

Math TWO - MVP Lessons with Identified OAS Standards

*This document is for the *lesson* only. ReadySetGo may cover other standards.

Module 1: Quadratics Functions				
MVP Lesson		MVP Type of Understanding	Description	OAS-M
1.1	Something to Talk About	Develop	An introduction to quadratic functions, designed to elicit representations and surface a new type of pattern and change	A2.A.1.1
1.2	I Rule	Solidify	Solidification of quadratic functions begins as quadratic patterns are examined in multiple representations and contrasted with linear relationships	A1.F.1.3, A2.A.1.1
1.3	Scott's Macho March	Solidify	Focus specifically on the nature of change between values in a quadratic being linear	A1.F.1.3, A2.A.1.1
1.4	Rabbit Run	Solidify	Focus on maximum/minimum point as well as domain and range for quadratics	A1.F.1.3, A2.A.1.1
1.5	The Tortoise and the Hare	Solidify	Comparing quadratic and exponential functions to clarify and distinguish between each type of growth as well as how that growth appears in each of their representations	A2.A.1.1, A2.A.1.2
1.6	How Does it Grow	Practice	Incorporating quadratics with the understandings of linear and exponential functions	A1.F.1.3, PA.A.2.1, A1.A.4.3, A1.F.1.1, A1.F.2.1, A1.F.3.2
Module 2: Structures of Expressions				
MVP Lesson		MVP Type of Understanding	Description	OAS-M
2.1	Transformers: Shifty Y's	Develop	Connecting transformations to quadratic functions and parabolas	A2.F.1.2
2.2	Transformers: More Than Meets the y's	Solidify	Working with vertex form of a quadratic, connecting the components to transformations	A2.F.1.2, A2.F.1.3
2.3	Building the Perfect Square	Develop	Visual and algebraic approaches to completing the square	A1.A.3.2, A2.A.2.3
2.4	A Square Deal	Solidify	Visual and algebraic approaches to completing the square	A1.A.3.2, A2.A.2.3

2.5	Be There or Be Square	Practice	Visual and algebraic approaches to completing the square	A1.A.3.2, A2.A.2.3
2.6	Factor Fixin'	Solidify	Connecting the factored and expanded forms of a quadratic	A1.A.3.3, A2.A.2.3
2.7	The x Factor	Solidify	Connecting the factored and expanded or standard forms of a quadratic	A1.A.3, A2.A.2.3
2.8H	The Wow Factor	Solidify	Connecting the factored and expanded forms of a quadratic when a value is not equal to one	A1.A.3, A2.A.2.3
2.9	Lining Up Quadratics	Solidify	Focus on the vertex and intercepts for quadratics	A1.F.1.2, A1.A.4.3, A1.F.1.3, A2.A.2.3, A2.F.1.3
2.10	I've Got a Fill-in	Practice	Building fluency in rewriting and connecting different forms of a quadratic	A2.A.2.3

Module 3: Solving Quadratics & Other Equations

MVP Lesson		MVP Type of Understanding	Description	OAS-M
3.1	The In-Betweeners	Develop	Examining values of continuous exponential functions between integers	A2.F.1.4
3.2	Half-Interested	Solidify	Connecting radicals and rules of exponents to create meaning for rational exponents	A2.N.1.4, A2.F.1.4
3.3	More Interesting	Solidify	Verifying that properties of exponents hold true for rational exponents	A2.A.1.4, A2.A.2.4
3.4	Radical Ideas	Practice	Becoming fluent converting between exponential and radical forms of expressions	A1.N.1.1, A1.N.1.2, A2.N.1.4, A2.A.2.4
3.5	Throwing and Interception	Develop	Developing the Quadratic Formula as a way for finding x-intercepts and roots of quadratic functions	A1.A.3.1, A2.A.1.1, A2.A.2.3, A2.F.1.3
3.6	Curbside Rivalry	Solidify	Examining how different forms of a quadratic expression can facilitate the solving of quadratic equations	A1.A.1.3, A2.A.1.1
3.7	Perfecting My Quads	Solidify	Building fluency with solving of quadratic equations	PC.F.3.2, PC.F.3.3
3.8	To Be Determined	Develop	Surfacing the need for complex number as solutions for some quadratic equations	PC.F.3.2, PC.F.3.3
3.9	Friends	Solidify	Extending the real and complex number systems	A2.N.1.2

