

NJDOE MODEL CURRICULUM PROJECT

CONTENT AREA: Mathematics, Pre-Algebra

GRADE: 7

UNIT #: 2

UNIT NAME: Algebra Basics

STUDENT LEARNING OBJECTIVES		CORRESPONDING CCSS	
1	Apply the properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients (including additive and multiplicative inverse, distributive, commutative, and associative properties).	<p style="background-color: #90ee90; display: inline-block; padding: 2px;">7.EE.1</p> <p style="background-color: #90ee90; display: inline-block; padding: 2px;">7.EE.2</p>	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. <i>For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05."</i>
2	Use equivalent expressions to demonstrate the relationship between quantities and determine simpler solutions to a problem, such as $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05."	<p style="background-color: #90ee90; display: inline-block; padding: 2px;">7.EE.2</p>	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. <i>For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05."</i>
3	Solve multi-step real life and mathematical problems with rational numbers in any form (fractions, decimals, percents) by applying properties of operations and converting rational numbers between forms as needed, and then assess the reasonableness of results using mental computation and estimation strategies.	<p style="background-color: #90ee90; display: inline-block; padding: 2px;">7.EE.3</p>	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.
4	Use variables to represent quantities in a real-world or mathematical problem by constructing simple equations and inequalities to represent problems. <i>Equations of the form $px + q = r$ and $p(x + q) = r$ and inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers.</i>	<p style="background-color: #90ee90; display: inline-block; padding: 2px;">7.EE.4</p>	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

5	Fluently solve equations and inequalities and graph the solution set of the inequality; interpret the solutions in the context of the problem.	Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p , q , and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.
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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.**
SLO 4 Compare arithmetic and algebraic solutions to the same real-world problems.
- 2. Reason abstractly and quantitatively.**
SLO 2 Find simpler but equivalent expressions
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
- 7. Look for and make use of structure.**
SLO 1 Examine the formation of rational expressions then perform appropriate arithmetic operations.
8. Look for and express regularity in repeated reasoning.

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

Greater Brunswick Charter School Curriculum

Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
1	Distibutive property	1	To use the distributive property to simply algebraic expressions	<i>What makes the distributive property so important for simplifying the expressions I am going to be using?</i>		<ul style="list-style-type: none"> • Lesson • Guided Practice • Independent Practice • i-Ready 	GlencoePre-Alg p.292-296
2	Coefficients and like terms	1, 2	To use coefficients and like terms to simplify expressions	<i>What do I recall from the last unit to help me simplify expressions with one variable?</i>		<ul style="list-style-type: none"> • Lesson • Collaboration • Investigation • i-Ready 	GlencoePre-Alg p.297-298
3	Simplifying algebraic expressions	1, 2	To use various arithmetic properties to simply expressions	<i>How can I recognize like terms?</i>		<ul style="list-style-type: none"> • Lesson • Guided Practice • Independent Practice • i-Ready 	GlencoePre-Alg p.298-304
4	Associative Property and simplifying expressions	1, 2	To upack associated portions of an expression to simplify it.	<i>How does the Associative Property help me decode expressions and find like terms?</i>		<ul style="list-style-type: none"> • Lesson • Guided Practice • Independent Practice • i-Ready 	GlencoePre-Alg p.305-308
5	Simplifying associated portions of an expression with a leading negative sign	1, 2	To distribute a negative sign through an associated portion of an expression	<i>How many terms are affected by the negative sign outside of the parentheses?</i>		<ul style="list-style-type: none"> • Lesson • Guided Practice • Independent Practice • i-Ready 	GlencoePre-Alg p.310-313
6	Factors of a term	1, 2	To identify the factors that are common to two terms	<i>How can I see all the fators for each different kind of term (constants, variable coefficients)?</i>	<p style="color: red;">No need to focus on GREATEST common factor. If students can just continue to find factrs until there are no more, that will usually go more quickly for them, especially when coefficients are large.</p>	<ul style="list-style-type: none"> • Lesson • Guided Practice • Independent Practice • i-Ready 	GlencoePre-Alg p.316-319

Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
7	Chapter topics	1, 2	To improve weak areas of chapter content			<ul style="list-style-type: none"> Differentiated review 	GlencoePre-Alg p.320-322
8		1, 2				<ul style="list-style-type: none"> Review Assessment 	
9	Properties of equality	1, 2, 3	To use the properties of equality to simplify expressions and balance/solve equations	<i>How does what I do to one side of an equation mean for the other side of the equation?</i>		<ul style="list-style-type: none"> Lesson Guided Practice Independent Practice i-Ready 	GlencoePre-Alg p.324-327
10						<ul style="list-style-type: none"> Lesson Guided Practice Independent Practice i-Ready 	GlencoePre-Alg p.327-328
11	Solving two step equations	1, 2, 3	To take action on both terms on each side of an equation to simplify expressions and find the value of the variable	<i>Is it any different taking action with two terms on each side?</i>		<ul style="list-style-type: none"> Lesson Guided Practice Independent Practice i-Ready 	GlencoePre-Alg p.333-335
12						An additional day for differentiated review with students who need it most while allowing others to do the review on p.338	<ul style="list-style-type: none"> Lesson Guided Practice Independent Practice i-Ready
13	.Writing Equations	3, 4	To create equations from real world situations	How can I identify the variable in each situation and know what is happening to it?		<ul style="list-style-type: none"> Lesson Guided Practice Independent Practice i-Ready 	GlencoePre-Alg p.339-341
14							<ul style="list-style-type: none"> Review Assessment
15	Two step equations with Distributive property	1, 2, 3	To solve two step equations requiring simplification using distribution of a factor	<i>How is this just like the two step equations I've been doing?</i>		<ul style="list-style-type: none"> Lesson Guided Practice Independent Practice i-Ready 	GlencoePre-Alg p.347-350

Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
16	Solving equations with variables on each side	1, 2, 3	To solve equations with variables on each side	<i>Once I get all the variable terms on one side, how is this different than what I've been doing?</i>		<ul style="list-style-type: none"> • Lesson • Guided Practice • Independent Practice • i-Ready 	GlencoePre-Alg p.356-359
17	Inequalities and graphing on the number line	4	To determine if an inequality is true or false given a value for the variable	<i>How is valuating inequalities just like evaluating equalities?</i>	You could place a quiz here that uses a portion of the day.	<ul style="list-style-type: none"> • Lesson • Guided Practice • Independent Practice • i-Ready 	GlencoePre-Alg p.361-365
18	Solving inequalities	1, 2, 3, 4, 5	To solve inequalities and graph their solution set	<i>When is solving inequalities just like solving equalities and when is it different?</i>		<ul style="list-style-type: none"> • Review previous work • RTI as needed • HOT Problems • i-Ready 	GlencoePre-Alg p.367-372
19	Solving multi-step inequalities	1, 2, 3, 4	To solve inequalities needing multiple steps to simplify	How is taking action on multiple terms just like simplifying equations		<ul style="list-style-type: none"> • Lesson • Guided Practice • Independent Practice • i-Ready 	GlencoePre-Alg p.374-378
20						<ul style="list-style-type: none"> • Lesson • Guided Practice • Independent Practice • i-Ready 	
21	Solving inequalities	1, 2, 3, 4				<ul style="list-style-type: none"> • Review • Assessment 	
22	Linear functions	5	To identify a linear function as opposed to a linear expression	<i>How can I use the function rules to identify whether an expression is a function?</i>		<ul style="list-style-type: none"> • Review • Assessment 	GlencoePre-Alg p.384-389
23	Graphing linear functions	5	To graph linear functions on a Cartesian plane	<i>How can I use points that make the equation true to plot points and draw a line?</i>		<ul style="list-style-type: none"> • Lesson • Guided Practice • Independent Practice • i-Ready 	GlencoePre-Alg p.390-394
24						<ul style="list-style-type: none"> • Lesson • Guided Practice • Independent Practice • i-Ready 	

Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
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25	Rate of change, Slope	5	To compute the slope of an line	<i>How do I predict how draw the rest of the line after I know two points?</i>		<ul style="list-style-type: none"> Review lesson RTI as needed Independent Practice i-Ready 	GlencoePre-Alg p.396-401
26	Direct variation	5	To identify the constant of variation and use it to solve problems	<i>How do my predictions for drawing the rest of the line end up showing me the constant of variation?</i>		<ul style="list-style-type: none"> Lesson Guided Practice Independent Practice i-Ready 	GlencoePre-Alg p.405-409
27	Slope-Intercept form	1, 2, 3, 5	To simplify a function into slope-intercept form and graph the equation.	<i>How is slope-intercept form really just simplifying an equation and graphing the result?</i>		<ul style="list-style-type: none"> Lesson Guided Practice Independent Practice i-Ready 	GlencoePre-Alg p.412-416
28	Unit 2 topics					<ul style="list-style-type: none"> Small group concept review RTI as needed i-Ready 	GlencoePre-Alg p.430-431
29						<ul style="list-style-type: none"> More practice on problems i-Ready 	GlencoePre-Alg Problem Solving Reflect
30						<ul style="list-style-type: none"> Review Assessment 	

Word Wall Candidates

Equivalent expressions	Distributive Propoerty	Term	Coefficient	Like terms
Constant	Linear expression	Factor	Inverse operations	Function
Independent variable	Dependent variable	Vertical Line Test	Function Rule	Function notation
Linear equation	Linear function	Function table	Y-intercept	X-intercept
Rate of change	Linear relationship	Constant rate of change	Slope	Direct variation
Constant of variation				

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Authentic Application

Your Goal: To determine the better price of three cell phone carriers at different times in the contract.

Your Role: To research the pricing plans for each carrier and represent the best deal for customers

Your Audience: Potential customers

The Situation: You will pick three carriers and do some exploring on their website. You will try to find information to come up with three equations, one from each carrier you choose, of the cost of the same product.

Three Aspects of the Assignment:

1. Write three equations reflecting the cost
2. Graph the equations on the same graph to show comparison

Your Product: Make a project board to show which company was the cheapest

Success Criteria:

CATEGORY	4	3	2	1
Research	Student found all the information they needed for the equations and the project board.	Student did research but did not do enough for either the equations or the project board.	Student did some research but numbers for the equation and information for project board was not accurate.	Student failed to research and completely altered the data.
Writing Linear Equations	Student accurately wrote two linear equations from the data they collected.	Student wrote the equations but was wrong on one aspect.	Student wrote the equations but they were wrong.	Student failed to write equations
Graphing Linear Equations	The student accurately graphed two linear equations.	The student graphed the equations but messed up on some aspect of graphing.	Student graphed one equation but not the other.	Student failed to graph either equation.
Brochure	The project board was creative and had a numerous amount of information.	The project board lacked creativeness.	The project board lacked an element required to be in project board.	Student failed to create a project board.
Oral Presentation	Student presented their information in a clear and concise manner that was enjoyable to watch.	Student presented their information in a fashion that was understandable to most people	Student presented their information but not in a clear manner	Student failed to give an oral presentation

