

Course Title: 6th grade Mathematics

Board Approval Date: 07/2018

Credit / Hours:

Reviewed Annually

Course Description:

This course focuses on mastery of the PA Core Standards for Mathematics. As students progress through this course they will participate in a systematic study of data displays and number systems, fraction operations and ratios, decimal operations and percent, algebraic expressions and equations, area and volume explorations, equivalent expressions and solving equations, variables and algebraic relationships, and applications: ratios, expressions, and equations.

Learning Activities / Modes of Assessment:

Large group instruction	Tests and Quizzes	CDT assessments
Small group work	Checklists / Teacher observation	IXL diagnostic and lessons
Collaborative learning		

Instructional Resources:

Everyday Mathematics / Common Core State Standards Edition (McGraw Hill, 2016)
Everyday Mathematics Online (Instructional Resources through Everyday Math)
IXL
Reflex math

Course Pacing Guide

Course: Math – Grade 6

Course Unit (Topic) (Days/Periods)	Length of Instruction
1. Data Displays and Number Systems	25 days
2. Fraction Operations and Ratios	24 days
3. Decimal Operations and Percent	22 days
4. Algebraic Expressions and Equations	23 days
5. Area and Volume Explorations	17 days
6. Equivalent Expressions and Solving Equations	18 days
7. Variables and Algebraic Relationships	22 days
8. Applications: Ratios, Expressions, and Equations	23 days
Total Days	172 days

Topic: Unit 1 Data Displays and Number Systems
 Subject(s): Math

Days: 25
 Grade(s):6th

Know:	Understand:	Do:
Bin Coordinate grid Counting number Data landmark Distribution Line plot/dot plot Histogram Integer Maximum Mean Measure of Center Median Minimum Mode Opposite Ordered Pair Origin Outlier Quadrant Range Rational Number Statistical question Unit fraction Variability Whole Number X-coordinate Y-coordinate	CC.2.1.6.E.4: Apply and extend previous understandings of numbers to the system of rational numbers. (5) CC.2.4.6.B.1: Demonstrate an understanding of statistical variability by displaying, analyzing and summarizing distributions. (10)	M06.A-N.3.1.3: Locate and plot integers and other rational numbers on a horizontal or vertical number line; locate and plot pairs of integers and other rational numbers on a coordinate plane. (12) M06.D-S.1.1.1: Display numerical data in plots on a number line, including line plots, histograms, and box-and-whisker plots. (33) M06.D-S.1.1.2: Determine quantitative measures of center (e.g., median, mean, mode) and variability (e.g., range, interquartile range, mean absolute deviation). (34) M06.D-S.1.1.3: Describe any overall pattern and any deviations from the overall pattern with reference to the context in which the data were gathered. (35) M06.D-S1.1.4: Relate the choice of measures of centers and variability to the shape of the data distribution and the context which the data were gathered. (36)

Lesson 1-1 : Exploring Statistical Questions

How do you use the Student Reference Book to formulate statistical questions?

Data statistical question statistics range

Lesson 1-2 : Creating Dot Plots

How do you create dot plots and use median and mode to match plots with statistical questions?

dot plot

data

landmark maximum

minimum

distribution

variability

median

mode

Lesson 1-3 : Introducing Mean

How do you find the mean and median for data sets?

average

mean

predict

Lesson 1-4 : Introducing the Mean as a Balancing Point

How do you explore the mean as a balance point for data sets?

balance point

Lesson 1-5 : Comparing Mean, Median, and Mode

How do you determine whether to use mean, median, or mode to summarize data sets?

measure of center

outlier

Lesson 1-6 : Analyzing Persuasive Graphs

How do you analyze persuasive graphs and describe their features?

Lesson 1-7 : Introducing Histograms

How do you compare bin sizes and analyze which bin to place numbers in, especially numbers that fall on endpoints?

histogram

bin

Lesson 1-8 : Examining Shapes of Graphs

How do you explore different distributions of data in histograms?

cluster

Lesson 1-9 : Analyzing Data (Day 1)

How do you analyze a data set, draw histograms, and then use their results to make a persuasive argument?

