

Secondary Mathematics Virtual Learning 2020-2021

In this unprecedented time, Montgomery County Public Schools recognizes that our students need teachers utilizing the latest information on remote-learning and prioritizing instructional standards. During the 2020-2021 school year, secondary mathematics instruction will emphasize the major standards and the most important concepts in each course. Decisions about these learnings are based on guidance from national leaders in curriculum, standards and student achievement. Documents used for guidance include:

- [2020-2021 Priority Instructional Content](#) from [Achieve the Core](#);
- [Adaptation Packs, Guidance for Planning IM Instructional Materials in Distance Learning Environments in 2020-2021](#), and [Priority Lessons Adjusted for Asynchronous Learning](#) from [Illustrative Mathematics](#); and
- [Mathematics Guidance Continuity of Learning Standards - Middle](#) and [Mathematics Guidance Continuity of Learning Standards - High](#) from the [Maryland State Department of Education](#).

The structure and organization of the Common Core math standards is outlined below to help understand the bulleted statements about reduced mathematical content in MCPS for the 2020-2021 school year. (More information about the Common Core State Standards can be found [here](#).) A domain is a larger group of related standards spanning multiple grade levels. Here are the standards by domain:

Counting & Cardinality (Elementary Only)	Operations & Algebraic Thinking (Elementary Only)	Number & Operations in Base Ten (Elementary Only)	Number & Operations - Fractions (Elementary Only)
Measurement & Data	Geometry	Ratios & Proportional Relationships	The Number System
Expression & Equations	Functions	Statistics & Probability	

To be more specific, clusters exist within the various domains in the Common Core math standards. Clusters are groups of individual standards that are related to each other by topic. There are three different types of clusters: major, minor, and supporting.

- *The vast majority of domains were included in the suggested scope and sequence.*
- *Rarely were a cluster of standards omitted altogether.*
- *A few units of study were omitted from the curriculum based upon performance learning descriptors of the Maryland Comprehensive Assessment Program (MCAP).*
 - *Statistics units were omitted from middle school courses (Math 6, Math 7, and (A)IM), Algebra 2, and Pre-Calculus, as they are not assessed on MCAP and are covered in Introduction to Statistics/AP Statistics.*
 - *Multiple geometry topics were omitted from (Applied) Investigations into Mathematics [(A)IM].*
 - *(A)IM had the most units omitted: Unit 3: Expressing Geometric Relationships, Unit 4: Statistics and Probability, half of Unit 5: The Real Number System and most of Unit 7: Transformations and Geometric Measurement*
 - *Conic sections were omitted from (Honors) Geometry.*

- *Matrices were omitted from (Honors) Pre-Calculus. Series were omitted from Pre-Calculus.*
- *More often than not, standards were addressed with fewer curriculum lessons and activities than traditionally, so the depth of content was reduced.*
 - Again, these decisions were based upon optional lessons and research-based guidance from the Illustrative Mathematics curriculum vendor, Maryland State Department of Education, and national education organization: Achieve the Core.

Illustrative Mathematics 6					
<i>Grade 6 Math: 95 lessons vs. the 141 in standard implementation. A reduction to 67% of the content.</i>					
Marking Period	Essential Standard(s)	Unit	Traditional Year Learning Targets	Virtual Learning Areas of Focus	Virtual Learning Lessons
MP 1	6.EE.A 6.G.A	1 - Area and Surface Area	Unit 1 - Learning Targets	Emphasize understanding of the reasoning leading to the triangle area formula; problems that focus on finding areas in real-world problems by decomposing figures into triangles and rectangles.	Lessons 1 – 10
	6.RP.A	2 - Introducing Ratios	Unit 2 - Learning Targets		Lessons 1, 2, 4, 5, 6, 7, 8
MP 2	6.RP.A	3 - Unit Rates and Percentages	Unit 3 - Learning Targets	Understanding of ratio concepts and using ratio reasoning to solve problems.	Lessons 11, 12, 13, 15
	6.NS.A 6.G.A	4 - Dividing Fractions	Unit 4 - Learning Targets		Lessons 1, 3 – 8, 10 – 13, 15
	Virtual Lesson Count vs. Traditional Model				48 vs. 70
MP 3	6.NS.B 6.EE.A	5 - Arithmetic in Base Ten	Unit 5 - Learning Targets	Common factors and multiples, including using distributive property for expressions.	Lessons 1 – 13
	6.EE.A 6.EE.B 6.EE.C	6 - Expressions and Equations	Unit 6 - Learning Targets	Expressions and Equations in a single variable are the building blocks of all later math courses. Emphasis is placed on reasoning about and solving one-variable equations and inequalities.	Lessons 1 – 19

