

NJDOE MODEL CURRICULUM PROJECT

CONTENT AREA: Mathematics

GRADE: 6

UNIT #4

UNIT NAME: Equations & Inequalities

Late February to Mid-April

STUDENT LEARNING OBJECTIVES		CORRESPONDING CCSS	
1	Use variables to represent numbers and write expressions when solving real world or mathematical problems.	6.EE.6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
2	Solve an equation or inequality to answer the question: which values from a specified set, if any, make the equation or inequality true? and check the solution using substitution to determine whether a given number in a specified set makes an equation or inequality true. (including formulas $V=lwh$ and $V=bh$)	6.EE.5	Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
3	Write and solve one step equations that represent real world or mathematical problems.	6.EE.7	Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.
4	Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real world or mathematical problem and represent them on a number line diagram.	6.EE.8	Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.
5	Use variables to represent two quantities that change in relationship to one another in a real world problem and write an equation to express one quantity, thought of as the dependent variable, in terms of another quantity, thought of as the independent variable.	6.EE.9	<i>Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</i>
6	Analyze the relationship between the dependent and independent variables in an equation using graphs and tables. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.	6.EE.9	<i>For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.</i>

Major Content **Supporting Content** **Additional Content** (Identified by PARCC Model Content Frameworks). ***Bold type indicates grade level fluency requirements.*** (Identified by PARCC Model Content Frameworks).

Selected Opportunities for Connection to Mathematical Practices

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.**
SLO #3 Order and justify steps to reach a solution to a one step equation.
- 4. Model with mathematics.**
SLO #6 The use of 2-D nets to solve surface area problems.
5. Use appropriate tools strategically.
- 6. Attend to precision.**
SLO #2 Real-world context involving careful attention to units of measure.
- 7. Look for and make use of structure.**
- 8. Look for and express regularity in repeated reasoning.**
SLO #1 The use of variables to represent real-world context over time.

All of the content presented at this grade level has connections to the standards for mathematical practices..

Bold type identifies possible starting points for connections to the SLOs in this unit.

Greater Brunswick Charter School Curriculum

Grade level: 6		Subject: Math			Unit #: 4		
Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
1	Equation readiness	2	To determine readiness for new learning	<i>Do I know enough to be successful in this next unit?</i>		<ul style="list-style-type: none"> • Independent practice • Intervention • i-Ready 	GlencoeMath p.510-512
2	Equations	2	Use the guess, check, and revise strategy to solve equations.	<i>How do I know what number to guess to make the equation be the same on both sides of the equal sign?</i>		<ul style="list-style-type: none"> • Lesson & Guided practice • Independent practice • Intervention • i-Ready 	GlencoeMath 7.1 p.513-519
3	Equations	2, 3	To write equations based on a real life situation	<i>How can I make my own equations to figure out real cases?</i>		<ul style="list-style-type: none"> • Lesson & Guided practice • Independent practice • Intervention • i-Ready 	GlencoeMath p.521-524
4	Creating and solving equations using addition	1, 2, 3	To solve equations in one variable using the Subtraction Property and inverse operations.	<i>How can I solve an equation without guessing?</i>		<ul style="list-style-type: none"> • Lesson & Guided practice • Independent practice • Intervention • i-Ready 	GlencoeMath 7.2 p.525-531
5	Equations	1, 2, 3	To write equations based on a real life situation	<i>How can I make my own equations to figure out real cases?</i>		<ul style="list-style-type: none"> • Lesson & Guided practice • Independent practice • Intervention • i-Ready 	GlencoeMath p.533-534
6	Creating and solving equations using addition	1, 2, 3	To solve equations in one variable using the Addition Property and inverse operations.	<i>How can I solve an equation without guessing?</i>		<ul style="list-style-type: none"> • Independent practice • Intervention • i-Ready 	GlencoeMath 7.3 p.535-541

