**Algebra 2**

**Khan Academy Video Correlations
By SpringBoard Activity**

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| **SB Activity** | **Video(s)** |
| **Unit 1: Equations, Inequalities, Functions** |
| **Activity 1***Creating Equations*1-1 Learning Targets:* Create an equation in one variable from a real-world context.
* Solve an equation in one variable.

1-2 Learning Targets:* Create equations in two variables to represent relationships between quantities.
* Graph two-variable equations

1-3 Learning Targets:* Write, solve, and graph absolute value equations.
* Solve and graph absolute value inequalities.
 | ***One-Variable Equations***  |
| [**Representing a relationship with a simple equation**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/why-of-algebra/v/representing-a-relationship-with-a-simple-equation)[**Linear equation word problem**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/linear-equation-word-problems-tu/v/linear-equation-word-problem-example)[**Word problem: solving equations**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/linear-equation-word-problems-tu/v/application-problems-with-equation-in-one-variable)[**Solving equations with the distributive property**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/complicated_equations/v/solving-equations-with-the-distributive-property)[**Ex 2: Multi-step equation**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/complicated_equations/v/ex-2-multi-step-equation)[**Variables on both sides**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/basic-equation-practice/v/equations-3) |
| ***Two-Variable Equations***  |
| [**Constructing linear equations to solve word problems**](http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/equation-of-a-line/v/word-problem-solving-4)[**Exploring linear relationships**](http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/graphing_solutions2/v/exploring-linear-relationships)[**Graphs of linear equations**](http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/graphing_solutions2/v/graphs-of-linear-equations)[**Application problem with graph**](http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/graphing_solutions2/v/application-problem-with-graph) |
| ***Absolute Value Equations and Inequalities***  |
| [**Absolute value equations**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-value-equations)[**Absolute value equations**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/u02-l2-t2-we1-absolute-value-equations-avi)[**Absolute value equations 1**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-value-equations-1)[**Absolute value equation example**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-value-equation-example)[**Absolute value equations example 1**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-value-equations-example-1)[**Absolute value equation example 2**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-value-equation-example-2)[**Absolute value equation with no solution**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-value-equation-with-no-solution) |
| ***Absolute Value Inequalities*** |
| [**Absolute value inequalities**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-value-inequalities)[**Absolute value inequalities example 1**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-value-inequalities-example-1)[**Absolute inequalities 2**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-inequalities-2)[**Absolute value inequalities example 3**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-value-inequalities-example-3) |
| **Activity 2***Graphing to Find Solutions*2-1 Learning Targets:* Write equations in two variables to represent relationships between quantities.
* Graph equations on coordinate axes with labels and scales.

2-2 Learning Targets:* Represent constraints by equations or inequalities.
* Use a graph to determine solutions of a system of inequalities.
 | ***Writing Linear Equations*** |
| [**Constructing linear equations to solve word problems**](http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/equation-of-a-line/v/word-problem-solving-4) |
| ***Graphing and Interpreting Two-Variable Equations*** |
| [**Graphing a line in slope intercept form**](http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/graphing-slope-intercept/v/graphing-a-line-in-slope-intercept-form)[**Interpreting intercepts of linear functions**](http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/graphing_with_intercepts/v/interpreting-intercepts-of-linear-functions) |
| ***Graphing Systems of Inequalities*** |
| [**Graphing systems of inequalities**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/systems_inequalities_precalc/v/graphing-systems-of-inequalities-2)[**Graphing systems of inequalities 2**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/systems_inequalities_precalc/v/u06-l3-t1-we3-graphing-systems-of-inequalities)[**Visualizing the solution set for a system of inequalities**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/systems_inequalities_precalc/v/graphical-system-of-inequalities) |
| **Activity 3***Systems of Linear Equations*3-1 Learning Targets:* Use graphing, substitution, and elimination to solve systems of linear equations in two variables.
* Formulate systems of linear equations in two variables to model real-world situations.

3-2 Learning Targets:* Solve systems of three linear equations in three variables using substitution and Gaussian elimination.
* Formulate systems of three linear equations in three variables to model a real-world situation.

3-3 Learning Targets:* Add, subtract, and multiply matrices.
* Use a graphing calculator to perform operations on matrices.

3-4 Learning Targets:* Solve systems of two linear equations in two variables by using graphing calculators with matrices.
* Solve systems of three linear equations in three variables by using graphing calculators with matrices.
 | ***Solving Systems of Two Equations in Two Variables: Graphing*** |
| [**Solving linear systems by graphing**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-through-examples/v/solving-linear-systems-by-graphing)[**Solving systems graphically**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-through-examples/v/solving-systems-graphically)[**Graphing systems of equations**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-through-examples/v/graphings-systems-of-equations)[**Graphical systems application problem**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-through-examples/v/graphical-systems-application-problem)[**Example 2: Graphically solving systems**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-through-examples/v/solving-systems-by-graphing-2)[**Example 3: Graphically solving systems**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-through-examples/v/solving-systems-by-graphing-3) |
| ***Solving Systems of Two Equations in Two Variables: Substitution*** |
| [**Example 1: Solving systems by substitution**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-with-substitution/v/solving-systems-by-substitution-1)[**Example 2: Solving systems by substitution**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-with-substitution/v/solving-systems-by-substitution-2)[**Example 3: Solving systems by substitution**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-with-substitution/v/solving-systems-by-substitution-3)[**The substitution method**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-with-substitution/v/the-substitution-method)[**Substitution method 2**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-with-substitution/v/substitution-method-2)[**Substitution method 3**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-with-substitution/v/substitution-method-3)[**Practice using substitution for systems**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-with-substitution/v/practice-using-substitution-for-systems) |
| ***Solving Systems of Two Equations in Two Variables: Elimination*** |
| [**Example 1: Solving systems by elimination**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/solving-systems-by-elimination)[**Example 2: Solving systems by elimination**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/solving-systems-by-elimination-2)[**Example 3: Solving systems by elimination**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/solving-systems-by-elimination-3)[**Addition elimination method 1**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/addition-elimination-method-1)[**Addition elimination method 2**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/addition-elimination-method-2)[**Addition elimination method 3**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/addition-elimination-method-3)[**Addition elimination method 4**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/addition-elimination-method-4)[**Simple elimination practice**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/simple-elimination-practice)[**Systems with elimination practice**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/systems-with-elimination-practice) |
| ***Consistent, Inconsistent, Dependent, and Independent Systems*** |
| [**Consistent and inconsistent systems**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/systems_tutorial_precalc/v/consistent-and-inconsistent-systems)[**Independent and dependent systems**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/systems_tutorial_precalc/v/independent-and-dependent-systems) |
| ***Solving Systems of Three Equations in Three Variables***  |
| [**Systems of three variables**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/fancier_systems_precalc/v/systems-of-three-variables)[**Systems of three variables 2**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/fancier_systems_precalc/v/systems-of-three-variables-2)[**Solutions to three variable system**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/fancier_systems_precalc/v/solutions-to-three-variable-system)[**Solutions to three variable system 2**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/fancier_systems_precalc/v/solutions-to-three-variable-system-2)[**Three equation application problem**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/fancier_systems_precalc/v/three-equation-application-problem) |
| ***Matrix Operations*** |
| [**Introduction to the matrix**](http://www.khanacademy.org/math/algebra2/alg2-matrices/basic-matrix-operations-alg2/v/introduction-to-the-matrix)[**Representing data with matrices**](http://www.khanacademy.org/math/algebra2/alg2-matrices/basic-matrix-operations-alg2/v/data-in-matrices)[**Matrix addition and subtraction**](http://www.khanacademy.org/math/algebra2/alg2-matrices/basic-matrix-operations-alg2/v/matrix-addition-and-subtraction-1)[**Matrix multiplication introduction**](http://www.khanacademy.org/math/algebra2/alg2-matrices/matrix-multiplication-alg2/v/matrix-multiplication-intro)[**Multiplying a matrix by a matrix**](http://www.khanacademy.org/math/algebra2/alg2-matrices/matrix-multiplication-alg2/v/multiplying-a-matrix-by-a-matrix)[**Defined and undefined matrix operations**](http://www.khanacademy.org/math/algebra2/alg2-matrices/matrix-multiplication-alg2/v/defined-and-undefined-matrix-operations) |
| ***Solving Matrix Equations*** |
| [**Matrix equations and systems**](http://www.khanacademy.org/math/precalculus/precalc-matrices/matrix-equations/v/matrix-equations-systems) |
| **Activity 4***Piecewise-Defined Functions*4-1 Learning Targets:* Graph piecewise-defined functions.
* Write the domain and range of functions using interval notation, inequalities, and set notation.