Lesson 1-9 : Analyzing Data (Day 2)

How do you examine others' work in a class discussion and then revise their work?

Lesson 1-10 : Introducing Integers

How do you identify integers and rational numbers and apply them to real-world contexts?

Lesson 1-11 : Building a Number Line Using Fraction Strips

How do you find and plot rational numbers on a number line?

unit fraction

Lesson 1-12 : Finding Fractions between Fractions

How do you zoom in on a number line to find fractions between fractions?

map scale

Lesson 1-13 : Locating Negative Rational Numbers on the Number Line

How do you locate negative rational numbers on a number line?

opposite

Lesson 1-14 : Plotting Ordered Pairs of Rational Numbers in 4 Quadrants

How do you plot and name points in 4 quadrants?

ordered pair

coordinate grid

quadrant

origin

x-coordinate

y-coordinate

Lesson 1-15 : Progress Check (Day 1)

What are the key concepts in Unit 1?

Lesson 1-15 : Progress Check (Day 2)

What are the key concepts in Unit 1?

What are strategies for responding to an open response question?

Topic: Unit 2 Fraction Operations and Ratios
 Subject(s): math

Days: 24
 Grade(s):6th

Know:	Understand:	Do:
Associative property Commutative property Dividend Division of Fractions property Divisor Equivalent ratios Greatest common factor (GCF) Least common multiple (LCM) Prime number Quotient Rate Ratio Reciprocal Similar Tape diagram Unit rate Unit ratio	CC.2.1.6.D.1: Understand ratio concepts and use ratio reasoning to solve problems. (1) CC.2.1.6.E.1: Apply and extend previous understandings of multiplication and division to divide fractions by fractions. (2) CC.2.1.6.E.3: Develop and/or apply number theory concepts to find common factors and multiples. (4)	M.06.A-R.1.1.1: Use ratio language and notation to describe a ratio relationship between two quantities. (1) M06.A-R.1.1.2: Find the unit rate a/b associated with a ratio $a:b$ and use rate language in the context of a ratio relationship. (2) M06.A-R.1.1.3: Construct tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and/or plot the pairs of values on the coordinate plane. Use tables to compare ratios. (3) M06.A-R.1.1.4: Solve unit rate problems including those involving unit pricing and constant speed. (4) M06.A-N.1.1.1: Interpret and compute quotients of fractions (including mixed numbers), and solve word problems involving division of fractions by fractions. (6) M06.A-N.2.2.1: Find the greatest common factor of two numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. (8)

Unit 2 Essential Questions:

How do you find the greatest common factor and the least common multiple?

How do you multiply and divide fractions?

Key Learning:

Unit 2

***The Greatest Common Factor**

***The Least Common Multiple**

***Fraction Multiplication**

***Fraction Division**

*** Ratios and Rates**

Lesson 2-1: The Greatest Common Factor

How do you find the greatest common factor (GCF) of two or more numbers?

2-1 Key Vocabulary

greatest common factor

prime number

relatively prime

Lesson 2-2: The Least Common Multiple

How do you find the least common multiple (LCM) and use it to solve real-world problems?

2-2 Key Vocabulary

multiple

least common multiple

Lesson 2-3: Fraction Multiplication on a Number Line

How do you find fractions of fractions and model fraction multiplication using a number line?

2-3 Key Vocabulary

divisible

Lesson 2-4 : Fraction Multiplication with Models and Diagrams

How do you use an area model and a partial-products diagram to solve fraction and mixed-number multiplication problems?

2-4 Key Vocabulary

area model

partial-products diagram

Lesson 2-5: Comparing Strategies for Multiplying Fractions

How do you compare models and analyze strategies for fraction multiplication?

