Trinity Lutheran School Mathematics Curriculum

Rationale Based on Scripture



Mathematics teaches students the concepts of order, exactness, and correctness, which reflect the order and exactness of God's wonderful creation. It also serves to prepare students for their lives by supplying them with a knowledge useful for good stewardship of God's gifts. At Trinity we hope to lead our students to wisely and prudently use their God-given gifts to the best of their abilities for the glory of God. To accomplish this, our students must be well-grounded in basic mathematical skills. These mathematical skills will enable students to succeed in an increasingly scientific and technological world.

Course Introduction

A thorough math curriculum is critical for success in our ever-changing world. The traditional math approach at Trinity Lutheran School gives students a firm foundation in computation, math concepts, problem solving strategies, data interpretation, algebraic expressions and equations, geometry, and statistics and probability. This foundation is constructed through daily instruction, concrete manipulatives when appropriate, and review in a cumulative manner. Ample time is provided to grant individual assistance until the concepts are mastered.

Exit Goals for Graduation

Students will demonstrate proficiency, understanding, and/or commitment to the following set of exit goals upon graduation. The level of proficiency of these exit goals will be dependent upon the individual gifts and effort of the student and at what grade the student started attending Trinity.

Through mathematics instruction, teachers strive to lead each child to:

- 1. *Growing Christians* who are able to develop their math skills in light of new developments in their lives and in society
- 2. *Proclaiming Christians* who are able to demonstrate God's order of creation in the logical structure of math
- 3. Discerning Thinkers who are able to:
 - a. organize a plan to complete a project
 - b. recognize and analyze patterns and incorporate them into problem-solving situations
 - c. decide upon an appropriate tool for solving a problem
 - d. apply their mathematical background to decision-making in new situation
 - e. recognize the potential, as well as the limitations, of mathematics in advancing the quality of life
- 4. Self-Directed and Lifelong Learners who are able to:
 - a. integrate the rules of mathematics into solving problems
 - b. apply numbers, variables, and data analysis effectively in real-world situations
 - c. integrate mathematical reasoning into producing a solution
 - d. evaluate a problem and choose an appropriate strategy to resolve it
 - e. justify solutions to their work
 - f. explore areas of mathematics for career and recreational value
- 5. Collaborative Contributors who are able to:

- a. contribute in solving group projects
- b. communicate effectively to relate their understanding of mathematics
- c. develop and complete tasks assigned to them
- 6. *Servant Leaders* who are able to utilize their God-given abilities in mathematics by serving others and the church
- 7. Dedicated Stewards who are able to:
 - a. evaluate and build on their previous knowledge of mathematics
 - b. apply mathematical concepts to guide their lives of Christian stewardship
 - c. incorporate their mathematical knowledge and skills as a productive member of society

Grade Level Measurable Objectives

At the end of each school year, students will demonstrate proficiency, understanding, and/or commitment to the following set of grade specific measurable objectives in these classifications: knowledge, skills, and attitudes.

Preschool

By the end of Preschool, the students will:

- 1. Uses comparison words
- 2. Sorts objects by color/shape/size
- 3. Arranges materials in graduated order
- 4. Compares numbers of objects
- 5. Counts objects
- 6. Verbally counts forward 1-10
- 7. Identifies basic colors
- 8. Identifies basic shapes
- 9. Makes simple patterns

Kindergarten

By the end of Kindergarten, the students will:

- 1. Counting and Cardinality
 - a. Know number names and the count sequence.
 - b. Count to tell the number of objects.
 - c. Compare numbers.
- 2. Operations and Algebraic Thinking
 - a. Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.
- 3. Number and Operations in Base Ten
 - a. Work with numbers 11–19 to gain foundations for place value.
- 4. Measurement and Data
 - a. Describe and compare measurable attributes.
 - b. Classify objects and count the number of objects in categories.
- 5. Geometry
 - a. Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).
 - b. Analyze, compare, create, and compose shapes.

