Summer School CC Algebra 2A Curricular Map
Model and Reason with Equations/Inequalities and Expressions Structure

Week	Conceptual Category	CCSS-M Standards/Practices	Domains and Clusters	Resources
1	**Algebra** *Creating Equations*	A-CED.1-2 A-CED.3-4 **MP 1, 2, 3, 4, 7**	**Creating Equations** A-CED -Create equations that describe numbers or relationships	**Illustrative Mathematics** • Buying a Car: A-CED.1 • Dimes and Quarters: A-CED.2 & A-CED.3 • Equations and Formulas: A-CED.4
2	**Algebra** *Reasoning with Equations and Inequalities*	A-REI.2 A-REI.3.1 A-REI.11 **MP 1, 2, 3, 4, 7**	**Reasoning with Equations and Inequalities** A-REI -A-Understand solving equations as a process of reasoning and explain the reasoning; A-REI -B-Solve equations and inequalities in one variable (absolute value); A-REI -D-Represent and solve equations and inequalities graphically	**Illustrative Mathematics** • Radical Equations: A-REI.2 • Introduction to Polynomials - College Fund: A-REI.11 • Population and Food Supply: A-REI.2, 3, 11
3	**Algebra** *Seeing Structure in Expressions*	A-SSE.1-2 A-SSE.4 **MP 1, 2, 3, 4, 7**	**Seeing Structure in Expressions** A-SSE-A -Interpret the structure of expressions A-SSE-B- Write expressions in equivalent forms to solve problems	**Illustrative Mathematics** • Animal Populations: A-SSE.1, 2 • Sum of Even and Odd: A-SSE.2 • A Lifetime of Savings: A-SSE.4
4	**Algebra** *Arithmetic with Polynomials and Rational Expressions*	A-APR.1 A-APR.2-3 A-APR.4-5 A-APR.6-7 **MP 1, 2, 3, 4, 7**	**Arithmetic with Polynomials and Rational Expressions** A-APR-A -Perform arithmetic operations on polynomials; A-APR-B -Understand the relationship between zeros and factors of polynomials ; A-APR-C -Use polynomial identities to solve problems A-APR-D- Rewrite Rational Expressions	**Mathematics Assessment Project** • Representing Polynomials: A-APR • Zeroes and factorization of a quadratic polynomial I: A-APR.2
5	**Algebra** *Arithmetic with Polynomials and Rational Expressions*	A-APR.4-5 A-APR.6-7 **MP 1, 2, 3, 4, 7**	**Arithmetic with Polynomials and Rational Expressions** A-APR-C -Use polynomial identities to solve problems A-APR-D- Rewrite Rational Expressions	**Mathematics Assessment Project** Representing Polynomials: A-APR • Interpreting Algebraic Expressions: A-APR **LAUSD Mathematics website –** http://achieve.lausd.net/math • Parabola Activity

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Week	Domains	Clusters and Standards
1	*Creating Equations*	**Create equations that describe numbers or relationships** A-CED.1. Create equations and inequalities in one variable including ones with absolute value and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. CA ★ A-CED.2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. ★ A-CED.3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. A-CED.4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. ★
2	*Reasoning with Equations and Inequalities*	**Understand solving equations as a process of reasoning and explain the reasoning;** A-REI.2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. **Solve equations and inequalities in one variable (absolute value);** A-REI.3.1. Solve one-variable equations and inequalities involving absolute value, graphing the solutions and interpreting them in context. CA **Represent and solve equations and inequalities graphically** A-REI.11. Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. ★

3	*Seeing Structure in Equations*	**Interpret the structure of expressions**
		A-SSE.1. Interpret expressions that represent a quantity in terms of its context. ★
		   a. Interpret parts of an expression, such as terms, factors, and coefficients. ★
		   b. Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret $P(1 + r)^n$ as the product of P and a factor not depending on P.* ★
		A-SSE.2. Use the structure of an expression to identify ways to rewrite it.
		Write expressions in equivalent forms to solve problems
		A-SSE.4. Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. *For example, calculate mortgage payments.* ★*Seeing Structure in Equations*

★Indicates a modeling standard linking mathematics to everyday life, work, and decision-making.
(+) Indicates additional mathematics to prepare students for advanced courses.

Week	Domains	Clusters and Standards
4	*Arithmetic with Polynomials and Rational Expressions*	**Perform arithmetic operations on polynomials;** A-APR.1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. **Understand the relationship between zeros and factors of polynomials** A-APR.2. Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$. A-APR.3. Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial **Use polynomial identities to solve problems** **A-APR.4.** Prove polynomial identities and use them to describe numerical relationships. *For example, the polynomial identity $(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2$ can be used to generate Pythagorean triples* **A-APR.5.** Know and apply the Binomial Theorem for the expansion of $(x + y)^n$ in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle.**(+)** **Rewrite Rational Expressions** **A-APR.6.** Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system. **(+)A-APR.7.** Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.

