NEW MILFORD PUBLIC SCHOOLS

New Milford, Connecticut

Grade 6 Mathematics

October/2022

BOE Approved November 2022

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New Milford's Mission Statement

The mission of the New Milford Public Schools, a collaborative partnership of students, educators, family and community, is to prepare each and every student to compete and excel in an ever-changing world, embrace challenges with vigor, respect and appreciate the worth of every human being, and contribute to society by providing effective instruction and dynamic curriculum, offering a wide range of valuable experiences, and inspiring students to pursue their dreams and aspirations.

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Math 6

Grade 6

In Grade 6, students focus on critical areas that build on grade 5 work and develop critical foundational knowledge for grade 7 and 8 work with ratios and proportional relationships, algebraic expression and equations, functions and the coordinate plane.

During the first critical area, students further expand their prior understanding of the meaning of multiplication and division of whole numbers and decimals, as well as apply the relationship between multiplication and division in order to explain why the procedure for dividing fractions works. Students use visual models to divide whole numbers by fractions and fractions by fractions to solve word problems. Furthermore, students extend their knowledge of numbers to the system of rational numbers which includes negative numbers. The focus for the grade is on the order and absolute value of rational numbers and location of the points in all four quadrants of the coordinate plane.

The second critical area of study, during sixth grade, focuses on writing, interpreting and using expressions and equations. Students understand and develop vocabulary necessary for writing expressions and equations that correspond to unique situations, use and evaluate expressions to solve problems and apply the properties of operations to rewrite equivalent expressions. Once students have a chance to study and solve problems involving ratios and rates, they further develop and connect relationships between two quantities in terms of independent and dependent variables using real-world problems. They solve problems using tables, equations and graphs.

The next area for students in sixth grade is to build on their prior knowledge of the area by reasoning about relationships among shapes using hand-on models. Students compose and decompose shapes from more familiar ones to determine the area, surface area and volume of 3 dimensional figures, as well as solve real world problems.

Last, students have the opportunity to develop their ability to think statistically. Learners explore populations, learn about variables associated with populations and use measures of center such as (average, mode and median) to describe data sets. Students conclude their studies by displaying numerical data in plots on a number line, including dot plots, histograms and box plots and performing a statistical investigation to include the collection, organization and analysis of the data in order to capture the learning.

Pacing Guide

Unit Title	# of Weeks
Unit 1: Compute Fluently with Positive Multi Digit Numbers	5
Unit 2: Positive and Negative Numbers in the Real World	3
Unit 3: Understand and Model the Division with Fractions	4
Unit 4: Ratios and Rates	4
Unit 5: Expressions, Equations and Inequalities	4
Unit 6: Proportional Relationships and Algebraic Reasoning	6
Unit 7: Applications of Geometry	4
Unit 8: Statistics and Distributions	5

UNIT 1 - COMPUTE FLUENTLY WITH POSITIVE MULTI-DIGIT NUMBERS

Stage 1 Desired Results

ESTABLISHED GOALS

CCSS.MATH.CONTENT.NS.B.4:
Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express 36 + 8 as 4(9+2).*

CCSS.MATH.CONTENT.NS.B.2:
Fluently divide multi-digit numbers using the standard algorithm.

CCSS.MATH.CONTENT.NS.B.3:
Fluently add, subtract, multiply and divide multi-digit decimals using the standard algorithm for each operation.

Transfer

Students will be able to independently use their learning to attend to the precision of different quantities using standardized systems.

Meaning

UNDERSTANDINGS

Students will understand that…

- Whole numbers can be broken down into partial numbers and vice versa
- A factor is a whole number that divides without a remainder into another number
- A multiple is a whole number that is a product of the whole number and any other factor
- Every integer greater than 1 is either a prime number or can be written as a product of its prime factors
- Multiplication is used to find the greatest common factor and least common multiple of two whole numbers
- Division is the inverse of multiplication
- Numbers can be represented in different formats and have the same value
- Place value and operations of whole numbers operations help to perform multi digit arithmetic using standard algorithms
- Compatible numbers are used to estimate the reasonableness of answers

ESSENTIAL QUESTIONS

Students will keep considering…

1. When is it best to use the Greatest Common Factor versus the Least Common Multiple to solve real world problems?
2. What are the properties in mathematics and how do they assist in performing various operations?
3. How does place value and operations with whole numbers help to perform operations with multi digit decimals?

Acquisition

Students will know…

- algorithm
- base
- common factor
- common multiple
- decompose
- digit
- distributive property

Students will be skilled at…

- Using estimates to check the reasonableness of exact computations
- Calculating GCF of two whole numbers less than equal to 100 and the LCM of two whole numbers less than equal to 12
- Determining and apply the use of GCF or LCM to solve real world problems

	● dividend ● divisor ● estimate ● expanded form ● exponents ● factor ● factor pair ● factored form ● factorization ● fraction ● greatest common factor ● inverse operation ● least common multiple ● multi digit decimal ● multiple ● multiplicative identity property of 1 ● multiplicative inverse ● operation ● order of operations ● partial product strategy ● partial quotient strategy ● place value ● power ● power of 10 ● prime factorization ● proper factors ● quotient ● remainder ● repeating decimal ● standard algorithm ● terminating decimal	● Communicating using precise vocabulary how the distributive property makes use of factors and multiples ● Writing exponential notation for repeated factors ● Estimating sums, differences, products and quotients of whole number multi digit numbers and multi digit decimals before performing operations ● Using compatibles numbers to estimate the reasonableness of answers ● Using the partial product and partial quotient strategies to develop fluency with the traditional, standard algorithm for division of multi digit whole numbers ● Using visual models to represent, add and subtract multi digit decimals ● Using knowledge of whole number division to divide multi digit decimals ● Interpreting remainders in real-world context

STAGE 2

Stage 2 – Evidence		
Code	**Evaluative Criteria**	**Assessment Evidence**
T, M, A	Rubric Criteria: **Mathematical Concepts:** 4 - Explanation shows complete understanding of mathematical concepts. 3 - Explanation shows substantial understanding of mathematical concepts. 2 - Explanation shows some understanding of mathematical concepts. 1 - Explanation shows very limited understanding of mathematical concepts OR is not written. **Strategy/Procedures:** 4 - Uses an efficient and effective strategy to solve the problem(s). 3 - Uses an effective strategy to solve the problem(s). 2 - Sometimes uses an effective strategy to solve the problem(s), but does not do it consistently. 1 - Rarely uses an effective strategy to solve the problem(s). **Mathematical Errors:** 4 - 90-100% of the steps and solutions have no mathematical errors. 3 - Almost all (85-89%) of the steps and solutions have no mathematical errors. 2 - Most (75-84%) of the steps and solutions have no mathematical errors. 1 - More than 75% of the steps and solutions have mathematical errors. **Completion:** 4 - All problems are completed. 3 - 75% of all problems are completed. 2 - 50% of all problems are completed. 1 - 25% or less of problems are completed. **Neatness and Organization:** 4 - The work is presented in a neat, clear, organized fashion that is easy to read.	PERFORMANCE TASK(S): **Goal:** Use a real life scenario to identify what information is needed to figure out how much are the coins in the video worth. **Role:** Calculating the final total of the transaction **Audience:** Classmates **Products:** Using a problem solving framework, evidence and transfer knowledge to calculate the total dollar amount of the transaction based on the count of the Coinstar transaction reciept **Standards for Success:** scoring rubric including focus on explanation, process and accuracy of the solution **Differentiation:** For more advanced students you can challenge them to use estimation in doubling or tripling the quantities. Consider students of language learners and accommodations by providing coin values with images, as well as a calculator, place value charts or graphic organizer to assist with the algorithms and organization

	3 - The work is presented in a neat and organized fashion that is usually easy to read. 2 - The work is presented in an organized fashion but may be hard to read at times. 1 - The work appears sloppy and unorganized. It is hard to know what information goes together	
T, M, A T, M, A T, M, A M, A M, A T, M, A		OTHER EVIDENCE: **Embedded Assessment 1:** Estimation, GCF and LCM **Embedded Assessment 2:** Operation of multi digit whole numbers and decimals through problem solving **Common Unit Test:** Compute fluently with Positive Multidigit Numbers **Skill Check**: Daily Warm-ups and/or Exit Tickets **Prompt**: What is important to understand when division leads to a quotient with a remainder in a word problem? **Homework:** Almost daily

