**Algebra I 1 year MAT 130**

 **(Common Core)**

**Resource(s) used:**

**Primary: Glencoe McGraw Hill Algebra I Common Core Edition Textbook**

**Secondary: eMathinstruction (online resources)**

**Secondary: EngageNY (online resources)**

The fundamental purpose of this course which is aligned with the content standards associated with the NYS Algebra I Common Core (CC) Learning Standards for Mathematics is to formalize and extend the mathematics that students learned in the middle school grades. The content standards define what students should understand and be able to do at the high school level; the Model Content Framework describes which content is included and emphasized within the Algebra 1 course, specifically. For high school mathematics, the standards are organized at three levels: conceptual categories, domains, and clusters. Common Core Algebra 1 is organized within four conceptual categories: Number & Quantity, Algebra, Functions, and Statistics & Probability. Each conceptual category contains domains of related clusters of standards. The lessons deepen and extend understanding of functions and students engage in methods for analyzing, solving, and using these functions in real world situations. The Mathematical Practice Standards apply throughout the course and, together with the contend standards, prescribe that students experience Mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations. A class period of instruction consists of 47 minutes each day, five days a week for a length of 40 weeks.

**Final Assessment:** Students will take the NYS Algebra I Common Core Regents Exam at the end of the year. Successful completion of one of the NYS Common Core Regents Exams is part of the requirement for High School graduation in NYS.

