpret a variety of graphs. 2,3
- Students will plot points on coordinate plane. 2,3
- Students will understand and use mathematics vocabulary necessary to understand and solve computation and word problems. 2,3
- Students will recognize and use operation and comparison symbols. 2,3

FRACTIONS AND DECIMALS

A. Fractions
- Students will read and write fractions and mixed numbers. 2,3
- Students will identify numerator and denominator. 2,3
- Students will identify the fractional part of a whole, group, set, or number. 2,3
- Students will compare and order fractions. 2,3
- Students will recognize equivalent fractions. 2,3
- Students will reduce fractions. 2,3
- Students will change improper fractions to mixed numbers and mixed numbers to improper fractions. 2,3

- Students will find least common denominator and greatest common factor. 2,3
- Students will convert fractions to decimals and percents. 2,3
B. Decimals
- Students will read and write decimals to the thousandths place. 2,3
- Students will compare and order decimals. 2,3
- Students will convert decimals to fractions and percents. 2,3
- Students will use all operations to solve problems with money. 2,3

COMPUTATION
A. Addition and Subtraction
- Students will review and reinforce addition and subtraction facts, regrouping, and mental addition and subtraction strategies of whole numbers. 2,3
- Students will know how to add and subtract decimal numbers. 2,3
B. Multiplication
- Students will know the multiplication facts to 10 x 12 and use a multiplication table. 2,3
- Students will understand various multiplication notations. 2,3
- Students will know how to multiply by powers of 10 using exponents up to squares and cubes. 2,3
- Students will identify multiples of a given number and common multiples of two numbers. 2,3
- Students will find factors of a given number and greatest common factors of two or more numbers. 2,3
- Students will multiply by 2 digit and 3 digit numbers with regrouping. 2,3
- Students will use rounding to estimate a product. 2,3
- Students will multiply decimal numbers. 2,3
- Students will multiply fractions and mixed numbers. 2,3
- Students will solve word problems with multiplication. 2,3
- Students will use mental multiplication strategies to solve problems. 2,3
C. Division
- Students will understand multiplication and division as inverse operations. 2,3
- Students will know basic division facts and use a multiplication table to find factors and quotients. 2,3
- Students will understand and use division notations: division box, division sign, and division bar. 2,3
- Students will divide whole numbers with up to four digit dividends by one or two digit divisors. 2,3
- Students will estimate the quotient using rounding. 2,3
- Students will understand how to divide whole numbers with remainders. 2,3
- Students will check division by multiplying. 2,3
- Students will apply mental strategies to solve division problems. 2,3
- Students will use division as one step in solving problems with more than one operation. 2,3
- Students will divide fractions and mixed numbers. 2,3

MEASUREMENT

- Students will understand and appropriately label measurements with the correct unit. 2,3
- Students will be able to convert one unit of measurement correctly into another. 2,3
- Students will learn U. S. Customary and metric units and their abbreviations for length, capacity, weight, and temperature. 2,3

A. Linear Measurement
- Students will estimate and make linear measurements up to one fourth of a whole in yards, feet inches, meters, centimeters, and millimeters. 2,3

B. Weight (Mass)
- Students will estimate and measure weight into pounds and ounces, grams and kilograms. 2,3

C. Capacity (Volume)
- Students will estimate and measure liquid capacity in cups, pints, quarts, gallons, milliliters, and liters. 2,3

D. Time
- Students will solve problems of elapsed time. 2,3
- Students will know days in each week, days in a common or leap year, days in each month, years in a decade, years in a century. 2,3