2-5 Key Vocabulary

Commutative Property of Multiplication

Associative Property of Multiplication

reciprocals

Lesson 2-6: Dividing Fractions with Common Denominators

How do you use different models to visualize how to divide by fractions, and divide fractions with common denominators?

2-6 Key Vocabulary

divisor

dividend

quotient

Lesson 2-7: Exploring Relationships in Fraction Division

How do you estimate answers for, match number models to, and solve problems using fraction division?

Lesson 2-8: Using Reciprocals to Divide Fractions

What are the patterns in rewriting fraction division problems as multiplication problems with the reciprocal of the divisor as one factor?

2-8 Key Vocabulary

Division of Fractions Property

Lesson 2-9: Introducing Ratios

How do you explore ratios and ratio notation?

2-9 Key Vocabulary

ratio

Lesson 2-10: Ratio Models: Tape Diagrams

How do you analyze, construct, and use tape diagrams to solve ratio problems?

2-10 Key Vocabulary

tape diagrams

Lesson 2-11: Equivalent Ratios

How do you use pictures to model and solve problems involving equivalent ratios?

2-11 Key Vocabulary

equivalent ratios

Lesson 2-12: Open Response (Day #1)

How do you make representations to compare ratios and find equivalent ratios? How do you use comparisons to write a ratio to meet given criteria?

Lesson 2-12: Open Response (Day #2)

How do you examine others' work in a class discussion and then revise your own work?

Lesson 2-13: Using Ratio/Rate Tables

How do you solve real-world rate and ratio problems using tables?

2-13 Key Vocabulary

rate

Lesson 2-14: Graphing Ratios

How do you find equivalent ratios and graph them on a coordinate grid?

Lesson 2-15: Progress Check (Day #1)

What are the key concepts in Unit 2?

Lesson 2-15: Progress Check (Day #2) Cumulative Assessment

Topic: Unit 4 Algebraic Expressions and Equations
 Subject(s): math

Days: 23
 Grade(s):6th

Know:	Understand:	Do:
Absolute value Algebraic expression Base Coefficient Constraints Define the variable Distributive property of + and x Equation Exponent Expression Inequality Infinite Magnitude Mean Absolut Deviation (M.A.D.) Nested parenthesis Open sentence Relation symbol Simplify Solution set Substitution Variable	CC.2.1.6.E.3: Develop and/or apply number theory concepts to find common factors and multiples. (4) CC.2.1.6.E.4: Apply and extend previous understandings of numbers to the system of rational numbers. (5) CC.2.2.6.B.1: Apply and extend previous understandings of arithmetic to algebraic expressions. (6) CC.2.2.6.B.2: Understand the process of solving a one-variable equation or inequality and apply to real-world and mathematical problems. (7)	M06.A-N.2.2.2: Apply the distributive property to express a sum of two whole numbers, 1 through 100, with a common factor as a multiple of a sum of two whole numbers with no common factor. (9) M06.A-N.3.1.1: Represent quantities in real world contexts using positive and negative numbers, explaining the meaning of 0 in each situation. (10) M.06.A-N.3.2.2: Interpret the absolute value of a rational number as its distance from 0 on a number line and as a magnitude for a positive or negative quantity in a real world situation. (14) M06.B-E.1.1.2: Write algebraic expressions from verbal descriptions. (17) M06.B-E.1.1.3: Identify parts of an expression using mathematical terms (e.g., sum, term, product, factor, quotient, coefficient, quantity). (18) M06.B-E.2.1.4: Write and inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem and/or represent solutions of such inequalities on number lines. (24)

Unit 3 Essential Question:

How do you make sense of problems and persevere in solving them while reasoning abstractly and quantitatively?

Key Learning:

Unit 3

***Decimal Numbers**

***Long Division with Whole Numbers**

***Operations with Decimals**

***Percent *Box Plots and IQR**

Lesson 3-1: Place Value and Expanded Form with Decimals

How do you identify fraction-decimal equivalencies? How do you read and write decimals in expanded notation?

