

## Board Approved August 2017

Department MathematicsSubject Algebra 1A

Week	Marking Period 1	Week	Marking Period 3
1	Summer assignment, benchmark, evaluate expressions, order of operations 1.1-1.2	11	Graphing with tables, intercepts, finding slope 4.2-4.4
2	Writing expressions, equations and inequalities, 1.3-1.4	12	Graphing with slope/point, and slope-y-intercept 4.5
3	Sets of numbers, add/subtract real numbers 2.1-2.3	13	Direct Variation, Writing and using linear equations in slope-intercept form 4.6, 5.15.2
4	Multiply/divide real numbers, distributive property 2.4-2.6	14	
5		15	Point-Slope and Standard Forms 5.3-5.4
Week	Marking Period 2	Week	Marking Period 4
6	Square roots and comparing real numbers, solving one and two-step equations 2.7-3.2	16	Parallel/Perpendicular Lines
7	Multi-step and variables on both sides 3.3-3.4	17	Linear Regression, test
8		18	Solving inequalities in one variable, Absolute value equations 6.1-6.2, 6.5
9	Ratios/Proportions/Percents 3.5-3.7	19	Multi-step inequalities and compound inequalities 6.3-6.4
10	Literal Equations, Plotting points 3.8-4.1	20	Solve absolute value inequalities and graphing linear inequalities 6.6-6.7

<b>Time Frame</b>	<b>2 WEEKS</b>						
<b>Topic</b>							
CHAPTER 1 - EXPRESSIONS, EQUATIONS, AND FUNCTIONS							
<b>Essential Questions</b>							
<ul style="list-style-type: none"> <li>• How do you write and evaluate algebraic expressions and powers?</li> <li>• How do you use the order of operations to evaluate expressions?</li> <li>• How do you write equations and inequalities? How do you write them to represent real world situations?</li> <li>• What is a relation? What is a function?</li> <li>• How can you represent a function as a table, verbal rule, equation, graph?</li> </ul>							
<b>Enduring Understandings</b>							
<ul style="list-style-type: none"> <li>• How large amounts of data are presented in a concise format, such as a graph or table. What happens to positive and negative values when they are combined.</li> <li>• Function patterns can be represented in two variables. Functional relationship relates the value of one variable, such as <math>y</math> or <math>f(x)</math>, to another variable, such as <math>x</math>. Functional relationships can be related visually by graphs, as well as by sets, rules, tables, and mappings.</li> </ul>							
<b>Alignment to NJSL</b>							
N.Q.1, A.SSE.1, A.CED.2, F.IF.4							
<b>Key Concepts and Skills</b>							
<ul style="list-style-type: none"> <li>• Students should be able to replace variables with numbers to solve an equation • Simplifying expressions using Exponents and Order of Operations • Determine patterns of both numerical and geometric sequences • Utilize data presented in a scatter Plot • Operations with Rational Numbers • Solve expressions using the Distributive Property</li> <li>• To interpret, sketch and analyze graphs from various situations ( ie time vs distance from home) • To identify relations and functions • To evaluate functions • To determine range and domain • To utilize function notation, <math>f(x)</math>, evaluate and construct tables • To use the vertical line test to determine if a relation is a function • To write function rules based on real world situations</li> </ul>							
<b>Learning Activities</b>							
Classzone.com, Khan Academy, Mathispower4u, youtube, communicators, Kahoot • Modeling Activity • Real-World Application-reading graphs in current newspapers • Play Order of Operations Game • Algebra Tile Activity • Human Number Line • Group Practice Chapt 1 Project: Watch it Disappear (Resource Book , 1-84,85)							
<b>Assessments</b>							
Homework, Quizzes, Tests, Activities							
<b>21<sup>st</sup> Century Skills</b>							
<b>X</b>	Creativity	<b>X</b>	Critical Thinking	<b>X</b>	Communication	<b>X</b>	Collaboration
<b>X</b>	Life & Career Skills		Information Literacy		Media Literacy		
<b>Interdisciplinary Connections</b>							
<ul style="list-style-type: none"> <li>• Problem Solving Examples from each section (ie.Sports, Carpentry, Baking, Gardening, Profit...)</li> <li>□ Historical data in tables and graphs</li> <li>• Application: History, Paul Revere's Ride (Resource 1-68)</li> </ul>							
<b>Technology Integration</b>							
8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.							

