Eighth Grade Mathematics

Mathematics Course Outline
Algebra I

Unit & Content Objectives	Time	Activities & Methods	Books & Materials	Evaluation Techniques
Exponents and Exponential Functions • Students will simplify expressions with zero and negative exponents. • Students will evaluate exponential expressions. • Students will write numbers in scientific and standard notation. • Students will use scientific notation. • Students will multiply powers. • Students will work with scientific notation. • Students will raise a power to a power. • Students will raise a product to a power. • Students will divide powers with the same base. • Students will raise a quotient to a power. • Students will form geometric sequences. • Students will use formulas when describing geometric sequences. • Students will evaluate exponential functions. • Students will graph exponential functions. • Students will model exponential growth. • Students will model exponential decay.	5 days/wk 45 min/day 2 semesters	• Student Workbooks	• Core Knowledge Teacher Handbook, Grade 8 • Holy Bible (NIV) • Prentice Hall Mathematics, Algebra I	• Teacher Observation • Homework • Tests • Quizzes

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Mathematics Course Outline

Unit & Content Objectives	Time	Activities & Methods	Books & Materials	Evaluation Techniques
Graphs and Functions • Students will interpret, sketch, and analyze graphs. • Students will identify relations and functions. • Students will evaluate functions. • Students will model functions using rules, tables, and graphs. • Students will write function rules using a table. • Students will write equations of a direct variation. • Students will use ratios and proportions with direct variations. • Students will solve inverse variations. • Students will compare direct and inverse variations. • Students will write rules for arithmetic sequences. • Students will use inductive reasoning in continuing number patterns.	5 days/wk 45 min/day 2 semesters	• Student Workbooks	• Core Knowledge Teacher Handbook, Grade 8 • Holy Bible (NIV) • Prentice Hall Mathematics, Algebra I	• Teacher Observation • Homework • Tests • Quizzes

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Linear Equations and Their Graphs • Students will find rates of change from tables and graphs. • Students will find slope. • Students will write linear equations in slope-intercept form. • Students will graph linear equations. • Students will interpret linear equations. • Students will graph equations using intercepts. • Students will write equations in standard form. • Students will graph and write linear equations using point-slope form. • Students will write a linear equation using data. • Students will determine whether lines are parallel or perpendicular. • Students will use equations to make predictions. • • Students will translate the graph of an absolute value equation.	5 days/wk 45 min/day 2 semesters	• Student Workbooks	• Core Knowledge Teacher Handbook, Grade 8 • Holy Bible (NIV) • Prentice Hall Mathematics, Algebra I	• Teacher Observation • Homework • Tests • Quizzes

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Polynomials and Factoring • Students will describe polynomials. • Students will add and subtract polynomials. • Students will multiply a polynomial by a monomial. • Students will factor a monomial from a polynomial. • Students will multiply using FOIL binomials. • Students will multiply trinomials and binomials. • Students will find the square of a binomial. • Students will find the difference of squares. • Students will factor trinomials. • Students will factor trinomials of a special type. • Students will factor perfect-square trinomials. • Students will factor the difference of squares. • Students will factor polynomials with four terms. • • Students will factor trinomials by grouping.	5 days/wk 45 min/day 2 semesters	• Student Workbooks	• Core Knowledge Teacher Handbook, Grade 8 • Holy Bible (NIV) • Prentice Hall Mathematics, Algebra I	• Teacher Observation • Homework • Tests • Quizzes

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Quadratic Equations and Functions • Students will graph quadratic functions. • Students will graph quadratic equations. • Students will graph quadratic inequalities. • Students will solve quadratic equations by graphing. • Students will solve quadratic equations using square roots. • Students will solve quadratic equations by factoring. • Students will solve quadratic equations by completing the square. • Students will use the quadratic formula when solving quadratic equations. • Students will choose an appropriate method for solving a quadratic equation. • Students will find the number of solutions of a quadratic equation. • Students will choose a linear, quadratic, or exponential model of data.	5 days/wk 45 min/day 2 semesters	• Student Workbooks	• Core Knowledge Teacher Handbook, Grade 8 • Holy Bible (NIV) • Prentice Hall Mathematics, Algebra I	• Teacher Observation • Homework • Tests • Quizzes

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Radical Expressions and Equations • Students will simplify radicals involving products. • Students will simplify radicals involving quotients. • Students will simplify sums and differences with radicals. • Students will simplify products and quotients with radicals. • Students will solve equations containing radicals. • Students will identify extraneous solutions. • Students will graph square root functions. • Students will translate graphs of square root functions. • Students will find trigonometric ratios. • • Students will solve problems using trigonometric ratios.	5 days/wk 45 min/day 2 semesters	• Student Workbooks	• Core Knowledge Teacher Handbook, Grade 8 • Holy Bible (NIV) • Prentice Hall Mathematics, Algebra I	• Teacher Observation • Homework • Tests • Quizzes

