



Sixth Grade Mathematics

JUNE 2009

1st Trimester

Number Sense

STUDENTS COMPARE AND ORDER POSITIVE AND NEGATIVE FRACTIONS, DECIMALS, AND MIXED NUMBERS. STUDENTS SOLVE PROBLEMS INVOLVING FRACTIONS, RATIOS, PROPORTIONS, AND PERCENTAGES.

- Compare and order positive and negative fractions, decimals, and mixed numbers and place them on a number line.

Rubric

FAR BELOW/BELOW BASIC	BASIC	PROFICIENT	ADVANCED
Unable to order and compare simple fractions and decimals.	Inconsistently orders and compares simple fractions and decimals.	Compares and order positive and negative fractions, decimals, and mixed numbers and places them on a number line.	Understands and explains equivalencies of fractions, decimals, and mixed numbers.

STUDENTS CALCULATE AND SOLVE PROBLEMS INVOLVING ADDITION, SUBTRACTION, MULTIPLICATION, AND DIVISION.

- Solve problems involving addition, subtraction, multiplication and division of positive fractions and explain why a particular operation was used for a given situation.
- Understand the least common multiple and the greatest common divisor of whole numbers; use them to solve problems with fractions.
- Solve addition, subtraction, multiplication, and division problems, including those arising in concrete situations that use positive and negative integers and combinations of these operations.

Rubric

FAR BELOW/BELOW BASIC	BASIC	PROFICIENT	ADVANCED
Unable to solve problems involving addition, subtraction, multiplication, and division of positive fractions.	Inconsistently solves problems involving addition, subtraction, multiplication, and division of positive fractions.	Solves problems involving addition, subtraction, multiplication, and division of positive fractions and explains why a particular operation was used for a given situation.	Explains the meaning of multiplication and division of positive fractions and performs the calculations.
No understanding of LCM and great GCD.	Inconsistently uses LCM and GCD to solve problems.	Understand the least common multiple and the greatest common divisor of whole numbers: Use them to solve problems with fractions.	Explain and demonstrate understanding LCM and GCD in problem solving.
Unable to solve addition, subtraction, multiplication, and division problems with positive and negative integers and combinations of these operations.	Inconsistently solves addition, subtraction, multiplication, and division problems with positive and negative integers and combinations of these operations.	Solves addition, subtraction, multiplication and division problems including those arising in concrete situations that use positive and negative integers and combinations of these operations.	Adds, subtracts, multiplies, and divides rational numbers (integers, fractions, and terminating decimals) and takes positive rational numbers to whole number powers.

Algebra and Functions

STUDENTS WRITE VERBAL EXPRESSIONS AND SENTENCES AS ALGEBRAIC EXPRESSIONS AND EQUATIONS; THEY EVALUATE ALGEBRAIC EXPRESSIONS.

- Write and solve one-step linear equations in one variable.
- Write and evaluate an algebraic expression for a given situation using up to three variables.
- Apply algebraic order of operations and the commutative, associative, and distributive properties to evaluate expression.
- Solve problems manually by understanding the correct order of operations by using a scientific calculator

Rubric

FAR BELOW/BELOW BASIC	BASIC	PROFICIENT	ADVANCED
Unable to write or solve simple algebraic equations.	Writes and solves simple algebraic equations with one variable by substituting given value (e.g. $6y-2=10$ $y=2$)	Understands and solves one-step linear equations with one variable (e.g. $6y-2=10$ What is y ?)	Can solve multi-variable equations and inequalities.
Unable to write and evaluates algebraic expressions using up to three variables	Inconsistently writes and evaluates algebraic expressions using up to three variables	Consistently writes and evaluates an algebraic expressions for a given situation using up to three variables	Able to evaluate expressions with three or more variables and multiple operations.
No understanding of commutative, associative, and distributive properties.	Limited understanding of commutative, associative, and distributive properties.	Apply algebraic order of operations and the commutative, associative, distributive properties to evaluate expressions.	Apply order of operations and various properties to problem solving.
No understanding of algebraic order of operations.	Limited understanding of algebraic order of operations.	Solve problems manually by understanding the correct order of operations or by using a scientific calculator.	Explain understanding of order of operations.

2nd Trimester

Number Sense

STUDENTS COMPARE AND ORDER POSITIVE AND NEGATIVE FRACTIONS, DECIMALS, AND MIXED NUMBERS. STUDENTS SOLVE PROBLEMS INVOLVING FRACTIONS, RATIOS, PROPORTIONS, AND PERCENTAGES.