3-1 Key Vocabulary

expanded form

name-collection box

Lesson 3-2: The Density of Rational Numbers

How do you use the expanded form for decimals to explore decimal place value?

Lesson 3-3: Reviewing Decimal Addition and Subtraction

How do you add and subtract using the U.S. traditional algorithms with decimals?

3-3 Key Vocabulary

place value

U.S. traditional algorithms for decimal addition/subtraction

Lesson 3-4: Reviewing Decimal Multiplication

What are strategies for decimal-multiplication?

3-4 Key Vocabulary

U.S. traditional algorithm for decimal multiplication

Lesson 3-5: U.S. Traditional Long Division with Whole Numbers

How do you use the U.S. traditional long-division algorithm to solve whole-number division problems?

3-5 Key Vocabulary

U.S. Traditional algorithm for long division

Lesson 3-6: Exploring Long Division with Decimals

How do you use the U.S. traditional long-division algorithm with decimals?

Lesson 3-7: Exploring Peruvian Flutes (Open Response Day #1)

How do you check answers while using pricing options to determine the best buy?

Lesson 3-7: Exploring Peruvian Flutes (Open Response Day #2)

How do you discuss possible solutions and revise your work?

Lesson 3-8: Introducing Percent

How do you estimate and represent percents using a 10-by-10 grid?

Key Vocabulary 3-8

percent

Lesson 3-9 : Finding Percents

How do you solve percent problems in a variety of contexts?

Lesson 3-10 : Percents as Ratios

How do you explore the connection between ratios and percents?

Key Vocabulary 3-1

ratio/rate table

Lesson 3-11: Exploring Percent Problem-Solving Strategies

What are the strategies and models for solving percent problems?

Lesson 3-12: Introducing Box Plots

How do you use a five-number summary to interpret a box plot?

Key Vocabulary 3-12

quartile

box plot

five-number summary

lower quartile (Q-1)

upper quartile (Q-3)

Lesson 3-13: Making Box Plots and Finding Interquartile Range

How do you make a box plot, compare data sets, and find interquartile range?

Key Vocabulary 3-13

interquartile range (IQR)

Lesson 3-14: Comparing Data Representations

How do you compare data representations with a focus on variability and measures of center?

Lesson 3-15 : Progress Check (Day #1) Unit 3 Assessment

What are the key concepts in Unit 3?

Lesson 3-15 : Progress Check (Day #2) Open Response Assessment

What are strategies for responding to an open response question?

Topic: Unit 3 Decimal Operations and Percent
 Subject(s): math

Days: 22
 Grade(s):6th

Know:	Understand:	Do:
Box plot/box-and-whisker plot Five number summary Interquartile range Lower quartile (Q1) Percent Quartile Ratio/rate table Upper quartile (Q3) U.S. traditional algorithm For decimal addition For decimal subtraction For decimal multiplication For decimal division	CC.2.1.6.D.1: Understand ratio concepts and use ratio reasoning to solve problems. (1) CC.2.1.6.E.2: Identify and choose appropriate processes to compute fluently with multi-digit numbers. (3) CC.2.4.6.B.1: Demonstrate an understanding of statistical variability by displaying, analyzing, and summarizing distributions. (10)	M06.A-R.1.1.3: Construct tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and/or plot the pairs of values on the coordinate plane. Use tables to compare ratios. (3) M06.A-R.1.1.5: Find a percent of a quantity as a rate per 100; solve problems involving finding the whole, given a part and the percentage. (5) M06.A-N.2.1.1: Solve problems involving operations with whole numbers, decimals (through thousandths), straight computation, or word problems. (7) M06.D-S.1.1.1: Display numerical data in plots on a number line, including line plots, histograms, and box-and-whisker plots. (33)

Unit 4 Essential Question:

How do you consider patterns, equations, properties, and inequalities as a means to introduce algebraic thinking?