**10-Week Marking Period**

|  |  |  |
| --- | --- | --- |
| **Lesson** | **Topic(s)**  | **Common Core NY State Standards** |
|  | **CHAPTER 1 – EXPRESSIONS, EQUATIONS AND FUNCTIONS** |  |
| **1 – 1**  | Variables and Expressions | A.SSE.1a, A.SSE.2 |
| **1 – 2**  | Order of Operations | A.SSE.1b, A.SSE.2 |
| **1 – 3**  | Properties of Numbers | A.SSE.1b, A.SSE.2 |
| **1 – 4**  | The Distributive Property | A.SSE.1a, A.SSE.2 |
| **1 – 5**  | Equations | A.CED.1, A.REI.3 |
| **1 – 6**  | Relations | A.REI.10, A.REI.3 |
|  | **CHAPTER 2 – LINEAR EQUATIONS** |  |
| **2 – 1** | Writing Equations | A.CED.1 |
| **2 – 1**  | Explore – Solving Equations | A.REI.3 |
| **2 – 2**  | Solving One-Step Equations | A.REI.1, A.REI.3 |
| **2 – 3**  | Solving Multi-Step Equations | A.REI.1, A.REI.3 |
| **2 – 4**  | Solving Equations with the Variable on Each Side | A.REI.1, A.REI.3 |
| **2 – 5**  | Solving Equations Involving Absolute Value | A.REI.1, A.REI.3 |
| **2 – 6**  | Ratios and Proportions | A.REI.1, A.REI.3 |
| **2 – 8** | Literal Equations and Dimensional Analysis | A.CED.4, A.REI.3 |
|  | **CHAPTER 3 – LINEAR FUNCTIONS** |  |
| **3 – 1** | Graphing Linear Equations | F.IF.4, F.IF.7a |
| **3 – 2**  | Solving Linear Equations by Graphing | A.REI.10, F.IF.7a |
| **3 – 2** | Extend – Graphing Linear Functions | N.Q.1, F.IF.7a |
| **3 – 3** | Explore – Rate of Change of a Linear Function | F.IF.6, F.LE.1a |
| **3 – 3**  | Rate of Change and Slope | F.IF.6, F.LE.1a |
| **3 – 5**  | Arithmetic Sequences as Linear Functions | F.BF.2, F.LE.2 |
|  | **CHAPTER 4 – EQUATIONS OF LINEAR FUNCTIONS** |  |
| **4 – 1**  | Graphing Equations in Slope-Intercept Form | F.IF.7a, S.ID.7 |
| **4 – 1**  | Extend – The Family of Linear Graphs | F.BF.3, S.ID.7 |
| **4 – 2** | Writing Equations in Slope-Intercept Form | F.BF.1, F.LE.2 |
|  | **CHAPTER 5 – LINEAR INEQUALITIES** |  |
| **5 – 1** | Solving Inequalities by Addition and Subtraction | A.CED.1, A.REI.3 |
| **5 – 2** | Explore – Solving Inequalities | A.REI.3 |
| **5 – 2**  | Solving Inequalities by Multiplication and Division | A.CED.1, A.REI.3 |
| **5 – 3** | Solving Multi-Step Inequalities | A.CED.1, A.REI.3 |
| **5 – 4** | Solving Compound Inequalities | A.CED.1, A.REI.3 |
| **5 – 5**  | Inequalities Involving Absolute Value | A.CED.1, A.REI.3 |
| **5 – 6** | Graphing Inequalities in Two Variables  | A.CED.3, A.REI.12 |
|  | **CHAPTER 6 – SYSTEM OF LINEAR EQUATIONS AND INEQUALITIES** |  |
| **6 – 1** | Graphing Systems of Equations | A.CED.3, A.REI.6 |
| **6 – 2** | Substitution | A.CED.3, A.REI.6 |
| **6 – 3** | Elimination Using Addition and Subtraction | A.CED.2, A.REI.6 |
| **6 – 4**  | Elimination Using Multiplication | A.REI.5, A.REI.6 |
| **6 – 5**  | Applying Systems of Linear Equations | A.REI.6 |
| **6 – 5** | Extend – Using Matrices to Solve Systems of Equations | A.REI.6 |
| **6 – 6** | Systems of Inequalities | A.REI.12 |