- Interpret and use ratios in different contexts (e.g. batting averages, miles per hour) to show the relative sizes of two quantities, using appropriate notations. (a/b , a to b , $a:b$)
- Use proportions to solve problems (e.g., determine the value of N if $4/7 = N/21$, find the length of a side of a polygon similar to a known polygon). Understand the multiplication of both sides of an equation as a multiplicative inverse.
- Calculate given percentages of quantities and solve problems involving discounts at sales, interest earned and tips.

Rubric

FAR BELOW/BELOW BASIC	BASIC	PROFICIENT	ADVANCED
Does not understand ratios	Demonstrates an inconsistent understanding and use of ratios in context	Interprets and uses ratios in different contexts (a/b , a to b , $a:b$)	Interprets and knows when to use ratios in real life situations
Does not understand proportion	Demonstrates an inconsistent use of proportions to solve problems	Uses proportions to solve problems (e.g., determine the value of N if $4/7 = N/21$, find the length of a side of a polygon similar to a known polygon). Understands the multiplication of both sides of an equation as a multiplicative inverse	Creates problems involving proportion
Unable to calculate percentages	Demonstrates inconsistency in calculations of percentages with tips, sales, tax, and interest	Calculates percentages with tips, sales, tax, and interest	Applies the concept of percentages to problem solving situations

Algebra and Functions

STUDENTS ANALYZE AND USE TABLES, GRAPHS, AND RULES TO SOLVE PROBLEMS INVOLVING RATES AND PROPORTIONS.

- Demonstrate an understanding that rate is a measure of one quantity per unit value of another quantity.
- Solve problems involving rates, average speed, distance, and time.

Rubric

FAR BELOW/BELOW BASIC	BASIC	PROFICIENT	ADVANCED
No understanding of the measurement of rate.	Limited understanding of measurement of rate.	Demonstrates an understanding that rate is a measure of one quantity per unit value of another quantity.	Solves multi-step problems involving rate, average speed, distance, and time.
No understanding of rate, average speed, distance, or time.	Limited understanding of rate, average speed, distance, and time.	Solve problems involving rates, average speed, distance, and time.	Solves multi-step problems involving rate, average speed, distance, and time.

Measurement and Geometry

STUDENTS IDENTIFY AND DESCRIBE THE PROPERTIES OF TWO-DIMENSIONAL FIGURES.

- Identify angles as vertical, adjacent, complementary, or supplementary and provide descriptions of these terms.
- Use the properties of complementary and supplementary angles and the sum of the angles of a triangle to solve problems involving an unknown angle.
- Draw quadrilaterals and triangles from given information about them.

Rubric

FAR BELOW/BELOW BASIC	BASIC	PROFICIENT	ADVANCED
Does not identify angles as vertical, adjacent, complementary, or supplementary or provide descriptions of these terms	Inconsistently identifies angles as vertical, adjacent, complementary, or supplementary and inconsistently provides descriptions of these terms	Identifies angles as vertical, adjacent, complementary, or supplementary and provides descriptions of these terms	Creates own problems to identify angles as vertical, adjacent, complementary, or supplementary and provides descriptions of these terms

Does not identify, describe and use properties of angles to solve problems including those with unknown angles	Inconsistently identifies, describes and uses properties of angles to solve problems including those with unknown angles	Uses the properties of complementary and supplementary angles and the sum of the angles of a triangle to solve problems involving and unknown angle	Creates own problems with identifying, describing and using properties of angles to solve problems including those with unknown angles
Does not identify, describe and use properties of quadrilaterals and triangles to solve problems	Inconsistently identifies, describes and uses properties of quadrilaterals and triangles to solve problems	Uses the properties of quadrilaterals and triangles to solve problems	Creates own problems with identifying, describing and using properties of quadrilaterals and triangles to solve problems

Statistics, Data Analysis and Probability

STUDENTS COMPUTE AND ANALYZE STATISTICAL MEASUREMENTS FOR DATA SETS.

- Compute the range, mean, median, and mode of data sets.
- Know why a specific measure of central tendency (mean, median, mode) provides the most useful information in a given context.

Rubric

FAR BELOW/BELOW BASIC	BASIC	PROFICIENT	ADVANCED
Unable to compute range, mean, median, and mode of data sets.	Inconsistently computes range, mean, median and mode of data sets.	Computes the range, mean, median and mode of data sets.	Interprets the results of measures of central tendency.
Unable to describe why specific measures of central tendency are useful in given contexts.	Has limited understanding of why a specific measure of central tendency (mean, median, mode) provides the most useful information in a given context.	Know why a specific measure of central tendency (mean, median, mode) provides the most useful information in a given context.	Explain why a specific measure of central tendency (mean, median, mode) provides the most useful information in a given context.

