Essential Standards are in Bold. All others should be taught as well.

2020-2021 Integrated Math II Curriculum Guide

Course Overview:

Integrated Math II builds upon concepts taught in Integrated Math I with an emphasis on quadratic and polynomial expressions, equations, and functions. This course also focuses on geometric similarity and interpreting functions from a real-life context. Students extend previous knowledge of exponential properties to rational exponents. This course also introduces probability of compound events and the complex number system.

Standards for Mathematical Practice:

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.
   Standards indicated with a star (★) are modeling standards.
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.

Literacy Standards for Mathematical Proficiency:

1. Use Multiple Reading Strategies.
2. Understand and use correct mathematical vocabulary.
3. Discuss and articulate mathematical ideas.
4. Write mathematical arguments.

ACT Standard Score Ranges

ACT Connection	200 level	300 level	400 level	500 level	600 level	700 level
ACT Score Range	13-15	16-19	20-23	24-27	28-32	33-36

TNReady Sub-Score Category for Integrated Math II

Structure and Operations	Equations and Inequalities	Functions	Geometry and Interpreting Data
29-34%	16-25%	13-17%	20-25%

53-64 Total Items

Standards that should transcend the entire course:

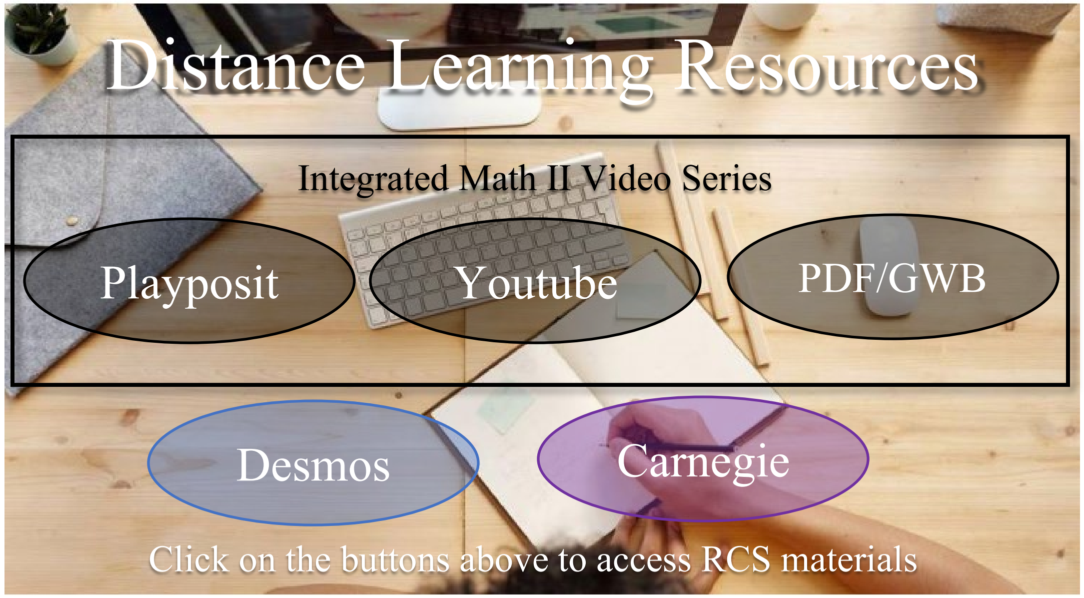
M2.A.CED.A.3 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

M2.A.REI.A.1 Explain each step in solving an equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

M2.N.Q.A.1 Identify, interpret, and justify appropriate quantities for the purpose of descriptive modeling.

Simplifying Square Roots

<u>Essential</u> Standards are in Bold. All others should be taught as well.



