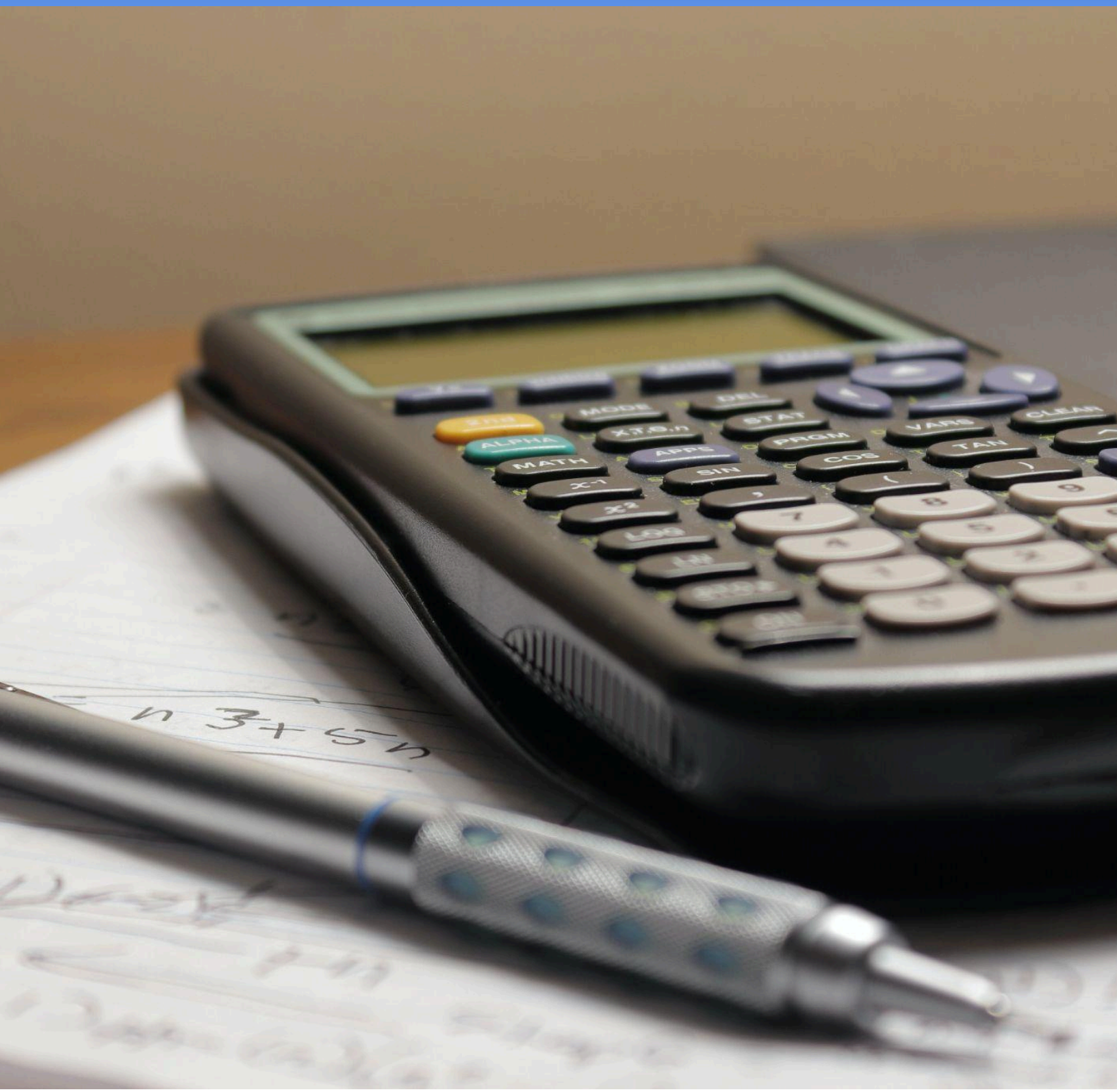
MATH 6

Course Overview Documents



A Program of the A+ Education Partnership
In partnership with the Alabama State Dept. of Education