| **6 – 6** | Extend – System of Inequalities  | A.REI.12 |
|  | **CHAPTER 7 – EXPONENTS AND EXPONENTIAL FUNCTIONS** |  |
| **7 – 1** | Multiplication Properties of Exponents |  |
| **7 – 3** | Rational Exponents |  |
| **7 – 5** | Explore – Family of Exponential Functions |  |
| **7 – 5** | Exponential Functions |  |
| **7 – 5**  | Extend – Solving Exponential Equations and Inequalities  |  |
| **7 – 6**  | Growth and Decay |  |
| **7 – 7** | Geometric Sequences as Exponential Functions |  |
| **7 – 7**  | Extend – Average Rate of Change of Exponential Functions |  |
| **7 – 8**  | Recursive Formulas  |  |
|  | **CHAPTER 8 – QUADRATIC EXPRESSIONS AND EQUATIONS** |  |
| **8 – 1**  | Adding and Subtracting Polynomials  | A.SSE.1a, A.APR.1 |
| **8 – 2**  | Multiplying a Polynomial by a Monomial  | A.APR.1 |
| **8 – 3** | Multiplying Polynomials | A.APR.1 |
| **8 – 4** | Special Products  | A.APR.1 |
| **8 – 5** | Explore – Factoring Using the Distributive Property | A.SSE.2 |
| **8 – 5** | Using the Distributive Property | A.SSE.2, A.SSE.3a |
| **8 – 5** | Explore – Factoring Trinomials  | A.SSE.2 |
| **8 – 6**  | Explore – Factoring Trinomials | A.SSE.3a, A.REI.4b |
| **8 – 7**  | Solving $x^{2}+bx+c=0$ | A.SSE.3a, A.REI.4b |
| **8 – 8**  | Solving $ax^{2}+bx+c=0$ | A.SSE.3a, A.REI.4b |
| **8 – 9**  | Perfect Squares | A.SSE.3a, A.REI.1 |
|  | **CHAPTER 9 – QUADRATIC FUNCTIONS AND EQUATIONS** |  |
| **9 – 1**  | Extend – Rate of Change of a Quadratic Function | F.IF.6 |
| **9 – 2**  | Solving Quadratic Equations by Graphing | A.REI.4b, F.IF.7a |
| **9 – 3**  | Explore – Family of Quadratic Functions | F.IF.7a, F.BF.3 |
| **9 – 3** | Transformations of Quadratic Functions | A.SSE.3b, F.IF.7a |
| **9 – 4**  | Solving Quadratic Equations by Completing the Square | A.REI.4, F.IF.8a |
| **9 – 4** | Extend – Finding the Maximum or Minimum Value | A.SSE.3b, F.IF.8a |
| **9 – 5**  | Solving Quadratic Equations by Using the Quadratic Formula | A.REI.4 |
| **9 – 6**  | Analyzing Functions with Successive Differences | F.IF.6, F.LE.1 |
| **9 – 7**  | Special Functions | F.IF.4, F.IF.7b |
|  | **CHAPTER 10 – RADICAL FUNCTIONS AND GEOMETRY**  |  |
| **10 – 1**  | Square Root Functions | F.IF.4, F.IF.7b |
| **10 – 1a**  | Cube Root Functions | F.IF.4, F.IF.7b |
| **10 – 1** | Extend – Graphing Square Root Functions | F.IF.7b |
| **10 – 2**  | Simplifying Radical Expressions | A.REI.4a |
| **10 – 2**  | Extend – Rational and Irrational Numbers | N.RN.3 |
|  | **CHAPTER 4 – EQUATIONS OF LINEAR FUNCTIONS****CHAPTER 12 – STATISTICS AND PROBABILITY** |  |
| **4 – 5**  | Scatter Plots and Lines of Fit | S.ID.6a, S.ID.6c |
| **4 – 6**  | Regression and Median-Fit Lines | S.ID.6, S.ID.8 |
| **12 – 2**  | Statistics and Parameters | S.ID.2 |
| **12 – 3**  | Distributions of Data | S.ID.2, S.ID.3 |
| **12 – 4**  | Comparing Sets of Data | S.ID.2, S.ID.3 |