STAGE 3

Stage 3 – Learning Plan		
Code	***Pre-Assessment***	
M M	● Unit Pre-Assessment ● Teacher monitors for prerequisite understanding(s) and misconception(s) though warm up questions	
	Summary of Key Learning Events and Instruction	Progress Monitoring
M	● Students will work independently to complete pre-assessment of prior knowledge involving numerical estimation, place value of whole numbers and decimal; teacher will plan and facilitate learning to clarify any prior misconception foundational to the new learning.	● Warm ups ● Classwork ● IXL ● Homework ● Exit Tickets ● Embedded Assessments ● Mid-Unit Assessment
T, A	● Teacher will engage students by presenting an activity, to help students explore, discuss and apply the place value system.	
T, A	● Teacher will engage students by presenting a warm up, such as a 3 Act Task, to help students explore, discuss and apply the estimation strategy as a tool in a variety of situations including checking answers and making decisions, as well as develop strategies for estimating results of arithmetic operations.	
T, A	● Teacher will engage students by presenting scenarios to help explore, discuss and continue to develop when addition, subtraction, multiplication, or division is the appropriate	

	operation to solve a problem.	
A	● Teacher will engage students by presenting scenarios to help explore, discuss and continue to develop ways to model sums, differences, products, and quotients with areas, fraction strips, and number lines.	
A	● Assess studnets's knowledge and application and review misconceptions as needed.	
T, A	● Teacher will present a lesson or task with contetx that engages students in exploring the greatest common factor of two whole numbers less than or equal to 100 and list the factors accordingly.	
A	● Teacher will present a lesson or task with context that examines the process of prime factorization and to find the GCF by multiplying common prime factors and integrating the distributive property using sums and its use in adding numbers 1-100 with a common factor. Example: 16 + 24 = 4 (4+6)	
M	● Students will engage in opportunities to analyze whole numbers and describe them using lesson vocabulary such as greatest common factor.	
T, A	● Teacher will present a lesson or task with context that engages students to develop strategies for finding the least common multiple of two numbers; students recognize and practice that LCM can be found by listing all multiples of two numbers and finding the least of common multiples.	
T, M, A	● Teacher will continue to engage students and facilitate problem solving situations where students can apply their knowledge; the teacher ensures that students have opportunities to talk with the teacher and with other students to make sense of what they are learning about GCF and LCM using precise vocabulary. Note: It is important to direct students in understanding and applying how GCF not only helps solve problems but also assists in simplifying fractions and producing equivalent fractions, as well as students recognizing that the greatest common factor represents the greatest number of equal-sized groups he can make.	
T, A	● Teacher will present a lesson or task to engage students in recognizing the fact that every whole number can be written in exactly one way as a product of prime numbers; Use exponential notation with appropriate vocabulary to write repeated factors.	
A	● Assess students' knowledge and application and review misconceptions.	

M	● Students will work independently to complete pre-assessment of prior knowledge involving understating place value, read and write decimals in standard and expanded form, use models and reasonableness to add, subtract and multiply decimals to the hundreths, division of a up to 4 digit number dividend and a two digit divisor, divide decimals to hundredths in context; teacher will plan and facilitate learning to clarify any prior misconception foundational to the new learning.	
T, M, A	● Teacher will prompt students to look for a connection between adding/subtracting, and multiplication/division; follow with introduction of the concept of inverse operations.	
T, M, A	● Teacher will introduce and engage the students in a problem solving situation to focus on the meaning of division such as, “Lara wants to purchase a new laptop for $192. She earns $16 an hour for babysitting. How many hours will she need to work in order to have enough money for her new purchase?; teacher during this session can assess different strategies of division and explore with students the similarities between the different strategies, such as partial quotients and standard algorithms.	
T, M, A	● Students practice solving problems and understand the connection between partial quotient, area models and the standard algorithm by comparing solutions side by side. Note: the goal is not fluency with larger numbers but rather accuracy and understanding of place value as students divide, as well as the meaning of the quotient.	
T, A	● Students apply learning to solve word problems and use mental math to estimate quotients by using compatible numbers while reasoning about the answers using accurate vocabulary terms.	
M, A	● Teachers will provide cyclical opportunities over time to allow for fluency over time by including real world scenarios and mental math by estimation.	
A	● Teachers will develop a lesson to engage students in estimating and modeling the sum, difference, product and quotient from problems prior to performing the algorithms.	
T, A	● Students will continue to develop their skill in estimating operations with multi digit decimals by rounding up numbers to the nearest whole number and reasoning about the answers to the problems.	
T, A	● Teachers will introduce and engage students to the idea that place	

	value is critical in adding and subtracting multi digit decimals; students understand that aligning multi digit decimals by place value can make it easier to add and subtract.	
M, A	● Teachers will introduce scenarios to engage students by applying prior knowledge multiplying and dividing by powers of 10 to allow students to build fluency operating with multi digit decimals.	
T, A	● Teachers will introduce scenarios to engage students in recognizing that you can rewrite a problem with decimal divisors as an equivalent problem with a whole number divisor.	
T, M, A	● Teacher will introduce and model strategies for dividing with multi digit whole numbers and decimals in context and allow for a cyclical practice for mastery throughout the year.	
A	● Assess knowledge and application though the unit CFA and review misconceptions as needed.	
A	● Review assessment and allow for opportunities to view common mistakes and misconceptions	
T	● Performance Task: Students use a real life scenario to identify what information is needed to figure out how much are the coins in the video worth.	

UNIT 2 - POSITIVE AND NEGATIVE NUMBERS IN THE REAL WORLD

Stage 1 Desired Results

ESTABLISHED GOALS

CCSS.MATH.CONTENT.NS.C.5:
Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

CCSS.MATH.CONTENT.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.

CCSS.MATH.CONTENT.NS.C.7:
Understand ordering and absolute value of rational numbers.

CCSS.MATH.CONTENT.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.

CCSS.MATH.CONTENT.G.A.3:
Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordiante. Apply these techniques in the context of solving real world and mathematical problems.

Transfer

Students will be able to independently use their learning to attend to the meaning of quantities and relate the concept of positive and negative numbers to real-world application.

Meaning

UNDERSTANDINGS

Students will understand that…

- Positive and negative numbers describe quantities that have opposite values or direction
- Opposite numbers as having the same distance from 0 in the opposite directions
- In addition to whole numbers and decimals, the number system includes integers which can be represented on the number line
- Positive and negative numbers can be compared and ordered on the number line
- Absolute value as a distance from 0 on the number line
- Absolute values can be interpreted in real world scenarios and compared
- Ordered pairs can be plotted on the four quadrants of the coordinate plane
- The axes of the coordinate plane can be extended in the opposite (negative) direction to represent negative numbers
- The signs of numbers in ordered pairs represent a singular location on the coordinate plane
- When two ordered pairs differ only in the signs of their coordinates, the points are reflections of each other across one or both the axes
- Real world problems can be solved by graphing pais in the coordinate system
- A line segment from one coordinate pair to

ESSENTIAL QUESTIONS

Students will keep considering…

1. When comparing numbers, how do you know which one is greater?
2. How are positive and negative numbers used to represent real world scenarios and everyday life concepts?
3. How is a number line similar to an absolute value and how are they different?
4. How do you know whether you should add or subtract the distances of each point from the axis when finding the distance between two points?

	another represents a distance and the distance from a point on a coordinate plane to an axis is an absolute value ● Given coordinates for the vertices, polygons can be drawn in the coordinate plane and solve real world problems	
	Acquisition	
	Students will know… ● absolute value ● area ● compare ● integers ● inequality ● inequality symbols ● negative numbers ● opposite numbers ● origin ● perimeter ● polygon ● positive numbers ● rational numbers ● reflection ● quadrants ● whole numbers ● x-axis ● x-coordinate ● y-axis ● y-coordinate	*Students will be skilled at…* ● Locatingintegers and other rational numbers on the number line ● Using precise mathematical vocabulary to discuss positive and negative numbers, as well as vertical and horizontal lines to show integers ● Using positive, negative numbers and zero to represent real world problem such as bank account balances, temperature, and sea levels ● Plotting integers on the number line and coordinates in all four quadrants of a coordinate plane; Quadrant I (+,+), Quadrant II (-,+), Quadrant III (-,-) and Quadrant IV (+,-) ● Reasoning that the opposite of the opposite of the numbers is the number itself such as (-(-3)), as well as zero is its own opposite ● Finding reflection points across axes ● Comparing using inequality symbols and order positive and negative numbers ● Writing and interpret inequalities in real world situations ● Interpreting absolute value in a real world situation ● Making comparison between values regarding absolute value and model absolute value with number lines ● Explaining orally, in journals or exit slips the reasoning that as the value on a negative rational number decreases, its absolute value (distance from zero) increases ● Solving real world problems by graphing points in all four quadrants of the coordinate plane

		• Finding distances between points in the coordinate plane by using coordinates and absolute value • Drawing polygons in the coordinate plane, given coordinates for the vertices

STAGE 2

Stage 2 – Evidence		
Code	**Evaluative Criteria**	**Assessment Evidence**
T, M, A	Rubric Criteria: **Mathematical Concepts:** 4 - Explanation shows complete understanding of mathematical concepts. 3 - Explanation shows substantial understanding of mathematical concepts. 2 - Explanation shows some understanding of mathematical concepts. 1 - Explanation shows very limited understanding of mathematical concepts OR is not written. **Strategy/Procedures:** 4 - Uses an efficient and effective strategy to solve the problem(s). 3 - Uses an effective strategy to solve the problem(s). 2 - Sometimes uses an effective strategy to solve the problem(s), but does not do it consistently. 1 - Rarely uses an effective strategy to solve the problem(s). **Mathematical Errors:** 4 - 90-100% of the steps and solutions have no mathematical errors. 3 - Almost all (85-89%) of the steps and solutions have no mathematical errors. 2 - Most (75-84%) of the steps and solutions have no mathematical errors. 1 - More than 75% of the steps and solutions have mathematical errors. **Completion:** 4 - All problems are completed.	PERFORMANCE TASK(S): **Goal:** Use real data accumulated in Nome, Alaska,over eight days, to answer questions accurately about temperature by interpreting and comparing points in the coordinate plane. **Role:** Interpreter of data in graphs **Audience:** Classmates **Products:** This task focuses students' attention on the y-values of the points, asking for the greatest y-value and the least y-value, as well as the greatest difference between y-values when the x-values are the same. **Standards for Success:** scoring rubric including focus on explanation, process and accuracy of the solution **Differentiation:** For more advanced students you can challenge them by using the task that challenges them to find distances between points.