MATH 6

Course Overview

1ST 9-WEEKS

Unit 1: Ratio Reasoning

Unit 2: Rates and Multi-Digit Division

Unit 3: Factors, Multiples, and Exponents

2ND 9-WEEKS

Unit 4: Decimal Computation

Unit 5: Rational Numbers

Unit 6: Graphing on the Coordinate Plane

Unit 7: Dividing with Fractions

Unit 8: Algebraic Expressions

Unit 8 may be started at the end of the 2nd 9-Weeks

3RD 9-WEEKS

Unit 8: Algebraic Expressions

Unit 9: One Variable Equations and Inequalities

Unit 10: Statistics

Unit 11: Perimeter & Area of Two-Dimensional Figures

Unit 11 may be started at the end of the 3rd 9-Weeks

4TH 9-WEEKS

Unit 11: Perimeter & Area of Two-Dimensional Figures

Unit 12: Surface Area and Volume of Three-Dimensional Figures

Extension Unit

STANDARDS CHECKLIST					
ALCOS	**1ST 9-WEEKS**	**2ND 9-WEEKS**	**3RD 9-WEEKS**	**4TH 9-WEEKS**	**UNITS**
1	X				1
2	X				2
3	X				1, 2
4		X			7
5	X				2
6	X	X			4
7	X				3
8	X				3
9		X			5
10		X			5
11		X			6
12		X			5
13		X			5
14	X				3
15	X	X			3, 8
16		X			8
17		X			8
18			X		9
19			X		9
20			X		9
21			X		9
22			X		10
23			X		10

STANDARDS CHECKLIST					
ALCOS	**1ST 9-WEEKS**	**2ND 9-WEEKS**	**3RD 9-WEEKS**	**4TH 9-WEEKS**	**UNITS**
24			X		10
25		X	X	X	6, 11
26			X	X	11
27				X	12
28		X		X	7, 12
29				X	12

MATH 6

Scope and Sequence – 1st 9 Weeks

UNIT 1: Ratio Reasoning	UNIT 2: Rates and Multi-Digit Division	UNIT 3: Factors, Multiples, and Exponents

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
WEEK 1	[1] Understand Ratios and Ratio Language	[1] Understand Ratios and Ratio Language	[2] Understand the Relationship between a Ratio and a Fraction	[3] Equivalent Ratios	[4] Equivalent Ratios using Tape Diagrams
WEEK 2	[4] Equivalent Ratios using Tape Diagrams	[5] Equivalent Ratio Tables	[5] Equivalent Ratio Tables	[6] Modeling Ratios with Double Number Lines	[6] Modeling Ratios with Double Number Lines
WEEK 3	[7] From Ratio Tables, Equations, and Double Number…	[7] From Ratio Tables, Equations, and Double Number…	[8] Collection of Formative Assessment		[1] Introducing Standard Algorithm of Division
WEEK 4	[1] Introducing Standard Algorithm of Division	[2] Standard Algorithm of Division with Larger Multi-Digit	[3] Introduction to Rates	[4] Cereal Math	[5] Unit Rate Exploration
WEEK 5	[6] The Difference between Unit Rates, Ratios….		[7] Unit Rate and Related Measurement Conversions	[7] Unit Rate and Related Measurement Conversions	[8] Rating the Trip
WEEK 6	[9] Converting Fractions to Decimals to Percents	[9] Converting Fractions to Decimals to Percents	[10] Percent of Quantity and Find the Quantity Given the Whole	[10] Percent of Quantity and Find the Quantity Given the Whole.	[11] Collection of Formative Assessment Tasks
WEEK 7	[11] Collection of Formative Assessment Tasks		[1] Exponents	[2] Reasoning with Factors and Multiples, Finding Prime….	[2] Reasoning with Factors and Multiples, Finding Prime….
WEEK 8	[3] Ladder Method- Find the GCF and LCM….	[3] Ladder Method- Find the GCF and LCM….	[3] Ladder Method- Find the GCF and LCM….	[3] Ladder Method- Find the GCF and LCM….	[4] Modeling the Distributive Property
WEEK 9	[4] Modeling the Distributive Property	[5] Order of Operations	[5] Order of Operations	[5] Order of Operations	

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Scope and Sequence – 2nd 9 Weeks

Unit 4: Decimal Computation	Unit 5: Rational Numbers	Unit 6: Graphing on the Coordinate Plane	Unit 7: Division with Fractions	Unit 8: Algebraic Expressions