GEOMETRY
- Students will identify and draw points, line segments, lines, rays, and angles. 2,3
- Students will identify and draw line that are horizontal, vertical, perpendicular, parallel, and intersecting. 2,3
- Students will identify, draw, estimate the measurement of, and describe the properties of angles as right, acute, and obtuse and that 90° is associated with a ¼ turn, 180° is a ½ turn, 270° is a ¾ turn, and 360° is a full turn. 2,3
- Students will identify, describe the properties of, and draw the following polygons: triangles, parallelograms, squares, rhombuses, rectangles, pentagons, hexagons, octagons, and trapezoids. 2,3
- The students will be able to describe and measure the perimeter of a polygon using a formula. 2,3
- The students will be able to describe and measure the area of a rectangle and a triangle using formulas. 2,3
- The students will be able to recognize and draw similar and congruent figures. 2,3
- Students will be able to identify and measure the radius and diameter of a circle. 2,3
- The students will be able to describe and classify various solids in terms of the number and shape of faces, edges, and vertices. 2,3
- The students will be able to compute the volume of a cube and rectangular prism using a formula. 2,3

PROBABILITY AND STATISTICS
- Students organize, represent, and interpret numerical and categorical data and clearly communicate their findings. 2,3

- Students make predictions for simple probability situations. 2,3

PRE-ALGEBRA
- Students will recognize numeric, geometric, and story-problem patterns in identifying the steps necessary to solve a word problem. 2,3
- The students will use variables to set up and solve equations. 2,3
- Students will understand and describe the various properties of addition and multiplication. 2,3
- Students will use logic and reasoning to solve logic puzzles. 2,3

ASSESSMENT TECHNIQUES
Saxon Math weekly assessments
Daily problem set practice
Daily fact speed tests
Iowa Test of Basic Skills

INSTRUCTIONAL RESOURCES
Saxon Math 4 - 2012 Edition
Resource materials for Saxon Math 4 - 2012 edition

ST. JOHN'S LUTHERAN SCHOOL

COURSE OF STUDY

SUBJECT: MATH	GRADE: Fifth

STATEMENT OF BELIEF

It is the belief of St. John's Lutheran School that all students should be provided the opportunity to develop a foundation of mathematical concepts and skills. This shall be accomplished through a well-structured mathematics program. This program includes the development of self-confident students who will acquire mastery of basic math skills, problem solving skills, and the ability to think critically. Students will be encouraged to reflect on the orderliness and dependability of God as they apply mathematics to daily life.

Fifth grade math will develop a working foundation and practical application of the basic algorithms for whole numbers, decimals, fractions, and percent. We will introduce new concepts in measurement, geometry, statistics, pre-algebra, and problem solving strategies.

COMPONENTS

Students will learn skills and concepts in:

+ Numbers and Number Sense
+ Whole Numbers, Decimals, and Fractions
+ Ratio and Percent
+ Computation
+ Measurement
+ Geometry
+ Probability, Statistics, and Data Analysis
+ Pre-algebra
+ Problem Solving Strategies

ESLRs ADDRESSED

II. Students will become **confident individuals** as they identify, develop, and use their God-given gifts and abilities.

III. Students will become **academically capable individuals** by obtaining the knowledge and skills needed to reach their potential and finding effective ways to apply what they learn to real life situations and challenges.

IV. Students will celebrate God's love by **serving Christ, His Church, and His world.**

PROCESS OUTCOMES

- Students will develop perseverance in solving problems.
- Students will apply math skills in everyday living.
- Students will learn and use math vocabulary.
- Students will model and verbalize math processes and properties.
- Students will develop a variety of strategies to solve problems.
- Students will know basic math facts.
- Students will identify math processes and concepts as a part to whole and whole to part.
- Students will recognize and apply mathematical patterns.
- Students will recognize and appreciate the orderliness of God's creation.
- Students will develop and maintain a feeling of confidence of the their God-given abilities in math.