Statistics, Data Analysis and Probability

STUDENTS USE DATA SAMPLES OF A POPULATION AND DESCRIBE THE CHARACTERISTICS AND LIMITATIONS OF THE SAMPLES.

- Identify different ways of selecting a sample and which method makes a sample more representative for a population.

Rubric

FAR BELOW/BELOW BASIC	BASIC	PROFICIENT	ADVANCED
No understanding of sampling.	Limited understanding of sample selection to represent a population.	Identify different ways of selecting a sample and which method makes a sample more representative for a population.	Identifies and uses the different ways of selecting a sample and which method makes a sample more representative for a population.

STUDENTS DETERMINE THEORETICAL AND EXPERIMENTAL PROBABILITIES AND USE THESE TO MAKE PREDICTIONS ABOUT EVENTS.

- Represent all possible outcomes for compound events in an organized way (e.g., tables, grids, tree diagrams) and express the theoretical probability of each outcome.
- Represent probabilities as ratios, proportions, decimal between 0 and 1, and percentages between 0 and 100.

Rubric

FAR BELOW/BELOW BASIC	BASIC	PROFICIENT	ADVANCED
Unable to represent possible outcomes for compound events.	Demonstrates a limited understanding of possible outcomes for compound events.	Represents all possible outcomes for compound events in an organized way and expresses the theoretical probability of each outcome.	Analyze theoretical probability vs. experimental probability and explain outcomes.
No understanding of proportion, decimals, <u>or</u> percentages.	Demonstrates a limited understanding of probability as proportions, decimals between 0 and 1, and percentages between 0 and 100.	Represents probabilities as ratios, proportions, decimals between 0 and 1 and percentages between 0 and 100.	Apply understanding of ratios, proportions and decimals to problem solving situations.

3rd Trimester

Algebra and Functions

STUDENTS INVESTIGATE GEOMETRIC PATTERNS AND DESCRIBE THEM ALGEBRAICALLY.

- Use variables in expressions describing geometric quantities (e.g., $P = 2w + 2l$, $A = \frac{1}{2}bh$, $C = \pi d$ —the formulas for the perimeter of a rectangle, the area of a triangle, and the circumference of a circle, respectively.)

Rubric

FAR BELOW/BELOW BASIC	BASIC	PROFICIENT	ADVANCED
Unable to use variables in expressions describing geometric quantities.	Inconsistently uses variables in expressions describing geometric quantities.	Use variables in expressions describing geometric quantities (e.g., $P = 2w + 2l$, $A = \frac{1}{2}bh$, $C = \pi d$ —the formulas for the perimeter of a rectangle, the area of a triangle, and the circumference of a circle, respectively.)	Explain variable use in formulas in geometric quantities.
Unable to express geometric relationships in symbolic form	Inconsistently expresses geometric relationships in symbolic form	Able to express geometric relationships in symbolic form <i>Given info, students use the formula to figure out missing. ie. The area of a rectangular prism is 30. The length of its base is 5 and the prism's height is 2. What is the width of the base?</i>	Explains and justifies geometric relationships in symbolic form

Measurement and Geometry

STUDENTS DEEPEN THEIR UNDERSTANDING OF THE MEASUREMENT OF PLANE AND SOLID SHAPES AND USE THIS UNDERSTANDING TO SOLVE PROBLEMS.

- Understand the concept of a constant such as π ; know the formulas for the circumference and area of a circle.
- Know common estimates for pi (3.14, 22/7) and use to estimate and calculate circumference and area of a circle; compare with actual measurement

Rubric

FAR BELOW/BELOW BASIC	BASIC	PROFICIENT	ADVANCED
Does not understand the mathematical concept of a constant such as pi	Limited understanding of the mathematical concept of a constant such as pi	Understand the concept of a constant such as π ; know the formulas for the circumference and area of a circle	Uses π and the formulas for the circumference and area of a circle in problem solving
Does not know common estimates of pi ($\pi = 3.14, 22/7$); unable to use estimates of pi	Inconsistently understands and uses common estimates of pi to determine circumference and area of a circle	Understands and uses common estimates of pi to determine circumference and area of a circle Compares estimates with actual measurements.	Understands and uses common estimates of pi to determine circumference and area of a circle in problem solving Compares estimates with actual measurements in a complex situation

Visalia Unified School District Technology Standards, K-12

1. General technology knowledge & skills

- 1.1 Hardware care
- 1.2 OS literacy
- 1.3 File management (file navigation, folder/sub folder organization, save/open/delete/rename commands)
- 1.4 Keyboarding (6th grade/15 wpm, 8th grade/20 wpm)
- 1.5 Peripheral use (printer, digital camera/camcorder, scanner)

