## Englewood Public School District <br> Mathematics <br> Grade 6 <br> Third Marking Period

## Unit - Equations and Inequalities

Overview: During this unit, students will about equations and inequalities, the coordinate plane, and area of polygons.
Time Frame: Chapter 8 - 12 days, Chapter 9 - 10 days, Chapter 10-12 days

## Enduring Understandings:

Equations and inequalities can be used to describe situations and solve real-world problems.
Every point on a coordinate plane can be represented by a pair of coordinates.
The area of a polygon can be found by dividing it into smaller shapes, and then adding the area of those shapes.

## Essential Questions:

How is the Order of Operations used in evaluating variable expressions that contain exponents?
How can substitutions be used to make an equation or inequality true?
What are dependent and independent variables?
What is the relationship between a dependent and an independent variable?
How can a coordinate plane be used to solve problems in geometry?
How is an ordered pair plotted on a coordinate plane?
How can real-world problems be solved using the coordinate system?

| Standards | Topics and Objectives | Activities | Resources | Assessments |
| :---: | :---: | :---: | :---: | :---: |
| Chapter 8 |  |  |  |  |
| 6.EE.A.2. Write, read, and evaluate expressions in which letters stand for numbers. <br> c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform | Topics <br> Solving algebraic equations, writing linear equations, solving simple inequalities and real-world problems with equations and inequalities. <br> Twenty-First Century Themes and Skills include: | 6.EE.B. 5 Make Use of Structure <br> 6.EE.B. 7 Morning Walk <br> 6.EE.B. 8 Fishing Adventures 1 <br> 6.EE.C. 9 Families of Triangles | SE-6B: 5-37 <br> My HRW - Online access to all Math in Focus materials listed above and Virtual Manipulatives <br> Technology Resources <br> - Math in Focus eBooks <br> - Math in Focus Teacher Resources CD | Unit 3 Benchmark <br> Assessments: <br> Common Formative <br> Assessment <br> Exact Path <br> Formative Assessments: <br> Math journal <br> (NJSLSA.R1, <br> NJSLSA.W2, |


| arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas $V=s^{3}$ and $A=6 \mathrm{~s}^{2}$ to find the volume and surface area of a cube with sides of length $s=1 / 2$. <br> 6.EE.B.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. <br> 6.EE.B.7. Solve real-world and mathematical problems by writing and solving equations of the form $x+p=$ $q$ and $p x=q$ for cases in which $p, q$ and $x$ are all nonnegative rational numbers. <br> 6.EE.B.8. Write an inequality of the form $x>c$ or $x<c$ to represent a constraint or condition in a | - Creativity and Innovation <br> - Critical Thinking and Problem Solving <br> - Communication and Collaboration <br> Objectives <br> The students will be able to: <br> - Solve equations in one variable. <br> - Express the relationship between two quantities as a linear equation. <br> - Use a table or graph to represent a linear equation. <br> - Use substitution to determine whether a given number is a solution of an inequality. <br> - Represent the solutions of an inequality on a number line. <br> - Solve real-world problems by writing inequalities. <br> - Reinforce, consolidate, and extend chapter skills and concepts. | Math Playground http://www.mathplaygrou nd.com/ <br> Math Fact Practice http://www.playkidsgam es.com/games/mathfact/ mathFact.htm <br> Grades 6-8 Math <br> Fluency Support <br> https://www.engageny.org /resource/mathematics- <br> fluency-support-grades-6- <br> 8 <br> Brain Genie <br> http://braingenie.ck12.org/ <br> Math Game Time <br> http://www.mathgametim e.com/ <br> Everything you need to know about math journals: <br> https://thecornerstoneforte achers.com/math-journals/ <br> (NJSLSA.R1, <br> NJSLSA.W2, <br> NJSLSA.L1) <br> Solving 2 step algebraic equations - lesson and activities: <br> https://betterlesson.com/le sson/591617/solving-2-step-algebraic-equations | - Interactive Whiteboard lessons <br> - Virtual Manipulatives <br> - Online Professional Development Videos <br> North Carolina Dept of Ed. <br> Wikispaces: <br> http://maccss.ncdpi.wikispa ces.net/Middle+School <br> Math Goodies - Math <br> Lessons <br> http://www.mathgoodies.co <br> m/ <br> Standards Solution <br> Lessons: <br> - PARCC Lesson 16: Practice PARCC Type I Expressions and Equations <br> - CCSS Lesson Plan: Hypothesize Equations and Inequalities <br> - CCSS Prescriptive Lesson Plan: Writing Expressions with Variables <br> - CCSS Prescriptive Lesson Plan: Solving Linear Equations <br> - CCSS Prescriptive Lesson Plan: Representing Real Life Problems with Inequalities | NJSLSA.L1) <br> Multiple choice / short answer assessments (CRP8) <br> Mini quizzes - assess just one topic, or what was done within 1 or 2 days (CRP8) <br> Summative Assessments: <br> Math in Focus Assessments <br> SE/TE: pp. 35, 36-37 <br> Assessments Course 1: <br> Chapter 8 <br> Test A pp. 83-84; <br> Test B pp. 85-86 <br> ExamView Assessment <br> Suite - Test and Practice Generator <br> Alternative Assessments: <br> Learning centers: each learning center focuses on a different type of problem (CRP8) <br> Create posters illustrating the main objectives of the unit <br> (RH.6-8.7) |
| :---: | :---: | :---: | :---: | :---: |