1st Quarter

<table>
<tr><th colspan="4">Unit 1 - Functions Derived from Linear Relationships</th></tr>
<tr><td colspan="4">Unit Overview: In this unit students should work with piecewise functions, including absolute value and step functions. Students should see how these function types model real-world situations and be able to interpret these graphs within their context. This unit is limited to the graphs of piecewise functions and does not include writing piecewise functions with multiple parts in function notation. However, students should work heavily with writing and graphing absolute value functions with various transformations. This will lead in nicely to transformations with quadratic functions in the next unit. Consider starting to simplify square roots through bellwork and other activities.</td></tr>
<tr><td colspan="2">Approximate Timeline</td><td>Carnegie Resources</td><td>TNReady Released Problems</td></tr>
<tr><td colspan="2">2 weeks
August 10 – August 21</td><td>Module 3, Topic 1, Lessons 1-4 (omit 2)</td><td>Click Here for Problems</td></tr>
<tr><td>Week</td><td colspan="2">Standards</td><td>Resources</td></tr>
<tr><td>August 10 – 14</td><td colspan="2">M2.F.IF.A.1 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities and sketch graphs showing key features given a verbal description of the relationship. ★</td><td>Video: Introduction
Video: Key Features of Graphs
Video: Function Types
Video: Graphing Piecewise Functions</td></tr>
</table>

	M2.F.IF.B.4 Graph functions expressed symbolically and show key features of the graph, by hand and using technology.★ b. Graph square root, cube root, and <u>piecewise-defined</u> functions, including <u>step functions</u> and <u>absolute value</u> functions.	Graphing Stories Better Lessons: Piecewise Functions Piecewise Functions Desmos – Polygraph: Absolute Value Desmos – Absolute Value Inequalities (If time)
August 17 - 21	M2.F.BF.B.2 Identify the effect on the graph of replacing *f(x)* by *f(x) + k*, *kf(x)*, *f(kx)*, and *f(x + k)* for specific values of k (both positive and negative); find the value of *k* given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. (Linear, Quadratic, Square root, Cube root, <u>Absolute Value</u>, or Exponential)	Video: Transformations Module 3, Topic 1, Lesson 1 Desmos – Transformations
ACT Connection		
AF 604. Given an equation or function, find an equation or function whose graph is a translation by a specified amount up or down AF 706. Given an equation or function, find an equation or function whose graph is a translation by specified amounts in the horizontal or vertical directions		

1st Quarter Continued

Unit 2 – Graphing Quadratic Functions		
Unit Overview: The focus of this unit is for students to be able to interpret and analyze quadratic functions graphically. They can first multiply two linear functions graphically to form a quadratic (by multiplying the y-values at each x). This activity will help with the zero-product property later. Real data should be presented to students to show how applicable they are in modeling real-world situations (regression). Students should recognize and graph quadratics from three forms: standard, vertex, and factored. It is important that students can extract information from each form to create a graph and realize when each form is best. Symmetry of quadratic functions should be emphasized, and students should be able to identify symmetry graphically and on a table of values. Vertex form provides a great opportunity to reinforce transformations from the previous unit. Horizontal shifts should be described as "what value makes the parent function 0?" Interpreting these graphs in context is paramount, which should create discussions about an appropriate domain. For example, all positive real numbers is an appropriate domain for a projectile motion problem.		
Approximate Timeline	Carnegie Resources	TNReady Released Problems
4 weeks August 24 – September 18	Module 3, Topic 3, Lessons 1-4 Module 4, Topic 2, Lesson 4 Mathia Custom Module: IM2 Mod2 Quadratics	Click here for Problems