GRADE LEVEL OBJECTIVES

NUMBERS AND NUMBER SENSE

+ Students will write numbers in expanded form (3)
+ Students will locate and order real numbers on a number line (3)
+ Students will order and compare real numbers (3)
+ Students will round numbers to specific place values (3)
+ Students will review square roots (3)
+ Students will identify sets (3)
+ Students will identify prime numbers less than 100 (3)
+ Students will identify composite numbers (3)
+ Students will factor numbers using common factors and prime factorization (3)
+ Students will understand powers of numbers (3)

WHOLE NUMBERS, DECIMALS, AND FRACTIONS

A. Whole Numbers
+ Students will recognize place value through billions (3)
+ Students will read and write numbers through billions (3)
+ Students will estimate sums, differences, products, and quotients (3)

B. Decimal Numbers
+ Students will recognize place value through ten-thousandths (3)
+ Students will read and write numbers through ten-thousandths (3)
+ Students will estimate sums, differences, products, and quotients (3)
+ Students will express equivalent fractions (3)

C. Fractions
+ Students will make equivalent fractions (3)
+ Students will learn to reduce fractions to lowest terms (3)
+ Students will estimate sums, differences, products, and quotients (3)

+ Students will identify reciprocals (3)
+ Students will express equivalent decimals (3)
+ Students will determine Greatest Common Factor (GCF) (3)
+ Students will determine Lowest Common Multiple (LCM) (3)

RATIO AND PERCENT

A. Ratio
+ Students will determine express simple ratios (3)
+ Students will use ratios to create a simple scale drawing (3)

B. Percent
+ Students will recognize the % sign and understand percent as "per hundred" (3)
+ Students will express equivalences between fractions, decimals, and percent (3)
+ Students will compute an unknown from the formula part/total = percent/100 (3)

COMPUTATION

+ Students will know basic facts for addition, subtraction, multiplication, and division (3)
+ Students will add whole numbers, decimals, fractions, and signed numbers (2,3)
+ Students will subtract whole numbers, decimals, fractions, and signed numbers (2,3)
+ Students will understand that subtraction is adding the opposite (3)
+ Students will multiply whole numbers, decimals, fractions, and signed numbers (2,3)
+ Students will divide whole numbers, decimals, fractions, and signed numbers (2,3)
+ Students will understand that division is multiplying by the inverse (reciprocal) (3)
+ Students will know the identity, commutative, associative, and distributive properties for addition and multiplication, and the multiplication property for zero (3)

MEASUREMENT

+ Students will learn U.S. Customary units for length, capacity, mass, and temperature (3)
+ Students will learn Metric units for length, capacity, mass, and temperature (3)
+ Students will find perimeter, area, and volume using proper units (3)
+ Students will learn time measurement (3)
+ Students will measure angles (3)

GEOMETRY

+ Students will identify points, segments, lines, rays, angles, and planes (3)
+ Students will identify different lines (3)
+ Students will describe different angles (3)
+ Students will describe and classify polygons and their components (3)
+ Students will circles and their components (3)
+ Students will describe and classify solids and their components (3)
+ Students will identify different transformations (3)

PROBABILITY, STATISTICS, AND DATA ANALYSIS

+ Students will express outcomes as probabilities and chance (3)
+ Students will collect data using tallies and surveys (3)
+ Students will organize and display data using plots, tables, and graphs (2,3)
+ Students will determine mean, median, mode, and range of a set of data (3)

PRE ALGEBRA

+ Students will identify variables in an equation (3)
+ Students will evaluate expressions with variables (2,3)

PROBLEMS SOLVING

+ Students will solve problems with multiple steps (2,3)
+ Students will solve problems involving more than one operation (3)

<u>ASSESSMENT TECHNIQUES</u>

+ Teacher observation
+ Daily practice and homework assignments
+ Chapter tests
+ Timed tests (math facts)
+ ITBS

<u>INSTRUCTIONAL RESOURCES</u>

+ Saxon Math 5 - 2012 Edition
+ I.D.E.A. Math
+ Geometric solids

ST. JOHN'S LUTHERAN SCHOOL

COURSE OF STUDY

SUBJECT: MATH	GRADE: Sixth

STATEMENT OF BELIEF

It is the belief of St. John's Lutheran School that all students should be provided the opportunity to develop a foundation of mathematical concepts and skills. This shall be accomplished through a well-structured mathematics program. This program includes the development of self confident students who will acquire mastery of basic math skills, problem solving skills, and the ability to think critically. Students will be encouraged to reflect on the orderliness and dependability of God as they apply mathematics to daily life.

