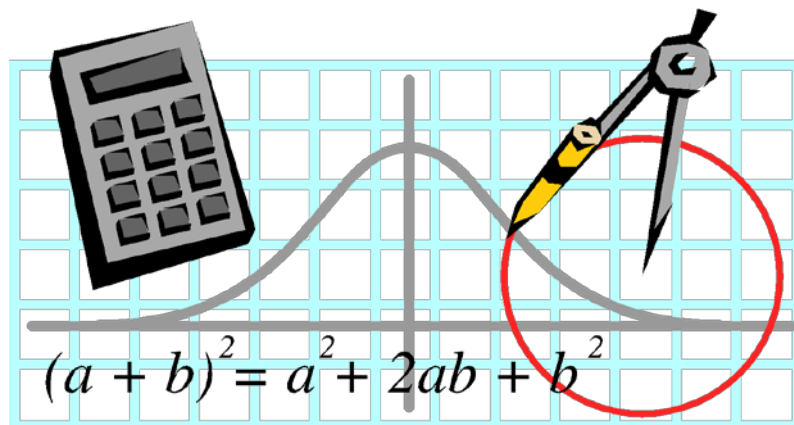


Planned Course of Study

Accelerated Math

Grade 7



NORTHWESTERN LEHIGH SCHOOL DISTRICT
6493 ROUTE 309
NEW TRIPOLI, PA 18066

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2020

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INTRODUCTION

The Grade 7 Mathematics curriculum guide contains planned course formats for the Northwestern Lehigh School District. The content of this document describes the objectives, activities, assessments, content, time frame, and standard alignment that serve as a guide to the specific units of study offered in Grade 7 Mathematics.

The Grade 7 Mathematics curriculum guide is the product of much diligent work on the part of the following staff members of the Task Force:

Rebecca Metzger

Jessica Becker

This document reflects their efforts to establish a well-defined and organized approach to teaching Mathematics in the Northwestern Lehigh School District.

Approved by Northwestern Lehigh School District Board of Education
May 2020

GRADE 7 ACCELERATED CORE MATHEMATICS

Math Unit	The Number System
PA Core Standards:	M07.A-N.1.1 Solve real world and mathematical problems involving the four operations with rational numbers.
Curriculum Framing Questions:	Essential Questions: • What are numbers? • How do we use numbers? Unit Questions: • What types of numbers exist on a number line? • How do I solve real world and mathematical problems involving rational numbers? • How do the rules and properties of addition, subtraction, multiplication and division help us compute rational numbers? Content Questions: • What is the relationship between fractions, decimals and integers? • How do I model addition and subtraction of integers on the number line? • How can I add, subtract, multiply and divide decimals, fractions, and integers to compute and/or solve word problems? • How can I convert a fraction to decimal to determine if it is a terminating or repeating?
Desired Results, Concepts, & Competencies	Students will: • Represent addition and subtraction on a horizontal or vertical number line. • Apply properties of operations to add and subtract rational numbers, including real-world contexts. • Apply properties of operations to multiply and divide rational numbers, including real-world contexts; demonstrate that the decimal form of a rational number terminates or eventually repeat.
Materials:	• Textbook resources • Chromebooks • Math On Call handbook • Supplemental materials

Assessments:	The Number System Unit is covered in two separate units Unit 1: Integers • 1 quiz • 1 test Unit 2: Rational Numbers • 3 quizzes • 1 test
Differentiated Instruction Strategies:	Integers: • Subtraction Mayheim • Scavenger Hunts Rational Numbers • Rational Number War • Number Line Match Up • Number Line Google Slides Activity-comparing, ordering, plotting • Scavenger Hunts • Math Libs
Unit 1 - August - September (approx. 4 weeks) - 5 Lessons Unit 2 - October through Mid November (approx. 5 weeks) - 6 Lessons	

