Mathematics DLM Grade 8

A Regional Collaborative by the Monmouth Beach, Oceanport, Shore Regional, and West Long Branch Districts

Aligned to the New Jersey Student Learning Standards

Course Title: Eighth Grade DLM Mathematics

Content Area: Mathematics

Grade Level(s): Eight

Course Description: This curriculum includes these units of study: Rational Number Operations, Analyze and Use Proportional Relationships, Analyze and Solve Percent Problems, Generate Equivalent Expressions, Solve Problems Using Equations and Inequalities, Use Sampling to Draw Inferences About Populations, Probability, and Solve Problems Involving Geometry.

Curriculum Writer(s): Shannon Scott and the Office of Curriculum and Instruction

Date Created and Approved by the Board of Education: August 2021

PACING GUIDE		
Topic Number	Topic Title	Range of Days
1	Unit 1 Number Sense/Rational Numbers	27-30 Days
2	Unit 2 Functions	37-40 Days
3	Unit 3 Expressions and Equations	40-43 Days
4	Unit 4 Statistics and Probability	34-37 Days
5	Unit 5 Geometry	27-30 Days

FULL COURSE CORE INSTRUCTIONAL AND SUPPLEMENTAL MATERIALS	
Core Instructional Materials (including primary digital resources)	iXL, Flocabulary, Education.com, Google Classroom
Supplemental Materials (including various levels of texts and digital resources used regularly throughout the course)	AdaptEd 4 Special Education, Touch Math, Money Math, Blooket, Mid-topic performance task
Benchmark Assessments (including midterm, final, triennial, quarterly, etc.)	Teacher made benchmarks

TOPIC 1: Unit 1 Number Sense/ Rational Numbers	
Topic Summary: Students develop an understanding of numbers, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. They use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems**.** **Interdisciplinary Connections:** Science, Social Studies, Art, Music, Health, Digital Research, and Presentations.	
NJSLS Number	NJSLS Content Description
NJSLS #	**Content Standards**
M.EE.8.NS.1	Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends less than or equal to one.
M.EE.8.NS.2.a	Express a fraction with a denominator of 100 as a decimal.
M.EE.8.NS.2.b	Compare quantities represented as decimals in real-world examples to hundredths.
	English Language Arts
ELA.EE.RI.8.1	Analyze text to identify where information is explicitly stated and where inferences must be drawn
ELA.EE.W.8.2.b	Provide facts, details, or other information related to the topic
ELA.EE.W.8.2.d	Select domain specific vocabulary to use in writing about the topic
8.1	**Educational Technology**
8.1 Strand A	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge. Strand A: The use of technology and digital tools requires knowledge and appropriate use of operations and related applications.
9.4	**Life LIteracies and Key Skills**

9.4.8.TL.3:	Select appropriate tools to organize and present information digitally.
9.4.8.TL.4	Synthesize and publish information about a local or global issue or event.

ASSESSMENTS	
Formative	1. Study Island Modules 2. Short constructed responses 3. Exit tickets 4. Quizzes 5. Observation, conferencing, questioning 6. Feedback on Google Docs/Comments/RealTime feedback 7. Digital Assessments - Google Forms
Summative	8. Teacher Created Benchmarks 9. Study Island Benchmarks 11. Performance Tasks and End-of-Unit Tests 12. Projects and presentations
Alternative and/or Performance	13. Portfolio

TOPIC UNDERSTANDINGS AND ACTIVITIES

Essential Questions
How can the properties of operations be used to solve problems involving integers and rational numbers?
How are rational numbers written as decimals?
How do you decide which rational numbers operations to use to solve problems?

Enduring Understandings	**Content Standard(s)**	**Instructional Outcomes (tied to enduring understandings)**
Rational numbers expressed as fractions can be written in decimal form.	M.EE.8.NS.2.a	Students will recognize rational numbers and write them in decimal form
The same properties used to multiply/divide integers also applies to multiplying/dividing rational numbers.	M.EE.8.NS.1	Students will multiply and divide positive and negative integers.