Sixth grade math continues to build on basic math operations and facts, ratios, decimals, probability, and pre-algebra. Sixth grade concentrates more on geometry concepts and higher-level thinking skills, as well as developing an understanding of the relationship between decimals, fractions, and percents.

COMPONENTS

Students will learn skills and concepts in:

+ Numbers and Number Sense
+ Whole Numbers, Decimals, and Fractions
+ Ratio and Percent
+ Computation
+ Measurement
+ Geometry
+ Probability, Statistics, and Data Analysis
+ Pre-algebra
+ Problems Solving Strategies

ESLRs ADDRESSED

II. Students will become **confident individuals** as they identify, develop, and use their God-given gifts and abilities.

III. Students will become **academically capable individuals** by obtaining the knowledge and skills needed to reach their potential and finding effective ways to apply what they learn to real life situations and challenges.

IV. Students will celebrate God's love by **serving Christ, His Church, and His world.**

PROCESS OUTCOMES

- Students will develop perseverance in solving problems.
- Students will apply math skills in everyday living.
- Students will learn and use math vocabulary.
- Students will model and verbalize math processes and properties.
- Students will develop a variety of strategies to solve problems.
- Students will know basic math facts.
- Students will identify math processes and concepts as a part to whole and whole to part.
- Students will recognize and apply mathematical patterns.
- Students will recognize and appreciate the orderliness of God's creation.
- Students will develop and maintain a feeling of confidence of the their God-given abilities in math.

GRADE LEVEL OBJECTIVES

NUMBER AND NUMBER SENSE
+ Students will read and write numbers (in digits and words) up to trillion. 2, 3
+ Students will recognize place value up to hundred billions.   2.3
+ Students will write numbers in expanded form using exponents. 2, 3
+ Students will locate positive and negative whole numbers on a number line. 2, 3
+ Students will know that the sum of an integer and its opposite is 0. 2, 3
+ Students will compare integers using <,>,=. 2. 3
+ Students will round numbers to the nearest 10; 100; 1,000; 10,000; 100,00; 1,000,000. 2, 3
+ Students will review perfect squares and roots; recognize the square root sign. 2,3
+ Students will identify prime numbers and composite numbers. 2, 3
+ Students will identify a set and members of a set, indicated by { }. 2, 3
+ Students will identify prime numbers and composite numbers. 2, 3
+ Students will determine Greatest Common Factor. 2, 3
+ Students will determine Least Common Factor. 2, 3
+ Students will know powers of 10, know "squared", "cubed", and to the "nth" power. 2, 3

WHOLE NUMBERS, DECIMALS, AND FRACTIONS

Whole Numbers
+ Students will estimate and find the sum, differences, or product of any two whole numbers . 2, 3
+ Students will estimate and find the quotient of a decimal divided by a whole number. 2, 3
+ Students will add, subtract, multiply and divide whole numbers and money, and whole numbers and money. 2, 3

Fractions
+ Students will compare mixed numbers and fractions with like and unlike denominators, using the signs <, >, and =. 2,3

+ Students will identify the reciprocal of a given fraction; the product of a given number and its reciprocal = 1. 2,3
+ Students will determine the LCD of fractions with unlike denominators.
+ Students will recognize equivalent fractions. 2,3
+ Students will multiply and divide mixed numbers and fractions.
+ Students will reduce fractions to lowest terms. 2,3
+ Students will add and subtract fractions (like and unlike denominators). 2,3
+ Students will round fractions to the nearest whole number. 2,3
+ Students will write fractions as decimals (1/4=25%) and percents. 2,3

Decimals
+ Students will read, write, and order decimals to the nearest hundredth-thousandth. 2,3
+ Students write decimals in expanded form. 2,3
+ Students will round decimals to the nearest 1/10,1/100,1/1000. 2,3
+ Students will estimate decimals sums, differences, and products by rounding. 2,3
+ Students will read and write decimals on a number line. 2,3
+ Students will add and subtract decimals through ten-thousandths. 2,3
+ Students will multiply decimals by 10;100;1000; other decimals. 2,3
+ Students will divide decimals by whole numbers. 2,3
+ Students will write decimals as fractions or percents. 2,3