Key Learning:

Unit 4

***Order of Operations**

***Patterns**

***Equations**

***Properties**

***Inequalities**

***Absolute Value**

Lesson 4-1: Parentheses, Exponents, and Calculators

How do you use parentheses and exponents on a calculator?

4-1 Key Vocabulary

1.) expression

2.) simplify

3.) base

4.)exponent

Lesson 4-2: Solving Problems with Order of Operations

How do you apply the order of operations to solve the Four-4s Problem?

4-2 Key Vocabulary

nested parentheses

Lesson 4-3: Expressions and Patterns

How do you write numerical expressions for special cases of a pattern and learn to generalize a pattern using an algebraic expression ?

4-3 Key Vocabulary

- 1.) variable
- 2.) algebraic expression
- 3.) define the variable
- 4.) substitution

Lesson 4-4: Representing Unknown Quantities with Algebraic Expressions

How do you write and evaluate algebraic expressions?

4-4 Key Vocabulary

- 1.) coefficient

Lesson 4-5: Exploring Equations

How do you write equations to represent patterns and determine the number of solutions for equations?

4-5 Key Vocabulary

- 1.) equation
- 2.) open sentence

Lesson 4-6: The Distributive Property and Equivalent Expressions

How do you explore the structure of the Distributive Property through area models and problem solving?

4-6 Key Vocabulary

- 1.) **Distributive Property of Multiplication over Addition**
- 2.) **Distributive Property of Multiplication over Subtraction**

Lesson 4-7: Applying Properties of Arithmetic

How do you generalize properties using variables and explore applications of the Distributive Property?

Lesson 4-8: Open Response

The Banquet Table (Day #1)

How do you analyze, build, and extend patterns and use patterns to solve problems?

Lesson 4-8: Open Response

The Banquet Table (Day #2)

How do you examine others' work in a discussion and then revise your work?

Lesson 4-9: Introduction to Inequalities

How do you use inequalities to represent real-world situations and match number sentences using $<$, $>$, \leq , \geq , $=$ to written descriptions?

4-9 Key Vocabulary

- 1.) **inequality**
- 2.) **relation symbol**

Lesson 4-10: Finding and Graphing Solution Sets of Inequalities

How do you find and graph solution sets for inequalities written with $<$, $>$, \leq , \geq , and $=$?

4-10 Key Vocabulary

- 1.) **solution set**
- 2.) **infinite**

Lesson 4-11: Inequalities to Represent Real-World Situations

How do you write and graph inequalities to represent real-world situations?

4-11 Key Vocabulary

- 1.) **constraints**

Lesson 4-12: Absolute Value as Distance

How do you explore absolute value as the distance from 0 on a number line?

4-12 Key Vocabulary

- 1.) **magnitude**
- 2.) **absolute value**

Lesson 4-13: Absolute Value

How do you use absolute value to compare magnitudes of numbers and to find distances between locations on number lines and coordinate grids?

Lesson 4-14: Mean Absolute Deviation

How do you calculate mean absolute deviation (m.a.d.) and use it to compare data sets?

4-14 Key Vocabulary

mean absolute deviation (m.a.d.)

Lesson 4-15 : Progress Check (Day #1)

What are the key concepts in Unit 4?

Lesson 4-15 : Progress Check (Day #2)