MP 4	6.NS.B 6.NS.C 6.EE.B 6.G.A	7 - Rational Numbers	Unit 7 - Learning Targets	Extend understanding of numbers to the system of rational numbers in real-world contexts while beginning foundational work on the coordinate plane.	Lessons 1 – 15
		Note: Unit 8 is omitted for Distance Learning Unit 8 Learning - Targets			None
Virtual Lesson Count vs. Traditional Model					47 vs. 71

Illustrative Mathematics 7					
<i>Grade 7 Math: 77 lessons vs. the 132 in standard implementation. A reduction to 58.3% of the content.</i>					
Marking Period	Essential Standard(s)	Unit	Traditional Year Learning Targets	Virtual Learning Areas of Focus	Virtual Learning Lessons
MP 1	7.G.B	1 - Scale Drawings	Unit 1 - Learning Targets	Build conceptual understanding of scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	Lessons 1 – 3, 7, 10, 12
	7.RP.A 7.G.A 7.G.B	2 - Introducing Proportional Relationships	Unit 2 - Learning Targets	Emphasis on recognizing and representing proportional relationships between quantities, while building conceptual understanding of proportional relationships through real-world contexts.	Lessons 1 – 13
MP 2	7.RP.A 7.G.B 7.EE.B	3 - Measuring Circles	Unit 3 - Learning Targets	Focus is placed on knowing and using the formulas for the area and circumference of a circle.	Lessons 1 – 5
	7.RP.A 7.NS.A	4 - Proportional Relationships and Percentages	Unit 4 - Learning Targets	Incorporation of foundational work on understanding of rational numbers (fractions and percents) to build towards operations with rational numbers.	Lessons 1 – 14
Virtual Lesson Count vs. Traditional Model					38 vs. 55
MP 3	7.RP.A 7.NS.A 7.EE.B	5 - Rational Number Arithmetic	Unit 5 - Learning Targets	Emphasis on interpreting sums of rational numbers (integers) by describing real-world contexts.	Lessons 1 – 17
MP 4	7.EE.A 7.EE.B	6 - Expressions, Equations and Inequalities	Unit 6 - Learning Targets	Emphasize equations relative to inequalities. Incorporate foundational work of reasoning about and solving one-variable equations to support students' work on constructing equations to solve problems.	Lessons 1 – 22

		Note: Units 7 & 8 are omitted for Distance Learning. Unit 7 Learning - Targets Unit 8 Learning - Targets	None
Virtual Lesson Count vs. Traditional Model			39 vs. 77

C2.0 Investigations into Mathematics

C2.0 Investigations in Mathematics: The elimination of [Unit 3](#), [Unit 4](#), half of Unit 5 and most of Unit 7. A reduction to approximately **57%** of the content.

Marking Period	Essential Standard(s)	Unit	Traditional Year Instructional Foci	Virtual Learning Areas of Focus
MP 1	7.RP.A	Unit 1 Topic 1 - Understanding Proportional Relationships	Unit 1 Instructional Focus	Reinforce conceptual understanding of scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
	7.RP.A 7.EE.B	Unit 1 Topic 2 - Application of Proportional Relationships		Emphasis on recognizing and representing proportional relationships between quantities, while building conceptual understanding of proportional relationships through real-world contexts.
				Incorporation of foundational work on understanding of rational numbers (fractions and percents) to build towards operations with rational numbers.
MP 2	7.NS.A	Unit 2 Topic 1- Building Understanding of Rational Numbers Operations	Unit 2 Instructional Focus	Emphasis on interpreting sums of rational numbers (integers) by describing real-world contexts.
	7.EE.A	Unit 2 Topic 2 - Integrating Rational Number Operations in Expressions and Equations		Emphasize equations relative to inequalities. Incorporate foundational work of reasoning about and solving one-variable equations to support students' work on constructing equations to solve problems.
	8.EE.A	Unit 5 Topic 1 - Magnitude and Scientific Notation		Unit 5 Instructional Focus
MP 3	8.EE.B	Unit 6 Topic 1 - Connecting Proportional	Unit 6 Instructional Focus	Emphasize slope as a proportionality emerging from the dilations of right triangles on the coordinate plane and interpreting unit rate as the slope of a graph.

