

## Correlation Between the College Board Standards for College Success and Glencoe's *Algebra 1* © 2010

Number	College Board Performance Expectation	Student Edition Lesson(s)
<b>Standard AI.1 Patterns of Change and Algebraic Representations</b>		
<b>Objective AI.1.1</b>		
AI.1.1.1	Determines whether a relationship is a function by using a graph or a verbal description of the relationship.	1-7
AI.1.1.2	Determines whether a relationship is linear or nonlinear based on whether it has a constant rate of change, its verbal description, its table of values, its graphical representation, or its symbolic form.	1-7, 3-1, 3-3, 3-5, 9-9
AI.1.1.3	Describes characteristics of <u>piecewise-linear</u> functions, including absolute value, and situations in which they arise.	2-5, 4-7, 5-5
AI.1.1.4	Applies the terminology and symbols associated with expressions, functions, and linear equations, including function notation, inputs, outputs, domain, range, slope, intercepts, and independent and dependent variables.	1-1, 1-2, 1-3, 1-4, 1-7, 3-1, 3-2, Explore 3-3
<b>Objective AI.1.2</b>		
AI.1.2.1	Generalizes linear patterns or arithmetic sequences using verbal rules and symbolic expressions such as $kx$ and $ax + b$ in representing proportional or more-general linear relationships, respectively.	3-4, 3-5, 3-6
AI.1.2.2	Analyzes a mathematical or real-world situation; determines whether the situation can be described by a linear model, and if so, determines the constant rate of change and develops and interprets a linear function to model that situation.	3-1, 3-2, 3-3, 3-5, 4-3, 4-5, 9-9
<b>Standard AI.2 Variables, Expressions, Equations, and Functions in Linear Settings</b>		
<b>Objective AI.2.1</b>		
AI.2.1.1	Represents linear patterns using tables, graphs, sequences, verbal rules, symbolic expressions, equations, and functions of the form $f(x) = ax + b$ .	3-1, 3-2, 3-5, 3-6, 4-1, 4-2, 4-3
AI.2.1.2	Describes the meaning of symbolic expressions of the form $ax + b$ in words, and interprets the changes resulting from different values of the parameters $a$ and $b$ .	4-1, Extend 4-1
AI.2.1.3	Develops equivalent algebraic expressions, equations, and inequalities using the properties of equality and inequality, as well as the commutative, associative, inverse, identity, and distributive properties.	1-1, 1-2, 1-3, 1-4, 1-5, 2-1, Explore 2-2, 2-2, Explore 2-3, 2-3, 2-4, 2-5, 5-1, 5-2, 5-3, 5-5
AI.2.1.4	Identifies and translates among equivalent representations of linear expressions, equations, inequalities, and systems of equations, using verbal, tabular, graphical, and symbolic representations.	1-1, 1-2, 1-3, 1-5, 1-6, 2-1, 2-2, 2-3, 5-1, 5-2, 5-3, 5-4, 5-5, 5-6, 6-1, 6-2, 6-3, 6-4, 6-5, 6-7, 6-8
AI.2.1.5	Writes, interprets, and translates among equivalent forms of linear equations and functions, including slope-intercept, point-slope, intercept, and general forms, recognizing that equivalent forms for a linear relationship reveal more or less information about a given situation.	2-1, 4-1, Extend 4-1, 4-2, 4-3, 4-6