First Grade

By the end of first grade, the students will:

- 1. Operations and Algebraic Thinking
 - a. Represent and solve problems involving addition and subtraction.
 - b. Understand and apply properties of operations and the relationship between addition and subtraction.
 - c. Add and subtract within 20.
 - d. Work with addition and subtraction equations.
- 2. Number and Operations in Base Ten
 - a. Extend the counting sequence.
 - b. Understand place value.
 - c. Use place value understanding and properties of operations to add and subtract.
- 3. Measurement and Data
 - a. Measure lengths indirectly and by iterating length units.
 - b. Tell and write time.
 - c. Represent and interpret data.
- 4. Geometry
 - a. Reason with shapes and their attributes.

Second Grade

By the end of second grade, the students will:

- 1. Operations and Algebraic Thinking
 - a. Represent and solve problems involving addition and subtraction.
 - b. Add and subtract within 20.
 - c. Work with equal groups of objects to gain foundations for multiplication.
- 2. Number and Operations in Base Ten
 - a. Understand place value.
 - b. Use place value understanding and properties of operations to add and subtract.
- 3. Measurement and Data
 - a. Measure and estimate lengths in standard units.
 - b. Relate addition and subtraction to length.
 - c. Work with time and money.
 - d. Represent and interpret data.
- 4. Geometry
 - a. Reason with shapes and their attributes.

Third Grade

By the end of third grade, the students will:

- 1. Operations and Algebraic Thinking
 - a. Represent and solve problems involving multiplication and division.
 - b. Understand properties of multiplication and the relationship between multiplication and division.
 - c. Multiply and divide within 100.
 - d. Solve problems involving the four operations, and identify and explain patterns in arithmetic.
- 2. Number and Operations in Base Ten
 - a. Use place value understanding and properties of operations to perform multi-digit arithmetic.
- 3. Number and Operations-Fractions
 - a. Develop understanding of fractions and numbers.

- 4. Measurement and Data
 - a. Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.
 - b. Represent and interpret data.
 - c. Geometric measurement: understand concepts of area and relate area to multiplication and to addition.
 - d. Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.
- 5. Geometry
 - a. Reason with shapes and their attributes.

Fourth Grade

By the end of fourth grade, the students will:

- 1. Operations and Algebraic Thinking
 - a. Use the four operations with whole numbers to solve problems.
 - b. Gain familiarity with factors and multiples.
 - c. Generate and analyze patterns.
- 2. Number and Operations in Base Ten
 - a. Generalize place value understanding for multi-digit whole numbers.
 - b. Use place value understanding and properties of operations to perform multi-digit arithmetic.
- 3. Number and Operations-Fractions
 - a. Extend understanding of fraction equivalence and ordering.
 - b. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
 - c. Understand decimal notation for fractions, and compare decimal fractions.
- 4. Measurement and Data
 - a. Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
 - b. Represent and interpret data.
 - c. Geometric measurement: understand concepts of angle and measure angles.
- 5. Geometry
 - a. Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

Fifth Grade

By the end of fifth grade, the students will:

- 1. Operations and Algebraic Thinking
 - a. Write and interpret numerical expressions.
 - b. Analyze patterns and relationships.
- 2. Number and Operations in Base Ten
 - a. Understand the place value system.
 - b. Perform operations with multi-digit whole numbers and with decimals to hundredths.
- 3. 3. Number and Operations Fractions
 - a. Use equivalent fractions as a strategy to add and subtract fractions.
 - b. Apply and extend previous understandings of multiplication and division to multiply and divide fractions
- 4. Measurement and Data
 - a. Convert like measurement units within a given measurement system.
 - b. Represent and interpret data.

- c. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.
- 5. Geometry
 - a. Graph points on the coordinate plane to solve real-world and mathematical problems.
 - b. Classify two-dimensional figures into categories based on their properties.