## Chapter 9

6.NS.C.6. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.
c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.
6.NS.C.8. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.
6.EE.A.2. Write, read, and evaluate expressions in which letters stand for numbers.
c. Evaluate expressions at

## Topics

Points on the coordinate plane, length of line segments, and real-world problems involving graphing,

Twenty-First Century Themes and Skills include:

- Creativity and Innovation
- Critical Thinking and Problem Solving
- Communication and Collaboration


## Objectives

The students will be able to:

- Name and locate points on the coordinate plane.
- Draw and identify polygons on the coordinate plane.
- Find lengths of horizontal and vertical line segments on the coordinate plane.
- Solve real-world problems involving coordinates and a coordinate plane.
- Solve real-world problems involving

| Math Playground <br> http://www.mathplaygrou |
| :--- |
| nd.com/ |
| Math Fact Practice |
| http://www.playkidsgam |
| es.com/games/mathfact/ |
| mathFact.htm |
| Grades 6-8 Math |
| Fluency Support |
| https://www.engageny.org |
| /resource/mathematics- |
| fluency-support-grades-6- |
| $\underline{8}$ |

## Brain Genie

http://braingenie.ck12.org/

## Math Game Time

http://www.mathgametim e.com/

## Everything you need to <br> know about math

 journals:https://thecornerstoneforte achers.com/math-journals/
(NJSLSA.R1,
NJSLSA.W2,
NJSLSA.L1)
Graphing points game:
http://www.shodor.org/int eractivate/activities/Gener alCoordinates/

SE-6B: 42-71

My HRW - Online access to all Math in Focus materials listed above and Virtual Manipulatives

## Technology Resources

- Math in Focus eBooks
- Math in Focus Teacher Resources CD
- Interactive Whiteboard lessons
- Virtual Manipulatives
- Online Professional Development Videos

North Carolina Dept of Ed. Wikispaces:
http://maccss.ncdpi.wikispa ces.net/Middle+School

Math Goodies - Math Lessons
http://www.mathgoodies.co m

## Standards Solution

## Lessons:

- CCSS Lesson Plan:

Location, Location, Location - Graphing on the Coordinate Plane Part 1

- CCSS Lesson Plan: The

Formative Assessments:
Math journal
(NJSLSA.R1, NJSLSA.W2, NJSLSA.L1)

Multiple choice / short answer assessments (CRP8)

Mini quizzes - assess just one topic, or what was done within 1 or 2 days (CRP8)

## Summative Assessments

## Math in Focus

Assessments
SE/TE: pp. 67, 68-71

## Assessments Course 1: Chapter 9 <br> Test A pp. 89-91; <br> Test B pp. 92-94 <br> ExamView Assessment Suite - Test and Practice Generator

Alternative Assessments:<br>Learning centers: each learning center focuses on a different type of



| a. Make tables of equivalent |
| :--- |
| ratios relating quantities |
| with whole-number |
| measurements, find missing |
| values in the tables, and plot |
| the pairs of values on the |
| coordinate plane. Use tables |
| to compare ratios. |
| b. Solve unit rate problems |
| including those involving |
| unit pricing and constant |
| speed. For example, if it took |
| 7 hours to mow 4 lawns, then |
| at that rate, how many lawns |
| could be mowed in 35 hours? |
| At what rate were lawns |
| being mowed? |
| Mathematical Practices |
| MP.1, MP.2, MP. 4 , |
| MP.5, MP.6, MP. 7 |

## Chapter 10

6.EE.A.2. Write, read, and evaluate expressions in which letters stand for numbers.
c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to

| Topics <br> Area of a triangle, parallelogram, trapezoids, other polygons, and composite figures. | 6.G.A.1, 6.G.A. 3 |
| :---: | :---: |
|  | Polygons in the |
|  | Coordinate Plane |
|  | Math Playground http://www.mathplaygrou |
|  | nd.com/ |
| Twenty-First Century Themes and Skills include: | Math Fact Practice |
|  | http://www.playkidsgam |
| Creativity and | es.com/games/mathfact/ |
| Innovation | mathFact.htm |
| - Critical Thinking and |  |
| - Problem Solving | Grades 6-8 Math |
| - Communication and |  |

SE-6B: 75-117

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## Technology Resources

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Formative Assessments:
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## Key Vocabulary:

## Chapter 8:

equation, solution, linear equation, independent variable, dependent variable, inequality

## Chapter 9:

coordinates, coordinate plane, x-axis, $y$-axis, quadrants, linear graph

## Chapter 10:

Formula, height, base, regular polygon
NJ Learning Standards Vocabulary: 6.NS.C. 6 \& 8

Apply and extend previous understanding of numbers to the system of rational numbers.