Problems involving rational numbers can be solved by making sense of the quantities and their relationships to each other.	M.EE.8.NS.1 M.EE.8.NS.2.b	Students will add positive and negative integers, and model integer addition in real-life applications.
Prepare for Topic Misunderstandings/Missed Concepts (content and skills based)		

TOPIC SPECIFIC ACTIVITIES, LINKED TO ASSESSMENTS, WITH INSTRUCTIONAL AND SUPPLEMENTAL MATERIALS		
Skills-based Learning Activities (tied to instructional outcomes)	**Assessments**	**Topical Instructional/Suppl. Materials (including leveled texts and digital resources)**
Mathematical Modeling Lesson Today's Challenge Mid-topic performance task iXL Problem of the Day (POD) Topic based project	3, 5, 8, 13	Flocabulary, Education.com, Superteacherworksheets.com, teacher made activities

TOPIC 2: Unit 2 Functions
Topic Summary: Students will define, evaluate, and compare functions and use functions to model relationships between quantities. Students will define a function as a set of ordered pairs in which the x-value is paired with exactly one y. Students will demonstrate how functions can be represented in many ways and become familiar with advantages and disadvantages such as: ordered pairs, numerically in tables, graphically, or as equations. **Interdisciplinary Connections:** Science, Social Studies, Art, Music, Health, Digital Research, and Presentations.

NJSLS Number	NJSLS Content Description
NJSLS #	**Content Standards**
M.EE.8.F.1-3	Given a function table containing at least 2 complete ordered pairs, identify a missing number that completes another ordered pair (limited to linear functions).
M.EE.8.F.4	Determine the values or rule of a function using a graph or a table.
	English Language Arts
ELA.EE.RI.8.1	Analyze text to identify where information is explicitly stated and where inferences must be drawn
ELA.EE.W.8.2.b	Provide facts, details, or other information related to the topic
ELA.EE.W.8.2.d	Select domain specific vocabulary to use in writing about the topic
8.1	**Educational Technology**
8.1 Strand A	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge. Strand A: The use of technology and digital tools requires knowledge and appropriate use of operations and related applications.
9.4	**Life LIteracies and Key Skills**
9.4.8.TL.3:	Select appropriate tools to organize and present information digitally.
9.4.8.TL.4	Synthesize and publish information about a local or global issue or event.

ASSESSMENTS	
Formative	1. Study Island Modules 2. Short constructed responses 3. Exit tickets 4. Quizzes 5. Observation, conferencing, questioning 6. Feedback on Google Docs/Comments/RealTime feedback 7. Digital Assessments - Google Forms
Summative	8. Teacher Created Benchmarks 9. Study Island Benchmarks

	10. Performance Tasks and End-of-Unit Tests 11.. Projects and presentations
Alternative and/or Performance	13. Portfolio

TOPIC UNDERSTANDINGS AND ACTIVITIES		
Essential Questions How can you use functions to model linear relationships? How are the properties of functions and functional operations useful? When is a coordinate system used in real life?		
Enduring Understandings	**Content Standard(s)**	**Instructional Outcomes (tied to enduring understandings)**
A relation is a set of ordered pairs. A function is a relation in which each input, or x-value, has exactly one output, or y-value.	M.EE.8.F.1-3 M.EE.8.F.4	Students will be able to Identify whether a relation is a function.
Different representations, such as equations, tables, and graphs, can represent a function.	M.EE.8.F.1-3 M.EE.8.F.4	Students will be able to interpret and identify functions in different representations: equations, tables, and graphs.
The graph of a linear function is a straight line; non-linear function is not a straight line.	M.EE.8.F.1-3 M.EE.8.F.4	Students will be able to identify linear and nonlinear functions in different representations.
Prepare for Topic Misunderstandings/Missed Concepts (content and skills based)		