<b>Time Frame</b>	<b>3 WEEKS</b>						
<b>Topic</b>							
CHAPTER 2- PROPERTIES OF REAL NUMBERS							
<b>Essential Questions</b>							
<ul style="list-style-type: none"> <li>• How do you compare positive and negative numbers?</li> <li>• How do you add, subtract, multiply, divide real numbers?</li> <li>• How do you apply the distributive property to simplify expressions?</li> <li>• How do you evaluate square roots (irrational numbers) and compare real numbers?</li> </ul>							
<b>Enduring Understandings</b>							
<ul style="list-style-type: none"> <li>• Properties for Add, subtract, multiply, divide Real Numbers.</li> <li>• Subtraction is equivalent to adding the opposite of second number.</li> <li>• Rewrite expressions by distributive property and combining like terms.</li> </ul>							
<b>Alignment to NJSLS</b>							
<b>N.Q.1, A.SSE.1, A.CED.2, F.IF.4</b>							
<b>Key Concepts and Skills</b>							
<ul style="list-style-type: none"> <li>• Subtraction is equivalent to adding the opposite of second number.</li> <li>• You can rewrite expressions by distributive property and combining like terms.</li> <li>• All positive real numbers have 2 square roots, zero has one , and negative real numbers have no real square root.</li> </ul>							
<b>Learning Activities</b>							
Classzone.com, Khan Academy, Mathispower4u, youtube, communicators, Kahoot Plus, minus chips. Animated Algebra. Algebra Tiles. Chapt 2 Project: (2-81,82) Decoding Universal Product Codes							
<b>Assessments</b>							
Homework, Quizzes, Tests, Activities							
<b>21<sup>st</sup> Century Skills</b>							
<b>X</b>	Creativity	<b>X</b>	Critical Thinking	<b>X</b>	Communication	<b>X</b>	Collaboration
<b>x</b>	Life & Career Skills		Information Literacy		Media Literacy		
<b>Interdisciplinary Connections</b>							
<ul style="list-style-type: none"> <li>• Problem Solving Examples from each section (ie. Astronomy, Temperature, Football, Profits, Ocean Depths, Mountain Elevations, Golf Scores,,)</li> <li>• Application History WWII (resource book 2-11),</li> <li>• Application Stockholders ( 2-22 )</li> </ul>							
<b>Technology Integration</b>							
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**Time Frame****3 WEEKS****Topic****CHAPTER 3 – SOLVING LINEAR EQUATIONS****Essential Questions**

- How do you solve one step equations using add, subtract, multiply, divide?
- How do you solve 2 step equations? How do you solve multi-step equations?
- How do you solve equations with variables on both sides?
- How do you write ratios and write and solve proportions?
- How do you solve proportions using cross products?
- How do you solve percent problems?
- How do you rewrite equations and formulas and solve for a given variable (literal equations)?

**Enduring Understandings**

- When solving an equation, 3 things may result:  $x$  will equal a number, the  $x$  will eliminate leaving either a true or false statement- if true, there are infinite solutions, if false, there are no solutions to the equation. The purpose of transforming a literal equation is to solve for a different value, such as  $\text{Area} = \text{length} \times \text{width}$ , what if you had the area and the width, how would you find the length? To solve a proportion, cross-multiplication is most effective

**Alignment to NJSL**

A.CED.1, A.SSE.1, A.REI.3, A.CED.1, A.CED.4

**Key Concepts and Skills**

- Students should be able to solve an equation in one variable with single or multi steps,
- Use inverse operations to undo an equation, cross products of a proportion are equal, □ represent % as a proportion,
- Solve literal equations same as any other equation, isolate dependent variable  $y$  on one side

**Learning Activities**

Classzone.com, Khan Academy, Mathispower4u, youtube, communicators, Kahoot , TI 84, Algebra Tiles  
 Chapt 3 Project -Ice Rescue (3-91,92)