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
WEEK 1	[1] Adding and Subtracting Decimals	[2] Multiplying Decimals	[2] Multiplying Decimals	[3] Dividing Decimals	[3] Dividing Decimals
WEEK 2	[4] Applying and Practicing multi-digit Decimals	[4] Applying and Practicing multi-digit Decimals		[1] Understanding Integers	[1] Understanding Integers
WEEK 3	[1] Understanding Integers	[2] Rational Numbers on a Number line	[2] Rational Numbers on a Number line	[2] Rational Numbers on a Number line	[3] The Opposite of a Number's Opposite
WEEK 4	[4] Absolute Value- Magnitude and Distance in Real…	[4] Absolute Value- Magnitude and Distance in Real…	[5] Rational Numbers in the Real World		[1] LTF: Ant and the Sugar
WEEK 5	[1] LTF: Ant and the Sugar	[2] Locations in the Coordinate Plane- Vocab. Acquisition….	[2] Locations in the Coordinate Plane- Vocab. Acquisition….	[3] LTF: Sketch My Graph	[3] LTF: Sketch My Graph
WEEK 6	[4] Distance between Points	[5] Real World Applications of Graphing on the Coordinate…	[5] Real World Applications of Graphing on the Coordinate…		[1] Introducing Fractions through Finding the Volume…
WEEK 7	[2] Division of a Fraction by a Fraction using Visual Models	[3] Division of a Fraction by a Fraction using Area Models	[3] Division of a Fraction by a Fraction using Area Models	[4] Division of Fractions Practice	[4] Division of Fractions Practice
WEEK 8	[5] Division of Fractions: Real World Applications	[5] Division of Fractions: Real World Applications		[1] Identify parts of an Expressions	[2] Identify and Translate Expressions
WEEK 9	[2] Identify and Translate Expressions	[3] Interpret and Evaluate Expressions	[3] Interpret and Evaluate Expressions	[4] Evaluate Expressions in Real World Problems	[4] Evaluate Expressions in Real World Problems

MATH 6

Scope and Sequence – 3rd 9 Weeks

Unit 8: Algebraic Expressions	Unit 9: One Variable Equations and Inequalities	Unit 10: Statistics	Unit 11: Perimeter and Area of 2D Figures

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
WEEK 1	(5) Understanding Equivalent Expressions	(6) Understanding & Modeling Equiv. Expression using Distrib.Prop	(6) Understanding & Modeling Equiv. Expression using Distrib.Prop	(7) Understanding Equivalent Expressions using Properties	
WEEK 2	(1) Intro to One Step Equations through Manipulatives	(2) One Step Equations	(2) One Step Equations	(3) Review Solving One Step Equations	(4) Finding Solutions to Make Equations True
WEEK 3	(5) Develop & Solve Equations for Real World Situations	(5) Develop & Solve Equations for Real World Situations		(6) From Equations to Inequalities & Intro to Ineq.	(7) Determine if Values are Solutions for Eq. or Inequalities
WEEK 4	(8) Writing & Graphing Inequalities in Real World Prob.	(8) Writing & Graphing Inequalities in Real World		(9) Understanding Independent & Dependent Variables	(9) Understanding Independent & Dependent Variables
WEEK 5	(9) Understanding Independent & Dependent		(1) What is a statistical question	(2) Developing a Statistical Project	(3) SOCS the Data
WEEK 6	(3) SOCS the Data	(4) Measures of Central Tendency and Variability	(4) Measures of Central Tendency and Variability	(4) Measures of Central Tendency and Variability	(4) Measures of Central Tendency and Variability
WEEK 7	(5) Is it Center or Is it Variability	(6) Stem-and-Leaf Plots	(7) Histograms	(7) Histograms	
WEEK 8	(8) Box and Whisker Plots	(8) Box and Whisker Plots	(9) Homeruns, Statistics, and Probability	(9) Homeruns, Statistics, and Probability	(10) Comparing Data Displays
WEEK 9	(10) Comparing Data Displays		(1) Discover Area Formulas of Quads using Composite Figure	(1) Discover Area Formulas of Quads using Composite Figure	(2) Area of Polygons through Composition and Decomposition

COURSE NAME

Scope and Sequence – 4th 9 Weeks

Unit 11: Perimeter and Area of Two-Dimensional Figures	Unit 12: Surface Area and Volume of Three-Dimensional Figures	Extension Unit