RATIO AND PERCENT
Ratio
+ Students will determine and express simple ratios. 2,3
+ Students will use ratios to interpret scale drawing. 2,3
+ Students will solve proportions, including word problems with on unknown. 2,3

Percent
+ Students will express equivalences between fractions, decimals, and percents and know common equivalencies: ¼ = 25% 2,3
+ Students will find the given percent of a number, and find what percent a given number is of another number. 2,3
+ Students will recognize the % sign and understand percent as "Per hundred," work with >100%. 2,3
+ Students will solve problems involving percent increase and decrease. 2,3
+ Students will use expressions with percents greater than 100%. 2,3

COMPUTATION
Multiplication
+ Students will know commutative, associative, and distributive properties. 2,3
+ Students will multiply 2 factors of up four-digits each, with and without a calculator. 2,3
+ Students will estimate a product.   2,3
+ Students will multiply by a decimal. 2,3

Division
+ Students understand division as opposite of multiplication. 2,3
+ Students will estimate the quotient. 2,3
+ Students will divide multi-digit dividends up to three-digit divisors. 2,3

+ Students will solve problems with remainders; round repeating decimal quotient. 2,3

Solving Problems
+ Students will solve word problems with multiple steps. 2,3
+ Students will solve problems with more than one operation, according to the order of operations. 2,3
+ Students will determine when it is appropriate to use mental math or pencil and paper to solve problems. 2,3

Measurement
+ Students will solve problems requiring conversion of units within the U>S Customary System, and within the metric system. 2,3

+ Students will associate prefixes used in metric system with quantities: (kilo=thousand, hecto = hundred, deka = ten, deci = tenth, centi = hundredth, milli = thousandth. 2,3
+ Students will solve problems on elapsed time; express parts of an hour in fraction or decimal form. 2,3
+ Students will determine the degree of precision required for a given problem, and will select appropriate measurement tools. 2,3

GEOMETRY
+ Students will identify and use signs that mean:
$\cong$ = congruent
$\sim$ = similar
$||$ = parallel
$\perp$ = perpendicular   2,3
+ Students will identify and draw points, segments, ray, lines. 2,3
+ Students will identify and draw lines: horizontal; vertical; parallel; perpendicular; intersecting; oblique. 2,3
+ Students will measure degrees in angles:
$90°$ = right angle
$<90°$ = acute angle
$>90°$ = obtuse angle
$180°$ = straight angle   2,3
+ Students will know that the sum of the measures of the angles of a triangle is $180°$. 2,3
+ Students will know six types of triangles; right, obtuse, acute, isosceles, equilateral, and scalene. 2,3
+ Students will know and understand congruent. 2,3
+ Students will identify polygons; triangle, quadrilateral, pentagon, hexagon, octagon, parallelogram, trapezoid, rhombus, rectangle, square. 2,3
+ Students will know that regular polygons have sides of equal length and angles of equal measure. 2,3
+ Students will identify and draw diagonals or polygons. 2.3
+ Students will construct a perpendicular bisector. 2,3
+ Students will bisect an angle. 2,3
+ Students will construct congruent angles. 2,3
+ Students will understand rotation, reflection, and translation. 2,3

+ Students will find the area (A) and perimeter (P) of plane figures, or given the area or perimeter find the missing dimension, using formulas. 2,3

Circle

+Students will know arc, chord, radius, and diameter. 2,3

+ Students will draw a circle with a compass. 2,3

+ Students will find circumference using C=πd, C= π2r. 2,3

Perimeter

+ Students will find perimeter of geometric shapes. 2,3

Area

+ Students will review formula for area of a rectangle (lxw) and solve problems using mi.2, yd.2, ft.2, in.2, km2, m2. 2,3

+ Students will find area of a triangle using A =1/2bxh). 2,3

+   Students will find that area of an irregular figure by diving into regular figures. 2,3