	3 - 75% of all problems are completed. 2 - 50% of all problems are completed. 1 - 25% or less of problems are completed. **Neatness and Organization:** 4 - The work is presented in a neat, clear, organized fashion that is easy to read. 3 - The work is presented in a neat and organized fashion that is usually easy to read. 2 - The work is presented in an organized fashion but may be hard to read at times. 1 - The work appears sloppy and unorganized. It is hard to know what information goes together	
T, M, A T, M, A T, M, A M, A M, A T, M, A		OTHER EVIDENCE: **Embedded Assessment 1:** Positive numbers, negative numbers and absolute value **Embedded Assessment 2:** Coordinate system and problem solving **Common Unit Test:** Units CFA **Skill Check**: Daily Warm-ups and/or Exit Tickets **Prompt**: Given a point in the coordinate plane, what possible pair of coordinates can show the reflection of that point? Explain through an example. **Homework:** Almost daily

STAGE 3

Stage 3 – Learning Plan		
Code	***Pre-Assessment***	
M	● Unit Pre-Assessment	
M	● Teacher monitors for prerequisite understanding(s) and misconception(s) though warm up questions	
	Summary of Key Learning Events and Instruction	Progress Monitoring
M	● Students will work independently to complete pre-assessment of prior knowledge involving the ability to locate whole numbers/fractions/decimals, compare and order positive numbers, plot points in the first quadrant of the coordinate plane, find perimeter and area of rectangle ; teacher will plan and facilitate learning to clarify any prior misconception foundational to the new learning.	● Warm ups ● Classwork ● IXL ● Homework ● Exit Tickets ● Embedded Assessments ● Mid-Unit Assessment
T, A	● Teacher will select an activity or 3 Act task to spike curiosity and engagement with number lines; Example: Students work with partner(s) to place cards with a mix of whole numbers, integers, decimals in an open number line using prior knowledge and reasoning.	
A	● Teacher will engage students by presenting a lesson to introduce and to help students explore with multiple examples using positive, negative integers and zero to represent real world situations such as bank accounts with credits and debits, temperature, and above and below sea levels.	
A	● Teacher will engage students through an activity such as a 3 Act Task to introduce the need of a coordinate system (this will be brought up later while learning about and using the coordinate system); students investigate the use of both vertical and horizontal number lines to illustrate real world scenarios.	
T, A	● Teacher will engage students in activity(s) that allow students to create their own examples of real word scenarios of positive and negative numbers on number lines and explain orally in groups the explanation of 0 in each situation.	
T, A	● Teacher will engage students in activity(s) that allow students to use appropriate vocabulary to respond to problems that involve plotting rational numbers and integers on number lines.	
A	● Teacher will engage and facilitate students in a discussion around	

	a number line that allows students to discover that a number and its opposite are equidistant from zero. Students learn that the opposite sign (-) shifts the number to the opposite side of 0; remind students that zero is its own opposite. Students will practice placing numbers on vertical or horizontal lines such as -4, 7, 1, 5.2, -9, ½, 6/2 and justify their order.	
A	● Teacher will engage students in activity(s) that allow students to help students relate graphing points and reflecting across zero on a number line to graphing and reflecting points across axes on a coordinate grid. Teacher facilitates through questioning the discovery and recognition of the quadrants and the signs. Students practice identifying the quadrants for ordered pairs based on the knowledge of the quadrant's signs.	
A	● Teacher will develop a lesson that engages students to discover the absolute value and recognize the symbols I I as representing absolute value. Students recognize that although with negative numbers like -5 is less than -3 in value, the absolute value (distance of a rational number from zero) increases; viceversa, with negative numbers, as the absolute value decreases the value increases. It is important for students to use many examples in adjusting their thinking in a real life context.	
T, A	● Teacher will provide and facilitate examples where students will continue to practice real world scenarios using the absolute value of numbers to answer questions like "Gia has -30 dollars in her account. What does that mean? Is a balance of -40 dollars greater?	
T, A	● Teacher will provide and facilitate examples where students will continue to practice vocabulary terms using examples and non-examples and teachers ensure that multiple experiences are provided for students to understand the relationship between numbers, absolute value, and statements about order.	
T, A	● Teacher will provide and facilitate examples where students will continue to practice using language related to integers and absolute value like: nerver, always, increase, decrease, farther, closest, above, below, have owe, gained, lost distance from zero, to the left, to the right, greater than, less than to interpret and absolute value in real world situations and to explain how ordering absolute values compares to ordering rational numbers	
A	● Assess students acquisition of the learning at this point in time	

A	● Review assessment and allow for opportunities to view common mistakes and misconceptions	
T, A	● Teacher refers back to the 3 Act Task about finding points in the plane and need for the coordinate system and continues to engage students in a learning experience to plot ordered pairs and identify the coordinates in all four quadrants of the coordinate plane.	
A	● Teacher will develop and introduce a lesson to engage students in understanding that when two ordered pairs differ only in the signs of their coordinates the points are reflections of each other across one or both axes; Students engage in an activity in groups by creating a coordinate grid on the floor and stand in points or place objects making sure that the two points have either the same first coordinate or second coordinate. Students lead to conclude that when one person/object is one the same x or y coordinate you are on the same line.	
A	● Students will continue to practice problems plotting points on all four quadrants of the coordinate palace and finding distances between points with the same first coordinate or the second same coordinate by using absolute value.	
T, A	● Teacher will develop a lesson that engages students by drawing polygons in the coordinate plane given the coordinates for the vertices and solve problems involving these polygons.	
T	● Performance Task: Students will describe a real world scenario involving temperature with real data accumulated in Nome, Alaska over eight days by answering the questions accurately.	
A	● Assess students acquisition of the learning at this point in time	
A	● Review assessment and allow for opportunities to view common mistakes and misconceptions	

UNIT 3 - UNDERSTAND AND MODEL THE DIVISION WITH FRACTIONS

Stage 1 Desired Results

ESTABLISHED GOALS

CCSS.MATH.CONTENT.NS.A.1:

Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?*.

Transfer

Students will be able to communicate precisely with others, use clear mathematical language, and model when discussing the understanding and procedure for dividing fractions.

Meaning

UNDERSTANDINGS

Students will understand that…

- A multiplication equation involving fractions is related to division of fractions and are inverse operations
- Division of fractions by fractions can be represented with visuals diagrams, manipulatives and equations to solve real world problems
- Problems can be written to match a given expression involving division of fractions
- Quotients can be interpreted in real world scenarios when dividing fractions
- A fractional divisor can represent the size of the group in a division scenario
- Division of fractions can be written procedurally using the multiplicative inverse

ESSENTIAL QUESTIONS

Students will keep considering…

1. How are multiplying fractions and dividing fractions connected?
2. Why does a fraction get smaller if multiplied by another fraction? Why does it grow if multiplied by a whole number greater than 1?
3. Why can you multiply by the reciprocal when dividing fractions?
4. What are the steps for dividing a fraction by fraction? Can we use common denominators to divide fraction by fraction?