Math Unit	Expressions
PA Core Standards:	M07.B-E.1.1 Use properties of operations to generate equivalent expressions.
Curriculum Framing Questions:	Essential Questions: - How can relationships be modeled symbolically? - Why is mathematical language important? Unit Questions: - What is the most appropriate way of communicating a mathematical idea in a particular situation? Content Questions: - How can I use the distributive property, combining like terms, and factoring to generate equivalent expressions? - How can I simplify and expand linear expressions?
Desired Results, Concepts, & Competencies	Students will: Apply properties of operations to add, subtract, factor, and expand linear expressions with rational coefficients. <i>Example 1: The expression $\frac{1}{2} \cdot (x + 6)$ is equivalent to $\frac{1}{2} \cdot x + 3$.</i> <i>Example 2: The expression $5.3 - y + 4.2$ is equivalent to $9.5 - y$ (or $-y + 9.5$).</i> <i>Example 3: The expression $4w - 10$ is equivalent to $2(2w - 5)$.</i>
Materials:	- Textbook Resources - Chromebooks - Math On Call handbook - Supplemental materials - Study Island
Assessments:	1 Unit Test
Mid November through beginning of December (Approx. 3 weeks) - 3 Lessons	

Math Unit	Equations and Inequalities
PA Core Standards:	M07. B-E.2.1 - Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers. M07.B-E.2.2 - Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems. M07.B-E.2.3 - Determine the reasonableness of the answer(s) in problem solving situations.
Curriculum Framing Questions:	Essential Questions: - How can relationships be modeled symbolically? - Why is mathematical language important? Unit Questions: - How do I create, solve, and interpret one-variable equation or inequalities in real-world and mathematical problems? - How can real-world problems be solved algebraically? - How can I write and evaluate an expression that represents a real-life problem? Content Questions: - How do I convert between forms of numbers and decide when it is appropriate to use each? - How do I apply properties of operations to calculate with numbers in any form? - How do I write and solve algebraic equations or inequalities to represent real-life problems? - How do you graph the solution set of an inequality? - How can I use estimation to determine if my answer is reasonable?
Desired Results, Concepts, & Competencies	Students will: - Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate. <i>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 (or $1.1 \times \\$25 = \\$27.50$).</i> - 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. <i>Example: The perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?</i> - 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, and graph the solution set of the inequality.

	<i>Example: A salesperson is paid \$50 per week plus \$3 per sale. This week she wants her pay to be at least \$100. Write an inequality for the number of sales the salesperson needs to make, and describe the solutions.</i> ● Determine the reasonableness of an answer(s), or interpret the solution(s) in the context of the problem. <i>Example: If you want to place a towel bar that is $9\frac{3}{4}$ 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.</i>
Materials:	● Textbook Resources ● Chromebooks ● Math On Call handbook ● Supplemental materials
Assessments:	Equations: ● 2 Quizzes ● 1 Unit Test Inequalities: ● 1 Test
Unit 1 Equations - Beginning of December - End of January (Approx. 6 weeks) - 6 Lessons Unit 2 Inequalities End of January (Approx. 2 weeks) - 4 Lessons	

Math Unit	Ratios and Proportional Relationships
PA Core Standards:	M07.A-R.1.1 Analyze, recognize, and represent proportional relationships and use them to model and solve real-world and mathematical problems.
Curriculum Framing Questions:	Essential Questions: - How can math help me understand relationships? Unit Questions: - How do rates and proportions help you describe and solve real-life problems? - What are proportional relationships? - What are slope and rate of change? Content Questions: - How can I compute and compare unit rates? - How do I determine whether two quantities are proportionally related? - If given a table, graph, equation, diagram, or verbal description, how do I identify the rate? - How do I represent proportional relationships using equations? - How do I use a point (x, y) on the graph to describe the relationship between two quantities in a real-life situation?
Desired Results, Concepts, & Competencies	Students will: - Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. <i>Example: If a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour.</i> - Determine whether two quantities are proportionally related (e.g., by testing for equivalent ratios in a table, or graphing on a coordinate plane and observing whether the graph is a straight line through the origin). - Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. - Represent proportional relationships by equations. <i>Example: If total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as $t = pn$.</i> - Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.