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
WEEK 1	(3) Approximating Areas of Irregular Shapes using Trapezoids	(4) Can you 'Hand-le' the Area	(4) Can you 'Hand-le' the Area	(5) Drawing Polygons on the Coordinate Plane.	(6) Perimeter and Area of Two-Dimensional Figures
WEEK 2	(7) The Biggest Area	(7) The Biggest Area	(8) Constructing Polygons on the Coordinate Plane	(9) Determining Area and Perim. of Polys on the Coordinate Plane	(10) Are the Units for Area Always Square
WEEK 3	(10) Are the Units for Area Always Square	(11) There's a Hole in my Bucket, Dear Liza, Dear Liza	(11) There's a Hole in my Bucket, Dear Liza, Dear Liza	(12) Area Under the Curve	(12) Area Under the Curve
WEEK 4		(1) Volume with Whole Numbers, Decimals, & Fractional Length	(1) Volume with Whole Numbers, Decimals, & Fractional Length	(1) Volume with Whole Numbers, Decimals, & Fractional Length	(1) Volume with Whole Numbers, Decimals, & Fractional Length
WEEK 5	(1) Volume with Whole Numbers, Decimals, & Fractional Length	(2) Box it Up	(2) Box it Up	(3) Nets for a Cube	(4) Represent 3D Figures Using Nets
WEEK 6	(4) Represent 3D Figures Using Nets	(5) Using Nets to Calculate Surface Area		(6) Surface Area in the Real World	(7) Surface Area of Prisms and Pyramids
WEEK 7	(7) Surface Area of Prisms and Pyramids	(8) Surface Area and Volume	(9) Surface Area and Volume in the Real World	(9) Surface Area and Volume in the Real World	
WEEK 8	(1) Best Payment Plan	(2) Alien Invasion	(2) Alien Invasion	(3) Road Trip	(3) Road Trip
WEEK 9	(4) Fire Trucks, Sky Divers, and Softball- An Intro...	(4) Fire Trucks, Sky Divers, and Softball- An Intro...	(5) The Roundtrip Drive	(5) The Roundtrip Drive	

MATH 6

Unit Overview

UNIT 1: Ratio Reasoning	RECOMMENDED TIME FRAME: 14 days

UNIT OVERVIEW

Proportional reasoning is a process that requires instruction and practice. It does not develop over time on its own. Grade 6 is the first of several years in which students develop this multiplicative thinking. Experience with proportional and nonproportional relationships, comparing and predicting ratios, and relating ratios to previously learned unit fractions will facilitate the development of proportional reasoning. Although algorithms provide efficient means for finding solutions, *the* ***cross-product algorithm*** commonly used for solving proportions ***will not*** aid in the development of proportional reasoning. Delaying the introduction of rules and algorithms will encourage thinking about multiplicative situations instead of indiscriminately applying rules. (6 Flipbook Final CCSS 2014) In this unit, students will learn about the relationship between two quantities. In addition, they will see how proportional relationships express how quantities change in relation to each other.

STANDARDS

1. Use appropriate notations [*a/b, a to b, a:b*] to represent a proportional relationship between quantities and use ratio language to describe the relationship between quantities.
3. Use ratio ~~and rate~~ reasoning to solve mathematical and real-world problems (including but not limited to ~~percent, measurement conversion, and~~ equivalent ratios) using a variety of models, including tables of equivalent ratios, tape diagrams, double number lines, and equations.

RESOURCES

Unit 1 Student Progress Monitoring Document

Unit 1 Proficiency Scale

Unit 1 Sample Summative Assessment

Unit 1 Sample Summative Assessment Key

MATH 6

Unit Overview

UNIT 2: Rates and Multi-Digit Division	RECOMMENDED TIME FRAME: 18 days

UNIT OVERVIEW

In this unit, students will learn how to fluently divide multi-digit whole numbers using the standard algorithm to solve real-world and mathematical problems. Students will apply multiplication and division by viewing equivalent rates as deriving from and extending pairs of rows (or columns) in the multiplication table and by analyzing simple drawings that indicate the relative size of quantities. Students will use reasoning about multiplication and division to solve rate problems about quantities. Division is the main focus of 6th grade. It will later extend from whole numbers to decimals to fractions. This unit shows students the relevance using a real-world application of division and multiplication through rates, percent, and measurement conversion.

STANDARDS

2. Use unit rates to represent and describe ratio relationships.
3. Use ~~ratio and~~ rate reasoning to solve mathematical and real-world problems (including but not limited to percent, measurement conversion, and equivalent ratios) using a variety of models, including tables of equivalent ratios, tape diagrams, double number lines, and equations.
5. Fluently divide multi-digit whole numbers using a standard algorithm to solve real-world and mathematical problems.

