Course Title:	Algebra 1
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Cycle/Division:	High School
Grade Level:	**9 or 10**
Credit Unit:	1
Duration:	one year
Course Prerequisites:	Grade 8 Math

Department's Vision:	• Produce the highest standards of excellence in teaching mathematics to prepare students to flourish and fulfill personal ambitions and career goals in an increasingly technological society.
Department's Mission:	• Develop students' abilities to become mathematical thinkers, lifelong learners, and link learning to life through problem solving and utilizing the high-tech resources.

COURSE DESCRIPTION:

Algebra 1
Unit 5: Linear systems and piecewise-defined functions
Solving systems of linear equations
Modeling with linear systems
Piecewise-defined functions
Rational exponents and radicals
Geometric Sequences and exponential functions
Exponential equations and models
Unit 7: Polynomial Operations
Adding and subtracting polynomials
Multiplying polynomials
Graphing quadratic functions
Connecting intercepts and zeros
Unit 8 Quadratic Equations and Modeling
Using factors to solve quadratic equations
Using square roots to solve quadratic equations
Linear, Exponential, and Quadratic Models

24: Functions and Inverses
Graphing Polynomial Functions
Algebra 2
Unit 8 Probability
Introduction to probability
Conditional probability and independence of events

GENERAL COURSE LEARNING OBJECTIVES:

- Creating an expression that describes a computation involving a general quantity requires the ability to express the computation in general terms, abstracting from specific instances.
- Finding approximate solutions of the equation. Converting a verbal description to an equation, inequality, or system of these is an essential skill in modeling.
- Solving quadratic equations
- Determining an output value for a particular input involves evaluating an expression; finding inputs that yield a given output involves solving an equation.
- Interpreting the probabilities relies on .an understanding of independence and conditional probability, which can be approached through the analysis of two-way tables.
- Understand independence and conditional probability and use them to interpret data.
- Understand and evaluate random processes underlying statistical experiments
- Use the rules of probability to compute probabilities of compound events in a uniform probability model

I.

STANDARDS/BENCHMARKS:

❖ Expressions:

An expression is a record of a computation with numbers, symbols that represent numbers, arithmetic operations, exponentiation, and, at more advanced levels, the operation of evaluating a function. Conventions about the use of parentheses and the order of operations assure that each expression is unambiguous. Creating an expression that describes a computation involving a general quantity requires the ability to express the computation in general terms, abstracting from specific instances.

Reading an expression with comprehension involves analysis of its underlying structure. This may suggest a different but equivalent way of writing the expression that exhibits some different aspect of its meaning. For example, p + 0.05p can be interpreted as the addition of a 5% tax to a price p. Rewriting p + 0.05p as 1.05p shows that adding a tax is the same as multiplying the price by a constant factor.

Algebraic manipulations are governed by the properties of operations and exponents, and the conventions of algebraic notation. At times, an expression is the result of applying operations

to simpler expressions. For example, p + 0.05p is the sum of the simpler expressions p and 0.05p. Viewing an expression as the result of operation on simpler expressions can sometimes clarify its underlying structure.

A spreadsheet or a computer algebra system (CAS) can be used to experiment with algebraic expressions, perform complicated algebraic manipulations, and understand how algebraic manipulations behave.

- Equations and inequalities:

An equation is a statement of equality between two expressions, often viewed as a question asking for which values of the variables the expressions on either side are in fact equal. These values are the solutions to the equation. An identity, in contrast, is true for all values of the variables; identities are often developed by rewriting an expression in an equivalent form. The solutions of an equation in one variable form a set of numbers; the solutions of an equation in two variables form a set of ordered pairs of numbers, which can be plotted in the coordinate plane. Two or more equations and/or inequalities form a system. A solution for such a system must satisfy every equation and inequality in the system.
An equation can often be solved by successively deducing from it one or more simpler equations. For example, one can add the same constant to both sides without changing the solutions, but squaring both sides might lead to extraneous solutions. Strategic competence in solving includes looking ahead for productive manipulations and anticipating the nature and number of solutions.
Some equations have no solutions in a given number system, but have a solution in a larger system. For example, the solution of x + 1 = 0 is an integer, not a whole number; the solution of 2x + 1 = 0 is a rational number, not an integer; the solutions of x2 – 2 = 0 are real numbers, not rational numbers; and the solutions of x2 + 2 = 0 are complex numbers, not real numbers.