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Week	Domains	Clusters and Standards
5	*Arithmetic with Polynomials and Rational Expressions*	**Use polynomial identities to solve problems** **A-APR.4.** Prove polynomial identities and use them to describe numerical relationships. *For example, the polynomial identity $(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2$ can be used to generate Pythagorean triples* **A-APR.5.** Know and apply the Binomial Theorem for the expansion of $(x + y)^n$ in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle.**(+)** **Rewrite Rational Expressions** **A-APR.6.** Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system. **(+)A-APR.7.** Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.

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Mathematical Practices

1.	Make sense of problems and persevere in solving them.
2.	Reason abstractly and quantitatively.
3.	Construct viable arguments and critique the reasoning of others.
4.	Model with mathematics.
5.	Use appropriate tools strategically.
6.	Attend to precision.
7.	Look for and make use of structure.
8.	Look for and express regularity in repeated reasoning.

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Resources

Illustrative Mathematics
- Buying a Car: A-CED.1
  http://www.illustrativemathematics.org/illustrations/582
- Basketball: A-CED.1 & A-REI.2   http://www.illustrativemathematics.org/illustrations/702
- How Much Folate: A-CED.2 http://www.illustrativemathematics.org/illustrations/1351
- Dimes and Quarters: A-CED.2 & A-CED.3 http://www.illustrativemathematics.org/illustrations/220
- Growing Coffee: A-CED.3 http://www.illustrativemathematics.org/illustrations/611
- Bernado and Sylvia Play a Game: A-CED.3 http://www.illustrativemathematics.org/illustrations/1010
- Clea on an Escalator: A-CED.2 http://www.illustrativemathematics.org/illustrations/1003
- Equations and Formulas: A-CED.4 http://www.illustrativemathematics.org/illustrations/393
- Radical Equations: A-REI.2 http://www.illustrativemathematics.org/illustrations/391
- Introduction to Polynomials - College Fund: A-REI.11 http://www.illustrativemathematics.org/illustrations/1551

Illustrative Mathematics
Growth Rate: Given growth charts for the heights of girls and boys, students will use slope to approximate rates of change in the height of boys and girls at different ages. Students will use these approximations to plot graphs of the rate of change of height vs. age for boys and girls.
http://illuminations.nctm.org/LessonDetail.aspx?id=L668

Mathematics Assessment Project
- Solving Linear Equations in two Variables: A-CED.2, 3; MP 2,3
  http://map.mathshell.org/materials/lessons.php?taskid=209#task209
- Optimization Problems: Boomerangs: A–CED.2; MP 1,2,3,4
  http://map.mathshell.org/materials/download.php?fileid=1241

Illustrative Mathematics
- Population and Food Supply : A-REI.2, 3, 11 http://www.illustrativemathematics.org/illustrations/645

NCTM Illuminations
- Trout Pond Population: A-CED.2. This investigation illustrates the use of iteration, recursion and algebra to model and analyze a changing fish population. Graphs, equations, tables, and technological tools are used to investigate the effect of varying parameters on the long-term population.

http://illuminations.nctm.org/LessonDetail.aspx?ID=L476

- Exploring Linear Data: A-CED.2. Students model linear data in a variety of settings that range from car repair costs to sports to medicine. Students work to construct scatterplots, interpret data points and trends, and investigate the notion of line of best fit.

http://illuminations.nctm.org/LessonDetail.aspx?id=L298

Illustrative Mathematics
- Animal Populations: A-SSE.1, 2 http://www.illustrativemathematics.org/illustrations/436
- Sum of Even and Odd: A-SSE.2
  http://www.illustrativemathematics.org/illustrations/198
- Seeing Dots: A-SSE.1, 2 http://www.illustrativemathematics.org/illustrations/21
- Zeroes and factorization of a quadratic polynomial I: A-APR.2
  http://www.illustrativemathematics.org/illustrations/787
- Zeroes and factorization of a quadratic polynomial II: A-APR.2
  http://www.illustrativemathematics.org/illustrations/789
- Zeroes and factorization of a non-polynomial function: A-SSE.2 http://www.illustrativemathematics.org/illustrations/796
- Trina's Triangles:A-SSE.4http://www.illustrativemathematics.org/illustrations/594

Egyptian Fraction II: A-SSE.6 http://www.illustrativemathematics.org/illustrations/1346

Illustrative Mathematics
- Course of Antibiotics: A-SSE.4 http://www.illustrativemathematics.org/illustrations/805
- Cantor Set: A-SSE.4 http://www.illustrativemathematics.org/illustrations/929
- A Lifetime of Savings: A-SSE.4 http://www.illustrativemathematics.org/illustrations/1283
- Combined Fuel Efficiency: A-SSE.6 http://www.illustrativemathematics.org/illustrations/825

Mathematics Assessment Project
Representing Polynomials: A-APR http://map.mathshell.org/materials/download.php?fileid=1271
Interpreting Algebraic Expressions: A-APR http://map.mathshell.org/materials/download.php?fileid=694

LAUSD Mathematics website – http://math.lausd.net
Parabola Activity