RESOURCES

Unit 2 Student Progress Monitoring Document

Unit 2 Proficiency Scale

Unit 2 Sample Summative Assessment

Unit 2 Sample Summative Assessment Key

MATH 6

Unit Overview

UNIT 3: Factors, Multiples, and Exponents	RECOMMENDED TIME FRAME: 13 days

UNIT OVERVIEW

In this unit, students will focus on finding the greatest common factor and least common multiple of two or more whole numbers. Students will be introduced to exponents and exponential form. Students will apply exponential form through using factors and multiples to determine prime factorization. Students will also learn how to use the distributive property to express the sum of two whole numbers with a common factor as a multiple of a sum of two whole numbers with no common factor. Students will then use exponents when solving order of operation with whole numbers. Students will see the relationship between parentheses or brackets in a numerical expression and using the distributive property. This unit will build upon skills that were learned in 4^{th} grade. It was here that students explored factor pairs for a whole number in the range 1-100 as well as whether a number is prime or composite. To be successful with this unit, students need to have a solid foundation of multiplicative reasoning. Students should have a fluent grasp of the basic multiplication facts as well as have a basic understanding of the divisibility rules (2, 3, 5, 6, 9, and 10).

STANDARDS

7. Use the distributive property to express the sum of two whole numbers with a common factor as a multiple of a sum of two whole numbers with no common factor.
8. Find the greatest common factor (GCF) and least common multiple (LCM) of two or more whole numbers.
   a. Use factors and multiples to determine prime factorization.
14. Write, evaluate, and compare expressions involving whole-number exponents.

RESOURCES

Unit 3 Student Progress Monitoring Document

Unit 3 Proficiency Scale

Unit 3 Sample Summative Assessment

Unit 3 Sample Summative Assessment Key

MATH 6

Unit Overview

UNIT 4: Decimal Computation	RECOMMENDED TIME FRAME: 8 days

UNIT OVERVIEW

Students will focus on fluently adding, subtracting, multiplying, and dividing multi-digit decimals using the standard algorithm for each operation. This unit will build upon skills that were learned in 5th grade. Students apply their understandings of models for decimals to add and subtract decimals to hundredths and use the relationship between decimals and fractions, as well as the relationship between finite decimals and whole numbers to understand and explain why the procedures for multiplying and dividing finite decimals make sense. To be successful with this unit, students need to have a solid foundation of multiplicative reasoning and an in-depth understanding of place value.

STANDARDS

6. Add, subtract, multiply, and divide decimals using a standard algorithm.

RESOURCES

Unit 4 Student Progress Monitoring Document

Unit 4 Proficiency Scale

Unit 4 Sample Summative Assessment

Unit 4 Sample Summative Assessment Key

MATH 6

Unit Overview

UNIT 5: Rational Numbers	RECOMMENDED TIME FRAME: 11 days

UNIT OVERVIEW

In this unit, students will focus on understanding positive and negative integers as well as rational numbers as points on the number line. Students will also focus on ordering numbers and finding the absolute value of a rational number. Students use rational numbers (fractions, decimals, and integers) to represent real-world contexts and understand the meaning of 0 in each situation. For example, 25 feet below sea level can be represented as -25; 25 feet above sea level can be represented as +25. In this scenario, zero would represent sea level. Instructional Strategies: The purpose of this cluster is to begin the study of the existence of negative numbers, their relationship to positive numbers, and the meaning and uses of absolute value. Starting with examples of having/owing and above/below zero sets the stage for understanding that there is a mathematical way to describe opposites. Students should already be familiar with the counting numbers (positive whole numbers and zero), as well as with fractions and decimals (also positive). They are now ready to understand that all numbers have an opposite. These special numbers can be shown on vertical or horizontal number lines, which then can be used to solve simple problems. Demonstration of understanding of positives and negatives involves translating words, numbers, and models: given the words "7 degrees below zero," showing it on a thermometer and writing -7; given -4 on a number line, writing a real-life example, and writing -4. Number lines also give the opportunity to model absolute value as the distance from zero. Simple comparisons can be made and order determined. Order can also be established and written mathematically: -3° C > -5° C or -5° C < -3° C. Finally, absolute values should be used to relate contextual problems to their meanings and solutions.
** Actual computation with negative and positive integers is handled in Grade 7.