The same solution techniques used to solve equations can be used to rearrange formulas. For example, the formula for the area of a trapezoid, A = ((b1+b2)/2)h, can be solved for h using the same deductive process.
Inequalities can be solved by reasoning about the properties of inequality. Many, but not all, of the properties of equality continue to hold for inequalities and can be useful in solving them.

- Connections to Functions and Modeling:

Expressions can define functions, and equivalent expressions define the same function. Asking when two functions have the same value for the same input leads to an equation; graphing the two functions allows for finding approximate solutions of the equation. Converting a verbal description to an equation, inequality, or system of these is an essential skill in modeling.

- Connections to Expressions, Equations, Modeling, and Coordinates:

Determining an output value for a particular input involves evaluating an expression; finding inputs that yield a given output involves solving an equation. Questions about when two functions have the same value for the same input lead to equations, whose solutions can be visualized from the intersection of their graphs. Because functions describe relationships

between quantities, they are frequently used in modeling. Sometimes functions are defined by a recursive process, which can be displayed effectively using a spreadsheet or other technology.

- ❖ Connections to Functions and Modeling:

Functions may be used to describe data; if the data suggest a linear relationship, the relationship can be modeled with a regression line, and its strength and direction can be expressed through a correlation coefficient.

- ❖ Statistics and Probability:

Random processes can be described mathematically by using a probability model: a list or description of the possible outcomes (the sample space), each of which is assigned a probability. In situations such as flipping a coin, rolling a number cube, or drawing a card, it might be reasonable to assume various outcomes are equally likely. In a probability model, sample points represent outcomes and combine to make up events; probabilities of events can be computed by applying the Addition and Multiplication Rules. Interpreting these probabilities relies on an understanding of independence and conditional probability, which can be approached through the analysis of two-way tables.
Technology plays an important role in statistics and probability by making it possible to generate plots, regression functions, and correlation coefficients, and to simulate many possible outcomes in a short amount of time.

II.

RESOURCES:

- ✓ Pencils, green pens, scissors, glue, geometry tool box, and Math folder with transparent pocket sheets.
- ✓ Holt Algebra 1 and Algebra 2 text book.
- ✓ Online resources
- ✓ HMH attached resources CD'S (lesson tutorial videos, power point presentations, one stop planer,…..)
- ✓ Internet.
- ✓ E-games and links
- ✓ Teacher's Handouts

III.

COURSE OUTLINE:

Semester 1:

Chapter's #	Chapter	Lesson(s)
Algebra I Module 11	Solving systems of linear equations	• 11.1: Solving linear systems by graphing • 11.2: Solving linear systems by substitution • 11.3: Solving linear systems by adding or subtracting • 11.4: Solving linear systems by multiplying first
Algebra I Module 12	Modeling with linear systems	• 12.1: Creating systems of linear equations • 12.2: Graphing systems of linear inequalities • 12.3: Modeling with linear systems
Algebra I Module 13	Piecewise-defined functions	• 13.3: Solving absolute value equations • 13.4: Solving absolute value inequalities
Algebra I Module 14	Rational exponents and radicals	• 14.1: Understanding rational exponents and radicals • 14.2: Simplifying expressions with rational exponents and radicals
Algebra I Module 15	Geometric Sequences and exponential functions	• 15.1: Understanding geometric sequences • 15.2: Constructing geometric sequences • 15.3: Constructing exponential functions • 15.4: Graphing exponential functions • 15.5: Transforming exponential functions
Algebra I Module 16	Exponential equations and models	• 16.1 Using Graphs and Properties to Solve Equations with Exponents • 16.2 Modeling Exponential Growth and