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7	More guessing	3	To solve complex problems through inductive reasoning	<i>How can seeing a real life situation in my mind help me find the solution?</i>	<i>This is really just a warm up to using multiplication and division to solve problems. Don't sweat the guessing part. The goal is to commit them to seeing a situation in their mind with real moving pictures instead of using key words</i>	<ul style="list-style-type: none"> Lesson & Guided practice Independent practice Intervention i-Ready 	GlencoeMath p.543-545
8	<ul style="list-style-type: none"> More guessing Review 	1, 2, 3	To solve more real life problems through inductive reasoning	<i>How much experience seeing real life situations do I need to be sure to do it every time?</i>		<ul style="list-style-type: none"> Independent practice Intervention as needed for strugglers i-Ready 	GlencoeMath p.546 Practice on making simple equations Word problems – easy Word problems – medium Word problems – hard
9	Assessment	1, 2, 3				<ul style="list-style-type: none"> Review Assessment 	
10	Equations	1, 2, 3	To write equations based on a real life situation involving multiplication	<i>How can I make my own equations to figure out real cases?</i>		Assessment	GlencoeMath p.547-549
11	Creating and solving equations using multiplication	1, 2, 3	To solve equations in one variable using the Multiplication and Division Properties and inverse operations.	<i>How can I solve an equation without guessing?</i>	<i>This is a great time to begin using words like "coefficient" and "term".</i>	<ul style="list-style-type: none"> Lesson & Guided practice Independent practice Intervention i-Ready 	GlencoeMath 7.4 p. 551-557
12	Creating and solving equations using division	1, 2, 3	To solve equations in one variable using the Multiplication and Division Properties and inverse operations.	<i>How can I solve an equation without guessing?</i>	<i>If you think the Inquiry Lab on p. 559 will be useful, insert it before this lesson.</i>	<ul style="list-style-type: none"> Lesson & Guided practice Independent practice Intervention i-Ready 	GlencoeMath 7.5 p.561-567

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13	Solving equations in one variable	1, 2, 3	To solidify capacity to solve equations in one variable using the entire toolbox	<i>Can I solve an equation I am given without needing to guess at the answer?</i>		<ul style="list-style-type: none"> Independent practice Intervention for strugglers i-Ready 	This is the page with all of the word problems offered above and more.
14	More practice	1, 2, 3	To solidify capacity to solve equations in one variable using the entire toolbox	<i>Can I solve an equation I am given without needing to guess at the answer?</i>		<ul style="list-style-type: none"> Independent practice Intervention for strugglers i-Ready 	GlencoeMath p572-573 Another site with problems you can adjust
15	Assessment	1, 2, 3				<ul style="list-style-type: none"> Review Assessment 	
16	Function readiness	1	To determine readiness for working with functions	<i>Do I know my stuff well enough to go on?</i>		<ul style="list-style-type: none"> Independent practice Intervention i-Ready 	GlencoeMath p.576-578
17	Function tables	1, 5	To construct input and output tables from equations	<i>How do I keep track of all the answers to a problem when the value for the letter changes?</i>		<ul style="list-style-type: none"> Lesson & Guided practice Independent practice Intervention i-Ready 	GlencoeMath 8.1 p.579-585
18	Function rules	1, 5	To define two types of sequences and determine the next value in a sequence.	<i>How does knowing what kind of sequence I have help me to know the next value?</i>	<p><i>The type of sequence doesn't come up a lot in the future. So, use it only as a tool to help them figure out the next value in the sequence.</i></p> <p><i>Also, take care to differentiate between this use of the word "term" and the one you used a few days ago and will use most in the future – a term in an equation.</i></p>	<ul style="list-style-type: none"> Lesson & Guided practice Independent practice Intervention i-Ready 	GlencoeMath 8.2 p.587-593

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19	Graphing functions	5, 6	To illustrate the relationship between independent and dependant variables on a coordinate plane.	<i>How does graphing the function help me see values between the points I know?</i>	<i>Review ordered pairs at the start of this lesson. In your models, don't compute and plot for every domain value. This will help them find those additional values from the graph.</i>	<ul style="list-style-type: none"> Lesson & Guided practice Independent practice Intervention i-Ready 	GlencoeMath 8.3 p. 595-601
20	More functions and graphing	5, 6	To illustrate the relationship between independent and dependant variables on a coordinate plane while creating the functions from words.	<i>How can I use what I did a couple weeks ago to create equations to graph?</i>		<ul style="list-style-type: none"> Lesson & Guided practice Independent practice Intervention i-Ready 	GlencoeMath 8.4 p. 603-609
21	Review	5, 6	To obtain more practice creating, solving, graphing functions	<i>How much practice do I need to feel comfortable solving any equation that comes my way?</i>	<i>It may help to give students the same problems they saw a few days ago and have them take the next steps with them.</i>	<ul style="list-style-type: none"> Independent practice Intervention for strugglers i-Ready 	GlencoeMath p.614 <ul style="list-style-type: none"> This is the page with all of the word problems offered above and more. Another site with problems you can adjust
22	Assessment	5, 6				<ul style="list-style-type: none"> Review Assessment 	
23	Making tables with inequalities	2, 4	To make tables from situations involving inequalities		<i>Review the inequality signs before the activity. Emphasize all the inequality concepts in the activities to help the slide to tomorrow.</i>	<ul style="list-style-type: none"> Lesson & Guided practice Independent practice Intervention i-Ready 	GlencoeMath p.615-616