4-2 Learning Targets:* Graph step functions and absolute value functions.
* Describe the attributes of these functions.

4-3 Learning Targets:* Identify the effect on the graph of replacing f(x) by f(x) + k, k · f(x), f(kx), and f(x + k).
* Find the value of k, given these graphs.
 | ***Piecewise Defined Functions*** |
| [**What is a function?**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/piecewise-functions-tutorial/v/what-is-a-function)[**Finding a piecewise function definition from graph**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/piecewise-functions-tutorial/v/finding-a-piecewise-function-definition-from-graph) |
| ***Absolute Value Functions*** |
| [**Graphs of absolute value functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/piecewise-functions-tutorial/v/graphs-of-absolute-value-functions)[**Absolute value graphing exercise example**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/piecewise-functions-tutorial/v/absolute-value-graphing-exercise-example) |
| **Activity 5***Function Composition and Operations*5-1 Learning Targets:* Combine functions using arithmetic operations.
* Build functions that model real-world scenarios.

5-2 Learning Targets:* Write functions that describe the relationship between two quantities.
* Explore the composition of two functions through a real-world scenario.

5-3 Learning Targets:* Write the composition of two functions.
* Evaluate the composition of two functions.
 | ***Operations with Functions*** |
| [**Sum of functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_expressions/v/sum-of-functions)[**Difference of functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_expressions/v/difference-of-functions)[**Product of functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_expressions/v/product-of-functions)[**Quotient of functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_expressions/v/quotient-of-functions) |
| ***Composition of Functions*** |
| [**Introduction to function composition**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/composing-functions/v/function-composition)[**Creating new function from composition**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/composing-functions/v/new-function-from-composition)[**Evaluating composite functions example**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/composing-functions/v/evaluating-composite-functions-example-1)[**Modeling with function composition**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/composing-functions/v/modeling-with-composite-functions) |
| **Activity 6***Inverse Functions*6-1 Learning Targets:* Find the inverse of a function.
* Write the inverse using the proper notation.

6-2 Learning Targets:* Use composition of functions to determine if functions are inverses of each other.
* Graph inverse functions and identify the symmetry.
 | ***Inverse Functions*** |
| [**Introduction to function inverses**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_inverses_2/v/introduction-to-function-inverses)[**Introduction to the inverse of a function**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/mathy-functions/v/linear-algebra-introduction-to-the-inverse-of-a-function)[**Function inverse example 1**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_inverses_2/v/function-inverse-example-1)[**Function inverses example 2**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_inverses_2/v/function-inverses-example-2)[**Function inverses example 3**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_inverses_2/v/function-inverses-example-3) |
| **Unit 2: Quadratic Functions** |
| **Activity 7***Applications of Quadratic Functions*7-1 Learning Targets:* Formulate quadratic functions in a problem-solving situation.
* Graph and interpret quadratic functions.

7-2 Learning Targets:* Factor quadratic expressions of the form x2 + bx + c.
* Factor quadratic expressions of the form ax2 + bx + c.

7-3 Learning Targets:* Solve quadratic equations by factoring.
* Interpret solutions of a quadratic equation.
* Create quadratic equations from solutions.

7-4 Learning Targets:* Solve quadratic inequalities.
* Graph the solutions to quadratic inequalities.
 | ***Analyzing a Quadratic Function***  |
| [**Graphing a parabola with a table of values**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/graphing-a-quadratic-function)[**Parabola vertex and axis of symmetry**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/quadratic-functions-2)[**Finding the vertex of a parabola example**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/finding-the-vertex-of-a-parabola-example)[**Graphing a parabola by finding the roots and vertex**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/quadratic-functions-3)[**Graphing a parabola using roots and vertex**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/graphing-a-parabola-using-roots-and-vertex)[**Multiple examples graphing parabolas using roots and vertices**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/graphs-of-quadratic-functions) |
| ***Factoring Quadratic Expressions***  |
| [**Factoring quadratic expressions**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-quadratic-expressions/v/factoring-quadratic-expressions)[**Examples: Factoring simple quadratics**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-quadratic-expressions/v/factoring-polynomials-1)[**Example 1: Factoring quadratic expressions**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-quadratic-expressions/v/factoring-trinomials-with-a-leading-1-coefficient)[**Example 1: Factoring trinomials with a common factor**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-quadratic-expressions/v/factoring-trinomials-with-a-common-factor) |
| ***Solving Quadratic Equations by Factoring***  |
| [**Solving a quadratic equation by factoring**](http://www.khanacademy.org/math/algebra/quadratics/factoring_quadratics/v/example-1-solving-a-quadratic-equation-by-factoring)[**Dimensions from volume of box**](http://www.khanacademy.org/math/algebra/quadratics/factoring_quadratics/v/example-3-solving-a-quadratic-equation-by-factoring) |
| ***More Uses for Factors***  |
| [**Quadratic inequalities**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_ineq/v/quadratic-inequalities)[**Quadratic inequalities (visual explanation)**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_ineq/v/quadratic-inequalities-visual-explanation) |
| **Activity 8***Introduction to Complex Numbers*8-1 Learning Targets:* Know the definition of the complex number i.
* Know that complex numbers can be written as a + bi, where a and b are real numbers.
* Graph complex numbers on the complex plane.

8-2 Learning Targets:* Add and subtract complex numbers.
* Multiply and divide complex numbers.

8-3 Learning Targets:* Factor quadratic expressions using complex conjugates.
* Solve quadratic equations with complex roots by factoring.
 | ***The Imaginary Unit , i*** |
| [**Introduction to i and imaginary numbers**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/imaginary_unit_i-a2/v/introduction-to-i-and-imaginary-numbers)[**Imaginary roots of negative numbers**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/imaginary_unit_i-a2/v/imaginary-roots-of-negative-numbers)[**i as the principal root of -1 (a little technical)**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/imaginary_unit_i-a2/v/i-as-the-principal-root-of-1-a-little-technical)[**Plotting complex numbers on the complex plane**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/complex_numbers/v/plotting-complex-numbers-on-the-complex-plane) |
| ***Operations with Complex Numbers*** |
| [**Calculating i raised to arbitrary exponents**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/imaginary_unit_i-a2/v/calculating-i-raised-to-arbitrary-exponents)[**Adding complex numbers**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/complex_numbers/v/adding-complex-numbers)[**Subtracting complex numbers**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/complex_numbers/v/subtracting-complex-numbers)[**Multiplying complex numbers**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/complex_numbers/v/multiplying-complex-numbers)[**Complex conjugates example**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/complex_numbers/v/complex-conjugates-example)[**Dividing complex numbers**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/complex_numbers/v/dividing-complex-numbers) |
| **Activity 9***Solving ax*2+ *bx* + *c* =09-1 Learning Targets:* Solve quadratic equations by taking square roots.
* Solve quadratic equations ax2 + bx + c = 0 by completing the square.