Week	Standards	Resources
August 24 - August 28	• Multiply two linear functions graphically to produce a quadratic **M2.F.IF.A.1 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities and sketch graphs showing key features given a verbal description of the relationship. ★** **Guarantee:** • **I can find intercepts of quadratic functions.** • **I can find the relative maximums/ minimums of a quadratic function.** *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; and end behavior(informally).* M2.F.IF.A.2 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. ★ • Introduce Three Forms: vertex, factored, and standard	Module 3, Topic 3, Lessons 1 & 2 Video: Key Features of Quadratics Video: Forms of a Quadratic Missing Function Task 2 (F.BF.A.1) Desmos: Polygraph Quadratics Desmos: Polygraph Quadratics 2 Desmos: Two Truths and a Lie Desmos: Discover Domain and Range (F.IF.A.2) OpenMiddle – Factored Form Minimum
August 31 – September 4	M2.F.IF.B.4 Graph functions expressed symbolically and show key features of the graph, by hand and using technology.★ Graph linear and quadratic functions and show intercepts, maxima, and minima. M2.S.ID.A.1 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. Fit a quadratic function to the data; use functions fitted to data to solve problems in the context of the data.	Module 3, Topic 3, Lessons 1 & 2 Video: Graphing from the three Forms Video: Quadratic Regression Root of the Problem Task Vegetable Garden Task Desmos: Parabolas Card Sort Module 4, Topic 2, Lesson 4 (Regression) Desmos: Build a Bigger Field Desmos: Penny Circle Application Quadratic Regression Quadratic Regression 2
September 7 – September 11	M2.F.BF.B.2 Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs.	Video: Transformations of Quadratics Module 3, Topic 3, Lesson 3 Desmos: Quadratic Marbleslides Desmos: Match My Parabola Desmos: Mario Quadratics
September 14 – September 18	M2.F.IF.A.3 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. ★	Video: Average Rate of Change Module 3, Topic 3, Lesson 4 Rocket Flights

	M2.F.IF.B.6 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	Bottle Rocket Task Missing Function Task 1 Forms of a Function Task
ACT Connection		
AF 604. Given an equation or function, find an equation or function whose graph is a translation by a specified amount up or down A 605. Solve quadratic equations (by graphing) AF 704. Analyze and draw conclusions based on information from graphs in the coordinate plane AF 705. Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$ AF 706. Given an equation or function, find an equation or function whose graph is a translation by specified amounts in the horizontal and vertical directions F 701. Compare actual values and the values of a modeling function to judge model fit and compare models F 702. Build functions for relations that are exponential AF 706. Given an equation or function, find an equation or function whose graph is a translation by specified amounts in the horizontal or vertical directions		

<u>Essential</u> Standards are in Bold. All others should be taught as well.

1st Quarter - 2nd Quarter

Unit 3 – Rewriting Polynomial Expressions		
Unit Overview: Students should begin to see that when two linear expressions are multiplied, a quadratic expression is created. They should also work with other operations with polynomials. However, multiplying two linear expressions is extremely important because they should then complete the process in reverse to factor quadratic expressions. They have already seen the three forms of a quadratic and the benefits to each, but now they should understand how to translate between the three forms. Completing the square (or another method) can then be used to go from standard to vertex form. Lastly, the symmetry of a quadratic learned last unit can be used to go from factored form to vertex form rather quickly (by averaging the two zeros).		
Approximate Timeline	Carnegie Resources	TNReady Released Problems
4 weeks September 21 – October 16	Module 4, Topic 1, Lessons 1 & 4 Mathia Custom Module: IM2 Mod3 Quadratics	Click here for Problems

Week	Standards	Resources
September 21 – September 25	**M2.A.APR.A.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.** **Guarantee:** • **I can add, subtract and multiply polynomials.**	Video: Operations with Polynomials Module 4, Topic 1, Lesson 1 Operations with Polynomials Khan Academy Videos/Practice
September 28 – October 2	**M2.A.APR.A.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.** **Guarantee:** **I can add, subtract and multiply polynomials.** **M2.A.SSE.A.2 Use the structure of an expression to identify ways to rewrite it.** **Guarantee:** • **I can factor a quadratic expression.**	Video: Factoring a Quadratic Module 4, Topic 1, Lesson 1 (Operations with Polynomials) Module 4, Topic 1, Lesson 4 (Factoring) Desmos - Pokemon Factoring Practice Desmos - Factoring Card Sort OpenMiddle – One Solution
October 5 – October 9	Fall Break	
October 12 – October 16	**M2.A.SSE.A.2 Use the structure of an expression to identify ways to rewrite it.** **Guarantee:** • **I can factor a quadratic expression.**	Module 4, Topic 1, Lesson 4 (Factoring) OpenMiddle – Factoring Quadratics Open Middle – Undefined C

