



AnsMar Publishers, Inc.

(K-6) CURRICULUM

**Student/Parent
Reference Guide
Excel Math
5th Grade**

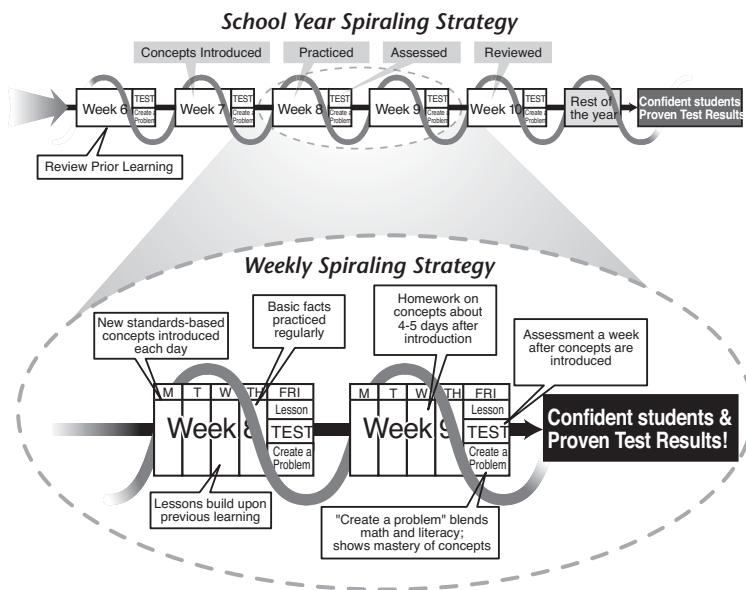
INTRODUCTION

We have been long asked to provide a permanent record of the lessons in our Excel Math curriculum for use at home. This first edition of a Student/Parent Guide is intended to make math learning more enjoyable and productive.

This reference guide for students and parents includes Lessons 1-20 from the 5th grade, and a few tips to help students achieve the objective for each lesson. It concludes with a glossary that defines math terms that are new for 5th grade.

If you want to help your student with a certain subject, use the following pages to locate the group of concepts, the specific concept and the lessons which cover it. In the academic world, these are called the "Scope and Sequence."

Excel Math uses a method of instruction known as "Spiraling" which can be a bit confusing to first-time users. We introduce a topic to students, then after a few days ask them to do some practice and some homework on that topic. Eventually we test their retention. Then the subject is taught again in more detail or at a higher level of difficulty. This approach has been proven to produce confident students who master elementary mathematics. Thanks for helping on this quest!



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Concepts Listed by Group with Lesson Numbers

PLACE VALUE AND COUNTING

Place value

- 1 Recognizing numbers less than a million
- 65 Recognizing tenths and hundredths places
- 80 Recognizing numbers up through trillions
- 80 Recognizing numbers given in expanded notation
- 121 Recognizing the thousandths place

Recognizing number words

- 1 Recognizing numbers less than a million
- 13 Recognizing ordinal number words up to 100
- 65 Recognizing decimal number words
- 80 Recognizing numbers up through trillions
- 108 Recognizing Roman Numerals I, V, X, L, C, D and M

Missing number series

- 6 Filling in missing numbers in sequences counting by 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10
- 87 Filling in missing numbers in sequences counting by 11 or 12
- 104 Filling in missing numbers in sequences counting by varying amounts
- 111 Filling in missing numbers in a sequence of decimal numbers

Putting numbers in order

- 6 Arranging 4 four-digit numbers in order from least to greatest and from greatest to least
- 43 Putting simple fractions in order from least to greatest and greatest to least
- 98 Putting decimal numbers in order from least to greatest and greatest to least
- 148 Arranging fractions, decimals and mixed numbers on a number line

ADDITION (WHOLE NUMBERS)

- 1 Adding 4 four-digit numbers with regrouping; recognizing addition and subtraction fact families
- 32 Learning about the Commutative Property of Addition
- 96 Learning about the Associative Property of Addition

SUBTRACTION (WHOLE NUMBERS)

- 1 Subtracting 2 three-digit numbers with regrouping; recognizing addition and subtraction fact families
- 3 Subtracting four-digit numbers with regrouping

MULTIPLICATION (WHOLE NUMBERS)