9-2 Learning Targets:* Derive the Quadratic Formula.
* Solve quadratic equations using the Quadratic Formula.

9-3 Learning Targets:* Solve quadratic equations using the Quadratic Formula.
* Use the discriminant to determine the nature of the solutions of a quadratic equation.
 | ***Completing the Square and Taking Square Roots***  |
| [**Solve quadratic equations by square roots**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_formula_tutorial/v/solving-quadratic-equations-by-square-roots)[**Solving quadratic equations by completing the square**](http://www.khanacademy.org/math/algebra/quadratics/completing_the_square/v/solving-quadratic-equations-by-completing-the-square)[**Example 1: Completing the square**](http://www.khanacademy.org/math/algebra/quadratics/completing_the_square/v/ex1-completing-the-square)[**Example 2: Completing the square**](http://www.khanacademy.org/math/algebra/quadratics/completing_the_square/v/ex2-completing-the-square)[**Example 3: Completing the square**](http://www.khanacademy.org/math/algebra/quadratics/completing_the_square/v/completing-the-square-to-solve-quadratic-equations) |
| ***The Quadratic Formula*** |
| [**Proof of quadratic formula**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_formula_tutorial/v/proof-of-quadratic-formula)[**How to use the quadratic formula**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_formula_tutorial/v/using-the-quadratic-formula) |
| ***Solutions of Quadratic Equations*** |
| [**Example: Complex roots for a quadratic**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_formula_tutorial/v/complex-roots-from-the-quadratic-formula)[**Discriminant of quadratic equations**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_formula_tutorial/v/discriminant-of-quadratic-equations)[**Discriminant for types of solutions for a quadratic**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_formula_tutorial/v/discriminant-for-types-of-solutions-for-a-quadratic) |
| **Activity 10***Writing Quadratic Equations*10-1 Learning Targets:* Derive a general equation for a parabola based on the definition of a parabola.
* Write the equation of a parabola given a graph and key features.

10-2 Learning Targets:* Explain why three points are needed to determine a parabola.
* Determine the quadratic function that passes through three given points on a plane.

10-3 Learning Targets:* Find a quadratic model for a given table of data.
* Use a quadratic model to make predictions.
 | ***Parabolas and Quadratic Equations*** |
| [**Parabola intuition example 1**](http://www.khanacademy.org/math/algebra2/conics_precalc/parabolas_precalc/v/parabola-intuition-example-1)[**Focus and directrix introduction**](http://www.khanacademy.org/math/algebra2/conics_precalc/parabolas_precalc/v/focus-and-directrix-introduction) |
| ***Writing the Equation of a Parabola*** |
| [**Using the focus and directrix to find the equation of a parabola**](http://www.khanacademy.org/math/algebra2/conics_precalc/parabolas_precalc/v/using-the-focus-and-directrix-to-find-the-equation-of-a-parabola)[**Equation for parabola from focus and directrix**](http://www.khanacademy.org/math/algebra2/conics_precalc/parabolas_precalc/v/equation-for-parabola-from-focus-and-directrix)[**Finding focus and directrix from vertex**](http://www.khanacademy.org/math/algebra2/conics_precalc/parabolas_precalc/v/finding-focus-and-directrix-from-vertex) |
| **Activity 11***Transformations of y* = *x*211-1 Learning Targets:* Describe translations of the parent function f(x) = x2.
* Given a translation of the function f(x) = x2, write the equation of the function.

11-2 Learning Targets:* Describe transformations of the parent function f(x) = x2.
* Given a transformation of the function f(x) = x2, write the equation of the function.

11-3 Learning Targets:* Write a quadratic function in vertex form.
* Use transformations to graph a quadratic function in vertex form.
 | *Transformations of y* = *x*2 |
| [**Shifting and scaling parabolas**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/shifting-and-scaling-parabolas)[**Graphing a parabola in vertex form**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/graphing-a-parabola-in-vertex-form) |
| **Activity 12***Graphing Quadratics and Quadratic Inequalities*12-1 Learning Targets:* Write a quadratic function from a verbal description.
* Identify and interpret key features of the graph of a quadratic function.

12-2 Learning Targets:* Write a quadratic function from a verbal description.
* Identify and interpret key features of the graph of a quadratic function.

12-3 Learning Targets:* Identify key features of a quadratic function from an equation written in standard form.
* Use key features to graph a quadratic function.

12-4 Learning Targets:* Use the discriminant to determine the nature of the solutions of a quadratic equation.
* Use the discriminant to help graph a quadratic function.

12-5 Learning Targets:* Graph a quadratic inequality in two variables.
* Determine the solutions to a quadratic inequality by graphing.
 | ***Key Features of Quadratic Functions*** |
| [**Parabola vertex and axis of symmetry**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/quadratic-functions-2) |
| ***Graphing Quadratic Functions*** |
| [**Examples: Graphing and interpreting quadratics**](http://www.khanacademy.org/math/algebra/quadratics/quadratic_odds_ends/v/algebra-ii-shifting-quadratic-graphs)[**Graphing a parabola with a table of values**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/graphing-a-quadratic-function)[**Finding the vertex of a parabola example**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/finding-the-vertex-of-a-parabola-example)[**Graphing a parabola by finding the roots and vertex**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/quadratic-functions-3)[**Graphing a parabola using roots and vertex**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/graphing-a-parabola-using-roots-and-vertex)[**Multiple examples graphing parabolas using roots and vertices**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/graphs-of-quadratic-functions) |
| The Discriminant |
| [**Discriminant of quadratic equations**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_formula_tutorial/v/discriminant-of-quadratic-equations)[**Discriminant for types of solutions for a quadratic**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_formula_tutorial/v/discriminant-for-types-of-solutions-for-a-quadratic) |
| **Activity 13***Systems of Linear and Nonlinear Equations*13-1 Learning Targets:* Use graphing to solve a system consisting of a linear and a nonlinear equation.
* Interpret the solutions of a system of equations.

13-2 Learning Targets:* Use substitution to solve a system consisting of a linear and nonlinear equation.
* Determine when a system consisting of a linear and nonlinear equation has no solution.
 | ***Systems of Nonlinear Equations*** |
| [**Non-linear systems of equations 1**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/non-linear-systems-tutorial/v/non-linear-systems-of-equations-1)[**Non-linear systems of equations 2**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/non-linear-systems-tutorial/v/non-linear-systems-of-equations-1)[**Non-linear systems of equations 3**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/non-linear-systems-tutorial/v/non-linear-systems-of-equations-3)[**Systems of nonlinear equations 1**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/non-linear-systems-tutorial/v/systems-of-nonlinear-equations-1)[**Systems of nonlinear equations 2**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/non-linear-systems-tutorial/v/systems-of-nonlinear-equations-2)[**Systems of nonlinear equations 3**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/non-linear-systems-tutorial/v/systems-of-nonlinear-equations-3) |
| **Unit 3: Polynomials** |
| **Activity 14***Introduction to Polynomials*14-1 Learning Targets:* Write a third-degree equation that represents a real-world situation.
* Graph a portion of this equation and evaluate the meaning of a relative maximum.

