## Baldwin Union Free Schools District

## Algebra 2 Scope and Sequence (Common Core)

July 2018

Module 1<br>Module 2<br>Module 3<br>Module 4

## Curriculum Writers

Administration
Lok H. Yung, Mathematics Supervisor 6-12

Teachers
Stacey Levine, Mathematics teacher
Sandra Pionegro, Mathematics teacher

| Module 1: Polynomial, Rational, and Radical Relationships - days |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Sub-Topics | Specific Topics | Common Core Standards | Resources | Days |
| Polynomials From Base Ten to Base X | - Successive Differences in <br> Polynomials <br> - The Multiplication of Polynomials <br> - The Division of Polynomials <br> - Comparing Methods-Long Division, Again? <br> - Putting It All Together <br> Dividing by $\mathrm{x}-\mathrm{a}$ and by $\mathrm{x}+\mathrm{a}$ <br> - Radicals and Conjugates <br> - The Power of Algebra-Finding Pythagorean Triples <br> - The Special Role of Zero in Factoring | A-SSE.A.2, <br> A-APR.C. 4 | https://www.khanacademy.org/math/algebra2/a rithmetic-with-polynomials/long-division-of-po lynomials/v/polynomial-division <br> https://www.khanacademy.org/math/algebra2/a rithmetic-with-polynomials/long-division-of-po lynomials/v/dividing-polynomials-1 <br> https://www.kutasoftware.com/freeia2.html <br> https://www.emathinstruction.com/wp-content/ uploads/2015/08/CCAlgII-U1L5-Multiplying-P olynomials.pdf <br> https://www.emathinstruction.com/wp-content/ uploads/2015/08/CCAlgII-U10L10-Polynomial -Long-Division.pdf <br> http://www.jmap.org/JMAP_RESOURCES_B Y TOPIC.htm\#AII | 15 |
| Factoring - Its Use and Its Obstacles | Overcoming Obstacles in Factoring - Mastering Factoring <br> - Graphing Factored Polynomials <br> - Structure in Graphs of Polynomial Functions <br> - Modeling with Polynomials-An Introduction <br> - Overcoming a Second Obstacle in Factoring-What If There Is a Remainder? | N-Q.A.2, <br> A-SSE.A.2, <br> A-APR.B.2, <br> A-APR.B.3, <br> A-APR.D.6, <br> F-IF.C.7c | http://www.jmap.org/JMAP RESOURCES B Y_TOPIC.htm\#AII <br> https://www.kutasoftware.com/freeia2.html <br> https://www.emathinstruction.com/wp-content/ uploads/2015/08/CCAlgII-U8L6-The-Quadrati c-Formula.pdf <br> https://www.emathinstruction.com/common-co | 21 |


|  | - The Remainder Theorem |  | re-algebra-ii/unit-10-polynomial-and-rational-f unctions/ <br> https://www.khanacademy.org/math/algebra2/p olynomial-functions/graphs-of-polynomials/a/g raphs-of-polynomials <br> https://www.cliffsnotes.com/study-guides/alge bra/algebra-ii/polynomial-functions/graphing-p olynomial-functions <br> http://www.sps 186.org/downloads/basic/12397 /SSAlg2Week4Day4.pdf <br> https://www.mgccc.edu/learning_lab/math/alg/ synthdiv.pdf |  |
| :---: | :---: | :---: | :---: | :---: |
| Solving and Applying Equations Polynomial, Rational, and Radical | Equivalent Rational Expressions <br> Comparing Rational Expressions <br> Multiplying and Dividing Rational <br> Expressions <br> - Adding and Subtracting Rational Expressions <br> - Solving Rational Equations <br> - Word Problems Leading to Rational Equations <br> - A Focus on Square Roots <br> - Solving Radical Equations <br> Linear Systems in Three Variables <br> - Systems of Equations <br> Graphing Systems of Equations <br> The Definition of a Parabola <br> - Are All Parabolas Congruent? <br> - Are All Parabolas Similar? | A-APR.D.6, <br> A-REI.A.1, <br> A-REI.A.2, <br> A-REI.B.4b, <br> A-REI.C.6, <br> A-REI.C.7, <br> G-GPE.A. 2 | https://www.khanacademy.org/math/algebra2/i ntro-to-conics-alg2/focus-and-directrix-of-a-pa rabola-alg2/v/focus-and-directrix-introduction <br> https://www.emathinstruction.com/common-co re-algebra-ii/unit-10-polynomial-and-rational-f unctions/ <br> https://cdn.kutasoftware.com/Worksheets/Alg2 /Complex\%20Fractions.pdf <br> https://cdn.kutasoftware.com/Worksheets/Alg2 /Vertex\%20Form\%20of\%20Parabolas.pdf <br> https://www.mathopenref.com/parabolafd.html | 23 |