**Algebra I 1 year MAT 130**

 **(Common Core)**

**Resource(s) used:**

**Primary: eMathinstruction (online resources)**

**Secondary: Glencoe McGraw Hill Algebra I Common Core Edition Textbook**

**Secondary: EngageNY (online resources)**

**10-Week Marking Period**

|  |  |  |
| --- | --- | --- |
| **Lesson** | **Topic(s)**  | **Common Core NY State Standards** |
|  | **UNIT 1 – THE BUILDING BLOCKS OF ALGEBRA****11 LESSONS** |  |
| **1** | Rates, Patterns and Problem Solving  | **N.Q.1, A.CED.2** |
| **2** | Variables and Expressions | **A.REI.1** |
| **3** | The Commutative and Associative Properties | **A.REI.1** |
| **4** | The Distributive Property  | **A.REI.1** |
| **5** | Equivalent Expressions | **A.REI.1** |
| **6** | Seeing Structure in Expressions | **A.SSE.1.b, A.SSE.2** |
| **7** | Exponents as Repeated Multiplication | **A.SSE.3c** |
| **8** | More Complex Equivalency  | **A.REI.1** |
| **9**  | More Structure Work | **A.SSE.1b, A.SSE.2** |
| **10** | Translating English to Algebra | **A.CED.1** |
| **11** | Algebraic Puzzles | **A.SSE.1b** |
|  | **UNIT 2 – LINEAR EXPRESSIONS, EQUATIONS AND INEQUALITIES** **13 LESSONS** |  |
| **1** | Equations and Their Solutions | **A.REI.3** |
| **2** | Seeing Structure to Solve Equations | **A.SSE.1b, A.REI.3** |
| **3** | A Linear Equation Solving Review | **A.CED.3, A.REI.3** |
| **4** | Justifying Steps in Solving an Equation | **A.CED.3, A.REI.3** |
| **5** | Linear Word Problems | **A.CED.1, A.REI.3** |
| **6** | More Linear Equations and Consecutive Integer Games | **A.CED.1, A.REI.3** |
| **7** | Solving Linear Equations with Unspecified Constants | **A.CED.4, A.REI.3** |
| **8** | Inequalities | **A.CED.1, A.CED.3, A.REI.3** |
| **9** | Solving Linear Inequalities  | **A.REI.3** |
| **10** | Compound Inequalities | **A.REI.3** |
| **11** | More Work with Compound Inequalities  | **A.REI.3** |
| **12** | Interval Notation | **A.REI.3** |
| **13** | Modeling with Inequalities  | **A.CED.1, A.REI.3** |
|  | **UNIT 3 – FUNCTIONS****7 LESSONS**  |  |
| **1** | Introduction to Functions | **F.IF.1** |
| **2** | Function Notation | **F.IF.1, F.IF.2** |
| **3** | Graphs of Functions | **F.IF.1, F.IF.2, F.IF.7a** |
| **4** | Graphical Features | **F.IF.1, F.IF.2, F.IF.4, F.IF.7b** |
| **5** | Exploring Functions Using the Graphing Calculator | **F.IF.1, F.IF.2, F.IF.4** |
| **6** | Average Rate of Change | **N.Q.1, F.IF.1, F.IF.2, F.IF.6** |
| **7** | The Domain and Range of a Function | **F.IF.1, F.IF.2, F.IF.5, F.IF.6** |
|  | **UNIT 4 – LINEAR FUNCTIONS AND ARITHEMETIC SEQUENCES** **13 LESSONS**  |  |
| **1** | Proportional Relationships  | **A.CED.2, F.IF.7a** |
| **2** | Unit Conversions  | **N.Q.1** |
| **3** | Nonproportional Linear Relationships  | **A.CED.2, F.IF.6, F.IF.7a, F.LE.1a** |
| **4** | More Work Graphing Linear Functions | **F.IF.7a, F.LE.1a** |
| **5** | Writing Equations in Slope-Intercept Form | **A.CED.2, F.LE.2** |
| **6** | Modeling with Linear Functions | **N.Q.2, A.CED.2, F.IF.5, F.IF.7a, F.BF.1a, F.LE.1b, F.LE.2, F.LE.5** |
| **7** | More Linear Modeling  | **N.Q.2, A.SSE.1a, A.CED.2, F.IF.6, F.BF.1a, F.LE.1b, F.LE.2, F.LE.5** |
| **8** | Strange Lines – Vertical and Horizontal  | **A.CED.3, F.IF.7** |
| **9** | Absolute Value and Step Functions | **F.IF.4, F.IF.7b** |
| **10** |  The Truth About Graphs  | **A.REI.10** |
| **11** | Graphs of Linear Inequalities  | **A.REI.12** |
| **12** | Introduction to Sequences  | **F.IF.3, F.BF.1a** |
| **13** | Arithmetic Sequences  | **F.IF.3, F.BF.1a, F.LE.2** |
|  | **UNIT 5 – SYSTEMS OF LINEAR EQUATIONS AND INEQUALITIES** **8 LESSONS** |  |
| **1** | Solutions to Systems and Solving by Graphing  | **A.CED.2, A.REI.6, A.REI.10** |
| **2** | Solving Systems by Substitution | **A.REI.6** |
| **3** | Properties of Systems and Their Solutions | **A.REI.5, A.REI.6** |
| **4** | The Elimination Method | **A.REI.6** |
| **5** | Modeling with Systems of Equations  | **A.CED.3, A.REI.6** |
