



# Cincinnati Hills Christian Academy

## Lower School Upper Elementary – Mathematics

### *Scope and Sequence*

### *Vision*

Mathematics is one discipline by which we better understand God's precise, orderly, and sometimes mysterious creation. As a result of a CHCA mathematics education, students will appreciate and develop proficiency in the use of mathematics. Proficiency in mathematics learning refers to conceptual understanding, procedural fluency, strategic competence, adaptive reasoning, and productive disposition. [Adding it Up, NRC, 2001] Students engage in and experience instruction based on The Standards for Mathematical Practice. [<http://www.corestandards.org/the-standards/mathematics>] Students demonstrate competency in mathematics using a variety of methods and media. Developmentally appropriate instruction challenges and supports students.

### *Competencies: Standards of Mathematical Practice*

***In the Standards for Mathematical Practice, CHCA students:***

- ❖ Make sense of problems and persevere in solving them.
- ❖ Reason abstractly and quantitatively.
- ❖ Construct viable arguments and critique the reasoning of others.
- ❖ Model with mathematics.
- ❖ Use appropriate tools strategically.
- ❖ Attend to precision.
- ❖ Look for and make use of structure.
- ❖ Look for and express regularity in repeated reasoning.
- ❖ See God's orderliness and mystery reflected in mathematics.

***Grade 4 Topics:*** Measurement is integrated into both math and science; Place value for multi-digit whole numbers: finding patterns, rounding, comparing; multi-digit arithmetic using mental math and estimation strategies; factors and multiples, prime and composite numbers; analyzing data and determining probability; average, median, mode, range; Fractions: adding, subtracting, and renaming equivalent fractions, improper fractions, and mixed numbers; decimals to hundredths: finding patterns, rounding, comparing, adding, subtracting; geometry: angles, lines, properties of shapes, area and perimeter, symmetry, and tessellations.

***Math 4 Honors Topics:*** Measurement is integrated into both math and science; Understanding the place value system for whole numbers and decimals; solve multi-step problems involving the four operations using standard algorithms; order of operations; multi-digit arithmetic using mental math and estimation strategies; factors and multiples, prime and composite numbers, square numbers; interpret and analyze data, average, median, mode, range, stem and leaf plots, line plots, outcomes; Use equivalent fractions as a strategy to add, subtract, and compare unlike fractions; conversion of decimals, fractions, and percent; geometry: angles, lines, properties of shapes, area and perimeter, symmetry, and tessellations.

***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; 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;



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**Math 5 Honors Topics:** Write and interpret numerical expressions; Analyze patterns and relationships; Apply and extend previous understandings of arithmetic to algebraic expressions; Apply and extend previous understanding of operations with whole numbers and decimals; Understand ratio concepts and use ratio reasoning to solve problems; Apply and extend previous understanding of multiplication and division to multiply and divide fractions; Apply and extend previous understandings of numbers to the system of rational numbers; Apply and extend previous understandings of operations with fractions to add and subtract rational numbers; 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 problems; Solve real-world and mathematical problems involving area, surface area, and volume.

**Math 6 Topics:** Understand, apply ratio concepts; fractions by fractions division; 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; Add, subtract, multiply and divide integers; Compare, order rational numbers; Write, read and evaluate algebraic expressions; Understand and apply one and two step equations and one step inequalities with whole numbers and integers; Represent, analyze dependent, independent variables relationships; Solve, apply area, surface area and volume problems.

**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 with rational numbers; 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.



# Cincinnati Hills Christian Academy Lower School Upper Elementary – Mathematics *Grades 4 – 6 Scope and Sequence*

***Pre-Algebra 6 Topics:*** Understand the real number system and the role of rational and irrational numbers; Reason about and solve one-variable equations and inequalities; Represent and analyze quantitative relationships between dependent and independent variables; Understand connections between proportional relationships and linear functions; analyze linear graphs, and solve equations involving linear functions; finding and interpreting slopes of lines, slope-intercept form, writing and sketching linear equations; exploring graphs of functions using online technology; Understand transformations: translations, reflections, rotations and dilations; Understand congruence as compared to similarity; Solve real-life and mathematical problems involving area, surface area , and volume of cylinders, pyramids, cones and spheres; Understand and apply Pythagorean Theorem and use the Pythagorean Theorem to solve real-world mathematical problems involving volume of cylinders, cones, and spheres.