3.10	iNumbers	Practice	Examine the arithmetic of real and complex numbers	A2.N.1.2
3.11H	Quadratic Quandaries	Develop	Solving Quadratic Inequalities	No OAS
3.12H	Complex Computations	Solidify	complex plane	A2.N.1.2
3.13H	All Systems Go!	Solidify	Solving systems of equations using inverse matrices	No OAS

Module 4: More Functions, More Features

MVP Lesson		MVP Type of Understanding	Description	OAS-M
4.1	Some of This, Some of That	Develop	Use prior knowledge of functions to develop understanding of piecewise functions	A1.F.1.4, A1.F.3.2, A2.F.1.2
4.2	Bike Lovers	Solidify	Solidification of graphing and writing equations for piecewise functions	A1.F.1.2, A1.F.1.4, A2.F.1.1, A2.F.1.8
4.3	More Functions with Features	Solidify	Incorporating absolute value as piecewise-defined functions	A1.F.1.4, A1.F.1.3, A1.F.1.2, A2.F.1.8
4.4	Reflections of a Bike Lover	Practice	Fluency with domain, range, absolute value and piecewise-defined functions	A1.F.1.2, A2.F.1.8, A2.F.2.2
4.5	What's Your Pace?	Develop	Comparing input and output values to develop understanding of inverse functions	A2.F.2.3
4.6	Bernie's Bikes	Solidify	Solidifying inverse functions using multiple representations	A2.F.2.3
4.7	More Features, More Functions	Practice	Using prior knowledge to identify features of a function as well as to create functions when given features	A1.F.1.3, A2.F.1.8, A2.F.2.3

Module 5: Geometric Figures

MVP Lesson		MVP Type of Understanding	Description	OAS-M
5.1	How Do You Know That?	Develop	An introduction to proof illustrated by the triangle interior angle sum theorem	G.2D.1.3, G.RL.1.2
5.2	Do You See What I See?	Develop	Reasoning from a diagram to develop proof-like arguments about lines and angles, triangles and parallelogram	G.2D.1.3, G.2D.1.4, G.RL.1.1, G.RL.1.2, G.C.1.2

5.3	It's All in Your Head	Solidify	Organizing proofs about lines, angles and triangles using flow diagrams and two-column proof formats	G.2D.1.9, G.RL.1.1
5.4	Parallelism Preserved and Protected	Solidify	Examining parallelism from a transformational perspective	G.2D.1.1, G.2D.1.2
5.5	Claims and Conjectures	Solidify	Generating conjectures from a diagram about lines, angles and triangles	G.2D.1.1, G.2D.1.2
5.6	Justification and Proof	Practice	Writing formal proofs to prove conjectures about lines, angles and triangle	G.2D.1.2
5.7	Parallelogram Conjectures and Proof	Solidify	Proving conjectures about parallelograms	G.2.D.1.4, G.2D.1.1, G.2D.1.2
5.8	Guess My Parallelogram	Practice	Identifying parallelograms from information about the diagonals	G.2D.1.3, G.2D.1.4
5.9	Centers of a Triangle	Practice	Reading and writing proofs about the concurrency of medians, angle bisectors and perpendicular bisectors of the sides of a triangle	No OAS

Module 6: Similarity & Right Triangle Trigonometry

MVP Lesson		MVP Type of Understanding	Description	OAS-M
6.1	Photocopy Faux Pas	Develop	Describing the essential features of a dilation	G.2D.1.9
6.2	Triangle Dilations	Solidify	Examining proportionality relationships in triangles that are known to be similar to each other based on dilations	G.2D.1.7
6.3	Similar Triangles and Other Figures	Solidify	Comparing definitions of similarity based on dilations and relationships between corresponding sides and angles	G.2D.1.1, G.2D.1.7
6.4	Cut by a Transversal	Solidify	Examining proportionality relationships of segments when two transversals intersect sets of parallel lines	G.2D.1.1, G.2D.1.2, G.2.D.1.7
6.5	Measured Reasoning	Practice	Applying theorems about lines, angles and proportional relationships when parallel lines are crossed by multiple transversals	G.2D.1.1, G.2D.1.2, G.2D.1.7
6.6	Yard Work in Segments	Solidify	Applying understanding of similar and congruent triangles to find the midpoint or any point on a line segment that partitions the segment into a given ratio	G.2D.1.4