Acquisition

Students will know…

- common denominator
- dividend
- divisor
- fraction
- quotient
- reciprocal

Students will be skilled at…

- Explaining the meaning of the quotient relative to a division of fractions expression (for example: students will explain that 3/4 ÷ 1/2 asks how many halves are in three-fourths; there is one half and a half of a half in three-fourths)
- Explaining the division of a fraction by a fraction using representations
- Estimating the quotient of an expression that divides a fraction by a fraction (for example: 3/4 ÷ 1/2 will be more than 1 because 1/2 is less than

		3/4 therefore there will be 1 whole half and some more in 3/4. Conversely, 1/5 ÷ 1/2 will yield a quotient less than 1 because 1/2 is greater than 1/5 so there cannot be one whole half in 1/5 of something.) ● Connecting a representation of division of a fraction by a fraction to an equation. ● Dividing a fraction by a fraction using a strategy ● Solve word problems using division of fractions and interpret quotients

STAGE 2

Stage 2 – Evidence		
Code	**Evaluative Criteria**	**Assessment Evidence**
T, M, A	Rubric Criteria: **Mathematical Concepts:** 4 - Explanation shows complete understanding of mathematical concepts. 3 - Explanation shows substantial understanding of mathematical concepts. 2 - Explanation shows some understanding of mathematical concepts. 1 - Explanation shows very limited understanding of mathematical concepts OR is not written. **Strategy/Procedures:** 4 - Uses an efficient and effective strategy to solve the problem(s). 3 - Uses an effective strategy to solve the problem(s). 2 - Sometimes uses an effective strategy to solve the problem(s), but does not do it consistently. 1 - Rarely uses an effective strategy to solve the problem(s). **Mathematical Errors:** 4 - 90-100% of the steps and solutions have no mathematical errors. 3 - Almost all (85-89%) of the steps and solutions have no mathematical errors. 2 - Most (75-84%) of the steps and solutions have no mathematical errors. 1 - More than 75% of the steps and solutions have mathematical errors. **Completion:** 4 - All problems are completed. 3 - 75% of all problems are completed. 2 - 50% of all problems are completed. 1 - 25% or less of problems are completed. **Neatness and Organization:** 4 - The work is presented in a neat, clear, organized fashion that is easy to read.	PERFORMANCE TASK(S): **Goal:** Use a real life scenario to identify and model the time needed to the next exit while stuck in a traffic jam. **Role:** Calculating time traveled **Audience:** Classmates **Products:** Model and calculate the time needed to the near exit using fractions in a real life scenario **Standards for Success:** scoring rubric including focus on explanation, process and accuracy of the solution **Differentiation:** For more advanced students you can challenge them to use estimation in doubling or tripling the quantities. Consider students of language learners and accommodations by providing vocabulary with images, as well as a calculator, place value charts or graphic organizer to assist with the algorithms and organization.

	3 - The work is presented in a neat and organized fashion that is usually easy to read. 2 - The work is presented in an organized fashion but may be hard to read at times. 1 - The work appears sloppy and unorganized. It is hard to know what information goes together	
T, M, A T, M, A M, A M, A T, M, A		OTHER EVIDENCE: **Embedded Assessment 1:** Estimation of quotients involving fractions in real life scenarios **Common Unit Test:** CFA Division of Fractions **Skill Check**: Daily Warm-ups and/or Exit Tickets **Prompt**: You divide two fractions, and the numerator of the quotient is a 4. What could the fractions be? **Homework:** Almost daily

STAGE 3

Stage 3 – Learning Plan		
Code	***Pre-Assessment***	
M	● Unit Pre-Assessment	
M	● Teacher monitors for prerequisite understanding(s) and misconception(s) though warm up questions	
	Summary of Key Learning Events and Instruction	Progress Monitoring
M	● Students will work independently to complete pre-assessment of prior knowledge involving knowledge of fractions (unit fractions, proper fraction, improper fractions, mixed fractions, equivalent fractions), conceptual understanding of division with unit fractions (whole number unit fraction and unit fraction by whole number) using area models/bar models/ and number lines to represent them; teacher will plan and facilitate learning to clarify any prior misconception foundational to the new learning.	● Warm ups ● Classwork ● IXL ● Homework ● Exit Tickets ● Embedded Assessments ● Mid-Unit Assessment
T, A	● Teacher will begin teaching division of fractions with a concrete hands-on model such as pattern blocks that students can engage,	
T, A	explore, discuss. Students explore the relationships between the shapes and answer questions such as: How many ⅛'s fit into a trapezoid and students show visually that three triangles (⅛'s) fit into a trapezoid (½).	
T, A	● Teacher will continue to engage students in exploring the idea that dividing with fractions is determining how many fraction size parts fit into the given (dividend) total amount. Students continue	

	to practice understanding quotients of fractions using familiar scenarios and visual representation. For example: Three people share ½ of a pizza. How many pieces does each person get? Students draw a diagram to show that each person gets ⅙ of a pizza.	
T, A	● Teacher will develop a lesson to engage students in estimating the quotient of an expression that divides a fraction by a fraction (for example: 3/4 ÷ 1/2 will be more than 1 because 1/2 is less than 3/4 therefore there will be 1 whole half and some more in 3/4. Conversely, 1/5 ÷ 1/2 will yield a quotient less than 1 because 1/2 is greater than 1/5 so there cannot be one whole half in 1/5 of something.) Students will practice estimating using real world scenarios.	
A	● Assess students acquisition of the learning at this point in time	
A	● Review assessment and allow for opportunities to view common mistakes and misconceptions	
T, A	● Teacher will develop a lesson to engage students in dividing fractions by a whole number and discuss the idea of decomposing a fraction into equal parts. Students will understand, discuss and practice that dividing by a fraction, the quotient is sometimes greater than the dividend.	
T, A	● Teacher will develop a lesson to engage students to develop strategies for dividing fractions in context, including mixed numbers. Explore equivalent fractions and the use of the reciprocals.	
T, A	● Teacher will develop a lesson to engage students to develop strategies for solving problems involving division with fraction. Students continue to develop why and how to multiply by the reciprocal when dividing by a fraction.	
T, A	● Teacher will engage students and facilitate groups on a real life task to apply learning in this unit and importance of fraction application in everyday life situations: *How many biscuits can you make?*	
T	● Performance Task: Students will model and calculate the time needed to the near exit using fractions in a real life scenario.	
T, A	● Assess knowledge and application though the unit CFA and review misconceptions as needed.	

UNIT 4 - RATIOS AND RATES

Stage 1 Desired Results

ESTABLISHED GOALS

CCSS.MATH.CONTENT.RP.A.1:

Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*

CCSS.MATH.CONTENT.RP.A.2:

Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."*[1]

[1] Expectations for unit rates in this grade are limited to non-complex fractions

Transfer

Students will be able to independently use their learning to attend to the meaning and model symbolically with mathematics real-life situations involving ratios.

Meaning

UNDERSTANDINGS

Students will understand that…

- A ratio is a relationship or comparison of two quantities, or measures, where there are *a* units of one quantity for every *b* units of the other
- Equivalent ratios make the same comparison and knowledge about the multiples and factors can be used to find equivalent ratios
- Order is important when writing a ratio and ratios are written or expressed as: *a* to *b, a:b,* or *a/b*
- A ratio can compare two parts or a part and a whole
- Reasoning about equivalent ratios can help find the amount of one quantity when you know the amount of the other quantity
- A rate is a special ratio that compares two quantities with different units of measure; for example a truck going 200 miles on 10 gallons of gas
- A unit rate expresses a ratio as a part to one
- The @ sign can used to interpret rate, as well as words *per* and/or *each*

ESSENTIAL QUESTIONS

Students will keep considering…

1. How can you represent the relationship between two quantities or measures?
2. What is a rate and how do you identify equivalent rates?
3. How can I use models (tape diagrams, double number lines, ratio tables, coordinate plane, etc) to display an understanding of ratios and proportional relationships?

Acquisition

Students will know…

- compare
- constant of proportionality
- equivalent ratio
- per/@

Students will be skilled at…

- Using ratio language to describe a ratio relationship between two quantities
- Using ratio reasoning to solve real world problems
- Identify and write equivalent ratios

	• proportion • rate • ratio • ratio language • ratio table • simplify a ratio • tape diagram • unit rate	• Justifying solutions to ratio problems using ratio language and models • Using models to show and identify rates • Using division to find unit rates • Solve unit rate problems involving contact speed and unit pricing • Using unit rates to find unknown values • Using unit rate to convert measurement units

STAGE 2

Stage 2 – Evidence		
Code	**Evaluative Criteria**	**Assessment Evidence**
T, M, A	Rubric Criteria: **Mathematical Concepts:** 4 - Explanation shows complete understanding of mathematical concepts. 3 - Explanation shows substantial understanding of mathematical concepts. 2 - Explanation shows some understanding of mathematical concepts. 1 - Explanation shows very limited understanding of mathematical concepts OR is not written. **Strategy/Procedures:** 4 - Uses an efficient and effective strategy to solve the problem(s). 3 - Uses an effective strategy to solve the problem(s). 2 - Sometimes uses an effective strategy to solve the problem(s), but does not do it consistently. 1 - Rarely uses an effective strategy to solve the problem(s). **Mathematical Errors:** 4 - 90-100% of the steps and solutions have no mathematical errors. 3 - Almost all (85-89%) of the steps and solutions have no mathematical errors. 2 - Most (75-84%) of the steps and solutions have no mathematical errors.	PERFORMANCE TASK(S): **Goal:** Use a real life scenario to identify which purchase of carrots is the best buy by applying ratio understanding and utilizing problem solving strategies. **Role:** Problem solver by utilizing information given and identity the best rate **Audience:** Classmates in groups **Products:** Using a problem solving framework, evidence and transfer knowledge to identify the best buy for the money **Standards for Success:** scoring rubric including focus on explanation, process and accuracy of the solution **Differentiation:** For more advanced students you can challenge them to use estimation in doubling or tripling the quantities. Consider students of language learners and accommodations by providing coin values with images, as well as a calculator, place value charts or graphic organizer to assist with the algorithms and organization