Materials:	• Textbook Resources • Chromebooks • Math On Call handbook • Supplemental materials
Assessments:	• Two quizzes • Unit test • Scale drawing project
February - Early March (Approx. 5 weeks) - 5 Lessons	

Math Unit	Geometry
PA Core Standards:	M07.C-G .1.1 - Describe and apply properties of geometric figures. M07.C-G .2.2 - Determine circumference, area, surface area, and volume.
Curriculum Framing Questions:	Essential Questions: - How can math help me understand my world? - How can relationships be expressed symbolically? Unit Questions: - How can we use models and/or formulas to find specific measures of selected 2D and 3D figures? Content Questions: - How can I use scale drawings to solve geometric figure problems? - What 2-dimensional figures are used to form solids? - How can I find the area and circumference of a circle? - How can I find the area, volume, and surface area of two- and three-dimensional objects using formulas?
Desired Results, Concepts, & Competencies	Students will: - Solve problems involving scale drawings of geometric figures, including finding length and area. - Describe the two-dimensional figures that result from slicing three-dimensional figures. <i>Example: Describe plane sections of right rectangular prisms and right rectangular pyramids.</i> - Find the area and circumference of a circle. Solve problems involving area and circumference of a circle(s). Formulas will be provided. - Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. Formulas will be provided.
Materials:	- Textbook Resources - Chromebooks - Math On Call handbook - Supplemental materials
Assessments:	2 Quizzes 1 Test
March- 4 Lessons	

Math Unit	Percent
PA Core Standards:	M07.A-R.1.1 Analyze, recognize, and represent proportional relationships and use them to model and solve real-world and mathematical problems.
Curriculum Framing Questions:	Essential Questions: - How can math help me understand relationships? Unit Questions: - How do rates, proportions, and equations help you describe and solve real-life percent problems? - How can I apply equations to percent change, markup, discounts and simple interest? Content Questions: - How do I rewrite fractions, decimals, and percents using different representations? - How do I use proportional relationships to solve simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease problems? - How do I use equations to solve simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease problems? - How do I apply the simple interest formula?
Desired Results, Concepts, & Competencies	Students will: - Represent proportional relationships by equations. <i>Example: If total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as $t = pn$.</i> - Use proportional relationships to solve multi-step ratio and percent problems. <i>Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease.</i>
Materials:	- Textbook resources - Chromebooks - Math On Call handbook - Supplemental materials
Assessments:	2 Quizzes 1 Advertisement Project

Differentiated Instruction Strategies:	● Target Shopping Activity
April (Approx. 3-4 weeks) - 6 Lessons	

Math Unit	Geometry
PA Core Standards:	M08.C-G.1 Demonstrate an understanding of geometric transformations.
Curriculum Framing Questions:	Essential Questions: • How can math help me understand my world? • How can relationships be expressed symbolically? Unit Questions: • How do I use dilation, translation, reflection and rotation to understand 2 dimensional figures Content Questions: • Can you identify and apply properties of rotations, reflections and translations? • Given two congruent figures, can you describe a sequence of transformations that exhibits the congruence between them? • Given a two-dimensional figure on a coordinate plane, can you describe the effect of dilations, translations, rotations, and reflections? • Given two similar two-dimensional figures, can you describe a sequence of transformations that exhibits the similarity between them?
Desired Results, Concepts, & Competencies	Students will: • Identify and apply properties of rotations, reflections, and translations. ◦ <i>Example: Angle measures are preserved in rotations, reflections, and translations.</i> • Given two congruent figures, describe a sequence of transformations that exhibits the congruence between them. • Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures, using coordinates. • Given two similar two-dimensional figures, describe a sequence of transformations that exhibits the similarity between them.
Materials:	• Textbook resources • Chromebooks • Math On Call handbook • Supplemental materials
Assessments:	• Chapter Test

	• Projects
May through June (approx.4 weeks)	