**Assessments**

Homework, Quizzes, Tests, Activities

**21<sup>st</sup> Century Skills**

	Creativity	<b>X</b>	Critical Thinking	<b>X</b>	Communication	<b>X</b>	Collaboration
<b>X</b>	Life & Career Skills		Information Literacy		Media Literacy		

**Interdisciplinary Connections**

- Problem Solving Examples from each section (ie. Olympics, Car Sales, Internet, Photography, Carpentry, ...)
- Application History Pony Express (resource book 3-12),
- Application Economics -Markup and cost (3-78 )

**Technology Integration**

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge

<b>Time Frame</b>	<b>3 WEEKS</b>						
<b>Topic</b>							
CHAPTER 4 –GRAPHING LINEAR EQUATIONS AND FUNCTIONS							
<b>Essential Questions</b>							
<ul style="list-style-type: none"> <li>• How do you plot points in the coordinate plane?</li> <li>• How do you graph linear equations? How do you use intercepts to graph equations?</li> <li>• How do you find the slope of a line and interpret slope as a rate of change?</li> <li>• How do you graph using slope-intercept form?</li> <li>• How do you write and graph direct variation equations?</li> <li>• What is function notation?</li> </ul>							
<b>Enduring Understandings</b>							
<ul style="list-style-type: none"> <li>• Slope is a ratio of rise over run Determine the sign of the slope by looking at the line from left to right There are many ways to solve problems but some are more efficient than others.</li> <li>• Graphs and equations are alternative ways for depicting and analyzing patterns of change.</li> <li>• Functional relationships can be expressed in real contexts, graphs, algebraic equations, tables and words. Each representation of a given function is simply a different way of expressing the same idea.</li> </ul>							
<b>Alignment to NJSL</b>							
F.IF.4, F.IF.6, S.ID.7, A.CED.2, A.CED.3, F.IF.5, F.IF.7a, F.BF.1a, F.LE.2, F.LE.5, G.GPE.5, F.BF.3, A.REI.12							
<b>Key Concepts and Skills</b>							
<ul style="list-style-type: none"> <li>• Students should be able to graph a linear equation on a coordinate plane from any form (standard, slope-intercept, point-slope)</li> <li>• Students will find the slope and y-intercept of a line graphically and algebraically</li> <li>• Determine if two lines are parallel or perpendicular graphically and algebraically</li> <li>• How to turn a line into an inequality by shading one of the sides</li> <li>• How to graph an absolute value function</li> </ul>							
<b>Learning Activities</b>							
Classzone.com, Khan Academy, Mathispower4u, youtube, communicators, Kahoot Graphing a line on a coordinate plane constructed on the floor of the classroom • Use a graphing calculator or website to discover how changing the coefficient of x or the constant changes the slope and y-intercept Algebra I in the graph • Use the graphing calculator with the Smart board to engage class discussions • Green Glob software Chapt 4 Project ( 4-103,104 Carnival Time )							
<b>Assessments</b>							
Homework, Quizzes, Tests, Activities - Answering questions on a website Sketching a line with intended results Self check quizzes online							
<b>21<sup>st</sup> Century Skills</b>							
	Creativity	X	Critical Thinking	X	Communication	X	Collaboration
X	Life & Career Skills		Information Literacy		Media Literacy		
<b>Interdisciplinary Connections</b>							

Department Mathematics

Subject Algebra1A

- Problem Solving Examples from each section (ie. Hourly pay, Jupiter's Moons, Plants, Music,...)
- Rates of change in science, history, and financial literacy, Application Mammals Gestation (4-14)
- Application on Minimum Wage relating history Fair Labor Act (4-56 Resource book) □  
Application on Gasoline prices (4-86)

### **Technology Integration**

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**Time Frame****3 WEEKS****Topic****CHAPTER 5 – WRITING LINEAR EQUATIONS****Essential Questions**

- How do you write an equation of a line in slope- intercept form?
- How do you write the equation of a line given two points?
- How do you write linear equations in point-slope form? Standard form?
- How do you write equations of parallel and perpendicular lines?
- How do you make scatter plots and write equations to model data? (include linear regression)
- How do you use the best-fitting line to make predictions about data?