October 19 – October 23	M2.F.IF.B.5 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.	Module 4, Topic 1, Lesson 4 (Completing the square) 3-2-1 Liftoff!
ACT Connection		
A 303. Combine like terms (e.g., 2x + 5x) A 402. Add and subtract simple algebraic expressions A 404. Multiply two binomials A 505. Add, subtract, and multiply polynomials A 508. Factor simple quadratics (e.g., the difference of squares and perfect square trinomials) A 601. Manipulate expressions and equations		

2nd Quarter Continued

Unit 4 – Solving Quadratic Equations		
Unit Overview: The rewriting techniques learned last unit will now aid students in finding the solutions to a quadratic equation. Factoring techniques will help students solve quadratic equations by factoring when possible. When factoring is not possible, completing the square can be used to help students understand why the quadratic formula is what it is. Students should use the quadratic formula to find all complex solutions. Lastly, students should work with this newly discovered number, i, and operations with complex numbers.		
Approximate Timeline	Carnegie Resources	TNReady Released Problems
4 weeks October 26 – November 20	Module 4, Topic 1, Lessons 2-5 Module 4, Topic 2, Lesson 1 Mathia Custom Module: IM2 Mod2 Quadratics	Click here for Problems
Week	Standards	Resources
October 26 – October 30	**M2.A.REI.B.2 Solve quadratic equations and inequalities in one variable.** **b. Solve quadratic equations by inspection (e.g., for x^2 = 49) and taking square roots. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b.** • **I can solve quadratics by taking square roots.** M2.A.CED.A.3 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, solve $A = \pi r^2$ for r.	Module 4, Topic 1, Lesson 2 & 3 (square roots) Cliffhanger Task Module 4, Topic 2, Lesson 1 (complex numbers) OpenMiddle – Complex Number Products OpenMiddle – Greatest Value

	M2.N.CN.A.1 Know there is a complex number i such that $i^2 = -1$, and every complex number has the form a + bi with a and b real. M2.N.CN.A.2 Know and use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.	OpenMiddle - 67
November 2 – November 6	M2.A.CED.A.1 Create equations in one variable and use them to solve problems. **M2.A.REI.B.2 Solve quadratic equations in one variable.** **b. Solve quadratic equations by knowing and applying the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b.** **Guarantee:** • **I can solve quadratic equations by factoring.** • **I can solve quadratic equations by using the quadratic formula.** M2.N.CN.B.3 Solve quadratic equations with real coefficients that have complex solutions.	(Create) Circle Fever Patterns in Piles Module 4, Topic 1, Lesson 4 (Factoring) Fencing Task Module 4, Topic 1, Lesson 5 (Quadratic formula) Springboard Task
November 9 – November 13	Same standards as last week	Two Squares are Equal (review – many solution paths)
November 16 – November 20	Same standards as last week. Add in: M2.A.REI.B.2 Solve quadratic inequalities in one variable.	
November 23 – November 24	Remediation and Enrichment	
November 25 – November 27	Thanksgiving Break	

ACT Connection
N 504. Exhibit some knowledge of the complex numbers A 506. Identify solutions to simple quadratic equations A 507. Solve quadratic equations in the form (x + a)(x + b) = 0, where a and b are numbers or variables A 605. Solve quadratic equations N 606. Multiply two complex numbers A 702. Match simple quadratic inequalities with their graphs on the number line N 704. Apply properties of complex numbers and the complex number system