		Decay
Algebra I Module 17	Adding and subtracting polynomials	• 17.1: Understanding polynomial expressions • 17.2: Adding polynomials expressions • 17.3 Subtracting polynomial expressions
Algebra I Module 18	Multiplying polynomials	• 18.1 Multiplying Polynomial Expressions by Monomials • 18.2 Adding polynomial expressions • 18.3 Special Products of Binomials
Algebra I Module 19	Graphing quadratic functions	• 19.2: Transforming quadratic functions • 19.3: Interpreting vertex form and standard form

Semester 2:

Chapter's #	Chapter	Lesson(s)
Algebra 1 Module 20	Connecting intercepts and zeros	• 20.1: Connecting intercepts and zeros • 20.2: Connecting intercepts and linear factors • 20.3: Apply the zero product property to solve equations
Algebra 1 Module 21	Using factors to solve quadratic equations	• 21.1: Solving equations by factoring x2+bx+c • 21.2: Solving equations by factoring ax2+ bx + c • 21.3: Using special factors to solve equations
Algebra 1 Module 22	Using square roots to solve quadratic equations	• 22.1: Solving equations by taking square roots • 22.2: Solving equations by completing the square

		• 22.3: Using the quadratic formula to solve equations • 22.4: Choosing a method for solving quadratic equations • 22.5: Solving non-linear systems
Algebra 1 Module 23	Linear, Exponential, and Quadratic Models	• 23.1 : Modeling with Quadratic Functions • 23.2 : Comparing Linear, Exponential, and Quadratic Models
Algebra 1 Module 24	Functions and Inverses.	• 24.1 : Graphing Polynomial Functions
Algebra 2 Module 19	Introduction to probability	• 19.1: Probability and set theory • 19.2: Permutations and probability • 19.3: Combinations and probability • 19.4: Mutually exclusive and overlapping events
Algebra 2 Module 20	Conditional probability and independence of events	• 20.1: Conditional probability Finding Conditional Probabilities from • 20.2: Independent events • 20.3: Dependent events

IV.

GRADING:

Grading Policy/ Assessment Tools:

- 1st The students will be provided with study guides or mock tests on the school website in the students portal, based on our curriculum manual, bench marks and objectives before every quiz, test, or exam.
- 2nd The students will be tested based on what they have practiced at home from the study guides or mock tests mentioned before.
- 3rd The evaluation will be based on what objectives did the students achieve, and in what objectives do they need help, through the detailed report that will be sent to the parents once during the semester and once again with the report card.
- Tests and quizzes will comprise the majority of the student's grade. There will be one major test given at the end of each chapter.
- Warm-up problems for review, textbook assignments, worksheets, etc. will comprise the majority of the daily work.

- Home Works and Assignments will provide students with the opportunity to practice the concepts explained in class and in the text.
- Students will apply the learned Math concepts in their daily lives through Sample Performance Indicators which will be prepared at home and done in class.
- Students will solve a higher-order thinking word problem on weekly basis (Problem of the Week).
- Students will keep a math notebook. In this notebook students will record responses to daily warm-up problems, lesson activities, post-lesson wrap-ups, review work, and daily textbook assignments.
- Class work is evaluated through participation, worksheets, class activities and group work done in the class.
- Passing mark 60 %

Grade Distribution:

Semester -1-		**Semester -2-**		**Final Exam**
Assessment	***Points/Weight***	***Assessment***	***Points/Weight***	
Class Work	15%	Class Work	15%	**Mid-Year / Final Exam 30%** **Total 100**
Homework	5%	Homework	5%	
Quizzes	30 %	Quizzes .	30 %	
Project Based Learning	10%	Project Based Learning	10%	
POP Quizzes	5 %	POP Quizzes	5 %	
MAP (Based on students results)	5%	MAP (Based on students results)	5%	

Cross-Curricular Project(s):

- ICT integration week
- Term projects-integrate Science with math (other subjects if applicable)