| A Surprise from Geometry Complex Numbers Overcome All Obstacles | - Complex Numbers as Solutions to Equations <br> - Factoring Extended to the Complex Realm | N-CN.A.1, <br> N-CN.A.2, <br> N-CN.C.7, <br> A-REI.A.2, <br> A-REI.B.4b, <br> A-REI.C. 7 | https://cdn.kutasoftware.com/Worksheets/Alg2 /Operations\%20with\%20Complex\%20Number s.pdf <br> https://cdn.kutasoftware.com/Worksheets/Alg2 Rationalizing\%20Imaginary\%20Denominators .pdf <br> https://www.emathinstruction.com/common-co re-algebra-ii/unit-9-complex-numbers/ | 4 |
| :---: | :---: | :---: | :---: | :---: |
| Review-Test-Reflect - 9 days Test \#-7 Total days |  |  |  |  |
| Module 2: Trigonometric Functions - days |  |  |  |  |
| Sub-Topics | Specific Topics | Common Core Standards | Resources *unit will be done out of order | Days |
| The Story of Trigonometry and Its Contexts | - From Circle-ometry to Trigonometry <br> Extending the Domain of Sine and Cosine to All Real Numbers <br> - Why Call It Tangent? <br> - Secant and the Co-Functions <br> Graphing the Sine and Cosine Functions <br> - Awkward! Who Chose the Number 360, Anyway? <br> - Basic Trigonometric Identities from Graphs | F-IF.C.7e, <br> F-TF.A.1, <br> F-TF.A. 2 | https://ginomath.wordpress.com/2018/04/03/tri gonometry-i-2/ <br> https://www.emathinstruction.com/common-co re-algebra-ii/unit-11-the-circular-functions/ (lessons 1-5) <br> https://www.ixl.com/math/algebra-2 <br> (Angle measures X. 1 - X.6, Trigonometry Y.3-Y.11) <br> https://mathbitsnotebook.com/Algebra2/TrigCo ncepts/TCoutline.html <br> https://www.khanacademy.org/math/trigonome try | 10 |


| Understanding <br> Trigonometric Functions and Putting Them to Use | - Transforming the Graph of the Sine Function <br> - Using Trigonometric Functions to Model Cyclical Behavior <br> Graphing the Tangent Function <br> - What Is a Trigonometric Identity? <br> - Proving Trigonometric Identities | F-IF.C.7e, <br> F-TF.B.5, <br> F-TF.C.8, <br> S.ID.B.6a | https://ginomath.wordpress.com/2018/04/17/tri gonometry-ii-2/ <br> https://www.emathinstruction.com/common-co re-algebra-ii/unit-11-the-circular-functions/ (lessons 6-11) <br> https://www.ixl.com/math/algebra-2 <br> (Trigonometric Functions Z.1-Z.9) <br> https://mathbitsnotebook.com/Algebra2/TrigGr aphs/TGoutline.html | 6 |
| :---: | :---: | :---: | :---: | :---: |
| Review-Test-Reflect- 3 days Test \#-2 Total days |  |  |  |  |
| Module 3: Exponential and Logarithmic Functions - days |  |  |  |  |
| Sub-Topics | Specific Topics | Common Core Standards | Resources | Days |
| Real Numbers | - Integer Exponents <br> Base 10 and Scientific Notation <br> - Rational Exponents-What are $2^{\wedge}(1 / 2)$ and $2^{\wedge}(1 / 3)$ ? <br> - Properties of Exponents and Radicals <br> - Irrational Exponents-What are $2^{\wedge} \sqrt{2}$ and $2^{\wedge} \pi$ ? <br> - Euler's Number, e | N-RN.A.1, <br> N-RN.A.2, <br> N-Q.A.2, <br> F-IF.B.6, <br> F-BF.A.1a, <br> F-LE.A. 2 | https://www.khanacademy.org/math/pre-algebr a/pre-algebra-exponents-radicals/pre-algebra-e xponents/a/exponents-review <br> https://mcckc.edu/tutoring/docs/br/math/expon logar/Exponent Rules Practice.pdf <br> https://cdn.kutasoftware.com/Worksheets/Alg1 /Writing\%20Scientific\%20Notation.pdf <br> http://www.mathwarehouse.com/algebra/expon ents/fraction-exponents/formula-examples-sim plify-exponents-with-fractions.php | 5 |