Multiplication facts

- 2 Learning the multiplication facts with products up through 30 and products with 5 (up to 45), 10 (up to 90), 11 (up to 99) or 12 (up to 48) as a factor
- 11 Recognizing multiplication and division fact families
- 16 Learning multiplication facts with products up to 50
- 28 Learning multiplication facts with products less than 100 with 12 as a factor
- 28 Recognizing multiples
- 38 Determining the lowest common multiple
- 38 Learning multiplication facts with products with 11 (up to 121) and 12 (up to 144) as a factor

One-digit multiplier, two or more digit multiplicand

- 2 Multiplying a two- or three-digit number by a one-digit multiplier

Two-digit multiplier

- 22 Multiplying 2 two-digit numbers, no regrouping
- 24 Multiplying 2 two-digit numbers, regrouping only with the ones or the tens place
- 36 Multiplying 2 two-digit numbers, regrouping twice
- 107 Multiplying a three-digit whole or decimal number or money amount by a two-digit number

Concepts Listed by Group with Lesson Numbers

Three-digit multiplier

139 Multiplying a three-digit number by a three-digit number

Other

- 11 Learning the terminology for multiplication
- 32 Learning about the Commutative Property of Multiplication
- 96 Learning about the Distributive and Associative Properties of Multiplication
- 153 Multiplying mixed numbers

DIVISION (WHOLE NUMBERS)

Division facts, no remainders

- 11 Recognizing multiplication and division fact families
- 11 Learning division facts with dividends up through 30 and dividends that are multiples of 5 (to 45), 10 (to 90), 11 (to 99) or 12 (to 48)
- 28 Learning division facts with dividends up through 50
- 49 Learning division facts with dividends up to 81 and less than 100 with 12 as a factor
- 61 Determining factors
- 62 Determining composite numbers, prime numbers and prime factors
- 73 Learning division facts with dividends up to 121 with 11 as a factor and up to 144 with 12 as a factor
- 88 Determining the greatest common factor
- 93 Determining if a number is a prime number

Division facts, remainders

- 29 Learning division facts with remainders with dividends up to 30 and dividends with 5 as a factor
- 38 Learning division facts with remainders with dividends to 50
- 71 Learning division facts with remainders with dividends to 81

One-digit divisor & two or more digit quotient

- 21 Dividing a one-digit divisor into a three-digit dividend with a three-digit quotient, no regrouping or remainders
- 26 Dividing a one-digit divisor into a three-digit dividend with a two-digit quotient, no regrouping or remainders
- 27 Continued – Dividing a one-digit divisor into a three-digit dividend with a two-digit quotient, no regrouping or remainders
- 33 Dividing a one-digit divisor into a three-digit dividend resulting in a two-digit or three-digit quotient, with regrouping and remainders
- 34 Continued – Dividing a one-digit divisor into a three-digit dividend resulting in a two-digit or three-digit quotient, with regrouping and remainders
- 41 Dividing money amounts by a one-digit divisor
- 46 Dividing a one-digit divisor into a four-digit dividend with a three-digit quotient and a zero in the tens place
- 47 Continued – Dividing a one-digit divisor into a four-digit dividend with three-digit quotient and zero in tens place
- 101 Dividing using short division
- 100 Calculating a decimal answer in division problems when zeroes need to be added to the right of the dividend
- 146 Simplifying division problems using powers of ten

Two-digit divisor

- 49 Dividing with a two-digit divisor and a dividend less than 100 with remainders
- 128 Dividing a two-digit divisor into a three-digit dividend with a two-digit quotient
- 141 Dividing a two-digit divisor into a three-digit dividend with a one-digit quotient

Three-digit divisor

- 119 Dividing a three-digit divisor into a three- or four-digit dividend with a one-digit quotient

Other

- 11 Learning the terminology for division
- 77 Recognizing division without the \div symbol
- 79 Dividing dollars by dollars
- 147 Dividing a decimal number by a decimal number
- 153 Dividing mixed numbers