Sixth Grade

By the end of sixth grade, the students will:

- 1. Ratios and Proportional Relationships
 - a. Understand ratio concepts and use ratio reasoning to solve problems.
- 2. The Number System
 - a. Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
 - b. Compute fluently with multi-digit numbers and find common factors and multiples.
 - c. Apply and extend previous understandings of numbers to the system of rational numbers.
- 3. Expressions and Equations
 - a. Apply and extend previous understandings of arithmetic to algebraic expressions.
 - b. Reason about and solve one-variable equations and inequalities.
 - c. Represent and analyze quantitative relationships between dependent and independent variables.
- 4. Geometry
 - a. Solve real-world and mathematical problems involving area, surface area, and volume.
- 5. Statistics and Probability
 - a. Develop understanding of statistical variability.
 - b. Summarize and describe distributions.

Seventh Grade

By the end of seventh grade, the students will:

- 1. Ratios and Proportional Relationships
 - a. Analyze proportional relationships and use them to solve real-world and mathematical problems.
- 2. The Number System
 - a. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
- 3. Expressions and Equations
 - a. Use properties of operations to generate equivalent expressions.
 - b. Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
- 4. Geometry
 - a. Draw, construct and describe geometrical figures and describe the relationships between them.
 - b. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.
- 5. Statistics and Probability
 - a. Use random sampling to draw inferences about a population.
 - b. Draw informal comparative inferences about two populations.
 - c. Investigate chance processes and develop, use, and evaluate probability models.

Eighth Grade

By the end of eighth grade, the students will:

- 1. The Number System
 - a. Know that there are numbers that are not rational, and approximate them by rational numbers.
- 2. Expressions and Equations
 - a. Work with radicals and integer exponents.
 - b. Understand the connections between proportional relationships, lines, and linear equations.
 - c. Analyze and solve linear equations and pairs of simultaneous linear equations.
- 3. Functions
 - a. Define, evaluate, and compare functions.
 - b. Use functions to model relationships between quantities.
- 4. Geometry
 - a. Understand congruence and similarity using physical models, transparencies, or geometry software.
 - b. Understand and apply the Pythagorean Theorem.
 - c. Solve real-world and mathematical problems involving volume of cylinders, cones and spheres.
- 5. Statistics and Probability
 - a. Investigate patterns of association in bivariate data.

Evidence of Continuity from Grade to Grade

The mathematics content of the Core Standards builds across grades and provides important foundations for the mathematics to be learned at subsequent levels. The coherence of the Core Standards lies in those connections, both within and across grade levels and topics. The graphic below illustrates those connections.

к	1	2	3	4	5	6	7	8
Counting and Cardinality								
Numbers and Operations in Base Ten Ratio					and Proportional Relationships			
			Numbers and OperationsFractions			The Number System		
Operations and Algebraic Thinking						Expressions and Equations		
Geometry								
Measurement and Data						Statistics and Probability		

At the early elementary grades, the focus is largely on the areas of number and operations in base ten and algebraic thinking. This expands to a focus on fractions later in elementary school. The K-5 mathematics content provides the groundwork for the study of ratios, proportional reasoning, the number system, expressions and equations, and functions at the middle school level. By providing a focused mathematics experience in elementary and middle school, a strong foundation is developed for the content to be learned at the high school level.

Assessment of the academic growth and achievement of each student

Each individual teacher uses a combination of formative and summative assessments which include class discussions, daily assignments, activities, quizzes, and tests. The length and level of the assessment is dependent on both the grade level and the student being taught.

Students in grades K-8 take the MAP Standardized Test twice a year. This test is another form of assessment that the teachers can use to gauge the progress of the students.

Evidence of fundamental principles of student growth

Consideration is given to different student abilities, each student is challenged, and differentiated instruction is being used. At TLS, students are put in a math class based on their ability. Students that struggle with math take a lower level math class. This provides more time for students to review and understand key concepts and build their confidence. Students that have received extra gifts in math are advanced to the next math class. This provides more challenging work for these students and allows them to take Algebra I as an eighth grader. Upon graduation from Trinity, these students may take a test to pass out of Algebra I and take Geometry in high school.