+ Students will compute volume in cubic units (l x w x h). 2,3

+ Students will find surface area of a rectangular prism. 2,3

PROBABILITY AND STATISTICS

+   Students will understand probability as a measure of the likelihood that an event will happen; using simple models, express probability of a given event as a fraction or ratio. 2,3

+   Students will collect and organize data in graphic form (bar, line, and circle graphs). 2,3

+   Students will solve problems requiring interpretation and application of graphically displayed data. 2,3

+ Students will plate points on a coordinate plane, using ordered pairs of positive and negative numbers. 2,3

+ Students will graph simple functions. 2,3

+ Students will find mean, median, range, and mode. 2,3

+ Students will construct a histogram. 2,3

+ Students will plot coordinates on a plane, x-axis, y-axis. 2,3

PRE-ALGEBRA

+   Students will recognize variables and solve basic equations using variables. 2,3

+ Students will write and solve equations for word problems. 2,3

+ Students will recognize patterns and sequence. 2,3

PROBLEM SOLVING STRATEGIES

+ Students will use logic and reasoning to solve logic puzzles. 2,3

+ Students will identify steps necessary to solve problems. 2,3

+   Students will differentiate between necessary and unnecessary information when solving problems. 2,3

+ Students will develop thinking skills and perseverance. 2,3

+ Students will identify situations in which estimation is sufficient, and will determine reasonableness of answers, including approximations within measurement. 2,3

ASSSESSMENT TECHIQUES
Daily homework assignments
Teacher observation
Saxon Math testing materials
Timed Math facts test
Iowa Test of Basic Skills

INSTRUCTIONAL RESOURCES
Saxon Math Course 1 – 2012 Edition
Saxon Math resource manual
Math games and math manipulatives

ST. JOHN'S LUTHERAN SCHOOL

COURSE OF STUDY

SUBJECT: MATH	GRADE: Seventh

STATEMENT OF BELIEF

It Is the belief of St. John's Lutheran School that all students should be provided the opportunity to develop a foundation of mathematical concepts and skills. This shall be accomplished through a well-structured mathematics program. This program includes the development of self confident students who will acquire mastery of basic math skills, problem solving skills, and the ability to think critically. Students will be encouraged to reflect on the orderliness and dependability of God as they apply mathematics to daily life.

The seventh grade math class reviews concepts taught in previous years in such a way that the concepts get more fully developed and the problems become more advanced and difficult. The class also introduces the students to new concepts in preparation for the forthcoming classes of pre-algebra and algebra.

COMPONENTS

Students will learn skills and concepts in:
- Number Sense and Working with Numbers
- Measurement and Geometry
- Statistics, Data Analysis, and Probability
- Algebra and Fractions
- Mathematical Reasoning: Problem Solving

ESLRs ADDRESSED

II. Students will become **confident individuals** as they identify, develop, and use their God-given gifts and abilities.

III. Students will become **academically capable individuals** by obtaining the knowledge and skills needed to reach their potential and finding effective ways to apply what they learn to real life situations and challenges.

IV. Students will celebrate God's love by **serving Christ, His Church, and His world.**

PROCESS OUTCOMES

- Students will develop perseverance in solving problems.
- Students will apply math skills in everyday living.
- Students will learn and use math vocabulary.
- Students will model and verbalize math processes and properties.
- Students will develop a variety of strategies to solve problems.

- Students will know basic math facts.
- Students will identify math processes and concepts as a part to whole and whole to part.
- Students will recognize and apply mathematical patterns.
- Students will recognize and appreciate the orderliness of God's creation.
- Students will develop and maintain a feeling of confidence of the their God-given abilities in math.

GRADE LEVEL OBJECTIVES

I. NUMBER SENSE AND WORKING WITH NUMBERS

A.   *Order of operations*

+   Students will know the proper order of operations including grouping symbols and be able to apply this knowledge to whole number and decimal expressions.

B.   *Algebraic Equations*

+   Students will learn basic algebraic equations, mainly using numerical expressions, and equations in the form K(a + b)>Ka + Kb and K(a - b)=Ka-Kb.