2. Writing, publishing & presentation with technology tools

- 2.1 Word processor (i.e.; Word, Student Writing Center, Story Book Weaver)
 - ◆ screen awareness (pull down menus, scroll bars, window menu, view menu)
 - ◆ editing tools (cut, copy, paste, find/replace)
 - ◆ formatting tools (font, alignment, page/paragraph setup)
- 2.2 Publishing & presentation (i.e.; Word, Publisher, Print Shop, KidPix, PowerPoint, FrontPage, Hyperstudio, Web Studio)
 - ◆ Audience clarification
 - ◆ Data organization
 - ◆ Screen awareness, program mechanics
 - ◆ Drawing tools
 - ◆ Graphic manipulation, graphic types
 - ◆ Design rules

3. Data analysis & problem solving with technology tools

- 3.1 Spreadsheet (i.e.; Excel, Cruncher)
 - ◆ Screen awareness, program mechanics
 - ◆ Page layout / data format
 - ◆ Data types (text, number, formulas)
 - ◆ Graph/chart format & interpretation
 - ◆ Data manipulation & presentation
- 3.2 Database (i.e.; Access)
 - ◆ Screen awareness, program mechanics
 - ◆ Page & report design
 - ◆ Data entry
 - ◆ Data manipulation & presentation
- 3.3 Concept mapping (i.e.; Inspiration)
 - ◆ Screen awareness, program mechanics
 - ◆ Idea organization
 - ◆ Idea presentation
- 3.4 Simulations (i.e.; Tom Snyder productions, Web quest)
 - ◆ Screen awareness, program mechanics

4. Information literacy, research & online communication with technology tools

- 4.1 Online search tools
 - ◆ Edited (print) vs. non-edited (online)
 - ◆ Athena book search
 - ◆ Search strategies
 - ◆ Site validation
 - ◆ Citation
- 4.2 Online communication tools
 - ◆ Email
 - ◆ Listserve
 - ◆ Discussion board

5. Responsible & ethical uses of technology

- 5.1 Copyright
- 5.2 Email etiquette & respectful communication
- 5.3 Password protection
- 5.4 Web use
 - ◆ Protection of personal information

Prior to the completion of 6th grade, students will:

STANDARD	SUGGESTED APPLICATION
<p>1. General technology knowledge & skills</p> <p>1.1 Practice care and responsible use with all equipment.</p> <p>1.1 Communicate about technology using developmentally appropriate terms.</p> <p>1.2 Demonstrate appropriate skill with windowing and editing keyboard shortcuts.</p> <p>1.3 Organize their work into a meaningful folder structure.</p> <p>1.4 Use touch-typing technique to type 15 words per minute in a 3-minute test.</p> <p>1.5 Use a digital camera, a scanner, a paint program to help illustrate a piece of writing.</p>	<p>Workstation</p> <p>Poster</p> <p>Windows 95/98/2000</p> <p>Keyboard device</p> <p>Camera, scanner, PowerPoint, KidPix</p>
<p>2. Writing, publishing & presentation with technology tools</p> <p>2.1 Write a story using a word processor.</p> <p>2.2 Produce some publication that incorporates custom graphics, font attributes, and good design principles.</p> <p>2.2 Use a presentation program to communicate an idea before a live audience.</p>	<p>Word, Publisher, PowerPoint Writing & Pub. Center</p> <p>Story Book Weaver</p>
<p>3. Data analysis & problem solving with technology tools</p> <p>3.1 Define the relationship between two or more data sets using pie or bar graphs.</p> <p>3.2 Collaborate with classmates to build a database used toward the analysis of a specific problem.</p> <p>3.3 Apply a mapping or outlining application during a writing assignment.</p> <p>3.4 Collaborate with classmates to explore abstract concepts using a simulation.</p>	<p>Excel, Cruncher</p> <p>Access</p> <p>Inspiration</p> <p>Tom Snyder product</p>
<p>4. Information literacy, research & online communication with technology tools</p> <p>4.1 Check the accuracy, relevance, appropriateness, and bias of electronic information sources.</p> <p>4.1 Use Athena to search for a book.</p> <p>4.1 Discuss the difference between edited (print-based) material and non-edited (some Web-sites) material.</p> <p>4.1 Apply basic search strategies to locate specific information.</p> <p>4.1 Cite Internet-based resources.</p> <p>4.2 Communicate with a teacher, family member, author, field experts or other student via email.</p>	<p>Athena</p> <p>IE 4+, Internet access</p>
<p>5. Responsible & ethical uses of technology</p> <p>5.1 Discuss copyright, email etiquette, Web site viewing, and privacy issues related to responsible use of technology and describe personal consequences of inappropriate use.</p>	<p>NA</p>