		Relationships to Linear Equations		
	8.EE.C	Unit 6 Topic 2 - Solving Linear Equations		Emphasis should be on solving linear equations in a single variable.
				Emphasize understanding of points of intersection as solutions to systems of linear equations and recognizing situations that result in zero, one or infinitely many solutions. Algebraic and graphical representations should be part of the exploration and learning.
MP 4	8.G.A	Unit 7 Topic 1 - Congruence Through Rigid Transformations	Unit 7 Instructional Focus	Emphasize key concepts in similarity of two-dimensional figures.
<p>Note: Units 3 & 4 are omitted for Distance Learning. Unit 3 Instructional Focus Unit 4 Instructional Focus</p>				

Illustrative Mathematics 8 <i>Grade 8 Math: 71 lessons vs. the 141 in standard implementation. A reduction to 56.8% of the content.</i>					
Marking Period	Essential Standard(s)	Unit	Traditional Year Learning Targets	Virtual Learning Areas of Focus	Virtual Learning Lessons
MP 1	8.G.A	1 - Rigid Transformations and Congruence	Unit 1 - Learning Targets	Emphasize key concepts in similarity of two-dimensional figures.	Lessons 1 – 13
	8.G.A 8.EE.B	2 - Dilations, Similarity and Introducing Slope	Unit 2 - Learning Targets	Emphasize slope as a proportionality emerging from the dilations of right triangles on the coordinate plane and interpreting unit rate as the slope of a graph.	Lessons 1 – 12
MP 2	8.EE.B 8.EE.C	3 - Linear Relationships	Unit 3 - Learning Targets	Emphasis should be on solving linear equations in a single variable.	Lessons 3, 5 – 13
	8.EE.C	4 - Linear Equations and Linear Systems	Unit 4 - Learning Targets	Emphasize understanding of points of intersection as solutions to systems of linear equations and recognizing situations that result in zero, one or infinitely many solutions. Algebraic and graphical representations should be part of the exploration and learning.	Lessons 2 – 14
Virtual Lesson Count vs. Traditional Model					38 vs. 60
MP 3	8.F.A 8.F.B 8.EE.C 8.G.C	5 - Functions and Volume	Unit 5 - Learning Targets	Emphasis should be on defining functions as a rule that assigns each input to exactly one output and representation of functions in different ways including equations.	Lessons 1 – 12
MP 4	8.EE.A	7 - Exponents and Scientific Notation	Unit 7 - Learning Targets	Emphasis integer exponents and equivalent numerical expressions.	Lessons 1 – 8
	8.NS.A 8.G.B	8 - Pythagorean Theorem and Irrational Numbers	Unit 8 - Learning Targets	Emphasis on rational and irrational numbers and when square roots of numbers can produce rational or irrational numbers.	Lessons 1 – 15 Omit 10 and 11
Virtual Lesson Count vs. Traditional Model					33 vs. 65

Illustrative Mathematics Algebra I					
Algebra 1: 102 lessons vs. 132 in a standard implementation. A reduction to 77% of the content.					
Marking Period	Essential Standard(s)	Unit	Traditional Year Learning Targets	Virtual Learning Areas of Focus	Virtual Learning Lessons
MP 1**	A-CED.A A-REI.A A-REI.B A-REI.C A-REI.D A-SSE.A F-BF.A F-BF.B F-IF.A F-IF.B F-IF.C F-LE.A F-LE.B	2 - Linear Equations, Inequalities and Systems	Unit 2 - Learning Targets	Emphasize equations and inequalities in two variables that represent the relationships between quantities and use those relationships to represent graphically and reason about viable solutions.	Lessons 1 – 26 [Lessons 8, 9 and 26 can be skipped]
		4 - Functions	Unit 4 - Learning Targets	Solve linear equations, inequalities and systems of equations and or inequalities algebraically and graphically.	Lessons 1 – 18 [Lessons 15 – 18 can be skipped]
MP 2		5 - Introduction to Exponential Functions	Unit 5 - Learning Targets	<p>Emphasize relationships that meet the definitions of functions, build functions using functional notation that model those relationships and build new functions from existing functions. Students will interpret those functions in context and analyze symbolic and graphic representations for key properties.</p> <p>Emphasize the comparison and construction of linear and exponential functions and the properties of growth by constant rates and ratios.</p>	Lessons 1 – 21 [Lesson 21 can be skipped]
Virtual Lesson Count vs. Traditional Model					57 vs. 65 Lessons
MP 3	A-SSE.A A-SSE.B F-BF.A F-BF.B F-IF.A F-IF.B F-IF.C	6 - Introduction to Quadratic Functions	Unit 6 - Learning Targets	Emphasize the different forms of a quadratic and how those forms describe quantities, changing forms of quadratics and the properties revealed by different algebraic representations.	Lessons 1 – 17 [Lessons 7, 15 - 17 can be skipped]
		7 - Quadratic Equations	Unit 7 - Learning Targets		Lessons 1 – 24 [Lessons 10, 11, 13 - 15, and 19-24 can be skipped]
MP 4**	S-ID.A	1 - One-Variable Statistics	Unit 1 - Learning Targets	Emphasize the representations, measures and interpretations of univariate data.	Lessons 1 – 16 [Lessons 6 – 8 & 16