Cumulative Assessment

Topic: Unit 5 Area and Volume Explorations
 Subject(s): math

Days: 17
 Grade(s):6th

Know:	Understand:	Do:
Acute angle Apex Base Compose Congruent Cubic Units Decompose Depth Edge Endpoint Equilateral triangle Face Geometric solid Height Interior Isosceles triangle Line segment Net Obtuse angle Parallelogram Polygon Quadrilateral Right angle Scale drawing Scalene triangle Surface area Vertex Volume	CC.2.1.6.E.4: Apply and extend previous understandings of numbers to the system of rational numbers. (5) CC.2.3.6.A.1: Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume. (9)	M06.A-N.3.2.3: Solve real-world and mathematical problems by plotting 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. (15) M06.C-G.1.1.1: Determine the area of triangles and special quadrilaterals (i.e., square, rectangle, parallelogram, rhombus, and trapezoid). Formulas will be provided. (27) M06.C-G.1.1.2: Determine the area of irregular or compound polygons. (28) M06.C-G.1.1.3: Determine the volume of right rectangular prisms with fractional edge lengths. Formulas will be provided. (29) M06.C-G.1.1.4: Given coordinates for the vertices of a polygon in the plane, use the coordinates to find side lengths and area of the polygon. Formulas will be provided. (30) M06.C-G.1.1.5: Represent three-dimensional figures using nets made of rectangles and triangles. (31) M06.C-G.1.1.6: Determine the surface area of triangular and rectangular prisms (including cubes). Formulas will be provided. (32)

Unit Essential Question:

What is area and volume?

How do you graph polygons on coordinate grids; decompose parallelograms, triangles, and other polygons to find area; investigate the surface area and volume of 3-dimensional figures; and consider the relationship between linear, area and volume measurements?

Key learning for Unit 5

* area

*volume

*surface area

*nets

* polygons on a coordinate grid

Lesson 5-1:

How do you draw polygons on a coordinate grid and find the lengths of their sides?

Vocabulary:

Polygon, line segment, endpoint, vertex, face, interior

Lesson 5-2:

How do you develop the formula for finding the area of a parallelogram?

Vocabulary:

Parallelogram, quadrilateral, base, height

Lesson 5-3:

How do you use the formula for finding the area of a parallelogram to derive a formula for finding the area of a triangle?

Vocabulary:

Equilateral triangle, isosceles triangle, scalene triangle, right angle, obtuse angle, acute angle

Lesson 5-4:

How do you decompose complex polygons into smaller polygons and use these to find the area?

Vocabulary:

Scale drawing, decompose, compose

Lesson 5-5:

How do you identify and assemble geometric nets and compare geometric solids?

Vocabulary:

Net, geometric solid, edge, congruent, apex

Lesson 5-6:

How do you sketch and use nets to find the surface area of prisms and pyramids?

Vocabulary:

Surface area

Lesson 5-7:

How do you find surface area of a variety of 3-dimensional shapes in real-world contexts?

Lesson 5-8 (Day 1):

How do you order polygons bases on the areas of the polygons and explain their ordering process?

Lesson 5-8 (Day 2):

How can you explain the ordering process in terms of precision and clarity?

Lesson 5-9:

What are the strategies for finding the volume of rectangular prisms and how do you apply those strategies to solving real world problems?

Vocabulary:

Volume, cubic units

Lesson 5-10:

How do you compute volume of rectangular prisms with fractional edge lengths?

Lesson 5-11:

How to you use volume of rectangular prisms to find the approximate volume of a person?

Vocabulary:

Depth

Lesson 5-12:

What are the different rates of increase for area and volume?

Lesson 5-13:

Day 1: Unit 5 Test

Day 2: Unit 5 Open response

Topic: Unit 6 Equivalent Expressions and Solving Equations
 Subject(s): math

Days: 18
 Grade(s):6th

Know:	Understand:	Do:
Coefficient Constant Empty set (null set) Equivalent equation Inverse-operations strategy Like terms Simplest form Simplify Term Trial and error	<p>CC.2.1.6.E.4: Apply and extend previous understanding of numbers to the system of rational numbers. (5)</p> <p>CC.2.2.6.B.1: Apply and extend previous understandings of arithmetic to algebraic expressions. (6)</p> <p>CC.2.2.6.B.2: Understand the process of solving a one-variable equation or inequality and apply to real-world and mathematical problems. (7)</p>	<p>M06.A-N.3.1.2: Determine the opposite of a number and recognize that the opposite of the opposite of a number is the number itself. (11)</p> <p>M06.B-E.1.1.1: Write and evaluate numerical expressions involving whole-number exponents. (16)</p> <p>M06.B-E.1.1.5: Apply the properties of operations to generate equivalent expressions. (20)</p> <p>M06.B-E.2.1.1: Use substitution to determine whether a given number is a specified set makes and equation or inequality true. (21)</p> <p>M06.B-E.2.1.2: Write algebraic expressions to represent real-world or mathematical problems. (22)</p> <p>M06.B-E.2.1.3: Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases which p, q, and x are all non-negative rational numbers. (23)</p>

Unit 6 Essential Question:

How do you recognize equivalent expressions, combine like terms, use set notation to write solutions and solve equations?