Rational numbers, opposites, origin, quadrants, coordinate plane, ordered pairs, x -axis, y -axis, coordinates

## 6.RP.A. 3

Understand ratio concepts and use ratio reasoning to solve problems.
ratio, equivalent ratios, tape diagram, unit rate

## 6.EE.A. 2

Apply and extend previous understanding of arithmetic to algebraic expressions.
exponents, base, numerical expressions, algebraic expressions, evaluate, sum, term, product, factor, quantity, quotient, coefficient, constant, like terms, equivalent expressions, variables

## 6.EE.B.5, 7 \& 8

Reason about and solve one-variable equations and inequalities.
inequalities, equations, greater than, $>$, less than, $<$, greater than or equal to, $\geq$, less than or equal to, $\leq$, profit, exceed

## 6.EE.C. 9

Represent and analyze quantitative relationships between dependent and independent variables.
dependent variables, independent variables, discrete data, continuous
data

## 6.G.A. 1 \& 3

Solve real-world problems involving area, surface area, and volume.
area, surface area, volume, decomposing, edges, dimensions, net, vertices, face, base, height, trapezoid, isosceles, right triangle, quadrilateral, rectangles, squares, parallelograms, trapezoids, rhombi, kites, right rectangular prism, diagonal

## Accommodations and Modifications:

Students with special needs: Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Modifications, alternative assessments, and scaffolding strategies will be used to support this learning. The use of Universal Design for Learning (UDL) will be considered for all students as teaching strategies are considered. Additional staff should be included so all students can fully participate in the standards associated with this curriculum.

ELL/ESL students: Students will be supported according to the recommendations for "can do's" as outlined by WIDA -
https://www.wida.us/standards/CAN_DOs/
Students at risk of school failure: Formative and summative data will be used to monitor student success at first signs of failure. Student work will be reviewed to determine support. This may include parent consultation, basic skills review and differentiation strategies. With considerations to UDL, time may be a factor in overcoming developmental considerations. More time will be made available with a certified instructor to aid students
in reaching the standards.
Gifted and Talented Students: Students excelling in mastery of standards will be challenged with complex, high level challenges.

## English Language Learners:

- Teaching modeling
- Peer modeling
- Word walls
- Give directions in small steps and in as few words as possible
- Provide visual aids
- Group similar problems together
- Repeat directions when necessary
- Provide a vocabulary list with definitions


## Special Education:

- Utilize modifications \& accommodations delineated in the students' IEP
- Work with paraprofessional
- Work with a partner
- Shorten assignments to focus on mastery or key concepts
- Maintain adequate space between desks
- Keep workspaces clear of unrelated materials
- Provide fewer problems to attain passing grades
- Tape a number line to the student’s desk
- Create a math journal that they can use during class, on assignments and (if teacher allows) on assessments
- Provide extra time to complete a task when needed
- Provide definitions of different graphs / charts with illustrations
- Allow tests to be taken in a separate room
- Allow students to use a calculator when appropriate

At-Risk:

- Use visual demonstrations, illustrations and models
- Give directions / instructions verbally and in simple written format
- Peer support
- Increased one - on - one time
- Teachers may modify instructions by modeling what the student is expected to do
- Instructions may be printed out in large print and hung up for the students to see during the time of the lesson
- Review behavior expectations and make adjustments
- Create a math journal that they can use during class, on assignments and (if teacher allows) on assessments
- Allow students to complete an independent project as an alternative test


## Gifted and Talented:

- Inquiry based instruction
- Independent study
- Higher order thinking skills
- Adjusting the pace of the lessons
- Real world scenarios
- Student driven instruction
- Allow students to complete an independent project as an alternative test

|  | $\bullet$ <br> Divide test into small <br> sections of similar questions <br> or problems |  |  |
| :--- | :--- | :--- | :--- |

## Interdisciplinary Connections: ELA

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content
NJSLSA.L1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking
RH.6-8.7 Integrate visual information (e.g., in charts, graphs, photographs, videos or maps) with other information in print and digital texts

## Integration of Technology Standards NJSLS:

8.1.8.A.1: Demonstrate knowledge of a real world problem using digital tools.

## $21^{\text {st }}$ century standards

9.2.8.B.1: Research careers within the 16 Career Clusters and determine attributes of career success.
9.2.8.B.2: Develop a Personalized Student Learning Plan with the assistance of an adult mentor that includes information about career areas of interest, goals and an educational path.
9.2.8.B.3: Evaluate communication, collaboration and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

## Career Ready Practices:

CRP2: Apply appropriate academic and technical skills
CRP4: Communicate clearly and effectively and with reason
CRP6: Demonstrate creativity and innovation
CRP8: Utilize critical thinking to make sense of problems and persevere in solving them

Major Supporting Additional (Identified by PARCC Model Content Frameworks)