	1 - More than 75% of the steps and solutions have mathematical errors. **Completion:** 4 - All problems are completed. 3 - 75% of all problems are completed. 2 - 50% of all problems are completed. 1 - 25% or less of problems are completed. **Neatness and Organization:** 4 - The work is presented in a neat, clear, organized fashion that is easy to read. 3 - The work is presented in a neat and organized fashion that is usually easy to read. 2 - The work is presented in an organized fashion but may be hard to read at times. 1 - The work appears sloppy and unorganized. It is hard to know what information goes together	
T, M, A T, M, A T, M, A M, A M, A T, M, A		OTHER EVIDENCE: **Embedded Assessment 1:** Understanding Concept of Ratio and Language **Embedded Assessment 2:** Unit rate and unit rate problems **Common Unit Test:** Ratios and Rates **Skill Check**: Daily Warm-ups and/or Exit Tickets **Prompt**: If we know the ratios of a part to total, how can we find the part to part ratio? Give an example and describe why the order of the ratio symbol is important. **Homework:** Almost daily

STAGE 3

Stage 3 – Learning Plan		
Code	***Pre-Assessment***	
M	● Unit Pre-Assessment	
M	● Teacher monitors for prerequisite understanding(s) and misconception(s) though warm up questions	
	Summary of Key Learning Events and Instruction	Progress Monitoring
M	● Students will work independently to complete pre-assessment of prior knowledge involving factors and multiples of whole numbers, equivalent fractions, multiplicative comparison describing one quantity as *n* time another quantity; teacher will plan and facilitate learning to clarify any prior misconception foundational to the new learning.	● Warm ups ● Classwork ● IXL ● Homework ● Exit Tickets ● Embedded Assessments ● Mid-Unit Assessment
A	● Teacher will engage students by presenting an activity to help students explore and discuss that a ratio is a relationship or comparison of two quantities or measures. Students discover by looking at images and develop ratio language to describe them such as *"There are 3 game controllers for each screen."*	
A	● Teachers will develop and present engaging warm-up questions to help explain the similarities and differences of fractions and ratios. Students review and practice equivalent fractions.	
T, A	● Teacher will develop a lesson and engage learners with the idea of comparing two quantities by describing how many units of one quantity there are for every x units of another quantity. Students understand and practice that ratio language can be used to compare two quantities.	
T, A	● Teacher will develop a lesson and engage learners with the idea that a ratio can compare quantities in different units or quantities that represent parts of a larger whole. Students understand and practice using mathematical notation to represent ratios.	
T, A	● Teacher will model the use of tape diagrams, ratio tables, and picture diagrams to show how to represent ratios. Students explore the idea that two different ratios can express the same comparison.	
T, M	● Students will practice independently and in teacher created groups the process of finding ratios in part to part, part to whole comparisons.	
T, M, A	● Assess students' knowledge and application and review misconceptions.	

A	● Teacher will use real-world examples to explain the concept of unit rates. Teacher will model the use of unit rates in real world situations	
T, A	● Students will continue to explore the relationship between unit rates and ratios in simple real life scenarios in small groups.	
T, M, A	● Students will practice independently to solve problems including the use of unit rates in simple real life scenarios.	
T, M, A	● Assess students' knowledge and application and review misconceptions.	
T	● Performance Task: Use a real life scenario to identify which purchase of carrots is the best buy by applying ratio understanding and utilizing problem solving strategies.	
T, A	● Assess knowledge and application though the unit CFA and review misconceptions as needed.	

UNIT 5 - EXPRESSIONS, EQUATIONS AND INEQUALITIES

Stage 1 Desired Results

ESTABLISHED GOALS

CCSS.MATH.CONTENT.EE.A.1:
Write and evaluate numerical expressions involving whole-number exponents.

CCSS.MATH.CONTENT.EE.A.2:
Write, read, and evaluate expressions in which letters stand for numbers.

CCSS.MATH.CONTENT.EE.A.2A:
Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as 5 - y*.

CCSS.MATH.CONTENT.EE.A.2B:
Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms*.

CCSS.MATH.CONTENT.EE.A.2C:
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 specify a particular order (Order of Operations). *For example, use the formulas V = s^3 and A = 6 s^2 to find the volume and surface area of a cube with sides of length s = 1/2*.

CCSS.MATH.CONTENT.EE.A.3:
Apply the properties of operations to generate equivalent expressions. *For*

Transfer

Students will be able to independently use their learning to model, graph and solve real-world scenarios through the application of algebraic thinking.

Meaning

UNDERSTANDINGS

Students will understand that…

- Variables can be used to write and evaluate expressions with whole number exponents
- Any base to the zero power is 1
- Properties can be used to generate equivalent expressions and identify equivalence
- Variables can be used to represent, write, and solve equations and inequalities for real world problems
- What it means to solve an equation and what is meant by a solution of an equation
- An equation with variables can be true or false depending on the value substituted for the variable
- Solving an equation means finding a value for the variable that makes the equation true
- What it means to solve an inequality and what is the meaning of the solution
- Evaluate whether a number in a specific set is a solution to an inequality

ESSENTIAL QUESTIONS

Students will keep considering…

1. How can you apply properties of operations to generate equivalent expressions?
2. How can variables be used to represent and solve equations and inequalities in real world problems?
3. How can an equation be used to represent and solve a real world/mathematical situation?

Acquisition

Students will know…

- algebraic expression
- associative property
- base (0f a power)
- coefficient
- commutative property of multiplication
- constant
- distributive property

Students will be skilled at…

- Using whole-number exponents to represent repeated multiplication
- Writing a power as a repeated multiplication
- Writing numerical and algebraic expressions that involve exponents
- Evaluating numerical and algebraic expressions that contain exponents
- Applying order of operations with exponents

example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y. **CCSS.MATH.CONTENT.EE.A.4:** Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.*. **CCSS.MATH.CONTENT.EE.A.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. **CCSS.MATH.CONTENT.EE.A.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. **CCSS.MATH.CONTENT.EE.A.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. **CCSS.MATH.CONTENT.EE.A.8:** Write an inequality of the form *x* > *c* or *x* < *c* to represent a constraint or condition in a real-world or	● equation ● equivalent ● equivalent expressions ● evaluate ● exponent ● expression(s) ● factor ● inequality ● like terms ● multiplicative identity ● nonnegative rational numbers ● numerical expressions ● power ● power of 10 ● product ● properties ● quantity ● quotient ● substitution ● sum ● term ● variable(s)	● Communicating orally and/or in writing about representing and evaluating expressions using precise vocabulary ● Applying the distributive property to a sum of two whole numbers ● Applying the distributive property to algebraic expressions ● Combining like terms ● Recognizing and generate equivalent expressions ● Using substitution to show whether a number in a specific set is a solution of an equation ● Writing one step equations to model real world and mathematical problems ● Solving one step equations by using algebraic reasoning and bar models that represent equations such as 3X = 30 ● Interpreting the solution to an algebraic equation in real world scenarios ● Writing inequalities to represent real world scenarios ● Graphing solutions of inequalities

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. **CCSS.MATH.CONTENT.NS.B.4:** Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express 36 + 8 as 4(9+2).*		

STAGE 2

Stage 2 – Evidence		
Code	**Evaluative Criteria**	**Assessment Evidence**
T, M, A	Rubric Criteria: **Mathematical Concepts:** 4 - Explanation shows complete understanding of mathematical concepts. 3 - Explanation shows substantial understanding of mathematical concepts. 2 - Explanation shows some understanding of mathematical concepts. 1 - Explanation shows very limited understanding of mathematical concepts OR is not written. **Strategy/Procedures:** 4 - Uses an efficient and effective strategy to solve the problem(s). 3 - Uses an effective strategy to solve the problem(s). 2 - Sometimes uses an effective strategy to solve the problem(s), but does not do it consistently. 1 - Rarely uses an effective strategy to solve the problem(s). **Mathematical Errors:** 4 - 90-100% of the steps and solutions have no mathematical errors. 3 - Almost all (85-89%) of the steps and solutions have no mathematical errors. 2 - Most (75-84%) of the steps and solutions have no mathematical errors. 1 - More than 75% of the steps and solutions have mathematical errors. **Completion:** 4 - All problems are completed. 3 - 75% of all problems are completed. 2 - 50% of all problems are completed. 1 - 25% or less of problems are completed. **Neatness and Organization:** 4 - The work is presented in a neat, clear, organized fashion that is easy to read.	PERFORMANCE TASK(S): **Goal:** Use a real life scenario to identify an algebraic expression that describes the number of children that can sit around a row of *n* tables. **Role:** working in groups to find solution(s) **Audience:** Classmates **Products:** Through teacher facilitation, students in groups will investigate, model and develop an algebraic expression to count the number of children who can sit at the table(s) in various scenarios **Standards for Success:** scoring rubric including focus on explanation, process and accuracy of the solution **Differentiation:** For more advanced students you can challenge them to use estimation and investigate various shapes for tables like squares. Consider students of language learners and accommodations by providing images, as well as a calculator, place value charts or graphic organizer to assist with the algorithms and organization.