TOPIC SPECIFIC ACTIVITIES, LINKED TO ASSESSMENTS, WITH INSTRUCTIONAL AND SUPPLEMENTAL MATERIALS		
Skills-based Learning Activities (tied to instructional outcomes)	**Assessments**	**Topical Instructional/Suppl. Materials (including leveled texts and digital resources)**
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TOPIC 3: Unit 3 Expressions and Equations

Topic Summary: Students bring several prior skills together to manipulate expressions into different equivalent forms. In the preceding unit, students operated and reasoned with positive and negative rational numbers. In this unit, they use these new skills to expand, factor, add, and subtract numerical and algebraic expressions. Students pay particular attention to the structure of expressions in order to better understand what an expression means and how it can be manipulated. Students also face authentic real-world, multi-step problems that require strategic use of rational numbers and estimation where appropriate.

Interdisciplinary Connections: Science, Social Studies, Art, Music, Health, Digital Research, and Presentations.

NJSLS Number	NJSLS Content Description
NJSLS #	**Content Standards**
M.EE.8.EE.1	Identify the meaning of an exponent (limited to exponents of 2 and 3)
M.EE.8.EE.2	Identify a geometric sequence of whole numbers with a whole number common ratio.
M.EE.8.EE.7	Solve simple algebraic equations with one variable using addition and subtraction.
	English Language Arts
ELA.EE.RI.8.1	Analyze text to identify where information is explicitly stated and where inferences must be drawn

ELA.EE.W.8.2.b	Provide facts, details, or other information related to the topic
ELA.EE.W.8.2.d	Select domain specific vocabulary to use in writing about the topic
8.1	**Educational Technology**
8.1 Strand A	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge. Strand A: The use of technology and digital tools requires knowledge and appropriate use of operations and related applications.
9.4	**Life LIteracies and Key Skills**
9.4.8.TL.3:	Select appropriate tools to organize and present information digitally.
9.4.8.TL.4	Synthesize and publish information about a local or global issue or event.

ASSESSMENTS	
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TOPIC UNDERSTANDINGS AND ACTIVITIES

Essential Questions
When is it useful to model a relationship with an equation?
What kinds of problems can you solve by adding/subtracting the different types of rational numbers?
How can properties of operations help to generate equivalent expressions that can be used in solving problems?

Enduring Understandings	Content Standard(s)	Instructional Outcomes (tied to enduring understandings)
Algebraic expressions can be used to represent and solve problems in real-world contexts.	M.EE.8.EE.1 M.EE.8.EE.2	Students will recognize when two expressions are equivalent, and use properties of operations to write equivalent expressions.
Rearranging or combining like terms does not change the value of an expression.	M.EE.8.EE.1 M.EE.8.EE.2	Students will use properties of operations to add expressions and model them in real life applications.
To solve a two-step inequality, add or subtract the constant, and then multiply or divide to isolate the variable.	M.EE.8.EE.7	Students will combine like integers and rational terms.

Prepare for Topic Misunderstandings/Missed Concepts (content and skills based)

TOPIC SPECIFIC ACTIVITIES, LINKED TO ASSESSMENTS, WITH INSTRUCTIONAL AND SUPPLEMENTAL MATERIALS

Skills-based Learning Activities (tied to instructional outcomes)	Assessments	Topical Instructional/Suppl. Materials (including leveled texts and digital resources)
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TOPIC 4: Unit 4 Statistics and Probability	
Topic Summary: Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences. **Interdisciplinary Connections:** Science, Social Studies, Art, Music, Health, Digital Research, and Presentations.	
NJSLS Number	NJSLS Content Description
NJSLS #	**Content Standards**
M.EE.8.SP.4	Construct a graph or table from given categorical data, and compare data categorized in the graph or table.
	English Language Arts
ELA.EE.RI.8.1	Analyze text to identify where information is explicitly stated and where inferences must be drawn
ELA.EE.W.8.2.b	Provide facts, details, or other information related to the topic
ELA.EE.W.8.2.d	Select domain specific vocabulary to use in writing about the topic
8.1	**Educational Technology**
8.1 Strand A	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge. Strand A: The use of technology and digital tools requires knowledge and appropriate use of operations and related applications.
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TOPIC UNDERSTANDINGS AND ACTIVITIES

Essential Questions
How can we gather, organize and display data to communicate and justify results in the real world?
How can sampling be used to draw inferences about one or more populations?
How can you investigate change processes and develop, use, and evaluate probability models?