STANDARDS

9. Use signed numbers to describe quantities that have opposite directions or values and to represent quantities in real-world contexts.
10. Locate integers and other rational numbers on a horizontal or vertical line diagram.
    a. Define opposites as numbers located on opposite sides of 0 and the same distance from 0 on a number line.
    b. Use rational numbers in real-world and mathematical situations, explaining the meaning of 0 in each situation.
12. Explain the meaning of absolute value and determine the absolute value of rational numbers in real-world contexts.
13. Compare and order rational numbers and absolute value of rational numbers with and without a number line in order to solve real-world and mathematical problems.

RESOURCES
Unit 5 Student Progress Monitoring Document
Unit 5 Proficiency Scale
Unit 5 Sample Summative Assessment
Unit 5 Sample Summative Assessment Key

UNIT 6: Graphing on the Coordinate Plane	RECOMMENDED TIME FRAME: 10 days

UNIT OVERVIEW

In this unit, students will use the coordinate plane to help solve real-world problems. Students use number lines to model negative numbers, prove the distance between opposites, and understand the meaning of absolute value. When students use the prior concepts listed in the last sentence, they should easily transfer to the creation and usage of four-quadrant coordinate grids. The students will plot in all four quadrants of a coordinate grid. The students will understand that differences between numbers can be found by counting the distance between numbers on the grid.

STANDARDS

11. Find the position of pairs of integers and other rational numbers on the coordinate plane.
    a. Identify quadrant locations of ordered pairs on the coordinate plane based on the signs of the *x* and *y* coordinates.
    b. Identify (*a,b*) and (*a,-b*) as reflections across the *x*-axis.
    c. Identify (*a,b*) and (*-a,b*) as reflections across the *y*-axis.
    d. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane, including finding distances between points with the same first or second coordinate.

RESOURCES

Unit 6 Student Progress Monitoring Document

Unit 6 Proficiency Scale

Unit 6 Sample Summative Assessment

Unit 6 Sample Summative Assessment Key

MATH 6

Unit Overview

UNIT 7: Dividing Fractions	RECOMMENDED TIME FRAME: 9 days

UNIT OVERVIEW

In Grade 5, students gained a conceptual understanding of dividing a whole number by a unit fraction as well as dividing a unit fraction by a whole number. In Grade 6, students will be introduced to dividing a whole number by a fraction as well as dividing a fraction by a fraction. Many opportunities with manipulatives, area models, and number lines should be provided before introducing the rule: "invert and multiply". It is best if the students "see" this pattern through their own discovery. One of the key concepts that should be reinforced in this unit is when looking at a problem such as $\frac{3}{4} \div \frac{1}{2}$, the students should think of this as "How many groups of $\frac{1}{2}$ fit into $\frac{3}{4}$?"

STANDARDS

4. Interpret and compute quotients of fractions using visual models and equations to represent problems.
   a. Use quotients of fractions to analyze and solve problems.

RESOURCES

Unit 7 Student Progress Monitoring Document

Unit 7 Proficiency Scale

Unit 7 Sample Summative Assessment

Unit 7 Sample Summative Assessment Key

UNIT 8: Algebraic Expressions	RECOMMENDED TIME FRAME: 12 days

UNIT OVERVIEW

Students write expressions from verbal descriptions using letters and numbers. Students understand order is important in writing subtraction and division problems. Students understand that the expression "5 times any number n" could be represented with 5n and that a number and letter written together means to multiply. Students use appropriate mathematical language to write verbal expressions from algebraic expressions. Students can describe expressions such as 3 (2 + 6) as the product of two factors: 3 and (2 + 6). The quantity (2 + 6) is viewed as one factor consisting of two terms. Students evaluate algebraic expressions, using order of operations as needed. Given an expression such as 3x + 2y, find the value of the expression when x is equal to 4 and y is equal to 2.4. This problem requires students to understand that multiplication is understood when numbers and variables are written together and to use the order of operations to evaluate. Students demonstrate an understanding of like terms as quantities being added or subtracted with the same variables and exponents. For example, 3x + 4x are like terms and can be combined as 7x; however, $3x + 4x^2$ are not. This concept can be illustrated by substituting in a value for x. For example, 9x – 3x = 6x not 6.