2nd Quarter Continued

<table>
<tr><th colspan="3">Unit 5 – Systems</th></tr>
<tr><td colspan="3">Unit Overview: This unit approaches quadratic equations from a graphical perspective by finding the intersection of a quadratic and linear function. This builds upon students understanding of systems in Integrated Math I by expanding to three linear equations and three unknowns. Some of this work should be done graphically (linear and quadratic, two equations two unknowns), algebraically (linear and quadratic, two equations two unknowns), and using matrices (three equations three unknowns). Be sure that students understand when using matrices is appropriate and when it is not.</td></tr>
<tr><td>Approximate Timeline</td><td>Carnegie Resources</td><td>TNReady Released Problems</td></tr>
<tr><td>1.5 weeks
November 30 – December 11</td><td>Not in the IM II Textbook</td><td>Click here for Problems</td></tr>
<tr><td>Week</td><td>Standards</td><td>Resources</td></tr>
<tr><td>November 30 – December 4</td><td>M2.A.REI.C.4 Solve a system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.

M2.A.REI.C.3 Write and solve a system of linear equations in context.
When solving algebraically, tasks are limited to systems of at most three equations and three variables. With graphic solutions systems are limited to only two variables</td><td>(Linear and Quadratic)
Word Problems
Khan Academy Videos

(Two linear equations)
Amusement Park Task

(three linear equations)
Video - Using Matrices</td></tr>
<tr><td>December 7 – December 11</td><td>Remediation and Midterm Review</td><td></td></tr>
<tr><td>December 14 – December 18</td><td>Midterms</td><td></td></tr>
<tr><td colspan="3">ACT Connection</td></tr>
<tr><td colspan="3">A 605. Solve systems of two linear equations</td></tr>
</table>

Essential Standards are in Bold. All others should be taught as well.

3rd Quarter

Unit 6 – Rewriting Exponential Expressions		
Unit Overview: Students continue to expand their work with exponents from middle school by extending their definition of exponents to include rational exponents in Integrated Math II. It is important that students understand that the repeated multiplication definition of exponents only works for natural exponents and cannot be used for rational exponents, negative exponents, or zero. To better understand rational exponents, students can show that $\left(x^{\frac{1}{n}}\right)^n = x$ by properties of exponents. Therefore, $x^{\frac{1}{n}}$ is the number whose nth power is x, in other words, $\sqrt[n]{x}$. Now we can understand $\left(x^{\frac{1}{n}}\right)^m$ or $x^{\frac{m}{n}}$.		
Approximate Timeline	Carnegie Resources	TNReady Released Problems
2 weeks January 5 – January 22	Module 3, Topic 1, Lessons 1-2	Click here for Problems

Week	Standards	Resources
January 5 – January 8	M2.F.IF.B.5 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Know and use the properties of exponents to rewrite exponential expressions. *For example, rewrite* $2(3)^{x+1}$ *as* $6(3)^x$ *or* $8(2)^{x-1}$ *as* $4(2)^x$. *Example #2, identify percent rate of change by rewriting expressions, such as rewriting y =*2^{-x} *as* $y = \left(\frac{1}{2}\right)^x$ *, or y = (1/3)*$^{-x}$ *as* $y = 3^x$. • I know and can use the properties of exponents. M2.N.RN.A.1 Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. *For example, we define* $5^{1/3}$ *to be the cube root of 5 because we want* $(5^{1/3})^3 = 5^{(1/3)3}$ *to hold, so* $(5^{1/3})^3$ *must equal 5.*	Module 3, Topic 2, Lesson 1 Khan Academy – Properties of Exponents Khan Academy – Exponents Challenge Khan Academy – Fractional Exponents Math Visions Project: Sections 1-4 Illustrative Math: Evaluating Exponents Illustrative Math: Extending the Definition of Exponents Rational Exponent Tasks (Tasks start on p.19)
January 11 – January 15	M2.N.RN.A.2 **Rewrite expressions involving radicals and rational exponents using the properties of exponents**	Module 3, Topic 2, Lesson1 Exponent Task Natural Order Task

ACT Connection
A 509. Work with squares and square roots of numbers N 605. Apply properties of rational exponents