					can be skipped]
	S-ID.B	3 - Two-Variable Statistics	Unit 3 - Learning Targets	Emphasize the representations, measures and interpretations of bivariate data.	Lessons 1 – 10 [Lessons 6 & 10 can be skipped]
Virtual Lesson Count vs. Traditional Model					45 vs. 67
**Please note that the Algebra I units will not follow the traditional sequential order. Instead it will follow 2, 4, 5, 6, 7, 1, 3. This is based on standards assessed on MCAP.					

Virtual Learning Areas of Focus for Curriculum 2.0 Geometry and Algebra 2 were based on guidance from the MSDE documents. Guidance was not available at the lesson level. Cross-cutting standards are first addressed in Algebra 1 and revisited in Algebra 2 and, in some cases, Precalculus.

C2.0 Geometry					
<i>Geometry: 94 lessons vs. 135 in a standard implementation. A reduction to 70% of the content.</i>					
Marking Period	Essential Standard(s)	Unit	Traditional Year Learning Targets	Virtual Learning Areas of Focus	Virtual Learning Lessons
MP 1	G-CO.A G-CO.B G-CO.C G-CO.D	1 - Constructions, Congruence, and Transformations	Unit 1 - Learning Targets	Constructions support exploration of transformations and congruence. Prove triangle congruence and use the fact that corresponding parts of congruent figures are congruent to solve problems.	Lessons 1 - 46 [Lessons 1, 2, and 14 can be skipped]
MP 2	G-SRT.A G-SRT.B G-SRT.C	2 - Similarity, Right Triangles, and Trigonometry	Unit 2 - Learning Targets	Given two figures, determine if they are similar, and determine measures of missing sides of similar figures. Define trigonometric ratios and solve problems involving right triangles.	Lessons 1 - 28 [Lessons 10-12, 20, and 25-28 can be skipped]
MP 3	G-GMD.A	3 - Extending to Three Dimensions	Unit 3 - Learning Targets	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.	Lessons 1 - 19 [Lessons 6, 11, 15, and 16 can be skipped]
MP 4	G-GPE.B	4 - Connecting Algebra and Geometry through Coordinates	Unit 4 - Learning Targets	Use the relationship between the slopes of parallel and perpendicular lines to solve problems.	Lessons 1 - 24 [Lessons 1-15, 23, and 24 can be skipped]
	G-C.A	5 - Circles	Unit 5 - Learning Targets	Use the relationship between angles, radii, chords, and tangents to solve problems.	Lessons 1 - 18 [Lessons 1 and 8-12 can be skipped]
Virtual Lesson Count vs. Traditional Model					94 vs. 135

C2.0 Algebra 2*Algebra 2: 73 lessons vs. the 92 in standard implementation. A reduction to 79% of the content.*

Marking Period	Essential Standards	Unit	Traditional Year Learning Targets	Virtual Learning Areas of Focus	Virtual Learning Lessons	
MP 1	N.RN.A N.CN.A N.CN.C A-SSE.A A-SSE.B A-APR.A A-APR.B A-APR.D A-CED.A A-REI.A A-REI.B F-IF.B F-IF.C F-BF.A F-BF.B F-LE.A F-LE.B F-TF.A F-TF.B	1 - Functions and Their Inverses	Unit 1 - Learning Targets	Find inverse functions, with a focus on square root functions as inverses of square functions and logarithmic functions as inverses of exponential functions, numerically, graphically, and algebraically. Solve radical and logarithmic equations.	Lessons 1 - 30	
MP 2		2 - Polynomial and Rational Functions	Unit 2 - Learning Targets	Manipulate polynomial and rational expressions, equations, and inequalities. Solve polynomial equations with complex roots. Explore polynomial and rational functions, and use them to solve problems.	Lessons 1 - 25	
MP 3		3 - Introduction to Trigonometric Functions	Unit 3 - Learning Targets	Define sinusoidal functions using a unit circle, and explore their behavior. Use sinusoidal functions to solve problems, and interpret trigonometric functions that arise in applications in terms of real-world context.	Lessons 1 - 11	
MP 4		4 - Functions	Unit 4 - Learning Targets	Interpret functions that arise in application in terms of real-world context, and use functions to solve problems.	Lessons 1 - 7	
Note: Units 5 & 6 are omitted for Distance Learning. Unit 5 - Learning Targets Unit 6 - Learning Targets					[19 lessons omitted]	
Virtual Lesson Count vs. Traditional Model					73 vs. 92	

Content in Precalculus completes cross-cutting standards from Algebra 2 and addresses plus standards that were not addressed in prior courses.