+   Students will know the distributive and associative properties and be able to apply to numeric expressions.

+   Students will recognize, create, and extend patterns and sequences.

C.   *Fractions*

+   Students will add, subtract, multiply, and divide mixed numbers and fractions.

+   Students will estimate relative magnitudes of fractions with common denominators.

+   Students will change improper fractions to mixed numbers.

D.   *Solving Problems and Equations*

+   Students will compare magnitudes of integers, signed decimals, and fractions using the symbols <. >, =, <, >.

+   Students will solve informally simple one-step equations with one variable.

+   Students will add and subtract integers and signed decimals using parentheses.

II. MEASUREMENT AND GEOMETRY

A.   *Three-dimensional Objects*

+   Students will describe and construct simple right prisms, cylinders, cones, and spheres, using the concepts of parallel and perpendicular.

+   Students will calculate the surface areas and volumes of simple right prisms, cylinders, and spheres.

B.   *Symmetry*

+   Students will construct plane figures that exhibit symmetry about a line and symmetry about a point.
+   Students will demonstrate by measurement both kinds of symmetry.

C.   *Angle Pairs*

+   Students will construct parallel lines and a transversal using a compass and straight edge.
+   Students will understand vertical angles, congruent angles, complementary angles, supplementary angles, adjacent angles, corresponding angles, and alternate interior and alternate exterior angles.

D.   *Triangles*

+   Students will demonstrate that the sum of the interior angles of a triangle equals 180 degrees.
+   Students will review the characteristics of right, equilateral, and isosceles triangles, as well as right, acute, and obtuse triangles.
+   Students will construct a circle that circumscribes a triangle using a compass and straight edge.

E.   *Perimeter*

+   Students will find the perimeter of geometric shapes.

F.   *Area*

+   Students will know and be able to use the area formulas for these figures: parallelogram, triangle, circle, trapezoid.

G.   **Metric System**

+   Students will use metric system to measure distance, weight, and volume.
+   Students will convert metric measurements.
+   Students will know the approximate English system equivalents to metric measurements.

III. STATISTICS, DATA ANALYSIS, AND PROBABILITY

A.   *Coordinate Plane*

+   Students will identify the coordinates of a given point.
+   Students will plot a point given its coordinates.
+   Students will calculate the distance between two points that lie on the horizontal x-axis.
+   Students will calculate the distance between two points that lie on the vertical y-axis.
+   Students will calculate the distance between two points on a coordinate plane using the Pythagorean theorem.

B.   *Proportions*

+   Students will recognize proportional relationships, if they exist, in tables of numbers and on graphs.
+   Students will use proportions to complete a set of data and complete a graph.
+   Students will calculate distances using the scale on a map.

+   Students will calculate percentages.
+   Students will calculate average speeds.

C.   *Geometric Proportions*

+   Students will calculate the variation in the area of similar triangles and parallelograms when there are given variations in one side.
+   Students will calculate the change in volume of right prisms, cylinders, and cones as the length of one of the dimensions changes.
+   Students will recognize that the change in a circle's radius and the change in area which results are not proportional.

D.   *Statistics*

+   Students will read and interpret statistical data presented in the form of tables and graphs.

+   Students will translate statistical data into line graphs, bar graphs, histograms, and circle graphs.

E.   *Probability*

+   Students will understand how to measure the likelihood that an event will happen, and be able to express the probability of a given event as a fraction or ratio.
+   Given a set of data, students will find the mean, median, range, and mode.
+   Students will make predictions and inferences based on experimental results.

IV. ALGEBRA

+   Students will understand what a variable is and how and why variables are used in math problems.
+   Students will learn how to isolate a variable and in so doing determine its value.
+   Students will learn to add, subtract, multiply, and divide problems having variables.

V. MATHEMATICAL REASONING : PROBLEM SOLVING

+   Students will use logic and reasoning to solve logic puzzles.
+   Students will identify steps necessary to solve problems.
+   Students will differentiate between necessary and unnecessary information when solving problems.
+   Students will develop thinking skills and perseverance.
+   Students will identify situations in which estimation is sufficient and determine the reasonableness of answers, including approximation within measurement.