14-2 Learning Targets:* Sketch the graphs of cubic functions.
* Identify the end behavior of polynomial functions.

14-3 Learning Targets:* Recognize even and odd functions given an equation or graph.
* Distinguish between even and odd functions and even-degree and odd-degree functions.
 | ***Polynomial Basics*** |
| [**Terms coefficients and exponents in a polynomial**](http://www.khanacademy.org/math/algebra-basics/quadratics-polynomials-topic/polynomial-basics-core-algebra/v/terms-coefficients-and-exponents-in-a-polynomial) |
| ***End Behavior Of Polynomial Functions*** |
| [**Polynomial end behavior**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-end-behavior/v/polynomial-end-behavior)[**Polynomial end behavior example**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-end-behavior/v/polynomial-end-behavior-example)[**Another polynomial end behavior example**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-end-behavior/v/another-polynomial-end-behavior-example)[**Polynomial end behavior exercise example**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-end-behavior/v/polynomial-end-behavior-exercise-example) |
| ***Even and Odd Functions*** |
| [**Recognizing odd and even functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/analyzing_functions/v/recognizing-odd-and-even-functions)[**Connection between even and odd numbers and functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/analyzing_functions/v/connection-between-even-and-odd-numbers-and-functions) |
| **Activity 15***Polynomial Operations*15-1 Learning Targets:* Use a real-world scenario to introduce polynomial addition and subtraction.
* Add and subtract polynomials.

15-2 Learning Targets:* Add, subtract, and multiply polynomials.
* Understand that polynomials are closed under the operations of addition, subtraction, and multiplication.

15-3 Learning Targets:* Determine the quotient of two polynomials.
* Prove a polynomial identity and use it to describe numerical relationships.
 | ***Adding and Subtraction Polynomials*** |
| [**Addition and subtraction of polynomials**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial_tutorial/v/addition-and-subtraction-of-polynomials) |
| ***Multiplying Polynomials*** |
| [**Multiplying polynomials example**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial_tutorial/v/multiplying-polynomials)[**Multiplying polynomials example 2**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial_tutorial/v/multiplying-polynomials-3) |
| ***Dividing Polynomials*** |
| [**Polynomial division**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/dividing_polynomials/v/polynomial-division)[**Polynomial divided by monomial**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/dividing_polynomials/v/polynomial-divided-by-monomial)[**Dividing polynomials 1**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/dividing_polynomials/v/dividing-polynomials-1)[**Dividing polynomials with remainders**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/dividing_polynomials/v/dividing-polynomials-with-remainders)[**Dividing polynomials with remainders example**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/dividing_polynomials/v/dividing-polynomials-with-remainders-example) |
| **Activity 16***Binomial Theorem*16-1 Learning Targets:* Find the number of combinations of an event.
* Create Pascal’s triangle.

16-2 Learning Targets:* Know the Binomial Theorem.
* Apply the Binomial Theorem to identify the coefficients or terms of any binomial expansion.
 | ***Pascal’s Triangle*** |
| [**Pascal’s triangle for binomial expansion**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/binomial_theorem/v/pascals-triangle-binomial-theorem) |
| ***Binomial Theorem*** |
| [**Binomial theorem**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/binomial_theorem/v/binomial-theorem)[**Determining coefficient in binomial expansion**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/binomial_theorem/v/coefficient-in-binomial-expansion)[**Connecting Pascal’s triangle to binomial combinatorics**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/binomial_theorem/v/binomial-theorem-intuition)[**Algorithm for mentally computing binomial expansion coefficients**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/binomial_theorem/v/binomial-expansion-algorithm)[**Binomial theorem combinatorics connection**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/binomial_theorem/v/binomial-theorem-part-3) |
| **Activity 17***Factors of Polynomials*17-1 Learning Targets:* Determine the linear factors of polynomial functions using algebraic methods.
* Determine the linear or quadratic factors of polynomials by factoring the sum or difference of two cubes and factoring by grouping.

17-2 Learning Targets:* Know and apply the Fundamental Theorem of Algebra.
* Write polynomial functions, given their degree and roots.
 | ***Factoring Polynomials: Algebraic Methods***  |
| [**Factor by grouping and factoring completely**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/factor-by-grouping-and-factoring-completely)[**Example: basic grouping**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/factoring-trinomials-by-grouping-1)[**Example 1: Factoring by grouping**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/factoring-trinomials-with-a-non-1-leading-coefficient-by-grouping)[**Example 2: Factoring by grouping**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/ex2-factoring-quad)[**Example 3: Factoring by grouping**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/u09-l1-t2-we3-factoring-trinomials)[**Example 4: Factoring by grouping**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/factoring-trinomials-by-grouping-4)[**Example 5: Factoring by grouping**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/factoring-trinomials-by-grouping-5)[**Example 6: Factoring by grouping**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/factoring-trinomials-by-grouping-6)[**Difference of cubes factoring**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/factoring-higher-deg-polynomials/v/difference-of-cubes-factoring)[**Factoring sum of cubes**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/factoring-higher-deg-polynomials/v/factoring-sum-of-cubes) |
| ***The Fundamental Theorem of Algebra***  |
| [**Fundamental theorem of algebra**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/fundamental-theorem-of-algebra/v/fundamental-theorem-of-algebra-intro)[**Fundamental theorem of algebra for quadratic**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/fundamental-theorem-of-algebra/v/fundamental-theorem-algebra-quadratic)[**Possible number of real roots**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/fundamental-theorem-of-algebra/v/possible-real-roots) |
| **Activity 18***Graphs of Polynomials*18-1 Learning Targets:* Graph polynomial functions by hand or using technology, identifying zeros when suitable factorizations are available, and showing end behavior.
* Recognize even and odd functions from their algebraic expressions.

18-2 Learning Targets:* Know and apply the Rational Root Theorem and Descartes’ Rule of Signs.
* Know and apply the Remainder Theorem and the Factor Theorem.

18-3 Learning Targets:* Compare properties of two functions each represented in a different way.
* Solve polynomial inequalities by graphing.
 | ***Graphing Polynomial Functions*** |
| [**Polynomial end behavior**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-end-behavior/v/polynomial-end-behavior)[**Polynomial end behavior example**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-end-behavior/v/polynomial-end-behavior-example)[**Another polynomial end behavior example**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-end-behavior/v/another-polynomial-end-behavior-example)[**Polynomial end behavior exercise example**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-end-behavior/v/polynomial-end-behavior-exercise-example)[**Recognizing odd and even functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/analyzing_functions/v/recognizing-odd-and-even-functions)[**Connection between even and odd numbers and functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/analyzing_functions/v/connection-between-even-and-odd-numbers-and-functions) |
| ***Finding the Roots of a Polynomial Function*** |
| [**Synthetic division**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/synthetic-division/v/synthetic-division)[**Synthetic division example 2**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/synthetic-division/v/synthetic-division-example-2)[**Why synthetic division works**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/synthetic-division/v/why-synthetic-division-works)[**Polynomial remainder theorem**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-remainder-theorem-tutorial/v/polynomial-remainder-theorem)[**Polynomial remainder theorem example**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-remainder-theorem-tutorial/v/polynomial-remainder-theorem-example)[**Polynomial remainder theorem to test factor**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-remainder-theorem-tutorial/v/polynomial-remainder-theorem-to-test-factor)[**Polynomial remainder theorem proof**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-remainder-theorem-tutorial/v/polynomial-remainder-theorem-proof) |
| ***Comparing Polynomial Functions*** |
| [**Recognizing features of functions (example 1)**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/analyzing_functions/v/recognizing-features-of-functions-example-1)[**Recognizing features of functions (example 2)**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/analyzing_functions/v/recognizing-features-of-functions-2-example-2)[**Recognizing features of functions (example 3)**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/analyzing_functions/v/recognizing-features-of-functions-2-example-3) |
| **Unit 4: Series, Exponential and Logarithmic Functions** |
| **Activity 19***Arithmetic Sequences and Series*19-1 Learning Targets:* Determine whether a given sequence is arithmetic.
* Find the common difference of an arithmetic sequence.
* Write an expression for an arithmetic sequence, and calculate the nth term.