C2.0 Precalculus					
<i>Precalculus: 39 lessons vs. the 56 in standard implementation. A reduction to 70% of the content.</i>					
Marking Period	Essential Standards	Unit	Traditional Year Learning Targets	Virtual Learning Areas of Focus	Virtual Learning Lessons
MP 1	A-SSE.B A-APR.D F-IF.B F-IF.C F-BF.B	1 - Polynomial, Power, and Rational Functions	Unit 1 Learning Targets	Introduce the concept of limit to explain end behavior and points of discontinuity, focusing on piecewise functions, power functions, and rational functions. Verify by composition that two functions are inverses. Recognize a function as the composition of two simpler functions. Understand that rational functions form a system analogous to rational numbers.	15 Lessons in 4 Topics [Topic 3 Lesson 4 and Topic 4 Lesson 3 can be skipped]
MP 2		2 - Exponential and Logarithmic Functions		Unit 2 Learning Targets	
Virtual Lesson Count vs. Traditional Model					19 vs. 21
MP 3	F-TF.A F-TF.B F-TF.C G-SRT.D	3 - Trigonometric Functions	Unit 3 Learning Targets	Choose trigonometric functions to model periodic phenomena. Solve trigonometric equations that arise in modeling contexts. Understand and apply the Law of Sines and Law of Cosines to find unknown measurements in triangles.	13 Lessons
MP 4		4 - Vectors and Parametrics		Unit 4 Learning Targets	
Note: Units 5 and 6 are omitted for Distance Learning.					[15 Lessons]

	Unit 5 Learning Targets Unit 6 Learning Targets	omitted]
Virtual Lesson Count vs. Traditional Model		20 vs. 35

C2.0 Honors Precalculus					
<i>Honors Precalculus: 48 lessons vs. the 70 in standard implementation. A reduction to 69% of the content.</i>					
Marking Period	Essential Standards	Unit	Traditional Year Learning Targets	Virtual Learning Areas of Focus	Virtual Learning Lessons
MP 1	A-SSE.B A-APR.D F-IF.B F-IF.C F-BF.B	1 - Polynomial, Power, and Rational Functions	Unit 1 Learning Targets	<p>Introduce the concept of limit to explain end behavior and points of discontinuity, focusing on piecewise functions, power functions, and rational functions.</p> <p>Verify by composition that two functions are inverses. Recognize a function as the composition of two simpler functions.</p> <p>Understand that rational functions form a system analogous to rational numbers.</p>	18 Lessons in 4 Topics [Topic 3 Lesson 4 and Topic 4 Lesson 2 and 3 can be skipped]
MP 2		2 - Exponential and Logarithmic Functions	Unit 2 Learning Targets	<p>Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.</p>	
Virtual Lesson Count vs. Traditional Model					21 vs. 24
MP 3	F-TF.A F-TF.B F-TF.C G-SRT.D	3 - Trigonometric Functions	Unit 3 Learning Targets	<p>Choose trigonometric functions to model periodic phenomena.</p> <p>Solve trigonometric equations that arise in modeling contexts.</p> <p>Understand and apply the Law of Sines and Law of Cosines to find unknown measurements in triangles.</p>	14 Lessons [Topic 4 Lesson 4 can be skipped]
MP 4	N-VM.A N-VM.B	4 - Vectors and Parametrics	Unit 4 Learning Targets	Solve problems involving velocities and other quantities that can be represented by vectors.	14 Lessons [Topic 2 Lesson 4 and Topic 3 Lessons 4-6 can be skipped]
	Note: Unit 5 is omitted for Distance Learning. Unit 5 Learning Targets				[9 Lessons omitted]

	A-SSE.B	6 - Discrete Math	Unit 6 Learning Targets	Use the formula for the sum of a finite geometric series to solve problems.	9 Lessons [Topic 1 Lessons 1-5 can be skipped]
Virtual Lesson Count vs. Traditional Model					27 vs. 46