ASSESSMENT TECHNIQUES

Daily homework assignments

Teacher observation

Saxon testing materials

IOWA Standardized Tests

INSTRUCTIONAL RESOURCES

Saxon Math Course 2 – 2012 Edition

Teacher generated reinforcement and enhancement activities

Assorted manipulatives

ST. JOHN'S LUTHERAN SCHOOL

COURSE OF STUDY

SUBJECT: MATH	GRADE: Eighth

STATEMENT OF BELIEF

It is the belief of St. John's Lutheran School that all students should be provided the opportunity to develop a foundation of mathematical concepts and skills. This shall be accomplished through a well-structured mathematics program. This program includes the development of self confident students who will acquire mastery of basic math skills, problem solving skills, and the ability to think critically. Students will be encouraged to reflect on the orderliness and dependability of God as they apply mathematics to daily life.

The 8th grade mathematics program reviews and builds upon previously taught concepts while providing an introduction to, and preparation for, high school algebra. We work extensively with solving advanced equations, as well as teaching higher-order problem solving skills. There is an emphasis on the use of percent and the application of both plane and spatial geometry in everyday math. Students become familiar with graphing on the coordinate plane. Logic problems and math puzzles are incorporated into the curriculum on a regular basis.

COMPONENTS

Students will learn skills and concepts in:

+ Number Sense and Working with Numbers
+ Measurement and Geometry
+ Statistics, Data Analysis, and Probability
+ Algebra and Fractions
+ Mathematical Reasoning: Problem Solving

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GRADE LEVEL OBJECTIVES

NUMBER SENSE AND WORKING WITH NUMBERS
Students will know basic math vocabulary. (2,3)
Students will know the properties of, and compute with, rational numbers expressed in a variety of forms. (3)
Students will simplify expressions by using the number properties and combining like terms. (3)
Students will perform operations with integer exponents, powers, and roots. (3)
Students will convert decimal numbers to and from scientific notation. (3)

MEASUREMENT AND GEOMETRY

Students will identify basic geometric figures. (3)
Students will compute perimeter, area, and volume of common geometric objects and use the results to find measures of less common objects. (3)
Students will know the Pythagorean theorem and deepen their understanding of plane and solid geometric shapes by constructing figures that meet given conditions. (3)
Students will identify attributes of figures. (3)

STATISTICS, DATA ANALYSIS, AND PROBABILITY

Students will collect, organize, and represent data sets that have one or more variables. (3)
Students will interpret and create charts, graphs, and tables indicating frequencies. (3)
Students will determine the probability of independent and dependent events. (3)
Students will find the number of permutations and the number of combinations using factorial notation. (3)

ALGEBRA AND FUNCTIONS

Students will express quantitative relationships by using algebraic terminology, expressions, symbols, equations, and inequalities. (3)
Students will solve linear equations and inequalities over the rational numbers. (3)
Students will graph and interpret linear equations and systems of equations. (3)
Students will apply algebra to right triangles, incorporating concepts of sine, cosine, and tangent. (3)

MATHEMATICAL REASONING: PROBLEM SOLVING

Students will use logic and reasoning to solve logic puzzles. (2,3)
Students will identify steps necessary to solve problems. (3)
Students will use strategies, skills, and concepts in finding solutions. (2,3)
Students will translate word phrases and sentences into algebraic expressions and evaluate algebraic expressions. (3)
Students will apply problem solving strategies to business and consumer problems. (2,3)
Students will develop things skills and perseverance. (2,3,4)

ASSESSMENT TECHNIQUES
Daily homework assignments
Teacher observation
Textbook testing materials
Teacher designed tests and quizzes

INSTRUCTIONAL RESOURCES
Pre-Algebra – An Accelerated Course   (Houghton Mifflin)
Developing Skills in Algebra One   (Dale Seymour Publications)
Assorted problem worksheets and manipulatives