Key learning for Unit 5

- * trial and error
- * inverse operations
- * solving equations
- * expressions

Lesson 6-1:

How do you find solutions with trial and error?

Vocabulary:

Trial and error

Lesson 6-2:

How do you write solutions to equations using set notation?

Vocabulary:

Empty set (null set)

Lesson 6-3:

How do you use bar models to solve equations?

Vocabulary:

Bar model

Lesson 6-4:

What is the pan-balance model for solving simple equations?

Lesson 6-5:

How do you use the pan balance model to solve numerical and algebraic equations?

Lesson 6-6:

How do you use the distributive property to combine like terms in algebraic expressions?

Vocabulary:

Simplify, term, constant, coefficient, like terms

Lesson 6-7:

How do you generate equivalent equations and use substitution to verify that equations are equivalent?

Vocabulary:

Simplest form, equivalent equation

Lesson 6-8 (day 1):

How do you write equations that model a real-life situation and use the equations to solve problems involving repeated reasoning?

Lesson 6-8 (day 2):

How do you examine others work and make corrections to your own work?

Lesson 6-9:

How do you use inverse operations to solve equations?

Vocabulary:

Inverse-operations strategy

Lesson 6-10:

How do you explore methods for solving equations?

Lesson 6-11:

How do you use and compare strategies for solving equations?

Lesson 6-12:

Day 1 – Unit 6 Test

Day 2 – Cumulative Test

Topic: Unit 7 Variables and Algebraic Relationships
 Subject(s): math

Days: 22
 Grade(s):6th

Know:	Understand:	Do:
<p>Dependent Variable Independent Variable</p>	<p>CC.2.1.6.D.1: Understand ratio concepts and use ratio reasoning to solve problems. (1)</p> <p>CC.2.1.6.E.4: Apply and extend previous understandings of numbers to the system of rational numbers. (5)</p> <p>CC.2.2.6.B.1: Apply and extend previous understandings of arithmetic to algebraic expressions. (6)</p> <p>CC.2.2.6.B.2: Understand the process of solving a one-variable equation or inequality and apply to real-world and mathematical problems. (7)</p> <p>CC.2.2.6.B.3: Represent and analyze quantitative relationships between dependent and independent variables. (8)</p>	<p>M06.A-R.1.1.3: Construct tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and/or plot the pairs of values on the coordinate plane. Use tables to compare ratios. (3)</p> <p>M06.A-R.1.1.4: Solve unit rate problems including those involving unit pricing and constant speed. (4)</p> <p>M06.A-N.3.1.3: Locate and plot integers and other rational numbers on a horizontal or vertical number line; locate and plot pairs of integers and other rational numbers on a coordinate plane. (12)</p> <p>M06.B-E.1.1.4: Evaluate expressions at specific values of their variables, including expressions that arise from formulas used in real-world problems. (19)</p> <p>M06.B-E.2.1.3: 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 non-negative rational numbers. (23)</p> <p>M06.B-E.2.1.4: Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real world or mathematical problem and/or represent solutions of such inequalities on number lines. (24)</p> <p>M06.B-E.3.1.1: Write an equation to express the relationship between the dependent and independent variables. (25)</p> <p>M06.B-E.3.1.2: Analyze the relationship between the dependent and independent variables using graphs and tables and/or relate these to an equation. (26)</p>

Unit 7 Essential Question:

How do you solve equations and what are variables?