	3 - The work is presented in a neat and organized fashion that is usually easy to read. 2 - The work is presented in an organized fashion but may be hard to read at times. 1 - The work appears sloppy and unorganized. It is hard to know what information goes together	
T, M, A T, M, A T, M, A M, A M, A M, A T, M, A		OTHER EVIDENCE: **Embedded Assessment 1:** Parts of Expressions, Writing Expressions **Embedded Assessment 2:** Parts of equations, representing and solving mathematical problems **Embedded Assessment 3:** Understanding, solving and graphing inequalities **Common Unit Test:** Expressions, Equations and Inequalities **Skill Check**: Daily Warm-ups and/or Exit Tickets **Prompt**: What is the best way to represent and analyze a relationship between variables? **Homework:** Almost daily

STAGE 3

Stage 3 – Learning Plan		
Code	***Pre-Assessment***	
M	● Unit Pre-Assessment	
M	● Teacher monitors for prerequisite understanding(s) and misconception(s) though warm up questions	
	Summary of Key Learning Events and Instruction	Progress Monitoring
M	● Students will work independently to complete pre-assessment of prior knowledge involving; a) understanding and evaluation of powers of 10, b) understanding and application of the order of operations in expressions (without exponents), c) reading, writing and evaluating algebraic expressions (without exponents). Teacher will plan and facilitate learning to clarify any prior misconception foundational to the new learning.	● Warm ups ● Classwork ● IXL ● Homework ● Exit Tickets ● Embedded Assessments ● Mid-Unit Assessment
A	● Teacher will develop and facilitate a lesson that explores the idea that writing repeated multiplication using exponents is related to modeling area and volume. Students understand and practice that exponents are an efficient notation for representing repeated multiplication.	
T, A	● Teacher will develop an engaging lesson for students to explore through modeling with squares and cubes scenarios like 3^2 and	

	3^3, as well as write exponential notations for examples such as 5 x 5 x 5 x 5 x 5 and evaluate a variety of examples such as 4^4, 4 + 2^4 *2, and 6 + 3^3.	
T, A	● Teacher will develop and facilitate a lesson that develops strategies for writing and evaluating expressions with exponents with no variables in real world context. Students recognize and practice that a power can be evaluated by thinking of the repeated multiplication and grouping the factors in a convenient way. Students discuss and engage in discovery through patterns to identify what happens to the value of the power each time the exponents increase or decrease by 1.	
T, A	● Teachers will develop engaging scenarios that develop and emphasize strategies for writing and evaluating expressions with exponents (no variables yet) in real world context. Students practice and refine the knowledge that exponents are evaluated prior to multiplication, addition or subtraction. Students continue to refine understanding using the order of operations to evaluate expressions.	
T, M	● Teacher will present warm-up questions helping explain the concept of using variables in a math problem. Students must engage in opportunities to translate expressions from verbal expressions to numerical ones and from numerical expressions to verbal expressions.	
T, M	● Students will engage in refining translating numerical expressions into word form and from a word form into variable expressions. Teacher will facilitate further the development of understanding for the parts of an algebraic expression, including variables coefficients, constants and the name of operations (sum, differences, product and quotient).	
T, A	● Teacher will develop opportunities for students to use multiplication to interpret 2(3 + x) as two groups of (3 + x) and have students use manipulative and/or other methods to create an array. Students will further use manipulative to interpret y as referring to one y and 3y as referring to 3y while discussing the distributive property, the multiplicative property of 1 and the commutative property to prove that 3y = y + y + y.	
T, M, A	● Students will further explore the different parts of an algebraic expression and recognize that algebraic expressions are equivalent if they can be rewritten in exactly the same form	

T, M, A	● Assess students' knowledge and application and review misconceptions.	
T, A	● Teacher will develop and introduce through an engaging lesson the idea of using a bar model to model an equation with and without a variable. Students will understand that the equal sign shows that the expressions on both sides have the same value. In addition, students understand that the value of a variable that makes an equation true is the solution to the equation.	
T, A	● Teacher develops a lesson to engage students in drawing comparisons between expressions and equations. Note that it is critical for students to be given multiple experiences and to focus on the understanding of the meaning of solving an expression or equation before developing the procedural.	
T, A	● Teacher continues to engage students to understand that solving an equation means finding a value of the variable that makes the equation true. Students practice using substitution to show whether a number in a specific set is a solution.	
T, A	● Teacher will engage students in writing one step equations to model real world and mathematical problems. Students continue to solve one step equations by using algebraic reasoning, as well as interpret the solution to an algebraic equation in context.	
T, A	● Teacher will engage students in real life scenarios to understand what it means to solve inequalities and what is meant by a solution of an inequality. Students determine whether a number in a specific set is a solution of an inequality.	
T, A	● Students are engaged in writing inequalities to represent real world scenarios and understand that inequalities have infinitely many solutions. Students practice graphing solutions to the inequalities.	
T, M, A T	● Assess students' knowledge and application and review misconceptions. ● Performance Task: Students will use a real life scenario to identify an algebraic expression that describes the number of children that	
T, A	can sit around a row of n tables. ● Assess knowledge and application though the unit CFA and review misconceptions as needed.	

UNIT 6 - PROPORTIONAL RELATIONSHIPS AND ALGEBRAIC REASONING

Stage 1 Desired Results

ESTABLISHED GOALS

CCSS.MATH.CONTENT.RP.A3:
Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

CCSS.MATH.CONTENT.RP.A.3.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.

CCSS.MATH.CONTENT.RP.A.3.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?*

CCSS.MATH.CONTENT.RP.A.3.C
Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.

CCSS.MATH.CONTENT.RP.A.3.D
Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

1 Expectations for unit rates in this grade are limited to non-complex fractions.

CCSS.MATH.CONTENT.EE.C9:
Use variables to represent two quantities in a real-world problem that change in relationship to one another;

Transfer

Students will be able to independently use their learning to model with mathematics real life situations using variables to represent two quantities symbolically, graphically, tabularly and contextually.

Meaning

UNDERSTANDINGS

Students will understand that…

- Division is used to find unit rates in problems such as the ones involving constant speed and unit pricing
- Unit rates can be used to find unknown values in equivalent ratios when three or four values are given
- Proportional relationships can be graphed in terms of dependent and independent variables
- Dependent and independent variables represent a relationship between two quantities
- Unit rates are used to convert measurements
- Equations represent a dependent variable in terms of another independent variable
- Graphs and tables are used to analyze the relationships between dependent and independent variables
- A percent is a rate per 100
- Models are used to show and identify percents in real world scenarios

ESSENTIAL QUESTIONS

Students will keep considering…

1. How can rates, ratios, and proportional reasoning help us better understand the use of ratios and rates in the world around us?
2. How can I use models (tape diagrams, double number lines, ratio tables, coordinate plane, etc) to display an understanding of ratios and proportional relationships?
3. How can you distinguish between an independent variable and a dependent variable?
4. How does the change in one variable affect the change in the other?
5. How can you relate tables and graphs to equations?

Acquisition

Students will know…

- axis
- convert
- dependent variable
- independent variable
- ordered pair
- rate

Students will be skilled at…

- Creating and interpreting a table of equivalent ratios
- Using a table to compare and find missing values
- Plotting pairs of values from a table to a coordinate plane
- Reasoning and solve rate problems comparing

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. 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.	● unit rate ● variable	two different units such as miles per minute ● Writing a percent rate as a rate over 100, including percents greater than 100 and less than 1 ● Finding the percents of a number using rate methods ● Representing relationships using models ● Converting units by dividing or multiplying ● Using variables to represent two quantities ● Identifying relationships between tables, graphs and equations ● Identifying a change in the independent variable creates a change in the depend variable and write equations to express a quantity in terms of the dependent and independent variable

STAGE 2

Stage 2 – Evidence		
Code	**Evaluative Criteria**	**Assessment Evidence**
T, M, A	Rubric Criteria: **Mathematical Concepts:** 4 - Explanation shows complete understanding of mathematical concepts. 3 - Explanation shows substantial understanding of mathematical concepts. 2 - Explanation shows some understanding of mathematical concepts. 1 - Explanation shows very limited understanding of mathematical concepts OR is not written. **Strategy/Procedures:** 4 - Uses an efficient and effective strategy to solve the problem(s). 3 - Uses an effective strategy to solve the problem(s). 2 - Sometimes uses an effective strategy to solve the problem(s), but does not do it consistently. 1 - Rarely uses an effective strategy to solve the problem(s). **Mathematical Errors:** 4 - 90-100% of the steps and solutions have no mathematical errors. 3 - Almost all (85-89%) of the steps and solutions have no mathematical errors. 2 - Most (75-84%) of the steps and solutions have no mathematical errors. 1 - More than 75% of the steps and solutions have mathematical errors. **Completion:** 4 - All problems are completed. 3 - 75% of all problems are completed. 2 - 50% of all problems are completed. 1 - 25% or less of problems are completed. **Neatness and Organization:** 4 - The work is presented in a neat, clear, organized fashion that is easy to read.	PERFORMANCE TASK(S): **Goal:** Use a real life scenario students analyze the article and speeding ticket in order to reason, accurately convert and calculate the speed of the motorcycle. **Role:** As mathematicians, students use ratio reasoning to investigate and derive accurate solutions. **Audience:** Classmates **Products:** Using a problem solving framework, students convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. **Standards for Success:** scoring rubric including focus on explanation, process and accuracy of the solution **Differentiation:** For more advanced students you can challenge them to develop equations, develop tables and graphs to represent the relationship between the speed and the fine. Consider students of language learners and accommodations by providing images, as well as a calculator, place value charts or graphic organizer to assist with the algorithms and organization.