19-2 Learning Targets:* Write a formula for the nth partial sum of an arithmetic series.
* Calculate partial sums of an arithmetic series.

19-3 Learning Targets:* Identify the index, lower and upper limits, and general term in sigma notation.
* Express the sum of a series using sigma notation.
* Find the sum of a series written in sigma notation.
 | ***Arithmetic Sequences*** |
| [**Explicit and recursive definitions of sequences**](http://www.khanacademy.org/math/precalculus/seq_induction/seq_and_series/v/explicit-and-recursive-definitions-of-sequences)[**Arithmetic sequences**](http://www.khanacademy.org/math/precalculus/seq_induction/seq_and_series/v/arithmetic-sequences)[**Finding the 100th term in a sequence**](http://www.khanacademy.org/math/precalculus/seq_induction/seq_and_series/v/finding-the-100th-term-in-a-sequence)[**Equations of sequence patterns**](http://www.khanacademy.org/math/precalculus/seq_induction/seq_and_series/v/equations-of-sequence-patterns) |
| ***Arithmetic Series*** |
| [**Explicitly defining a series**](http://www.khanacademy.org/math/integral-calculus/sequences_series_approx_calc/calculus-series/v/explicitly-defining-series) |
| ***Sigma Notation*** |
| [**Sigma notation for sums**](http://www.khanacademy.org/math/precalculus/seq_induction/geometric-sequence-series/v/sigma-notation-sum)[**Writing a series in sigma notation**](http://www.khanacademy.org/math/integral-calculus/sequences_series_approx_calc/calculus-series/v/writing-series-sigma-notation) |
| **Activity 20***Geometric Sequences and Series*20-1 Learning Targets:* Identify the index, lower and upper limits, and general term in sigma notation.
* Express the sum of a series using sigma notation.
* Find the sum of a series written in sigma notation.

20-2 Learning Targets:* Derive the formula for the sum of a finite geometric series.
* Calculate the partial sums of a geometric series.

20-3 Learning Targets:* Determine if an infinite geometric sum converges.
* Find the sum of a convergent geometric series.
 | ***Geometric Sequences*** |
| [**Geometric sequences introduction**](http://www.khanacademy.org/math/precalculus/seq_induction/precalc-geometric-sequences/v/geometric-sequences-introduction)[**Geometric sequences**](http://www.khanacademy.org/math/precalculus/seq_induction/precalc-geometric-sequences/v/geometric-sequences) |
| ***Geometric Series*** |
| [**Series as sum of sequence**](http://www.khanacademy.org/math/precalculus/seq_induction/seq_and_series/v/series-as-sum-of-sequence)[**Geometric series**](http://www.khanacademy.org/math/precalculus/seq_induction/geometric-sequence-series/v/geometric-series-introduction)[**Formula for a finite geometric series**](http://www.khanacademy.org/math/integral-calculus/sequences_series_approx_calc/seq_series_review/v/geometric-series)[**Sum of an infinite geometric series**](http://www.khanacademy.org/math/integral-calculus/sequences_series_approx_calc/seq_series_review/v/infinite-geometric-series)[**Another derivation of the sum of an infinite geometric series**](http://www.khanacademy.org/math/integral-calculus/sequences_series_approx_calc/seq_series_review/v/deriving-geometric-series-sum-formula) |
| ***Convergence and Divergence*** |
| [**Geometric series convergence and divergence examples**](http://www.khanacademy.org/math/integral-calculus/sequences_series_approx_calc/seq_series_review/v/geometric-series-convergence-divergence) |
| **Activity 21***Exponential Functions and Graphs*21-1 Learning Targets:* Identify data that grow exponentially.
* Compare the rates of change of linear and exponential data.

21-2 Learning Targets:* Identify and write exponential functions.
* Determine the decay factor or growth factor of an exponential function.

21-3 Learning Targets:* Determine when an exponential function is increasing or decreasing.
* Describe the end behavior of exponential functions.
* Identify asymptotes of exponential functions.

21-4 Learning Targets:* Explore how changing parameters affects the graph of an exponential function.
* Graph transformations of exponential functions.

21-5 Learning Targets:* Graph the function f(x) = ex.
* Graph transformations of f(x) = ex.
 | ***Exponential Functions*** |
| [**Understanding linear and exponential models**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/exp_growth_decay/v/linear-exponential-models)[**Exponential growth and decay word problems**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/exponential-modeling/v/word-problem-solving-exponential-growth-and-decay)[**Decay of cesium 137 example**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/exponential-modeling/v/decay-of-cesium-137-example)[**Modeling ticket fines with exponential function**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/exponential-modeling/v/modeling-ticket-fines-with-exponential-function) |
| ***Graphs of Exponential Functions*** |
| [**Graphing exponential functions**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/exp_growth_decay/v/graphing-exponential-functions)[**Constructing linear and exponential functions from graphs**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/exp_growth_decay/v/constructing-linear-and-exponential-functions-from-graph) |
| **Activity 22***Logarithms and Their Properties*22-1 Learning Targets:* Complete tables and plot points for exponential data.
* Write and graph an exponential function for a given context.
* Find the domain and range of an exponential function.

22-2 Learning Targets:* Use technology to graph y = log x.
* Evaluate a logarithm using technology.
* Rewrite exponential equations as their corresponding logarithmic equations.
* Rewrite logarithmic equations as their corresponding exponential equations.

22-3 Learning Targets:* Make conjectures about properties of logarithms.
* Write and apply the Product Property and Quotient Property of Logarithms.
* Rewrite logarithmic expressions by using properties.

22-4 Learning Targets:* Make conjectures about properties of logarithms.
* Write and apply the Power Property of Logarithms.
* Rewrite logarithmic expressions by using their properties.
 | ***Exponential Functions*** |
| [**Graphing exponential functions**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/exp_growth_decay/v/graphing-exponential-functions)[**Constructing linear and exponential functions from data**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/exp_growth_decay/v/constructing-linear-and-exponential-functions-from-data)[**Matching functions to their graphs**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/log_functions/v/matching-exponential-functions) |
| ***Logarithms*** |
| [**Logarithms**](http://www.khanacademy.org/math/algebra2/logarithms-tutorial/logarithm_basics/v/logarithms)[**Writing in logarithmic and exponential form**](http://www.khanacademy.org/math/algebra2/logarithms-tutorial/logarithm_basics/v/exponential-to-logarithmic-form)[**Introduction to logarithm properties**](http://www.khanacademy.org/math/algebra2/logarithms-tutorial/logarithm_properties/v/introduction-to-logarithm-properties)[**Introduction to logarithm properties (part 2)**](http://www.khanacademy.org/math/algebra2/logarithms-tutorial/logarithm_properties/v/introduction-to-logarithm-properties-part-2) |
| **Activity 23***Inverse Functions: Exponential and Logarithmic Functions*23-1 Learning Targets:* Use composition to verify two functions as inverse.
* Define the logarithm of y with base b.
* Write the Inverse Properties for logarithms.

