COLLEGE PREP ALGEBRA 1

Course Number: 301-CP
Grade: 9
Credits: 5
Recommended Prerequisite: Completion of grade 8 Mathematics

Required Materials:

1. Writing utensil
2. Textbook or online textbook access
3. Notebook
4. Scientific or graphing calculator

Course Description:
This course stresses equations, radicals, polynomials, graphing, probability and statistics, functions and factoring. Real world applications are utilized throughout the course to make mathematics relevant. This will be accomplished through the use of manipulatives, activities interactive technology, and an exploratory approach to learning.

General Performance Objectives:
Students will be able to:

1. Solve first degree equations and inequalities with one variable, including proportions, absolute value equations, literal equations, and compound inequalities.
2. Model situations with algebraic equations.
3. Create and interpret a variety of graphs.
4. Understand and use the concept of function.
5. Graph and write linear equations using points, slope or intercepts.
6. Summarize, represent, and interpret data

Massachusetts Curriculum Frameworks for Mathematics:
http://goo.gl/tv2ya

Units and Themes:

	Unit Title	Standard
I.	**Pre-Algebra Review**	
II.	**Solving Equations**	A-SSE.1; A-CED; A-REI.1,3,5,6
III.	**Solving Inequalities**	A-SSE.1; A-CED; A-REI.1,3,5,6
IV.	**Graphs and Functions**	F-IF.1,2,4,5,6; F-FBF.1,2; F-LE.2; A-REI.1,3,5,6
V.	**Graphs and Writing Linear Equations**	F-IF.1,2,4,5,6 ; F-LE; A-CED

VI.	**Solve Systems of Linear Equations & Inequalities**	A-REI.5,6,10,11
VII.	**Exponents**	F-FBF.2; F-IF.8,10; F-LE.1,2,3,5; N-RN.1,2
VIII.	**Polynomials and Factoring**	A-REI.4; A-APR; A-CED
IX.	**Quadratics**	A-REI.4; F-IF.7
X.	**Statistics and Probability**	S-ID; N-Q.1
XI.	**Review, Midterm Exam, Final Exams**	

Course Outline: (number of days are an approximation and may be adjusted by course demands)

I. Pre-Algebra Review (6 days)
- A. Integer operations
- B. Order of operations
- C. Distributive property
- D. Classification of numbers
- E. Properties of real numbers

II. Solving Equations (12 days)
- A. Solving multistep linear equations
- B. Solving absolute value equations
- C. Modeling situations with algebraic expressions and/or equations
- D. Literal equations

III. Solving Inequalities (10 days)
- A. Solving inequalities
- B. Graphing solutions on a number line
- C. Compound inequalities
- D. Solving absolute value inequalities
- E. Modeling situations with equations/inequalities

IV. Graphs and Functions (10 days)
- A. Domain and range (including acceptable domain & range pertaining to real world examples)
- B. State the domain and range from a graph
- C. Function notation
- D. Writing function rules
- E. Direct variation

V. Graphing and Writing Linear Equations (14 days)
- A. Rate of change
- B. Graphing lines
- C. Equations of a line: slope intercept, standard form, point slope
- D. Parallel and perpendicular lines
- E. Graphing linear inequalities in two variables

VI. Solving Systems of Linear Equations and Inequalities (13 days)
- A. Graphing

B. Substitution
C. Addition/Elimination
D. Applications of systems of linear equations
E. Systems of inequalities
F. Real world applications

VII. Exponents (15 days)

A. Zero and negative exponents
B. Use scientific notation
C. Multiplication properties of exponents
D. Raise a power to a power
E. Raise a product to a power
F. Division properties of exponents
G. Exponential growth and decay

VIII. Polynomials and Factoring (17 days)

A. Add and subtract polynomials
B. Multiply polynomials
C. Factor using the greatest common factor
D. Factor polynomials

IX. Quadratics (20 days)

A. Find and estimate square roots
B. Simplify radicals
C. Graph quadratic functions
D. Solve quadratic equations by graphing
E. Solve quadratic equations using square roots
F. Solve quadratic equations by factoring
G. Real world applications

X. Statistics and Probability (5 days)

A. Measures of central tendency
B. Histograms, frequency tables, box and whisker plots
C. Theoretical and experimental probability

XI. Review, Midterm exam, Final exam (5 days)

Suggested Instructional Strategies:

1. Lecture
2. Written exercises
3. Group work
4. Projects
5. Use of manipulatives and online tools
6. Use of a variety of questioning techniques
7. Board work
8. Calculator/graphing calculator activities
9. Games (Math Jeopardy, etc.)
10. Student presentations

11. A variety of assessment tools (partner quizzes, etc.)

Suggested Integrated Activities:

1. Students will wrole a pair of numbered cubes and graphically organize their results. They will then determine the experimental probabilities and compare this to theoretical probability.
2. Students will use Geosketchpad to explore systems of linear functions.
3. Stations/differentiated instruction
4. Interactive games

Use of tools/technology:

1. Use of scientific or graphing calculator
2. Use of iPads and/or computer carts
3. Use of Smart Board
4. Use of classroom responders or students' own devices as responders
5. View online video selections (YouTube, Khan Academy, etc)
6. Use of Google apps for education

Assessment Techniques:

1. Students will take free-response performance tests.
2. Students will participate in classroom discussions and demonstrate problem solving on the Smartboard or individual white boards.
3. Students will work in cooperative situations and report their results.
4. Students will prepare integrated projects.Students will take free-response performance tests.
5. Students will be formatively assessed using Google forms, Quizlet, Kahoot or similar.
6. Students will respond to essential questions.
7. Students will be evaluated on District Determined Measures.
8. Students will participate in classroom discussions.
9. Students will demonstrate problem-solving skills.
10. Students will work cooperatively and report or present results.
11. Students will create projects and do presentations to demonstrate mastery.