| Logarithms | Bacteria and Exponential Growth <br> - The "WhatPower" Function <br> $\square$ Building Logarithmic Tables <br> - The Most Important Property of Logarithms <br> - Properties of Logarithms <br> - Changing the Base <br> - Solving Logarithmic Equations | $\begin{aligned} & \text { N-Q.A.2, } \\ & \text { A-CED.A.1, } \\ & \text { F-BF.A.1a, } \\ & \text { F-LE.A. } 4 \end{aligned}$ | https://www.emathinstruction.com/common-co <br> re-algebra-ii/unit-4-exponential-and-logarithmi <br> c-functions/ <br> (lessons 8-11) <br> https://www.khanacademy.org/search?page_se arch_query=logarithmic\%20and\%20exponenti al\%20functions <br> https://www.ixl.com/math/algebra-2 <br> (Exponential and Log Functions R. 1 - R.11) | 7 |
| :---: | :---: | :---: | :---: | :---: |
| Exponential and Logarithmic Functions and their Graphs | - Graphs of Exponential Functions and Logarithmic Functions <br> $\square$ The Inverse Relationship Between Logarithmic and Exponential Functions <br> - Transformations of the Graphs of Logarithmic and Exponential Functions <br> - Choosing a Model | F-IF.B.4, <br> F-IF.B.5, <br> F-IF.C.7e, <br> F-BF.A.1a, <br> F-BF.B.3, <br> F-BF.B.4a, <br> F-LE.A.2, <br> F-LE.A. 4 | https://www.ix1.com/math/algebra-2 <br> (S.1-S.8) <br> https://www.khanacademy.org/search?page se arch_query=logarithmic\%20and\%20exponenti al\%20functions <br> https://www.emathinstruction.com/wp-content/ uploads/2015/08/CCAlgII-U3L5-Inverses-of-L inear-Functions.pdf | 4 |
| Using Logarithms in Modeling Situations | - Solving Exponential Equations <br> - Percent Rate of Change <br> - Modeling with Exponential Functions <br> - Newton's Law of Cooling, Revisited | A-SSE.B.3c, A-CED.A.1, A-REI.D.11, F-IF.A.3, F-IF.B.6, F-IF.C.8b, F-IF.C.9, F-BF.A.1a, F-BF.A.1b, F-BF.A.2, F-BF.B.4a, F-LE.A.4, F-LE.B. 5 | https://www.emathinstruction.com/wp-content/ uploads/2015/08/CCAlgII-U4L7-Mindful-Perc ent-Manipulation.pdf <br> https://www.emathinstruction.com/wp-content/ uploads/2015/08/CCAlgII-U4L13-Compound-I nterest.pdf <br> https://www.emathinstruction.com/wp-content/ uploads/2015/08/CCAlgII-U4L14-Newtons-La w-of-Cooling.pdf | 4 |