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AI.2.1.6	Judges whether a scatterplot appears to show a linear trend, and if it does, draws a trend line and writes an equation for that line; uses the equation to make predictions; and interprets the slope of the line in context.	4-5
<b>Objective AI.2.2</b>		
AI.2.2.1	Describes and distinguishes among the different uses of variables: as symbols for varying quantities (such as $5x$ ); as symbols for fixed and possibly unknown values in equations (such as $3x + 2 = 5$ ); as symbols for all numbers in properties (such as $x + x = 2x$ ); as symbols in formulas (such as $A = l \cdot w$ ); and as symbols for parameters (such as the $m$ for slope in $y = mx + b$ ).	1-1, 2-1, 2-8, 4-1
AI.2.2.2	Identifies the constant and variable terms in linear expressions, equations, and inequalities and in systems of equations and inequalities.	1-1, 1-6, 4-1, 2-1, 3-1, 5-1, 5-2, 5-3, 5-4, 5-6, 6-1, 6-3, 6-8
AI.2.2.3	Identifies and distinguishes among parameters and the independent and dependent variables in a linear relationship (e.g., in $y = mx + b$ , $x$ and $y$ are the independent and dependent variables, respectively, and $m$ and $b$ are the parameters).	1-6, 3-1, 3-2, 4-1, 5-6
AI.2.2.4	Describes and distinguishes among the types of equations that can be constructed by equating linear expressions, including identities (e.g., $x + x = 2x$ ); equations for which there is no solution (e.g., $x + 1 = x + 2$ ); formulas (e.g., $C = \pi d$ ); equations where the solution is unique (e.g., $2x + 3 = 5$ ); and equations relating two variables (e.g., $y = 3x + 7$ ).	1-5, 2-1, 2-2, 4-2
<b>Objective AI.2.3</b>		
AI.2.3.1	Constructs a linear equation or linear inequality to model a real-world situation, using a variety of methods and representations.	2-1, 2-2, 2-3, 2-4, 3-1, 3-4, 3-5, 3-6, Explore 4-1, 4-1, 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 5-1, 5-2, 5-3, 5-6, 6-1, 6-2, 6-3, 6-4, 6-5, 6-7, 6-8, Extend 6-8
AI.2.3.2	Analyzes and explains the reasoning used to solve linear equations and linear inequalities.	Explore 2-2, 2-2, Explore 2-3, 2-3, 2-4, 2-6, 3-2, 5-1, 5-2, 5-3, 5-4, 5-6
AI.2.3.3	Solves a linear equation or inequality using symbolic methods, graphs, tables, and technology.	2-2, 2-3, 2-4, 3-2, 5-1, 5-2, 5-3, 5-4, 5-6
AI.2.3.4	Constructs a system of linear equations modeling a real-world situation, using a variety of methods and representations.	6-1, 6-2, 6-3, 6-4, 6-5, 6-7, 6-8, Extend 6-8
AI.2.3.5	Analyzes and explains the reasoning used to solve a system of linear equations.	6-1, 6-2, 6-3, 6-4, 6-5, 6-7