6.7	Pythagoras by Proportions	Practice	Using similar triangles to prove the Pythagorean theorem and theorems about geometric means in right triangles	No OAS
6.8	Are Relationships Predictable?	Develop	Developing an understanding of right triangle trigonometric relationships based on similar triangles	G.RT.1.2, G.RT.1.3, G.RT.1.4
6.9	Relationships with Meaning	Solidify	Finding relationships between the sine and cosine ratios for right triangles, including the Pythagorean identity	G.RT.1.1, G.RT.1.3, G.RT.1.4
6.10	Finding the Value of a Relationship	Solidify	Solving for unknowns in right triangles using trigonometric ratios	G.RT.1.1, G.RT.1.3, G.RT.1.4
6.11	Solving Right Triangles Using Trigonometric Relationships	Practice	Setting up and solving right triangles to model real world contexts	G.RT.1.1, G.RT.1.3, G.RT.1.4
Module 7: Circles a Geometric Perspective				
MVP Lesson		MVP Type of Understanding	Description	OAS-M
7.1	Centered	Develop	Searching for centers of rotation using perpendicular bisectors as a tool	No OAS (using constructions)
7.2	Circle Dilations	Solidify	Proving circles similar	No OAS (similarity of circles)
7.3	Cyclic Polygons	Solidify	Examining relationships between central angles, inscribed angles, circumscribed angles and their arcs	G.C.1.2
7.4	Planning the Gazebo	Develop	Developing formulas for perimeter and area of regular polygons	G.2D.1.6
7.5	From Polygons to Circles	Solidify	Justifying formulas for circumference and area of circles using intuitive limit arguments	No OAS
7.6	Circular Reasoning	Practice	Applying and practicing circle relationships	G.C.1.2
7.7	Pied!	Develop	Using proportional reasoning to calculate arc length and area of sectors	PC.T.1.3
7.8	Madison's Round Garden	Practice	Using the ratio of arc length to radius to develop radians as a way of measuring angles	PC.T.1.1

7.9	Rays and Radians	Solidify & Practice	Converting between degree measure and radian measure of an angle	PC.T.1.2
7.10	Sand Castles	Solidify	Examining the proportionality relationships of lengths, areas and volumes when geometric figures are scaled up	G.3D.1.2
7.11	Footprints in the Sand	Solidify	Examining informal, dissection arguments for the volume formulas of prisms, pyramids and cylinders	G.3D.1.2
7.12	Cavalieri to the Rescue	Solidify	Examining informal, dissection arguments based on Cavalieri's principle for the volume formulas of oblique prisms, pyramids and cylinders	No OAS
Module 8: Circles and Other Conics				
MVP Lesson		MVP Type of Understanding	Description	OAS-M
8.1	Circling Triangles (or Triangulating Circles)	Develop	Deriving the equation of a circle using the Pythagorean Theorem	G.C.1.3, G.C.1.4
8.2	Getting Centered	Solidify	Complete the square to find the center and radius of a circle given by an equation	G.C.1.3, A2.A.1.1
8.3	Circle Challenges	Practice	Writing the equation of a circle given various information	G.C.1.3
8.4	Directing Our Focus	Develop	Derive the equation of a parabola given a focus and directrix	PC.CS
8.5	Functioning with Parabolas	Solidify	Connecting the equations of parabolas to prior work with quadratic functions	PC.CS
8.6	Turn It Around	Solidify	Writing the equation of a parabola with a vertical directrix, and constructing an argument that all parabolas are similar	No OAS

8.7H	Operating on a Shoestring	Solidify	Exploring features of ellipses and writing the equation of an ellipse using the fact that the sum of the distances from the foci is constant.	PC.CS
8.8H	What Happens If...?	Solidify	Exploring features of hyperbolas writing the equations of a hyperbola using the fact that the difference of the distances from the foci is constant	PC.CS
Module 9: Probability				
MVP Lesson		MVP Type of Understanding	Description	OAS-M
9.1	TB or Not TB	Develop	Estimating conditional probabilities and interpreting the meaning of a set of data	A1.D.1.1, A1.D.A.2
9.2	Chocolate versus Vanilla	Solidify	Examining conditional probability using multiple representations	A1.D.2.1, A1.D.2.3
9.3	Fried Freddy's	Solidify	Using samples to estimate probabilities	A1.D.2
9.4	Visualizing with Venn	Solidify	Creating Venn diagrams using data while examining the addition rule for probability	A1.D.2.2
9.5	Freddy Revisited	Solidify	Examining independence of events using two-way tables	No OAS
9.6	Striving for Independence	Practice	Using data in various representations to determine independence	No OAS