Enduring Understandings	Content Standard(s)	Instructional Outcomes (tied to enduring understandings)
Probability is the likelihood an event will occur. Probability can be described using a ratio such as 1 out of 2. The closer the ratio is to 0 the less likely it is to occur. The closer the value is to 1 is more likely the event will occur.	M.EE.8.SP.4	Students will use probability to describe the likelihood that an event will occur and relate probability to mathematical fairness.
A model, such as a table,or organized list, can represent the sample space of a compound event. The sample space can then be used to determine the probability of a favorable outcome	M.EE.8.SP.4	Students will analyze populations using the mean, median, mode, range.

The possible outcomes of a compound event (a combination of two or more events) can be represented using a table, or an organized list	M.EE.8.SP.4	Students will develop and use probability models to evaluate a situation.
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TOPIC 5: Unit 5 Geometry	
Topic Summary: Students continue their work with area from Grade 6, solving problems involving the area. Students will gain familiarity with the relationships between angles formed by intersecting lines. They will solve real-world and mathematical problems involving area and perimeter of two-dimensional objects composed of triangles, quadrilaterals, polygons. **Interdisciplinary Connections:** Science, Social Studies, Art, Music, Health, Digital Research, and Presentations.	
NJSLS Number	NJSLS Content Description

NJSLS #	Content Standards
M.EE.8.G.1	Recognize translations, rotations, and reflections of shapes
M.EE.8.G.2	Identify shapes that are congruent.
M.EE.8.G.5	Compare any angle to a right angle, and describe the angle as greater than, less than, or congruent to a right angle.
M.EE.8.G.9	Use the formulas for perimeter, area, and volume to solve real-world and mathematical problems (limited to perimeter and area of rectangles and volume of rectangular prisms).
M.EE.8.G.4	Identify similar shapes with and without rotation.
	English Language Arts
ELA.EE.RI.8.1	Analyze text to identify where information is explicitly stated and where inferences must be drawn
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ASSESSMENTS	
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	4. Quizzes 5. Observation, conferencing, questioning 6. Feedback on Google Docs/Comments/RealTime feedback 7. Digital Assessments - Google Forms
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TOPIC UNDERSTANDINGS AND ACTIVITIES

Essential Questions
How can geometry be used to solve problems?
Why are geometry and geometric figures relevant and important?
How can geometry be used to solve problems about real-world situations, spatial relationships, and logical reasoning?

Enduring Understandings	Content Standard(s)	Instructional Outcomes (tied to enduring understandings)
You can use $a^2 + b^2 = c^2$ to prove it's a right triangle.	M.EE.8.G.5	Students will be able to understand and apply the Converse of the Pythagorean Theorem to identify right triangles and analyze two-dimensional shapes.
The Pythagorean Theorem can be used to determine if a triangle is a right triangle and to find the missing side length of a triangle.	M.EE.8.G.5	Given two side lengths of a right triangle, students will be able to use the Pythagorean Theorem to find the length of the third side.
How do you know if shapes are congruent?	M.EE.8.G.2 M.EE.8.G.5	Students will be able to explain the properties of and identify congruent triangles.

Prepare for Topic Misunderstandings/Missed Concepts (content and skills based)




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Modifications (ELL, Special Education, At-Risk Students, Gifted & Talented, & 504 Plans)	
Supports for Students With IEPs	• Allow extra time to complete assignments or tests • Guided notes and/or scaffold outline for written assignments • Work in a small group • Solidify and refine concepts through repetition • Allow answers to be given orally or dictated • Use multi-sensory teaching approaches • Utilize assistive technology and materials • Use large print books, Braille, or books on CD (digital text) • Follow all IEP modifications