3rd Quarter Continued

Unit 7 – Graphing Exponential Functions		
Unit Overview: In Integrated Math I, students studied the graphs of exponential functions with integer exponents (geometric sequences). Now that students understand rational exponents, they can fully understand exponential functions as a continuous graph. Students should work with translations of exponential functions and exponential regression.		
Approximate Timeline	Carnegie Resources	TNReady Released Problems
1 week January 18 – January 22	Module 3, Topic 2, Lessons 3-4	Click here for Problems

Week	Standards	Resources
January 18 – January 22	M2.F.IF.B.4 Graph functions expressed symbolically and show key features of the graph, by hand and using technology.★ c. Graph exponential functions, showing intercepts and end behavior. M2.F.BF.B.2 Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. M2.S.ID.A.1 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. Fit an exponential function to the data; use functions fitted to data to solve problems in the context of the data.	Module 3, Topic 2, Lessons 2-4 Desmos - Exponential Bundle (7 Activities) Honeybees Task *Desmos: Modeling with Exponentials (S.ID.B.4) App Gold Rush Amazon Workforce Spotify Growth Rate Hotel Room Prices Linear or Exponential? Guide: Regression in Desmos
ACT Connection		
AF 604. Given an equation or function, find an equation or function whose graph is a translation by a specified amount up or down AF 706. Given an equation or function, find an equation or function whose graph is a translation by specified amounts in the horizontal or vertical directions		

3rd Quarter Continued

Unit 8 – Similarity			
Unit Overview: In Integrated Math I students normally learn that two figures are congruent if one figure can be formed with rigid motions performed on the other (However, this is a gap from last year). Starting with congruence this year will lead nicely into using rigid motions followed by a dilation to prove that two figures are similar. Students should also find missing side lengths by setting up proportions or find missing angle measures by analyzing similarity statements.			
Approximate Timeline		Carnegie Resources	TNReady Released Problems
3 weeks January 25 – February		Module 1, Topic 3, Lesson 1 Module 2, Topic 1, Lessons 1-5 Mathia Module: IM1 Mod 4 (Congruence) Mathia Module: IM2 Mod 1 (Similarity)	Click here for Problems
Week	Standards		Resources
January 25 – January 29	Gap from Integrated Math 1 – Triangle Congruence M1.G.CO.B.6 Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to determine informally if they are congruent. M1.G.CO.B.7 Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent. M1.G.CO.B.8 Explain how the criteria for triangle congruence (ASA, SAS, AAS, and SSS) follow from the definition of congruence in terms of rigid motions. • I can identify corresponding parts in two triangles. • I can determine which combinations of congruent corresponding parts must be known to verify that two triangles are congruent.		Module 1, Topic 3, Lesson 1
February 1 – February 5	M2.G.SRT.A.1 Verify informally the properties of dilations given by a center and a scale factor. M2.G.SRT.A.2 Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all		Module 2, Topic 1, Lessons 1-2 Desmos – Working with Dilations (G.SRT.A.1) Desmos – Transformation Golf (G.SRT.A.1) Illustrative Math: Dilating a Line (G.SRT.A.1) Illustrative Math: Similar Triangles (G.SRT.A.2) Illustrative Math: Are they Similar? (G.SRT.A.2)

	corresponding pairs of angles and the proportionality of all corresponding pairs of sides. M2.G.SRT.A.3 Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.	Illustrative Math: Similar Triangles 2 (G.SRT.A.3) Midpoint Mania
February 8 – February 12	M2.G.SRT.B.4 Prove theorems about similar triangles. For example, *prove a line parallel to one side of a triangle divides the other two proportionally* M2.G.SRT.B.5 Use congruence and similarity criteria for triangles to solve problems and to justify relationships in geometric figures. • I can use proportions to solve problems involving similar triangles.	Module 2, Topic 1, Lessons 3-5 Cumulative Similarity Tasks Similar Triangles Applications Playing Catch Task
ACT Connection		
G 405. Use geometric formulas when all necessary information is given		