	3 - The work is presented in a neat and organized fashion that is usually easy to read. 2 - The work is presented in an organized fashion but may be hard to read at times. 1 - The work appears sloppy and unorganized. It is hard to know what information goes together	
T, M, A T, M, A T, M, A M, A M, A T, M, A		OTHER EVIDENCE: **Embedded Assessment 1:** Using Unit Rates to Convert Measurement **Embedded Assessment 2:** Graphing Proportional Relationships and Percents **Common Unit Test:** Proportional Relationships and Algebraic Reasoning **Skill Check**: Daily Warm-ups and/or Exit Tickets **Prompt**: Why is it necessary to have a system of measurement and how does knowing about converting within a system or systems is an important life skill to understand real life situations? **Homework:** Almost daily

STAGE 3

Stage 3 – Learning Plan		
Code	***Pre-Assessment***	
M M	● Unit Pre-Assessment ● Teacher monitors for prerequisite understanding(s) and misconception(s) though warm up questions	
	Summary of Key Learning Events and Instruction	Progress Monitoring
M	● Students will work independently to complete pre-assessment of prior knowledge involving ratio understanding, equivalent ratio tables, plotting pairs in the coordinate plane; teacher will plan and facilitate learning to clarify any prior misconception foundational to the new learning.	● Warm ups ● Classwork ● IXL ● Homework ● Exit Tickets ● Embedded Assessments ● Mid-Unit Assessment
T, A	● Teacher will develop a lesson to engage students in exploring the idea that a rate contains information about equivalent ratios. Students will discuss and practice to understand that equivalent ratios have the same unit rate using tables and/ or double number lines.	
T, A	● Teacher will develop a lesson to engage students in using various strategies for using unit rates to find an unknown quantity in an equivalent ratio. Students will discuss and practice to understand that real life rate problems can be solved by dividing numbers in a ratio to find the unit rate and use the unit rate as a multiplier to	

	solve other mathematical problems.	
T, A	● Teacher will develop a lesson to engage students in using various strategies, like tables and double number lines, to compare two or more ratios. Students practice to further understand unit rates in context.	
T, A	● Teacher will develop a lesson engaging students using various strategies to convert measurements by using ratio reasoning in context within metric and customary systems. Students will discuss and solve a variety of mathematical problems.	
T, M, A	● Assess students' knowledge and application and review misconceptions.	
T, A	● Teacher will develop a lesson engaging students to explore that the value of one quantity (or variable) can depend on the value of another quantity (or variable). Students explore and discuss real life scenarios to determine which variable is independent and which is dependent.	
T, A	● Teacher will develop a lesson engaging students in strategies to write an equation that represents the relationship between two quantities. Students continue to master, through real life examples, that an equation with two variables represents a pattern that stands for the value of the independent variable to the value of the dependent variable.	
T, A	● Teacher will develop a lesson engaging students to explore strategies for analyzing the relationship between two quantities such as tables and graphs to understand how the change in one value changes the dependent one.	
T, A	● Students discuss and practice, using real life scenarios, to analyze and represent relationships between two variables, as well as the connections between the two.	
T, A	● Teacher will develop a lesson engaging students to explore percents as a rate per 100. Students practice to understand the modeling of percent(s) on a hundredths grid and/ or on a bar model similar to a fraction representation.	
T, A	● Teacher will develop a lesson engaging students to understand that a percent is another way to express a portion of a quantity. It is critical that students discuss and practice to understand the relationships between fractions, percents and decimals.	
T, A	● Students discuss and practice, using real life scenarios, percents at a rate of 100.	

T, M, A T T, A	● Assess students' knowledge and application and review misconceptions. ● Performance Task: Students will ● Assess knowledge and application though the unit CFA and review misconceptions as needed.	

UNIT 7 - APPLICATIONS OF GEOMETRY

Stage 1 Desired Results

ESTABLISHED GOALS

CCSS.MATH.CONTENT.G.A.1:
Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

CCSS.MATH.CONTENT.G.A.2:
Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas *V = l w h* and *V = b h* to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

CCSS.MATH.CONTENT.G.A.4:
Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

Transfer

Students will be able to independently use their learning to analyze and calculate the dimensions of various objects using standardized shapes and figures.

Meaning

UNDERSTANDINGS

Students will understand that…

- Shapes can be put together and apart (composed and decomposed) to create shapes whose area is equal to that of the sum of the areas of the joining shapes or remaining
- Area formula are generalizations deriving from familiar shapes
- Area is two dimensional involving length and width (sometime either or can be referred to the height)
- Filling a solid with cubes and counting them gives the same result as using a volume formula
- Volume is three dimensional involving, length, width and height (sometimes the base can represent the length or width)
- Nets relate to visual representation of three dimensional figures
- Expressions and equations can assist to finding the area of nets by relating the two dimensional figures to three dimensional figures

ESSENTIAL QUESTIONS

Students will keep considering…

1. How can you find the area of a polygon by decomposing (deconstructing) it into other shapes?
2. What is volume and how does it relate to the attribute of an individual figure?
3. What strategies could you use to recognize the existence of, and visualize components of three dimensional shapes that are not visible from a given viewpoint?

Acquisition

	Students will know… ● area ● base (of a parallelogram) ● base (of a triangle) ● compose ● decompose ● difference ● dimension ● expression ● height (of a parallelogram) ● height (of a triangle) ● parallelogram ● perpendicular ● polygon ● product ● trapezoid (exclusive) ● trapezoid (inclusive)	*Students will be skilled at…* ● Finding the area of parallelograms with whole number side lengths by composing and decomposing ● Identifying base/height of a parallelogram ● Generalizing and use the area of a parallelogram ● Using the formula of a parallelogram accurately to solve problems involving fractional and decimal lengths ● Finding the area of triangles with whole number side lengths by composing and decomposing into rectangles and parallelograms ● Identifying base/height of a triangle ● Generalizing and use the area of a triangle ● Finding area of polygons by composing and decomposing triangles, rectangles and parallelograms ● Finding the volume of a rectangular prism ● Solving mathematical real world problems involving volume ● Identifying and draw nets for three dimensional figures ● Using nets to find the surface area of three dimensional figures

STAGE 2

Stage 2 – Evidence		
Code	**Evaluative Criteria**	**Assessment Evidence**
T, M, A	Rubric Criteria: **Mathematical Concepts:** 4 - Explanation shows complete understanding of mathematical concepts. 3 - Explanation shows substantial understanding of mathematical concepts. 2 - Explanation shows some understanding of mathematical concepts. 1 - Explanation shows very limited understanding of mathematical concepts OR is not written. **Strategy/Procedures:** 4 - Uses an efficient and effective strategy to solve the problem(s). 3 - Uses an effective strategy to solve the problem(s). 2 - Sometimes uses an effective strategy to solve the problem(s), but does not do it consistently. 1 - Rarely uses an effective strategy to solve the problem(s). **Mathematical Errors:** 4 - 90-100% of the steps and solutions have no mathematical errors. 3 - Almost all (85-89%) of the steps and solutions have no mathematical errors. 2 - Most (75-84%) of the steps and solutions have no mathematical errors. 1 - More than 75% of the steps and solutions have mathematical errors. **Completion:** 4 - All problems are completed. 3 - 75% of all problems are completed. 2 - 50% of all problems are completed. 1 - 25% or less of problems are completed. **Neatness and Organization:** 4 - The work is presented in a neat, clear, organized fashion that is easy to read.	PERFORMANCE TASK(S): **Goal:** Design a new cereal box for a cereal company **Role:** Employee proposing a solution to the company's manager **Audience:** Manager and classmates **Products:** Using a problem solving framework, evidence and transfer knowledge to design a new cereal box and use appropriate vocabulary to explain the findings **Standards for Success:** scoring rubric including focus on explanation, process and accuracy of the solution **Differentiation:** Consider students of language learners and accommodations by providing images, as well as a calculator, place value charts or graphic organizer to assist with the algorithms and organization

	3 - The work is presented in a neat and organized fashion that is usually easy to read. 2 - The work is presented in an organized fashion but may be hard to read at times. 1 - The work appears sloppy and unorganized. It is hard to know what information goes together	
T, M, A T, M, A T, M, A M, A M, A T, M, A		OTHER EVIDENCE: **Embedded Assessment 1:** Areas of triangles and parallelograms **Embedded Assessment 2:** Volume and area of nest **Common Unit Test:** Application of Geometry **Skill Check**: Daily Warm-ups and/or Exit Tickets **Prompt**: How can knowledge of areas and volume help in different carreers? **Homework:** Almost daily