23-2 Learning Targets:* Apply the properties of logarithms in any base.
* Compare and expand logarithmic expressions.
* Use the Change of Base Formula.

23-3 Learning Targets:* Find intercepts and asymptotes of logarithmic functions.
* Determine the domain and range of a logarithmic function.
* Write and graph transformations of logarithmic functions.
 | ***Logarithms in Other Bases*** |
| [**Change of base formula**](http://www.khanacademy.org/math/algebra2/logarithms-tutorial/logarithm_properties/v/change-of-base-formulahttp%3A//www.khanacademy.org/math/algebra2/logarithms-tutorial/logarithm_properties/v/change-of-base-formula)[**Change of base formula proof**](http://www.khanacademy.org/math/algebra2/logarithms-tutorial/logarithm_properties/v/change-of-base-formula-proof) |
| ***Graphing Logarithmic Functions*** |
| [**Graphing logarithmic functions**](http://www.khanacademy.org/math/algebra2/logarithms-tutorial/logarithm_basics/v/graphing-logarithmic-functions)[**Graphs of logarithmic functions**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/log_functions/v/logarithmic-function-graphs) |
| **Activity 24***Logarithmic and Exponential Equations and Inequalities*24-1 Learning Targets:* Write exponential equations to represent situations.
* Solve exponential equations.

24-2 Learning Targets:* Solve exponential equations using logarithms.
* Estimate the solution to an exponential equation.
* Apply the compounded interest formula.

24-3 Learning Targets:* Solve logarithmic equations.
* Identify extraneous solutions to logarithmic equations.
* Use properties of logarithms to rewrite logarithmic expressions.

24-4 Learning Targets:* Solve exponential inequalities.
* Solve logarithmic inequalities.
 | ***Exponential Equations*** |
| [**Solving exponential equation**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/exponential-modeling/v/solve-exponentials)[**Solving exponential equation with logarithm**](http://www.khanacademy.org/math/algebra2/logarithms-tutorial/logarithm_basics/v/exponential-equation) |
| ***Logarithmic Equations*** |
| [**Solving logarithmic equations**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/logarithmic-equations/v/solving-logarithmic-equations_dup_1)[**Solving logarithmic equations**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/logarithmic-equations/v/solving-logarithmic-equations) |
| ***Application: Compound Interest*** |
| [**Introduction to compound interest and e**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/continuous_compounding/v/introduction-to-compound-interest-and-e)[**Compound interest and e (part 2)**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/continuous_compounding/v/compound-interest-and-e-part-2)[**Compound interest and e (part 3)**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/continuous_compounding/v/compound-interest-and-e-part-3)[**Compound interest and e (part 4)**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/continuous_compounding/v/compound-interest-and-e-part-4) |
| **Unit 5: Radical and Rational Functions** |
| **Activity 25***Square Root and Cube Root Functions** 1. Learning Targets:
* Graph and describe transformations of the square root function y=√x.
* Interpret key features of a graph that models a relationship between two quantities.

25-2 Learning Targets:* Solve square root equations.
* Identify extraneous solutions.
	1. Learning Targets:
* Graph transformations of the cube root function y=3√x*.* .
* Identify key features of a graph that models a relationship between two quantities.
	1. Learning Targets:
* Solve cube root equations.
* Check the reasonableness of solutions.
 | ***Graphing Radical Functions*** |
| [**Flipping and shifting radical functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/shifting-reflecting-functions/v/flipping-shifting-radical-functions)[**Matching radical functions with graphs exercise example**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/shifting-reflecting-functions/v/radical-function-graphs-exercise) |
| ***Solving Radical Equations*** |
| [**Equations for radical functions example**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/shifting-reflecting-functions/v/radical-functions-equations)[**Solving radical equations**](http://www.khanacademy.org/math/algebra/exponent-equations/radical_equations/v/solving-radical-equations)[**Solving radical equations 1**](http://www.khanacademy.org/math/algebra/exponent-equations/radical_equations/v/solving-radical-equations-1)[**Solving radical equations 2**](http://www.khanacademy.org/math/algebra/exponent-equations/radical_equations/v/solving-radical-equations-2)[**Solving radical equations 3**](http://www.khanacademy.org/math/algebra/exponent-equations/radical_equations/v/solving-radical-equations-3)[**Extraneous solutions to radical equations**](http://www.khanacademy.org/math/algebra/exponent-equations/radical_equations/v/extraneous-solutions-to-radical-equations) |
| ***Applying Radical Equations*** |
| [**Applying radical equations 1**](http://www.khanacademy.org/math/algebra/exponent-equations/radical_equations/v/applying-radical-equations-1)[**Applying radical equations 2**](http://www.khanacademy.org/math/algebra/exponent-equations/radical_equations/v/applying-radical-equations-2)[**Applying radical equations 3**](http://www.khanacademy.org/math/algebra/exponent-equations/radical_equations/v/applying-radical-equations-3) |
| **Activity 26***Inverses: Roots, Squares, and Cubes*26-1 Learning Targets:* Graph and write the inverse of square root functions.
* Find a square root model for a given table of data.

26-2 Learning Targets:* Graph and write the inverse of square root functions.
* Find the inverse relations of quadratic functions.

26-3 Learning Targets:* Graph and write the inverse of cube root functions.
* Find the inverse relations of cubic functions.
 | ***Inverse Functions*** |
| [**Introduction to function inverses**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_inverses_2/v/introduction-to-function-inverses)[**Function inverses example 2**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_inverses_2/v/function-inverses-example-2)[**Function inverses example 3**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_inverses_2/v/function-inverses-example-3) |
| **Activity 27***Introduction to Rational Functions*27-1 Learning Targets:* Formulate rational equations that model real-world situations.
* Graph equations on coordinate axes.

27-2 Learning Targets:* Formulate rational equations that model real-world situations.
* Graph equations on coordinate axes.

27-3 Learning Targets:* Determine the horizontal and vertical asymptotes of a rational function.
* Graph a rational function on the coordinate plane.
 | ***Graphs of Rational Functions*** |
| [**Matching rational functions to their graphs**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/example-rational-functions-graphs)[**Another rational function graph example**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/another-rational-function-graph-example)[**A third example of graphing a rational function**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/a-third-example-of-graphing-a-rational-function) |
| ***Asymptotes of Rational Functions*** |
| [**Asymptotes of rational functions**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/asymptotes-of-rational-functions)[**Horizontal and vertical asymptotes of function**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/horizontal-vertical-asymptotes) |
| **Activity 28***Inverse Variation and Rational Functions*28-1 Learning Targets:* Create, solve, and graph an equation involving inverse variation.
* Solve an equation involving combined variation.