| **6** | Solving Equations Graphically  | **A.REI.11** |
| **7** | Solving Systems of Inequalities  | **A.REI.12** |
| **8** | Modeling with Systems of Inequalities  | **A.CED.3, A.REI.12** |
|  | **UNIT 6 – EXPONENTS, EXPONENTS AND MORE EXPONENTS** **9 LESSONS**  |  |
| **1** | Simplifying Expressions Involving Exponents  | **A.SSE.3c** |
| **2** | Zero and Negative Exponents  | **A.SSE.3c** |
| **3** | Exponential Growth  | **A.CED.2, F.IF.5, F.BF.1a, F.LE.1c, F.LE.2** |
| **4** | Introduction to Exponential Functions | **F.IF.6, F.LE.1c** |
| **5** | Percent Review | **A.CED.1, F.LE.1c, F.LE.2, F.LE.5** |
| **6** | Percent Increase and Decrease | **F.LE.2, F.LE.3, F.LE.5** |
| **7** | Exponential Models Based on Percent Growth  | **N.Q.2, A.SSE.1a, A.CED.1, A.CED.2, F.IF.6, F.LE.1a, F.LE.1c, F.LE.2** |
| **8** | Linear Versus Exponential  | **A.CED.2, F.IF.6, F.BF.1a, F.LE.1a, F.LE.1b, F.LE.1c, F.LE.2** |
| **9** | Geometric Sequences  | **A.CED.3, F.IF.3, F.BF.1a, F.LE.2** |
|  | **UNIT 7 – POLYNOMIALS** **6 LESSSONS**  |  |
| **1** | Introduction to Polynomials | **A.APR.1** |
| **2** | Multiplying Polynomials | **A.APR.1** |
| **3** | Factoring Polynomials | **A.SSE.1a, A.SSE.1b, A.SSE.2** |
| **4** | Factoring Based on Conjugate Pairs | **A.SSE.2** |
| **5** | Factoring Trinomials | **A.SSE.2** |
| **6** | More Work Factoring Trinomials  | **A.SSE.2** |
|  | **UNIT 8 – QUADRATIC FUNCTIONS AND THEIR ALGEBRA****7 LESSONS**  |  |
| **1** | Introduction to Quadratic Functions | **A.CED.3, F.IF.4, F.IF.7a** |
| **2** | More Work with Parabolas | **F.IF.7a** |
| **3** | The Shifted Form of a Parabola | **F.IF.7a, F.BF.3** |
| **4** | Completing the Square | **A.SSE.3b, F.IF.8a, F.IF.9, F.BF.3** |
| **5** | Stretching Parabolas and More Completing the Square | **A.SSE.3b, F.IF.8a, F.BF.3** |
| **6** | The Zeros of a Quadratic  | **A.SSE.3a, A.APR.3, A.REI.4b, F.IF.8a** |
| **7** | More Zero Product Law Work | **A.SSE.3a, A.APR.3, A.REI.4b** |
| **8** | Quadratic Word Problems | **A.SSE.3a, A.CED.1, A.REI.4b** |
|  | **UNIT 9 – ROOTS AND IRRATIONAL NUMBERS** **8 LESSONS**  |  |
| **1** | Square Roots | **N.RN.3, I.IF.7b** |
| **2** | Irrational Numbers  | **N.RN.3** |
| **3** | Square Root Functions and Shifting  | **F.IF.1, F.IF.7b, F.BF.3** |
| **4** | Solving Quadratics Using Inverse Operations | **A.SSE.1b, A.REI.4b** |
| **5** | Finding Zeros by Completing the Square | **N.RN.3, A.SSE.1b, A.REI.4a, A.REI.4b** |
| **6** | The Quadratic Formula | **A.REI.4a, A.REI.4b** |
| **7** | Final Work with Quadratic Functions | **A.SSE.3a, A.REI.4a, A.REI.4b** |
| **8** | Cube Roots  | **F.IF.1, F.IF.6, F.IF.7b, F.BF.3** |
|  | **UNIT 10 – STATISTICS****10 LESSONS** |  |
| **1** | Graphical Displays of Data | **N.Q.1, S.ID.1, S.ID.3** |
| **2** | Quartiles and Box Plots  | **S.Q.1, S.ID.1, S.ID.2, S.ID.3** |
| **3** | Measures of Central Tendency  | **N.Q.2, S.ID.2, S.ID.3** |
| **4** | Variation within a Data Set | **N.Q.2, S.ID.2, S.ID.3** |
| **5** | Two Way Frequency Tables | **S.ID.5** |
| **6** | Bivariate Data Analysis  | **S.ID.6a, S.ID.6c, S.ID.9** |
| **7** | Linear Regression on the Calculator | **S.ID.6a, S.ID.6c, S.ID7, S.ID.9** |
| **8** | Other Types of Regression | **S.ID.6a** |
| **9** | Quantifying Predictability  | **S.ID.6a, S.ID.6c, S.ID.8** |
| **10** | Residuals  | **S.ID.6a, S.ID.6c, S.ID.8** |
|  | **UNIT 11 – A FINAL LOOK AT FUNCTIONS AND MODELING** **8 LESSONS** |  |
| **1** | Function Transformations | **F.IF.1, F.BF.3** |
| **2** | Horizontal Stretching of Functions | **F.BF.3** |
| **3** | Discrete Functions | **A.CED.3, F.IF.5** |
| **4** | Another Look at Linear and Exponential Models | **F.LE.1a, F.LE.1b, F.LE.1c, F.LE.5, S.ID.6a, S.ID.6b, S.ID.6c** |
| **5** | Step Functions Revisited | **F.IF.7b** |
| **6** | Piecewise Linear Functions | **A.CED.3, F.IF.6, F.IF.7b** |
| **7** | Quadratic Models | **N.Q.2** |
| **8** | Limits on the Accuracy of Our Models | **N.Q.3** |