



Cincinnati Hills Christian Academy

Lower School Upper Elementary – Mathematics

Scope and Sequence

Vision: Mathematics is one tool by which we better understand God’s precise, orderly, and sometimes mysterious creation. As a result of a CHCA mathematics education, students will value mathematics and develop proficiency in the use of mathematics. Proficiency in mathematics learning refers to conceptual understanding, procedural fluency, strategic competence, and adaptive reasoning. [*Adding it Up*, NRC, 2001] Students experience instruction based on Standards for Mathematical Practice. [<http://www.corestandards.org/Math/Practice>] Students express an understanding of concepts using a variety of methods and media. Developmentally appropriate instruction challenges and supports students..

Standards: What a CHCA student will know and be able to do in **Mathematics:** *What a CHCA student will know and be able to do in Mathematics K-4:* Demonstrate understanding by applying concepts to problems in the following: ●Operations and Algebraic Thinking. ●Number and Operations in Base Ten. ●Number and Operations—Fractions. ●Measurement and Data. ●Geometry. *By the close of Pre-Algebra:* Demonstrate understanding by applying concepts to problems in the following: ●Ratios and Proportional Relationship. ●The Number System. ●Expressions and Equation. ●Functions. ●Geometry. ●Statistics and Probability. *In courses Algebra I and beyond:* Demonstrate understanding by applying concepts to problems in the following: ●Number and Quantity. ●Algebra. ●Functions. ●Geometry. ●Statistics and Probability. ●Modeling. *In Standards of Mathematical Practice K-12:* ●Be mathematical problem solvers. ●Reason and construct mathematical arguments. ●Communicate mathematically. ●See connections both within mathematics and to other subject areas. ●Look for and make use of structure and patterns. *Theological Integration:* ●See God’s orderliness and mystery reflected in mathematics.

Grade 4 Topics: Place value for multi-digit whole numbers; finding patterns, rounding, comparing; multi-digit arithmetic using mental math and estimation strategies; factors and multiples; analyzing data and determining probability; adding, subtracting, and renaming equivalent fractions, improper fractions, and mixed numbers; decimals to hundredths: finding patterns, rounding, comparing, adding, subtracting, and converting decimals to fractions; geometry: angles, lines, properties of shapes, area and perimeter, symmetry, and tessellations.

Math 4 Accelerated Topics: Place value; probability; solve multi-step problems involving the four operations using standard algorithms; order of operations; properties of operations; patterns of multiplication and division by 10; read, write, and compare decimals; round decimals; add and subtract decimals; add and subtract unlike fractions; extend whole number understanding to multiplication and division of fractions; interpret and analyze data, average, median mode, range, step and leaf plots, outcomes; geometry: angle and angle measures, parallel and perpendicular line segments, properties of squares and rectangles; area and perimeter.

Math 5 Topics: Write and interpret numerical expressions; Analyze patterns and relationships; Understand the place value system; Perform operations with multi-digit whole numbers and with decimals to hundredths; Use equivalent fractions as a strategy to add and subtract fractions; Apply and extend previous understandings of multiplication and division to multiply and divide fractions; Convert like measurement units w/in given measurement system; Represent and interpret data; Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition; Graph points on the coordinate plane to solve real-world and mathematical problem; Classify two-dimensional figures into categories based on their properties.



Cincinnati Hills Christian Academy

Lower School Upper Elementary – Mathematics

Scope and Sequence

Math 5 Honors Topics: Write and interpret numerical expressions; Analyze patterns and relationships; Apply and extend previous understandings of arithmetic to algebraic expressions; Understand the place value system; Perform operations with multi-digit whole numbers and with decimals to hundredths; Understand ratio concepts and use ratio reasoning to solve problems; Use equivalent fractions as a strategy to add and subtract fractions; Apply and extend previous understanding of multiplication and division to multiply and divide fractions; Apply and extend previous understandings of multiplication and division to divide fractions by fractions. Compute fluently with multi-digit numbers and find common factors and multiples; Apply and extend previous understandings of numbers to the system of rational numbers; Convert like measurement units within a given measurement system; Represent and interpret data; Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition; Develop understanding of statistical variability; Graph points on the coordinate plane to solve real-world and mathematical problems; Classify two-dimensional figures into categories based on their properties; Solve real-world and mathematical problems involving area, surface area, and volume; Draw construct, and describe geometrical figures and describe the relationships between them.

Math 5 Advanced Topics: Write and interpret numerical expressions; Analyze patterns and relationships; Apply and extend previous understanding of arithmetic to algebraic expressions; Reason about and solve one-variable equations and inequalities (5-8); Represent and analyze quantitative relationships between dependent and independent variables; Understand ratio concepts and use ratio reasoning to solve problems; Analyze proportional relationships and use them to solve real-world and mathematical problems; Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers; Apply and extend previous understandings of multiplication and division to divide fractions by fractions; Compute fluently with multi-digit numbers and find common factors and multiples; Apply and extend previous understandings of numbers to the system of rational numbers; Develop understanding of statistical variability; Summarize and describe distributions; Solve real-world and mathematical problems involving area, surface area, and volume; Draw, construct, and describe geometrical figures and describe the relationships between them; Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

Math 6 Topics: Understand, apply ratio concepts; fractions by fractions division; Fluently divide multi-digit numbers; Fluently add, subtract, multiply and divide multi-digit decimals; Find common factors/multiples; Understand rational numbers concepts related to number line; Understand integers as ordered pairs with coordinate system; Compare, order rational numbers; Write, read and evaluate algebraic expressions; Understand, apply one step equations and inequalities; Represent, analyze dependent, independent variables relationships; Solve, apply area, surface area and volume problems; Develop statistical variability understanding; Summarize, describe data distributions.

Math 6 Honors Topics: Analyze proportional relationships and use them to solve real-world and mathematical problems; Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers; Use properties of operations to generate equivalent expressions; Solve real-life and mathematical problems using numerical and algebraic expressions and equations; Draw, construct, and describe geometrical figures and describe the relationships between them; Solve real-life and mathematical problems involving angle measure, area, surface area, and volume; Use random sampling to draw inferences about a population; Investigate chance processes and develop, use, and evaluate probability models.



Cincinnati Hills Christian Academy

Lower School Upper Elementary – Mathematics

Scope and Sequence

Math 6 Advanced/Pre-Algebra Topics: Understand the real number system and the role of rational and irrational numbers; Understand connections between proportional relationships and linear functions; analyze linear graphs, and solve equations involving linear functions, including solving systems of equations; Investigate patterns of association in bivariate data and understand connections to linear functions; Understand congruence as compared to similarity; Understand and apply Pythagorean Theorem; Solve real-world mathematical problems involving volume of cylinders, cones, and spheres; study simple and compound probability.