| Geometric Series and Finance | - Geometric Sequences and Exponential Growth and Decay <br> - The Mathematics Behind a Structured Savings Plan <br> - Buying a Car <br> - Credit Cards <br> - Buying a House <br> - The Million Dollar Problem | A-SSE.B.4, <br> F-IF.C.7e, <br> F-IF.C.8b, <br> F-IF.C.9, <br> F-BF.A.1b, <br> F.BF.A.2, <br> F-LE.B. 5 | https://ginomath.wordpress.com/2018/03/13/ge ometric-series-word-problems/ <br> https://www.ixl.com/math/algebra-2 $\text { BB.1-BB. } 12$ | 5 |
| :---: | :---: | :---: | :---: | :---: |
| Test and Review - 2 days Test \#-2 Total days |  |  |  |  |
| Module 4: Inferences and Conclusions from Data - days |  |  |  |  |
| Sub-Topics | Specific Topics | Common Core Standards | Resources | Days |
| Probability | - Calculating Probabilities of Events Using Two-Way Tables. <br> - Calculating Conditional Probabilities and Evaluating Independence Using Two-Way Tables. <br> - Events and Venn Diagrams - Probability Rules | $\begin{aligned} & \text { S-IC.A.2, } \\ & \text { S-CP.A.1, } \\ & \text { S-CP.A.2, } \\ & \text { S-CP.A.3, } \\ & \text { S-CP.A.4, } \\ & \text { S-CP.A.5, } \\ & \text { S-CP.B.6, } \\ & \text { S-CP.B. } 7 \end{aligned}$ | https://www.emathinstruction.com/common-co re-algebra-ii/unit-12-probability/ <br> https://ginomath.wordpress.com/2018/05/01/pr obability-3/ <br> https://www.khanacademy.org/search?search a gain=1\&page_search_query=algebra $+2+$ proba bility <br> https://www.ixl.com/math/algebra-2 <br> CC. 1 - CC. 12 | 6 |
| Modeling Data Distributions | - Distributions-Center, Shape, and Spread <br> - Using a Curve to Model a Data Distribution <br> - Normal Distributions | S-ID.A. 4 | https://ginomath.wordpress.com/2018/05/14/sta tistics-2/ <br> https://www.emathinstruction.com/common-co re-algebra-ii/unit-13-statistics/ <br> (Lessons 3-4) | 3 |


| Drawing Conclusions Using Data from a Sample | - Types of Statistical Studies <br> - Using Sample Data to Estimate a <br> Population Characteristic <br> - Sampling Variability in the Sample Proportion. <br> - Margin of Error When Estimating a Population Proportion <br> - Sampling Variability in the Sample Mean <br> - Margin of Error When Estimating a Population Mean <br> - Evaluating Reports Based on Data from a Sample | $\begin{aligned} & \text { S-IC.A.1, } \\ & \text { S-IC.B.3, } \\ & \text { S-IC.B.4, } \\ & \text { S-IC.B.6 } \end{aligned}$ | https://ginomath.wordpress.com/2018/05/14/sta tistics-2/ <br> https://www.emathinstruction.com/common-co <br> re-algebra-ii/unit-13-statistics/ <br> (Lessons 5-10) <br> https://mathbitsnotebook.com/Algebra2/Statisti cs/SToutline.html <br> https://www.youtube.com/watch?v=qtgzjfySU XS | 4 |
| :---: | :---: | :---: | :---: | :---: |
| Drawing Conclusions Using Data from an Experiment | - Experiments and the Role of Random Assignment <br> - Differences Due to Random Assignment Alone | $\begin{aligned} & \text { S-IC.B.3, } \\ & \text { S-IC.B.5, } \\ & \text { S-IC.B.6) } \end{aligned}$ | https://ginomath.wordpress.com/2018/05/14/sta tistics-2/ | 1 |
| Review and Test - 2 days Test \#-2 Total days |  |  |  |  |
| MP1 Quarterly: 3 Review 1 Test <br> Midterm: 3 Review <br> MP3 Quarterly 3 Review 1 Test <br> REGENTS REVIEW: 15 approximately days |  |  |  |  |