Key learning for Unit 7

- * inequalities
- * equations
- * spreadsheets
- * unit rate comparisons
- * independent and dependent variables

Lesson 7-1:

How do you write and interpret inequalities and graph solutions?

Lesson 7-2:

How do you write and interpret inequalities and graph solution sets for real world situations?

Lesson 7-3:

How do you set up spreadsheets for situations with changing values?

Vocabulary:

Formula, spreadsheet program, cell, address box, display bar

Lesson 7-4:

How do you use spreadsheets to solve complicated problems?

Vocabulary:

Consecutive numbers

Lesson 7-5:

How do you find unit rates?

Lesson 7-6:

How do you convert among units of measure and compare rates?

Lesson 7-7 (Day 1):

How do you calculate water usage and write a plan to cut water usage?

Lesson 7-7 (Day 2):

How can you improve your work from day 1?

Lesson 7-8:

How do you represent a growing system by using numbers, symbols, words, and graphs?

Lesson 7-9:

How do you analyze relationships between independent and dependent variables in different real-world situations?

Vocabulary:

Dependent variable, independent variable

Lesson 7-10:

How do you use diagrams, formulas, and graphs to make predictions and draw conclusions?

Lesson 7-11:

How do you match graphs with real-world situations?

Topic: Unit 8 Applications: Ratios, Expressions, and Equations
 Subject(s): math

Days: 23
 Grade(s):6th

Know:	Understand:	Do:
Circumference Diameter Enlarge Fulcrum Population density Prediction line Ratio comparison Scale factor Scale Model Significant digits	CC.2.1.6.D.1: Understand ratio concepts and use ratio reasoning to solve problems. (1) CC.2.2.6.B.2: Understand the process of solving a one-variable equation or inequality and apply to real-world and mathematical problems. (7)	M06.A-R.1.1.1: Use ratio language and notation to describe a ratio relationship between two quantities. (1) M06.A-R.1.1.2: Find the unit rate a/b associated with a ratio $a:b$ and use rate language in the context of a ratio relationship. (2) M06.A-R.1.1.3: Construct tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and/or plot the pairs of values on the coordinate plane. Use table to compare ratios. (3) M06.A-R.1.1.4: Solve unit rate problems including those involving unit pricing and constant speed. (4) M06.B-E.2.1.2: Write an algebraic expression to represent real-world or mathematical problems. (22) M06.B-E.2.1.3: 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 non-negative rational numbers. (23)

Unit 8 Essential Question:

How do you apply your prior explorations of proportional reasoning, ratios and rates, and expressions and equations to solve problems and answer questions about real-world situations?

Key learning for Unit 8

- * applying ratios and proportions
- * population density
- * expressions and equations
- * representing quantitative relationships

Lesson 8-1: Increasing Garden Production

How do you use ratios to double the yield of a garden?

Lesson 8-2:

How do you interpret a scale drawing of a gallery wall to find the dimensions of artwork?

Vocabulary:

Scale factor

Lesson 8-3:

How do you enlarge the dimensions of a scale drawing on a coordinate grid?

Vocabulary:

Enlarge

Lesson 8-4:

How do you use proportional reasoning to compare the sizes of planets to Earth and create a scale model?

Vocabulary:

Ratio comparison, diameter, significant digits, scale model

Lesson 8-5:

How do you find population density of different areas?

Vocabulary:

Population density

Lesson 8-6:

How do you solve equations to balance mobiles and how do you make a mobile?

Vocabulary:

Mobile, fulcrum

Lesson 8-7 (Day 1):

How do you generate patterns and generalize with algebraic expressions?

Lesson 8-7 (Day 2):

How do you revise your work from Day 1?

Lesson 8-8:

How do you use one body measure to predict another?

Vocabulary:

Anthropometry, prediction line, circumference

Lesson 8-9:

How do you use a spreadsheet to plan a road trip with given cost and budget constraints?