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Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
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24	Inequalities	1, 4	To substitute values into inequalities to determine if they are a part of the solution set.		<i>Transfer the concept of solution set from being one number in an equation to half of all numbers in an inequality – that “this number and this number and all of these numbers” work in the inequality.</i>	<ul style="list-style-type: none"> Lesson & Guided practice Independent practice Intervention i-Ready 	GlencoeMath 8.5 p.617-623
25	Solution sets of inequalities on a number line	1, 4	To graph solution sets of inequalities on a number line.	<i>How is graphing inequalities on a number line the same and different than graphing equalities?</i>		<ul style="list-style-type: none"> Lesson & Guided practice Independent practice Intervention i-Ready 	GlencoeMath 8.6 p.625-631
26	Solving inequalities	1, 4	To solve inequalities in one variable.	<i>How can I make my own inequalities to solve?</i>		<ul style="list-style-type: none"> Lesson & Guided practice Independent practice Intervention i-Ready 	GlencoeMath p.633-634
27	Solving inequalities	1, 2, 4	To solve inequalities in one variable.	<i>What are the differences between working with equations and working with inequalities? (Except for the solution set, there are none for people not working with negative numbers.)</i>	<i>Emphasize that all of the properties work the same way as with inequalities. There is nothing new to learn here.</i>	<ul style="list-style-type: none"> Lesson & Guided practice Independent practice Intervention i-Ready 	GlencoeMath 8.7 p.635-641
28	Solving inequalities	1, 2, 4	To solve inequalities in one variable.		<i>It may help to give students the same problems they saw a few days ago and change them to inequalities to solve and graph. This will reinforce that most of the concepts are exactly the same.</i>	<ul style="list-style-type: none"> Independent practice Intervention for strugglers i-Ready 	<ul style="list-style-type: none"> This is the page with all of the word problems offered above and more. Another site with problems you can adjust
29	Assessment	1, 2, 4				<ul style="list-style-type: none"> Review Assessment 	

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Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources				
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<u>Word Wall Candidates</u>											
	Addition Property		Expression		Inverse Operations		Independent Variable		Function Rule		
	Subtraction Property		Equation		Solve		Dependent Variable		Function Table		
	Multiplication Property		Inequality		Solution		Linear Function				
	Division Property		Function		Equals sign		Term				
<u>Authentic Application</u>											
Your Goal:	To determine the evacuation time from classrooms to specific doors in the school.										
Your Role:	Researcher and presenter										
Your Audience:	School officials, your classmates										
The Situation:	<p>You are to create an equation or inequality to calculate the time it takes to evacuate the building from each classroom that exits through a specific door. In making your equation or inequality, remember parts of your equation will be:</p> <ul style="list-style-type: none"> • Time to get to the classroom door from inside the classroom, which will be the same for most classrooms, • Time to travel from the classroom door to the exit door, which will be different for every classroom and dependent on its distance from the exit, and • Time to reach a safe distance from the school, which will be different for each exit door but will not change for that exit. 										
The Product:	You are to provide an equation or an inequality that will reliably predict the amount of time it will take to evacuate a classroom based on its distance from the exit.										
Success criteria:	Rubric score 0 to 12.										
	Score	1	2	3	4						
	The research data	All of the data is exact and accurate	All of the data values are in place, but some of them are only estimates.	There are needed data values that are missing from the research	No data was researched						
	The function	The function works effectively and accurately for all classrooms intended.	The function has all needed components accounting for each of the three components, but one component is faulty.	The function has all needed components accounting for each of the three components, but two components are faulty.	The function does not predict a nearly accurate amount of time or there is no function.						