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AI.2.3.6	Solves a system consisting of two linear equations in two unknowns, using graphs, tables, symbolic methods, and technology, and describes the nature of the solutions (no solution, one solution, infinitely many solutions).	6-1, Extend 6-1, 6-2, 6-3, 6-4, 6-5
AI.2.3.7	Solves the equation $r = ax + b$ by using the fact that the value of $x$ determined by this equation is the $x$ -coordinate of the solution to the system of equations $\begin{cases} y = ax + b \\ y = r \end{cases}$ . Relates this solution method to graphical and technology-aided methods of solving equations.	Extend 6-1
<b>Standard AI.3 Nonlinear Expressions, Equations, and Functions</b>		
<b>Objective AI.3.1</b>		
AI.3.1.1	Identifies nonlinear (exponential, quadratic, and equations of the form $y = \frac{k}{x}$ ) relationships in graphical or tabular displays through an examination of successive differences, ratios, symbolic forms, or graphical properties.	9-1, 9-6, 9-9, 11-1
AI.3.1.2	Identifies terms in a geometric (exponential) sequence using verbal rules or symbolic expressions.	9-8
AI.3.1.3	Multiplies a pair of linear expressions, and interprets the result of the operation numerically by evaluation, through a table of values, and graphically.	7-7
<b>Objective AI.3.2</b>		
AI.3.2.1	Finds integer powers of rational numbers; evaluates the meaning of integer powers of variables in expressions, and applies the basic laws of exponents ( $a^m \cdot a^n = a^{m+n}$ and $(a^m)^n = a^{mn}$ ( $(am)n = amn$ , and for all $a \neq 0$ , $a^0 = 1$ and $\frac{a^m}{a^n} = a^{m-n}$ ).	7-1, 7-2, 11-3
AI.3.2.2	Distinguishes among general representations for exponential equations ( $y = b^x$ , $y = a(b^x)$ ) and quadratic equations ( $y = x^2$ , $y = -x^2$ , $y = ax^2$ , $y = x^2 + c$ , $y = ax^2 + c$ ), and describes how the values of $a$ , $b$ , and $c$ affect their graphical and tabular representations.	8-3, 8-4, 9-1, 9-3, 9-6
AI.3.2.3	Provides and describes multiple representations of solutions to simple exponential and quadratic equations using manipulative models, tables, graphs, symbolic expressions, and technology.	8-3, 8-4, 8-5, 8-6, 9-2, 9-4, 9-5
AI.3.2.4	Factors simple quadratic expressions (limited to the removal of monomial terms, perfect-square trinomials, difference of squares, and quadratics of the form $x^2 + bx + c$ that factor over the integers), and applies the <u>zero-product property</u> to determine the solutions of the related equation.	Explore 8-2, 8-2, Explore 8-3, 8-3, 8-4, 8-5, 8-6
AI.3.2.5	Solves quadratic equations using completing the square and technology, and interprets such solutions in terms of the original problem context.	9-2, 9-4
<b>Standard AI.4 Surveys and Random Sampling</b>		
<b>Objective AI.4.1</b>		

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AI.4.1.1	Formulates a question of interest and defines key components that can be addressed through a survey. Defines the population, the variables to measure, and how to measure the variables; identifies <u>factors</u> that may influence survey outcomes; designs questionnaires.	Explore 12-1, 12-1, 12-2
AI.4.1.2	Describes techniques for drawing <u>simple random samples</u> of members from a population. Identifies situations in which a <u>stratified random sample</u> from a population would be preferred over a simple random sample.	12-1
AI.4.1.3	Identifies and describes the differences between a sample and a <u>census</u> , explaining the advantages and disadvantages of each.	12-1
AI.4.1.4	Designs and implements the selection of a simple random sample from a population; collects and organizes survey data; displays the data in appropriate tables or graphs; and summarizes the data using measures of center and spread, including the <u>mean absolute deviation</u> .	12-1, 12-2, 12-3
AI.4.1.5	Explains the question of interest and the sampling methods used to answer the question, and interprets the results obtained in the context of the question.	12-1, 12-2
AI.4.1.6	Describes how the method of selecting subjects for a sample and the methods of measurement of outcomes can affect survey results. Explains how biases may arise from both sampling errors and measurement errors.	Explore 12-1, 12-1, 12-2
AI.4.1.7	Examines survey results reported in the media, discussing and evaluating how the sample was drawn from the population and the methods used to measure, collect, and represent the data collected. Identifies possible sources of bias that may affect survey results.	12-2
<b>Objective AI.4.2</b>		
AI.4.2.1	Compares measures of center and spread computed using sample data drawn from a population ( <u>sample statistics</u> ) with the same measures of center and spread computed using data from a census of the population ( <u>population parameters</u> ). Observes that sample means tend to approach the population mean as sample size increases.	12-3
AI.4.2.2	Recognizes that measures of center and spread computed using data from a random sample are likely to differ from sample to sample even when the samples are drawn from the same population and have the same number of observations.	12-3
AI.4.2.3	Distinguishes between random and nonrandom sampling methods. Compares results from simple random and nonrandom samples drawn from the same population; discusses how and why the results might differ because of potential sources of bias in the various samples	12-1