STANDARDS

15. Write, read, and evaluate expressions in which letters represent numbers in real-world contexts.
    a. Interpret a variable as an unknown value for any number in a specified set, depending on the context.
    b. Write expressions to represent verbal statements and real-world scenarios.
    c. Identify parts of an expression using mathematical terms such as sum, term, product, factor, quotient, and coefficient.
16. Generate equivalent algebraic expressions using the properties of operations, including inverse, identity, commutative, associative, and distributive.
17. Determine whether two expressions are equivalent and justify the reasoning.

RESOURCES

Unit 8 Student Progress Monitoring Document

Unit 8 Proficiency Scale

Unit 8 Sample Summative Assessment

Unit 8 Sample Summative Assessment Key

UNIT 9: One Variable Equations and Inequalities	RECOMMENDED TIME FRAME: 17 days

UNIT OVERVIEW

In this unit, students will focus on one-variable equations and inequalities. The students will use equations and inequalities to help solve real-world problems. In order for students to understand equations, the skill of solving an equation must be developed conceptually before it is developed procedurally. This means that students should be thinking about what numbers could possibly be a solution to the equation before solving the equation. Provide multiple situations in which students must determine if a single value is required as a solution, or if the situation allows for multiple solutions. This creates the need for both types of equations (a single solution for the situation) and inequalities (multiple solutions for the situation). **Solutions to equations should not require using the rules for operations with negative numbers since the conceptual understanding of negatives and positives is being introduced in Grade 6.** When working with inequalities, provide situations in which the solution is not limited to the set of positive whole numbers but includes rational numbers. The process of translating between mathematical phrases and symbolic notation will also assist students in the writing of equations/inequalities for a situation. This process should go both ways. Students should be able to write a mathematical phrase for an equation. Additionally, the writing of equations from a situation or story does not come naturally for many students. The last concept and standard taught in this unit is the need to understand the relationship between two variables. This begins with the distinction between dependent and independent variables. The independent variable is the variable that can be changed while the dependent variable is the variable that is affected by the change in the independent variable. Students recognize that the independent variable is graphed on the x-axis and the dependent variable is graphed on the y-axis.

STANDARDS

18. Determine whether a value is a solution to an equation or inequality by using substitution to conclude whether a given value makes the equation or inequality true.
19. Write and solve an equation in the form of $x+p=q$ or $px=q$ for cases in which p, q, and x are all non-negative rational numbers to solve real-world and mathematical problems.
    a. Interpret the solution of an equation in the context of the problem.
20. Write and solve inequalities in the form of $x>c$, $x<c$, $x\geq c$, or $x \leq c$ to represent a constraint or condition in a real-world or mathematical problem.
    a. Interpret the solution of an inequality in the context of a problem.
    b. Represent the solutions of inequalities on a number line and explain that the solution set may contain infinitely many solutions.
21. Identify, represent, and analyze two quantities that change in relationship to one another in real-world or mathematical situations.
    a. Use tables, graphs, and equations to represent the relationship between independent and dependent variables.

RESOURCES

Unit 9 Student Progress Monitoring Document

Unit 9 Proficiency Scale

Unit 9 Sample Summative Assessment

Unit 9 Sample Summative Assessment Key

MATH 6

Unit Overview

UNIT 10: Statistics	RECOMMENDED TIME FRAME: 20 days

UNIT OVERVIEW

Grade 6 is the introduction to the formal study of statistics through the complete statistical process of formulating questions, collecting data, analyzing data, and making inferences from data for students. Students need multiple opportunities to look at data to determine and word statistical questions. Data should be analyzed using a number of graphical techniques including organized lists, box-plots, bar graphs, histograms, and stem-and-leaf plots. This will help students begin to understand that responses to a statistical question will vary, and that this variability is described in terms of spread and overall shape.

Students will begin to relate their informal knowledge of mean, mode and median to understand that data can be described by single values. They begin doing this by describing the data in the context of situations. The single value for each of the measures of center (mean, median, or mode) and measures of spread (range or interquartile range) is used to summarize the data. The important purpose of the measure of center and variability is not the value itself, but the interpretation it provides. The important purpose of the number is not the value itself, but the interpretation it provides for the variation of the data. Students will organize data on dot plots, histograms, and box plots in order to identify the characteristics of a data set and the "story" it might "tell." Students also recognize that a measure of variability (range or interquartile range) is useful for reviewing and analyzing data sets, as well as for describing attributes of data sets such as clusters, peaks, gaps, and symmetry, among others. Importantly, students are not formally required to define outliers based on the interquartile range and boxplots in grade 6 by the ALCOS. A formal definition and plotting of outliers starts in grade 9, Geometry with Data Analysis" (pg. 48). Using words such as extreme value or unusual value is sufficient for students to describe data that may be formally outliers.