Math Unit	Statistics
PA Core Standards:	M07.D-S.1.1 - Draw inferences about populations based on random sampling concepts. M07.D-S.2.1 - Use statistical measures to compare two numerical data distributions.
Curriculum Framing Questions:	Essential Questions: - How can data help me organize my world? Unit Questions: - How do I display, analyze, and summarize numerical data? - How do I determine measures of central tendency and variability? Content Questions: - How do I determine if a sample of a population is a random sample? - How do I use data gathered from a random sample to draw inferences about a population? - How do I use measures of central tendency and variability to compare numerical data?
Desired Results, Concepts, & Competencies	Students will: - Determine whether a sample is a random sample given a real-world situation. - Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. <i>Example 1: Estimate the mean word length in a book by randomly sampling words from the book.</i> <i>Example 2: Predict the winner of a school election based on randomly sampled survey data.</i> - Compare two numerical data distributions using measures of center and variability. <i>Example 1: The mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team. This difference is equal to approximately twice the variability (mean absolute deviation) on either team. On a line plot, note the difference between the two distributions of heights.</i> <i>Example 2: Decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth- grade science book.</i>
Materials:	- Textbook Resources - Chromebooks - Math On Call handbook - Supplemental materials

Assessments:	• Class Checkpoints • Class Activities • Classwork Quizzes
September through early October Core Extensions (1-2 times per week)	

Math Unit	Probability
PA Core Standards:	M07.D-S.3.1 - Predict or determine the likelihood of outcomes M07.D-S.3.2 - Use probability to predict outcomes
Curriculum Framing Questions:	Essential Questions: - How can data help me organize my world? Unit Questions: - How do I determine the chance of something occurring? - How can I use probability to help me make wise decisions in real-life? - How can predictions be made based on data? Content Questions: - How can we predict or determine the likelihood of an outcome? - How can we determine the probability of a chance event given the relative frequency or predict the approximate relative frequency given the probability? - How can we find the probability of a simple event? - How can we use organized lists, tables, tree diagrams, and simulation to find probabilities of independent compound events?
Desired Results, Concepts, & Competencies	Students will: - Predict or determine whether some outcomes are certain, more likely, less likely, equally likely, or impossible (i.e., a probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event). - Determine the probability of a chance event given relative frequency. Predict the approximate relative frequency given the probability. <i>Example: When rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.</i> - Find the probability of a simple event, including the probability of a simple event not occurring. <i>Example: What is the probability of not rolling a 1 on a number cube?</i> - Find probabilities of independent compound events using organized lists, tables, tree diagrams, and simulation.

Materials:	• Textbook Resources • Chromebooks • Math On Call handbook • Supplemental materials
Assessments:	• Class Checkpoints • Class Activities • Classwork Quizzes
Differentiated Instruction Strategies:	• Comparing Experimental and Theoretical Probability Dice Activity
November-December Core Extensions (1-2 periods a week)	

Math Unit	Geometry
PA Core Standards:	M07.C-G .2.1 Identify, use and describe properties of angles and their measures.
Curriculum Framing Questions:	Essential Questions: - How can math help me understand my world? - How can relationships be expressed symbolically? - How does measurement help us understand triangles? Unit Questions: - How can we use equations to help us understand geometry? - How can we use models and/or equations to find specific angle measures? - How can the relationship among lines and angles be used to solve problems? Content Questions: - How can I use angle and side measurements to identify and describe a triangle? - How can we identify and use properties of supplementary, complementary and adjacent angles to write and solve an equation for an unknown angle? - How can we identify and use properties of angles formed when two parallel lines are cut by a transversal?
Desired Results, Concepts, & Competencies	Students will: - Identify or describe the properties of all types of triangles based on angle and side measure. - Use and apply the triangle inequality theorem. - Identify and use properties of supplementary, complementary and adjacent angles in a multi- step problem to write and solve simple equations for an unknown angle in a figure. - Identify and use properties of angles formed when two parallel lines are cut by a transversal (e.g., angles may include alternate interior, alternate exterior, vertical, corresponding).
Materials:	- Textbook Resources - Chromebooks - Math On Call handbook - Supplemental materials - Instructional Videos
Assessments:	Class Checkpoints

	• Class Activities • Classwork Quizzes
January through May Core Extension Period (1-2 periods per week)	