STAGE 3

Stage 3 – Learning Plan		
Code	***Pre-Assessment***	
M	● Unit Pre-Assessment	
M	● Teacher monitors for prerequisite understanding(s) and misconception(s) though warm up questions	
	Summary of Key Learning Events and Instruction	Progress Monitoring
M	● Students will work independently to complete pre-assessment of prior knowledge involving the understanding that area is measured in square units, finding the area of a rectangle, solve real life problems involving area of squares and rectangle with whole numbers; teacher will plan and facilitate learning to clarify any prior misconception foundational to the new learning.	● Warm ups ● Classwork ● IXL ● Homework ● Exit Tickets ● Embedded Assessments ● Mid-Unit Assessment
A	● Teacher will develop engaging activities where students explore the area of parallelograms is the amount of space the shape covers, as well as identify heights as perpendicular to the base. Note: It is crucial to accomplish this through hands-on discovery and visual representations.	
T, A	● Teacher will develop engaging activities where students explore and practice strategies for finding areas of parallelograms including the composing and decomposing of rectangles, as well as formulas.	
T, A	● Students will continue to discuss and solve problems including the area of parallelograms.	
A	● Teacher will develop engaging activities where students explore	

	identical triangles arranged to form rectangles and parallelograms. Students find the relationship of triangles and the relationship to the area of a parallelogram through hands-on activities.	
T, A	● Teacher will develop engaging activities where students develop strategies to find the area of a triangle. Students recognize the area of a triangle as half of the area of a parallelogram and practice solving area problems in context.	
A	● Teacher will develop engaging activities where students identify and develop strategies for areas of polygons.	
T, M, A	● Assess students' knowledge and application and review misconceptions.	
T, A	● Teacher will develop engaging activities where students explore with hands on manipulations that cubes with unit fraction edge lengths can be used to find volume. Students develop an understanding of volumes.	
T, A	● Teacher will develop engaging activities where students develop and practice strategies for solving real world and mathematical problems involving volume.	
T, A	● Teacher will develop engaging activities where students explore strategies for finding which 2 dimensional shapes make up the net for a given 3 dimensional figure. Students practice with hands-on activities.	
T, A	● Students continue to develop strategies for finding the surface area of 3 dimensional figures using nets.	
T, M, A	● Assess students' knowledge and application and review misconceptions.	
T	● Performance Task: Students will design a new cereal box and use appropriate vocabulary to explain the findings.	
T, A	● Assess knowledge and application though the unit CFA and review misconceptions as needed.	

Stage 1 Desired Results

ESTABLISHED GOALS

CCSS.MATH.CONTENT.SP.A.1:
Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages*.

CCSS.MATH.CONTENT.SP.A.2:
Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.

CCSS.MATH.CONTENT.SP.A.3:
Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.

CCSS.MATH.CONTENT.SP.B.4:
Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

CCSS.MATH.CONTENT.SP.B.5:
Summarize numerical data sets in relation to their context, such as by:

CCSS.MATH.CONTENT.6.SP.B.5.A
Reporting the number of observations.

CCSS.MATH.CONTENT.6.SP.B.5.B
Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

CCSS.MATH.CONTENT.6.SP.B.5.C
Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as

Transfer

Students will be able to independently use their learning to look for and make use of structure to collect and analyze information.

Meaning

UNDERSTANDINGS

Students will understand that…

- Collected data can be analyzed to answer a question
- Various statistical methods are used for specific purposes
- Data consists of different attributes, counts, and measurements
- Graphs show a distribution shape, whether centered around symmetret or containing unusual traits like clusters, gaps, and outliers
- Different forms of data representation are used including charts, graphs, and statistics

ESSENTIAL QUESTIONS

Students will keep considering…

1. How does our interpretation of data guide our decisions?
2. What is the best way to represent collected data?
3. How can I explain the data distribution?

Acquisition

Students will know…

- attribute
- box plot
- categorical data
- data
- dot plot
- histogram
- interquartile range
- mean
- mean absolute value
- measures of variation
- median
- mode
- numerical data
- outlier
- quartile
- range

Students will be skilled at…

- Collecting, analyzing, and interpreting sets of data
- Describing the shape of data distribution based on its center, spread, and/or variability
- Creating surveys as a tool to collect data, formulate and answer a statistical question
- Differentiating between categorical and numerical data
- Describing a set of data using its center (mean, median, and mode), spread (range), and overall shape
- Determining appropriate center and variation for various data sets
- Identifying how changes in data affect the mean, median, and mode of a data set
- Compiling and organize data in the form of a table, histogram, dot plot, line plot, ordered-value

describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. **CCSS.MATH.CONTENT.6.SP.B.5.D** Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	● sample ● sample space ● scale ● statistics ● statistical question ● variability	bar graph, or box plot ● Determining which graph or table is best suited to represent a data set ● Performing a statistical investigation including the collection, organization, and analysis of the data ● Communicating a deep understanding of observations, measures of center and spread, graph to represent data collected and overall patterns in a distribution including any outliers impacted the measures of center

STAGE 2

Stage 2 – Evidence		
Code	**Evaluative Criteria**	**Assessment Evidence**
T, M, A	Rubric Criteria: **Mathematical Concepts:** 4 - Explanation shows complete understanding of mathematical concepts. 3 - Explanation shows substantial understanding of mathematical concepts. 2 - Explanation shows some understanding of mathematical concepts. 1 - Explanation shows very limited understanding of mathematical concepts OR is not written. **Strategy/Procedures:** 4 - Uses an efficient and effective strategy to solve the problem(s). 3 - Uses an effective strategy to solve the problem(s). 2 - Sometimes uses an effective strategy to solve the problem(s), but does not do it consistently. 1 - Rarely uses an effective strategy to solve the problem(s). **Mathematical Errors:** 4 - 90-100% of the steps and solutions have no mathematical errors. 3 - Almost all (85-89%) of the steps and solutions have no mathematical errors. 2 - Most (75-84%) of the steps and solutions have no mathematical errors. 1 - More than 75% of the steps and solutions have mathematical errors. **Completion:** 4 - All problems are completed. 3 - 75% of all problems are completed. 2 - 50% of all problems are completed. 1 - 25% or less of problems are completed. **Neatness and Organization:** 4 - The work is presented in a neat, clear, organized fashion that is easy to read.	**Goal:** Use a real life scenario to analyze the statistics and identify which group of students performed better. **Role:** Analyzing data using statistics **Audience:** Classmates **Products:** Generate quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. **Standards for Success:** scoring rubric including focus on explanation, process and accuracy of the solution **Differentiation:** For more advanced students you can challenge them to use estimation in doubling or tripling the scores by using desmos to perform the statistics. Consider students of language learners and accommodations by providing images, as well as a calculator, place value charts or graphic organizer to assist with the algorithms and organization

	3 - The work is presented in a neat and organized fashion that is usually easy to read. 2 - The work is presented in an organized fashion but may be hard to read at times. 1 - The work appears sloppy and unorganized. It is hard to know what information goes together	
T, M, A T, M , A T, M , A M, A M, A T, M, A		OTHER EVIDENCE: **Embedded Assessment 1:** Data Organization, Finding the Mean **Embedded Assessment 2:** Variability, Data Analysis **Common Unit Test:** Data Collection and Organization, Data Types, Various Data Displays, Variability, Data Analysis **Skill Check**: Daily warm-ups **Prompt**: What data should I collect to help answer a statistical question? **Homework:** Almost daily

STAGE 3

Stage 3 – Learning Plan		
Code	***Pre-Assessment***	
M	● Unit Pre-Assessment	
M	● Teacher monitors for prerequisite understanding(s) and misconception(s) though warm up questions	
	Summary of Key Learning Events and Instruction *Student success at transfer, meaning, and acquisition depends on…*	Progress Monitoring ● Warm ups ● Classwork ● IXL ● Homework ● Exit Tickets ● Embedded Assessments ● Mid-Unit Assessment
M, A	● Teacher checks for prior knowledge using warm-up and questioning activities involving collecting data and creating dot plots.	
M	● Students will work independently to complete pre-assessment involving collecting data and creating dot plots.	
A	● Teacher will present warm-up questions helping explain and facilitate discussion in discovering what us the study of statistics through examples, statistical versus non statistical questions, categorical and numerical data and developing vocabulary.	
T, M	● Students will practice identifying the difference between categorical and numerical data along with calculating the mean, median, and mode.	
T, A	● Assess students' knowledge and application and review misconceptions.	
T, A	● Teacher will model how change in data changes the distribution of data.	
A	● Teacher will model the different charts, tables, and diagrams used for presenting data.	
T	● Students will experiment with the different charts, tables, and diagrams to determine which one best fits a particular data set.	
T	● Performance Task: Students will use a real life scenario to analyze the statistics and identify which group of students performed better.	
M, T, A	● Assess knowledge and application though the unit CFA and review misconceptions as needed.	