While ACAP is neutral for this domain as far as calculators are concerned, teachers are encouraged to allow students to use a calculator for the lessons and assessment. They will have a difficult time completing the tasks and assessment in a timely manner if they are not allowed to use a calculator.

STANDARDS

22. Write examples and non-examples of statistical questions, explaining that a statistical question anticipates variability in the data related to the question.
23. Calculate, interpret, and compare measures of center (mean, median, mode) and variability (range and interquartile range) in real-world data sets.
    a. Determine which measure of center best represents a real-world data set.
    b. Interpret the measures of center and variability in the context of a problem.
24. Represent numerical data graphically, using dot plots, line plots, histograms, stem and leaf plots, and box plots.
    a. Analyze the graphical representation of data by describing the center, spread, shape (including approximately symmetric or skewed), and unusual features (including gaps, peaks, clusters, and extreme values).
    b. Use graphical representations of real-world data to describe the context from which they were collected.

RESOURCES

Unit 10 Student Progress Monitoring Document

Unit 10 Proficiency Scale

Unit 10 Sample Summative Assessment

Unit 10 Sample Summative Assessment Key

UNIT 11: Perimeter and Area of Two-Dimensional Figures	RECOMMENDED TIME FRAME: 19 days

UNIT OVERVIEW

Students in Grade 6 build on their work with area in elementary school by reasoning about relationships among shapes to determine area, surface area, and volume. An understanding of how to find the area and volume of a figure is developed in 4th and 5th grade. This should be built upon in 6th grade to facilitate student's discovery of area formulas of polygons by composing and decomposing figures. Students should know the formulas, but "knowing the formula" does not mean memorization of the formula. To "know" means to understand why the formula works and how the formula relates to the measure (area or volume) and the figure. It is very important for students to continue to physically manipulate materials and make connections to the symbolic and more abstract aspects of geometry.

STANDARDS

25. Graph polygons in the coordinate plane given coordinates of the vertices to solve real-world and mathematical problems.
    a. Determine missing vertices of a rectangle with the same x-coordinate or the same y-coordinate when graphed in the coordinate plane.
    b. Use coordinates to find the length of a side between points having the same x-coordinate or the same y-coordinate.
    c. Calculate perimeter and area of a polygon graphed in the coordinate plane (limiting to polygons in which consecutive vertices have the same x-coordinate or the same y-coordinate).
26. Calculate the area of triangles, special quadrilaterals, and other polygons by composing and decomposing them into known shapes.
    a. Apply the techniques of composing and decomposing polygons to find area in the context of solving real-world and mathematical problems.

RESOURCES

Unit 11 Student Progress Monitoring Document

Unit 11 Proficiency Scale

Unit 11 Sample Summative Assessment

Unit 11 Sample Summative Assessment Key

MATH 6

Unit Overview

UNIT 12: Surface Area and Volume of Three-Dimensional Figures	RECOMMENDED TIME FRAME: 19 days

UNIT OVERVIEW

Students will focus on solving real-world and mathematical problems that focus on surface area and volume of three-dimensional figures. Students understand the relationship between a net and finding the surface area of three-dimensional figures. A net is a two-dimensional representation of a three-dimensional figure. Students represent three-dimensional figures whose nets are composed of rectangles and triangles. Students recognize that parallel lines on a net are congruent. Using the dimensions of the individual faces, students calculate the area of each rectangle and/or triangle and add these sums together to find the surface area of the figure. It's very important for students to physically manipulate materials and make connections to the symbolic and more abstract aspects of geometry.

Students also describe the types of faces needed to create a three-dimensional figure. Students make and test conjectures by determining what is needed to create a specific three-dimensional figure.

STANDARDS

27. Determine the surface area of three-dimensional figures by representing them with nets composed of rectangles and triangles to solve real-world and mathematical problems.
28. Apply previous understanding of volume of right rectangular prisms to those with fractional edge lengths to solve real-world and mathematical problems.
    a. Use models (cubes or drawings) and the volume formulas (V = lwh and V = Bh) to find and compare volumes of right rectangular prisms.

RESOURCES

Unit 12 Student Progress Monitoring Document

Unit 12 Proficiency Scale

Unit 12 Sample Summative Assessment

Unit 12 Sample Summative Assessment Key