**Enduring Understandings**

- Write linear equations in a variety of forms, Write equations of Parallel and Perpendicular lines,
- Use linear models to solve problems
- Model data with line of best fit, Predict with Linear Models

**Alignment to NJSL**

**F.IF.4, F.IF.6, S.ID.7, A.CED.2, A.CED.3, F.IF.5, F.IF.7a, F.BF.1a, F.LE.2, F.LE.5, G.GPE.5, F.BF.3, A.REI.12**

**Key Concepts and Skills**

If you know  $m$  and  $b$  you can write equation and graph the line, If you know 2 points you can write the equation of the line, or a point and slope to use point/slope formula for equation, lines with the same slope are parallel, lines with slopes that are negative reciprocals are perpendicular, use scatter plots to determine relationships of data (best fit line)

**Learning Activities**

Classzone.com, Khan Academy, Mathispower4u, youtube, communicators, Kahoot Internet Activity Model Data ( text p 342) , TI 84 Linear Regression Activities/Labs, Spreadsheet Activity: Predicting Fuel Consumption in US (Resource Book - 5-76) Chapt 5 Project – Predicting Femur Length (5-90,91)

**Assessments**

Homework, Quizzes, Tests, Activities

**21<sup>st</sup> Century Skills**

<b>X</b>	Creativity	<b>X</b>	Critical Thinking	<b>X</b>	Communication	<b>X</b>	Collaboration
<b>X</b>	Life & Career Skills	<b>X</b>	Information Literacy		Media Literacy		

**Interdisciplinary Connections**

- Problem Solving examples in each section relating scatter plots, graphs, equations to real life (ie. Hotel rates, Crops, Imports, Oil Changes, Sports, National Parks, States and Populations, Nutrition)
- Application Break Even Analysis (5-12), Bald Eagles (5-22), Cell Phone Use (5-72),

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**Time Frame** | **3 WEEKS****Topic****CHAPTER 6- SOLVING AND GRAPHING LINEAR INEQUALITIES****Essential Questions**

- How do you solve and graph linear inequalities using add and subtract?
- How do you solve and graph linear inequalities using multiply and divide?
- How do you solve multi-step inequalities?
- How do you solve compound inequalities?
- How do you solve absolute value equations and inequalities?
- How do you graph absolute value functions?
- How do you graph linear inequalities in two variables?

**Enduring Understandings**

- You solve inequalities the same as equations using inverse operations to isolate the variable. You must remember to flip the inequality symbol when multiplying or dividing by a negative. You can represent the solution with a graph on a number line.
- An inequality results in an infinite amount of answers with an ending or beginning value. Absolute value equations result in an infinite amount of points between two values or outside of two values.

**Alignment to NJSL**

F.IF.4, F.IF.6, S.ID.7, A.CED.2, A.CED.3, F.IF.5, F.IF.7a, F.BF.1a, F.LE.2, F.LE.5, G.GPE.5, F.BF.3, A.REI.12

**Key Concepts and Skills**

Represent the solution set to an inequality with a graph on a number line; Flip the inequality symbol when multiplying or dividing by a negative; You can graph compound inequalities joined by and and or; A linear inequality in 2 variables is a shaded region of all the points that solve the inequality.

- When solving an inequality, you are finding the endpoint and then shading in a specific direction.
- When solving an absolute value, you are getting 2 answers most of the time.

**Learning Activities**

Classzone.com, Khan Academy, Mathispower4u, youtube, communicators, Kahoot Spreadsheet Activity (6-84)

Chapt 6 Project : Movies (6-99,100)

**Assessments**

Homework, Quizzes, Tests, Activities

**21<sup>st</sup> Century Skills**

<b>X</b>	Creativity	<b>X</b>	Critical Thinking	<b>X</b>	Communication	<b>X</b>	Collaboration
<b>X</b>	Life & Career Skills	<b>X</b>	Information Literacy		Media Literacy		

**Interdisciplinary Connections**

- Problem Solving examples in each section ( ie. Sports, job earnings, astronomy, nutrition, ...)
- Application History : People in Flight (6-41)
- Application CD Players ( 6-80)

**Technology Integration**

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