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Unit & Content Objectives	Time	Activities & Methods	Books & Materials	Evaluation Techniques
Rational Expressions and Functions • Students will graph rational functions. • Students will identify types of functions. • Students will simplify rational expressions. • Students will multiply rational expressions. • Students will divide rational expressions. • Students will divide polynomials. • Students will add and subtract rational expressions with like denominators. • Students will add and subtract rational expressions with unlike denominators. • Students will solve rational equations. • Students will solve proportions. • Students will use the multiplication counting principle. • Students will find permutations. • Students will find combinations. • • Students will find probability with counting techniques.	5 days/wk 45 min/day 2 semesters	• Student Workbooks	• Core Knowledge Teacher Handbook, Grade 8 • Holy Bible (NIV) • Prentice Hall Mathematics, Algebra I	• Teacher Observation • Homework • Tests • Quizzes

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Rational Numbers • Students will add rational numbers using models and rules. • Students will subtract rational numbers. • Students will multiply rational numbers. • Students will divide rational numbers. • Students will use the Distributive Property. • Students will simplify algebraic equations. • Students will identify properties. • Students will use deductive reasoning. • Students will find theoretical probability. • Students will find experimental probability. • Students will find the probability of independent events. • • Students will find the probability of dependent events.	5 days/wk 45 min/day 2 semesters	• Student Workbooks	• Core Knowledge Teacher Handbook, Grade 8 • Holy Bible (NIV) • Prentice Hall Mathematics, Algebra I	• Teacher Observation • Homework • Tests • Quizzes

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Solving Equations • Students will solve two-step equations. • Students will use the Distributive Property when combining like terms. • Students will use the Distributive Property when solving equations. • Students will find ratio and rates. • Students will solve proportions. • Students will solve proportions using similar figures. • Students will use scales when measuring indirectly. • Students will define a variable in terms of another variable. • Students will use the distance formula. • Students will find percent of change. • Students will find percent error. • Students will find square roots. • Students will estimate and use square roots. • Students will use the Pythagorean Theorem. • Students will identify right triangles.	5 days/wk 45 min/day 2 semesters	• Student Workbooks	• Core Knowledge Teacher Handbook, Grade 8 • Holy Bible (NIV) • Prentice Hall Mathematics, Algebra I	• Teacher Observation • Homework • Tests • Quizzes

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Solving Inequalities • Students will identify solutions of inequalities. • Students will graph and write inequalities. • Students will solve inequalities using addition. • Students will solve inequalities using subtraction. • Students will solve inequalities using multiplication. • Students will solve inequalities using division. • Students will solve multi-step inequalities with variables on one side. • Students will solve multi-step inequalities with variables on both sides. • Students will solve compound inequalities which contain the words 'and' or 'or.' • Students will solve equations that involve absolute value. • Students will solve inequalities that involve absolute value.	5 days/wk 45 min/day 2 semesters	• Student Workbooks	• Core Knowledge Teacher Handbook, Grade 8 • Holy Bible (NIV) • Prentice Hall Mathematics, Algebra I	• Teacher Observation • Homework • Tests • Quizzes

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Systems of Equations and Inequalities • Students will solve systems by graphing. • Students will analyze special types of systems. • Students will solve systems using substitution. • Students will solve systems by adding or subtracting. • Students will solve systems by multiplying. • Students will write systems of linear inequalities. • Students will graph linear inequalities. • Students will write and use linear inequalities with real-world situations. • Students will solve systems of linear inequalities by graphing. • Students will model real-world situations using systems of linear inequalities.	5 days/wk 45 min/day 2 semesters	• • Student Workbooks	• Core Knowledge Teacher Handbook, Grade 8 • Holy Bible (NIV) • Prentice Hall Mathematics, Algebra I	• Teacher Observation • Homework • Tests • Quizzes

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Variables, Function Patterns, and Graphs • Students will model relationships with variables and equations. • Students will simplify and evaluate expressions and formulas. • Students will simplify and evaluate expressions containing grouping symbols. • Students will classify and compare numbers. • Students will write function rules. • Students will understand relationships of quantities in a function. • Students will analyze data using scatter plots. • Students will find central tendency using mean, median, mode, and range. • Students will make, use, and read stem-and-leaf plots.	5 days/wk 45 min/day 2 semesters	• Student Workbooks	• Core Knowledge Teacher Handbook, Grade 8 • Holy Bible (NIV) • Prentice Hall Mathematics, Algebra I	• Teacher Observation • Homework • Tests • Quizzes