3rd Quarter Continued

Unit 9 – Trigonometry		
Unit Overview: Using properties of similar triangles, students should realize that all right triangles that are similar have the same trigonometric ratios. These ratios are only affected by the angles in the triangle, so these trigonometric ratios apply no matter how large the triangle is. We can use these trigonometric ratios to solve problems and find missing side lengths.		
Approximate Timeline	Carnegie Resources	TNReady Released Problems
3 weeks February 15 – March 5	Module 2, Topic 2, Lessons 1-5 Mathia Custom Module: IM2 Mod1	Click here for Problems

Week	Standards	Resources
February 15 – February 19	M2.G.SRT.C.6 Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles. M2.G.SRT.C.7 Explain and use the relationship between the sine and cosine of complementary angles. (sinx = cos(90-x) and cosx = sin(90-x). This is where the word cosine comes from: the cosine of an angle is simply <u>the sine of the angle's complement</u> - the co in cosine means complement).	Module 2, Topic 2, Lesson 1 Take the Ladder Illustrative Math: Defining Trig Ratios Module 2, Topic 2, Lessons 5 What's Your Sine? Task Relating Sine and Cosine Edutoolbox: Relating Trig Functions Illustrative Math: Relating Sine and Cosine Geogebra Applet (G.SRT.C.6)

		Geogebra Relating Sine and Cosine (G.SRT.C.7)
February 22 – February 26	M2.G.SRT.C.8 **Solve triangles.** **a. Know and use trigonometric ratios (including inverse trig) and the Pythagorean Theorem to solve right triangles in applied problems.** **Guarantee:** • **I can use trigonometric ratios (including inverse trig) and the Pythagorean Theorem to solve right triangles.**	Module 2, Topic 2, Lessons 2-4 Solar Collector Task Problem-Based Tasks Television Size Task Math Vision Project: Section 6.10 & 6.11 Performance Task: Sohcahtoa Mountain Performance Task: Building Ramps Review Worksheets
March 1 – March 5	Remediation and Enrichment or… M2.G.SRT.C.8 Solve triangles. b. Know and use the Law of Sines and the Law of Cosines to solve triangles in applied problems. Recognize when it is appropriate to use each.	More than Right Task (Key) Law of Sines Application Law of Cosines Application Law of Cosines Application
ACT Connection		
G 405. Use geometric formulas when all necessary information is given G 508. Given the length of two sides of a right triangle, find the third when the lengths are Pythagorean triples G 509 Express the sine, cosine, and tangent of an angle in a right triangle as a ratio of given side lengths G 602. Use Pythagorean theorem G 604. Apply basic trigonometric ratios to solve right-triangle problems		

3rd Quarter Continued

Unit 10 – Volume and Surface Area		
Unit Overview: Students have worked with volume and surface area in middle school, but they will now work to understand why the formulas are the way they are and apply them in various situations. Students should not strictly memorize the formulas.		
Approximate Timeline	Carnegie Resources	TNReady Released Problems
1.5 weeks March 8 – March 19	Module 2, Topic 3, Lessons 3-4	Click here for Problems

Week	Standards	Resources
March 8 – March 12	M2.G.GMD.A.1 Give an informal argument for the formulas for the circumference of a circle and the volume and surface area of a cylinder, cone, prism, and pyramid.	Module 2, Topic 3, Lesson 3 Problem-Based Tasks Illustrative Math: Cavalieri's Principle Mathshell: Best-sized Cans

	M2.G.GMD.A.2 Know and use volume and surface area formulas for cylinders, cones, prisms, pyramids, and spheres to solve problems.★	Illustrative Math: Egyptian Pyramids Area and Volume Applications
March 15 – March 17	M2.G.GMD.A.2 Know and use volume and surface area formulas for cylinders, cones, prisms, pyramids, and spheres to solve problems.★	Module 2, Topic 3, Lesson 4 Desmos – Polygraph: 3D Figures 3act-math: Will all the soup fit? 3act-math: Hot Coffee
ACT Connection		
G 405. Use geometric formulas when all necessary information is given G 601. Use relationships involving area, perimeter, and volume of geometric figures to compute another measure (e.g., surface area for a cube of a given volume and simple geometric probability)		