28-2 Learning Targets:* Describe transformations of the parent function f(x)=1/*x* and sketch the graphs.
* Identify the x-intercepts, y-intercepts, and asymptotes of transformations of the parent function f(x)=1/x.
 | ***Direct and Inverse Variation*** |
| [**Direct and inverse variation**](http://www.khanacademy.org/math/algebra-basics/core-algebra-linear-equations-inequalities/core-algebra-direct_inverse_variation/v/direct-and-inverse-variation)[**Recognizing direct and inverse variation**](http://www.khanacademy.org/math/algebra-basics/core-algebra-linear-equations-inequalities/core-algebra-direct_inverse_variation/v/recognizing-direct-and-inverse-variation) |
| **Activity 29***Simplifying Rational Expressions*29-1 Learning Targets:* Simplify rational expressions.
* Multiply and divide rational expressions.

29-2 Learning Targets:* Add and subtract rational expressions.
* Simplify complex fractions.

29-3 Learning Targets:* Identify the vertical asymptotes of rational functions by finding the domain values that make the functions undefined.
* Use the degrees of the numerator and denominator of rational functions to identify the horizontal asymptotes.

29-4 Learning Targets:* Analyze and graph rational functions, identifying any asymptotes, intercepts, and holes.
* Analyze and graph rational functions representing real-world scenarios.
 | ***Multiplying and Dividing Rational Expressions*** |
| [**Simplifying rational expressions introduction**](http://www.khanacademy.org/math/algebra2/rational-expressions/simplifying-rational-alg/v/simplifying-rational-expressions-introduction)[**Simplifying rational expressions 1**](http://www.khanacademy.org/math/algebra2/rational-expressions/simplifying-rational-alg/v/simplifying-rational-expressions-1)[**Simplifying rational expressions 2**](http://www.khanacademy.org/math/algebra2/rational-expressions/simplifying-rational-alg/v/simplifying-rational-expressions-2)[**Simplifying rational expressions 2**](http://www.khanacademy.org/math/algebra2/rational-expressions/simplifying-rational-alg/v/simplifying-rational-expressions-example-2)[**Simplifying rational expressions 3**](http://www.khanacademy.org/math/algebra2/rational-expressions/simplifying-rational-alg/v/simplifying-rational-expressions-3) |
| [**Multiplying and simplifying rational expressions**](http://www.khanacademy.org/math/algebra2/rational-expressions/multi-div-rational-exp/v/multiplying-and-simplifying-rational-expressions)[**Multiplying and dividing rational expressions 1**](http://www.khanacademy.org/math/algebra2/rational-expressions/multi-div-rational-exp/v/multiplying-and-dividing-rational-expressions-1)[**Multiplying and dividing rational expressions 2**](http://www.khanacademy.org/math/algebra2/rational-expressions/multi-div-rational-exp/v/multiplying-and-dividing-rational-expressions-2)[**Multiplying and dividing rational expressions 3**](http://www.khanacademy.org/math/algebra2/rational-expressions/multi-div-rational-exp/v/multiplying-and-dividing-rational-expressions-3) |
| ***Adding and Subtracting Rational Expressions*** |
| [**Adding and subtracting rational expressions**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational_expressions/v/adding-and-subtracting-rational-expressions)[**Adding and subtracting rational expressions 2**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational_expressions/v/adding-and-subtracting-rational-expressions-2)[**Subtracting rational expressions**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational_expressions/v/subtracting-rational-expressions)[**Simplifying first for subtracting rational expressions**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational_expressions/v/simplifying-first-for-subtracting-rational-expressions)[**Rationalizing denominators of expressions**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational_expressions/v/rationalizing-denominators-of-expressions) |
| ***Finding Horizontal and Vertical Asymptotes*** |
| [**Asymptotes of rational functions**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/asymptotes-of-rational-functions)[**Horizontal and vertical asymptotes of function**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/horizontal-vertical-asymptotes) |
| ***Graphing Rational Functions*** |
| [**Matching rational functions to their graphs**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/example-rational-functions-graphs)[**Another rational function graph example**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/another-rational-function-graph-example)[**A third example of graphing a rational function**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/a-third-example-of-graphing-a-rational-function) |
| **Activity 30***Rational Equations and Inequalities*30-1 Learning Targets:* Solve rational equations, identifying any extraneous solutions.
* Create and solve rational equations that represent work problems.

30-2 Learning Targets:* Solve rational inequalities by graphing.
* Solve rational inequalities by finding the sign of the inequality on either side of the numerator and denominator zeros.
 | ***Solving Rational Equations***  |
| [**Ex 1: Multi step equation**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/ex-1-multi-step-equation)[**Rational equations**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/rational-equations)[**Solving rational equations 1**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/solving-rational-equations-1)[**Solving rational equations 2**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/solving-rational-equations-2)[**Solving rational equations 3**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/solving-rational-equations-3)[**Applying rational equations 1**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/applying-rational-equations-1)[**Applying rational equations 2**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/applying-rational-equations-2)[**Applying rational equations 3**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/applying-rational-equations-3)[**Extraneous solutions to rational equations**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/extraneous-solutions-to-rational-equations) |
| ***Solving Rational Inequalities***  |
| [**Rational inequalities**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/rational-inequalities)[**Rational inequalities 2**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/rational-inequalities-2) |
| **Unit 6: Trigonometry** |
| **Activity 31***Understanding Radian Measure*31-1 Learning Targets:* Develop formulas for the length of an arc.
* Describe radian measure.

31-2 Learning Targets:* Develop and apply formulas for the length of an arc.
* Apply radian measure.
 | ***Radian Measure*** |
| [**Introduction to radians**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/radians_tutorial/v/introduction-to-radians)[**Introduction to the unit circle**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/Trig-unit-circle/v/unit-circle-definition-of-trig-functions-1)[**Rotation by radians and quadrants**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/radians_tutorial/v/rotation-by-radians-and-quadrants) |
| ***Arc Length*** |
| [**Arc length as a fraction of circumference**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/radians_tutorial/v/arc-length-as-fraction-of-circumference)[**Finding arc length from radian angle measure**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/radians_tutorial/v/arc-length-from-angle-measure) |
| ***Radian and Degree Measure*** |
| [**Example: Radian measure and arc length**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/radians_tutorial/v/radian-measure-and-arc-length)[**Radians and degrees**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/radians_tutorial/v/radians-and-degrees)[**Example: Converting degrees to radians**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/radians_tutorial/v/we-converting-degrees-to-radians)[**Example: Converting radians to degrees**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/radians_tutorial/v/we-converting-radians-to-degrees)[**Radian and degree conversion practice**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/radians_tutorial/v/radian-and-degree-conversion-practice) |
| **Activity 32***Trigonometric Functions*32-1 Learning Targets:* Explore angles drawn in standard position on the coordinate plane.
* Find the sine of θ and the cosine of θ.

32-2 Learning Targets:* Find the sine of θ and the cosine of θ using special right triangles.
* Find the tan of θ.
 | ***The Unit Circle*** |
| [**Introduction to the unit circle**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/Trig-unit-circle/v/unit-circle-definition-of-trig-functions-1)[**Solving triangle in unit circle**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/trig-functions-special-angles/v/solving-triangle-unit-circle) |
| ***Trigonometric Ratios*** |
| [**Matching ratios to trig functions**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/Trig-unit-circle/v/matching-ratios-trig-functions) |
| **Activity 33***Trigonometric Identities: Pythagorean Connection*33-1 Learning Targets:* Prove the Pythagorean identity.
* Use the Pythagorean identity to find sin θ, cos θ, or tan θ, given the value of one of these functions and the quadrant of θ.