3rd Quarter – 4th Quarter

Unit 11 – Probability		
Unit Overview: Students should begin by recognizing when events are independent or dependent. Conditional probabilities should then be calculated when appropriate. Students should understand that P(A and B) = P(A)*P(B given A). Students can divide both sides of the equation by P(A) to rearrange the formula to reveal P(B given A) = P(A and B)/P(A). They should see conditional probability through visuals such as Venn diagrams and two-way tables.		
Approximate Timeline	Carnegie Resources	TNReady Released Problems
1.5 weeks (As time allows) March 22 – March	Module 5, Topic 1, Lessons 1-4 Module 5, Topic 2, Lessons 1-2	Click here for Problems

Week	Standards	Resources
March 18 – 19	M2.S.CP.A.1 Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”). M2.S.CP.A.2 Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.	Module 5, Topic 1, Lessons 1 and 4 Eureka Math Supplemental Textbook: Teacher Edition Student Edition
March 22 – March 26	M2.S.CP.A.3 Know and understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.	Module 5, Topic 1, Lessons 2 and 3 Eureka Math Supplemental Textbook: Teacher Edition Student Edition

	M2.S.CP.A.4 Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. M2.S.CP.B.5 Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A and interpret the answer in terms of the model. *For example, a teacher gave two exams. 75 percent passed the first exam and 25 percent passed both. What percent who passed the first exam also passed the second exam?* M2.S.CP.B.6 Know and apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model. *For example, in a math class of 32 students, 14 are boys and 18 are girls. On a unit test 6 boys and 5 girls made an A. If a student is chosen at random from a class, what is the probability of choosing a girl or an A student?*	Desmos – Chance Experiements Desmos - Conditional Probability Desmos – 2-way Tables Module 5, Topic 2, Lessons 1 and 2 (focus on frequency tables)
March 29 – April 2	Spring Break	
April 5 – April 9	TNReady Review	
Approximately April 12 – April 30	TNReady Testing	

ACT Connection
S 404. Describe events as combinations of other events (e.g., using *and*, *or*, and *not*) S 604. Compute a probability when the event and/or sample space are not given or obvious S 605. Recognize the concepts of conditional and joint probability expressed in real-world contexts S 606. Recognize the concept of independence expressed in real-world contexts S 704. Exhibit knowledge of conditional and joint probability

<u>Essential</u> Standards are in Bold. All others should be taught as well.

4th Quarter Continued

Unit 12 – Integrated Math III & ACT Prep		
Unit Overview: After testing, there are a variety of different topics that will prepare students for Integrated Math III and ACT.		
Approximate Timeline	Carnegie Resources	TNReady Released Problems
3 weeks May 3 – May 21	N/A	N/A

Week	Standards	Resources
May 3 – May 7	Equation of a circle	Khan Academy Video/Practice Desmos: The Equation of a Circle Desmos: Equations of Circles
May 10 – May 14	The basics of Cubics Functions	Graphing Cubics 1 Graphing Cubics 2 Graphing Cubics 3 Graphing Cubics 4 Desmos: Intro to Graphs of Cubic Functions Triple Trouble
May 17 – May 21	Matrices	Khan Academy Intro and Practice Khan Academy Adding and Subtracting Matrices Khan Academy Multiplying by a Scalar Khan Academy Multiplying Matrices Matrix Operations Activities on Delta Math IXL Matrix Multiplication (10-Question Preview)

ACT Connection
G 609. Recognize special characteristics of parabolas and circles (e.g., the vertex of a parabola and the center or radius of a circle) N 406. Add two matrices that have whole number entries N 505. Add and subtract matrices that have integer entries N 607. Use relations involving addition, subtraction, and scalar multiplication of vectors and of matrices N 705. Multiply matrices N 706. Apply properties of matrices and properties of matrices as a number system