33-2 Learning Targets:* Define the three reciprocal trigonometric functions.
* Use the Pythagorean identity and the reciprocal trigonometric functions to prove other trigonometric identities.
 | ***Pythagorean Identities*** |
| [**Pythagorean trig identity from soh cah toa**](http://www.khanacademy.org/math/trigonometry/less-basic-trigonometry/pythagorean-identity/v/pythagorean-trig-identity-from-soh-cah-toa)[**Pythagorean trig identity from unit circle**](http://www.khanacademy.org/math/trigonometry/less-basic-trigonometry/pythagorean-identity/v/pythagorean-trig-identity-from-unit-circle)[**Using the Pythagorean trig identity**](http://www.khanacademy.org/math/trigonometry/less-basic-trigonometry/pythagorean-identity/v/using-the-pythagorean-trig-identity)[**Examples using pythagorean identities to simplify trigonometric expressions**](http://www.khanacademy.org/math/trigonometry/less-basic-trigonometry/pythagorean-identity/v/examples-using-pythagorean-identities-to-simplify-trigonometric-expressions) |
| ***Reciprocal Functions*** |
| [**Secant (sec), cosecant (csc) and cotangent (cot) example**](http://www.khanacademy.org/math/trigonometry/basic-trigonometry/reciprocal-trig-functions/v/example-the-six-trig-ratios)[**Example: Using trig to solve for missing information**](http://www.khanacademy.org/math/trigonometry/basic-trigonometry/reciprocal-trig-functions/v/example-using-trig-to-solve-for-missing-information) |
| **Activity 34***Graphs of Trigonometric Functions*34-1 Learning Targets:* Identify periodic functions.
* Find the period, midline, and amplitude of periodic functions.

34-2 Learning Targets:* Graph the sine function, y = a sin b x.
* Find the period, midline, and amplitude of sine functions.

34-3 Learning Targets:* Graph the cosine function, y = a cos bx.
* Find the period, midline, and amplitude of cosine functions.

34-4 Learning Targets:* Graph the tangent function, y = a tan b x.
* Find the period, and midline of tangent functions.

34-5 Learning Targets:* Describe and graph functions of the form y = a sin b(x − h) + k, y = a cos b(x − h) + k, and y = a tan b(x − h) + k.
* Find the period, amplitude, and midline of these trigonometric functions.
 | ***Periodic Functions*** |
| [**Midline, amplitude and period of a function**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/midline-amplitude-period)[**Example: Amplitude and period**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/we-amplitude-and-period)[**Plotting maxima, minima and midline intersections of trig function**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/plotting-trig-features) |
| ***Sine Function*** |
| [**Example: Graph, domain, and range of sine function**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/we-graph-domain-and-range-of-sine-function) |
| ***Cosine Function*** |
| [**Example: Graph of cosine**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/we-graph-of-cosine-function)[**Example: Intersection of sine and cosine**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/we-graphs-of-sine-and-cosine-functions) |
| ***Transformations*** |
| [**Example: Amplitude and period transformations**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/example-amplitude-and-period-transformations)[**Example: Amplitude and period cosine transformations**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/amplitude-and-period-cosine-transformations) |
| ***Tangent Function*** |
| [**Tangent graph**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/tangent-graph) |
| **Activity 35***Choosing Functions to Model Periodic Phenomena*35-1 Learning Targets:* Use trigonometric functions to model real-world periodic phenomena.
* Identify key features of these functions.
 | ***Modeling Periodic Phenomena*** |
| [**Modeling annual temperature variation with trigonometry**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/modeling-periodic-functions/v/modeling-temperature-fluxtuations)[**Applying inverse trig function with model**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/modeling-periodic-functions/v/inverse-trig-with-model)[**Modeling temperature through the day**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/modeling-periodic-functions/v/modeling-with-shifted-trig-functions)[**Day length in Alaska**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/modeling-periodic-functions/v/modeling-periodic-function-with-shift)[**Example: Figure out the trig function**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/matching-a-trigonometric-function-to-its-graph)[**Determining the equation of a trig function**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/trig-function-equation) |
| **Unit 7: Probability and Statistics** |
| **Activity 36***Normal Distribution*36-1 Learning Targets:* Represent distribution with appropriate data plots.
* Interpret shape of a distribution and relate shape to measures of center and spread.

36-2 Learning Targets:* Recognize characteristics of a normal distribution.
* Use mean and standard deviation to completely describe a normal distribution.

36-3 Learning Targets:* Estimate probabilities associated with z-scores using normal curve sketches.
* Determine probabilities for z-scores using a standard normal table.

36-4 Learning Targets:* Determine probabilities for z-scores using technology.
* Use a normal distribution, when appropriate, as a model for a population from which a sample of numeric data has been drawn.
 | ***Distribution*** |
| [**Comparing means of distributions**](http://www.khanacademy.org/math/probability/descriptive-statistics/central_tendency/v/comparing-distribution-means)[**Means and medians of different distributions**](http://www.khanacademy.org/math/probability/descriptive-statistics/central_tendency/v/comparing-means-and-medians) |
| ***Normal Distribution*** |
| [**Introduction to the normal distribution**](http://www.khanacademy.org/math/probability/statistics-inferential/normal_distribution/v/introduction-to-the-normal-distribution) [**normal distribution problems: Qualitative sense of normal distributions**](http://www.khanacademy.org/math/probability/statistics-inferential/normal_distribution/v/ck12-org-normal-distribution-problems-qualitative-sense-of-normal-distributions) |
| **Activity 37***Random Sampling*37-1 Learning Targets:* Explain why random sampling is advantageous when conducting a survey

37-2 Learning Targets:* Explain why random allocation of treatments is critical to a good experiment.

37-3 Learning Targets:* .Identify a confounding variable in an observational study.
 | ***Sampling*** |
| [**Introduction to random sampling**](http://www.khanacademy.org/math/recreational-math/math-warmup/random-sample-warmup/v/random-sample-warmup1)[**Random sampling intuition**](http://www.khanacademy.org/math/recreational-math/math-warmup/random-sample-warmup/v/random-sample-warmup2)[**Reasonable samples**](http://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-probability-statistics/cc-7th-population-sampling/v/reasonable-samples)[**Inferring population mean from sample mean**](http://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-probability-statistics/cc-7th-population-sampling/v/statistics-sample-vs-population-mean) |
| **Activity 38***Simulations* | **N/A** |
| **Activity 39***Margin of Error*39-1 Learning Targets:* Use margin of error in an estimate of a population proportion.
* Use simulation models for random samples.

39-2 Learning Targets:* Use margin of error in an estimate of a population proportion.
* Relate margin of error to the population proportion and to the sample size.
 | ***Error*** |
| [**Standard error of the mean**](http://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/standard-error-of-the-mean)[**Population standard deviation**](http://www.khanacademy.org/math/probability/descriptive-statistics/variance_std_deviation/v/population-standard-deviation)[**Sample standard deviation and bias**](http://www.khanacademy.org/math/probability/descriptive-statistics/variance_std_deviation/v/sample-standard-deviation-and-bias)[**Sampling distribution of the sample mean**](http://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/sampling-distribution-of-the-sample-mean)[**Sampling distribution of the sample mean 2**](http://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/sampling-distribution-of-the-sample-mean-2)[**Sampling distribution example problem**](http://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/sampling-distribution-example-problem) |
| **Activity 40***Designing and Conducting Simulations* | **N/A** |