Concepts Listed by Group with Lesson Numbers

FRACTIONS

- 9 Computing one half of a group
- 15 Defining numerator and denominator
- 15 Determining the fractional part of a group of items when modeled or given in words, including extraneous information or the word “not”
- 15 Learning that the whole is the sum of its parts
- 15 Adding and subtracting fractions
- 23 Adding and subtracting fractions and mixed numbers with like denominators
- 31 Determining equivalent fractions using models or money
- 39 Calculating equivalent fractions using multiplication
- 43 Comparing fractions
- 43 Putting simple fractions in order from least to greatest and greatest to least
- 44 Computing $\frac{1}{2}$ to $\frac{1}{9}$ of a group of items
- 50 Adding and subtracting fractions with unlike denominators
- 59 Calculating equivalent fractions using division
- 65 Writing mixed numbers as decimals
- 68 Changing an improper fraction to a mixed or whole number
- 69 Adding and subtracting fractions in word problems
- 76 Simplifying fractions
- 77 Converting improper fractions as part of mixed numbers
- 78 Determining the improper fraction with the greatest or least value in a set of fractions
- 78 Putting fractions in order from least to greatest and greatest to least
- 83 Converting fractions to percents by setting up equivalent fractions
- 99 Simplifying improper fractions as part of mixed number answers
- 105 Comparing fractions in word problems
- 106 Selecting the fraction that best represents a shaded region
- 110 Multiplying fractions and whole numbers by fractions
- 113 Converting mixed numbers to decimal numbers by setting up equivalent fractions
- 117 Writing probabilities as lowest-terms fractions
- 118 Determining the reciprocal of a whole number or fraction
- 122 Subtracting fractions with regrouping
- 126 Using multiplication and division to cross simplify fraction problems
- 127 Converting mixed numbers to improper fractions
- 129 Dividing fractions
- 135 Calculating averages involving fractions
- 136 Converting fractions to decimals using division
- 148 Arranging fractions, decimals and mixed numbers on a number line
- 153 Multiplying and dividing mixed numbers

MONEY

- 3 Recognizing money number words
- 3 Recognizing the dollar symbol and decimal point
- 3 Regrouping with money amounts when adding, subtracting or multiplying money amounts
- 4 Learning change equivalents up to \$1.00
- 4 Recognizing coins
- 4 Calculating change using the least number of coins
- 41 Rounding to the nearest dollar
- 41 Dividing money amounts by a one-digit divisor
- 79 Dividing dollars by dollars
- 97 Calculating cost per unit
- 107 Multiplying a money amount by a two-digit number
- 149 Computing sales tax

Concepts Listed by Group with Lesson Numbers

DECIMALS

- 65 Recognizing tenths and hundredths places
- 65 Recognizing decimal number words
- 65 Writing decimal numbers as mixed numbers
- 65 Writing mixed numbers as decimals
- 66 Adding and subtracting decimal numbers
- 81 Multiplying a decimal number by a whole number
- 82 Solving equations involving decimals
- 83 Converting decimals to percents by setting up equivalent fractions
- 85 Comparing decimal numbers in true and not true statements
- 85 Comparing decimal numbers in less than and greater than problems
- 94 Dividing a decimal number by a whole number
- 98 Putting decimal numbers in order from least to greatest and greatest to least
- 100 Solving word problems involving decimals
- 100 Calculating a decimal answer in division problems when zeroes need to be added to the right of the dividend
- 107 Multiplying a three-digit decimal number by a two-digit number
- 111 Filling in missing numbers in a sequence of decimal numbers
- 113 Converting mixed numbers to decimal numbers by setting up equivalent fractions
- 120 Determining where to place the decimal when multiplying and dividing decimal numbers by powers of ten
- 121 Recognizing the thousandths place
- 121 Rounding decimal numbers to the nearest tenth or hundredth
- 125 Selecting the decimal that best represents a shaded region
- 131 Computing products involving two decimal numbers
- 132 Continued — Computing products involving two decimal numbers
- 135 Calculating averages involving decimals
- 136 Converting fractions to decimals using division
- 147 Dividing a decimal number by a decimal number
- 148 Arranging fractions, decimals and mixed numbers on a number line

PERCENT

- 83 Converting fractions and decimals to percents by setting up equivalent fractions
- 109 Determining percent in word problems
- 112 Converting percents to decimals
- 112 Computing the percent of a whole number
- 116 Solving problems using data displayed as percent pie graphs
- 125 Selecting the percent that best represents a shaded region
- 130 Solving word problems involving percent
- 149 Computing sales tax

TIME - CLOCK

- 8 Telling time to the minute
- 8 Recognizing a quarter past or before the hour or half past the hour
- 8 Calculating minutes before the hour
- 8 Learning $60 \text{ minutes} = 1 \text{ hour}$
- 8 Calculating elapsed time
- 57 Calculating elapsed time (hours) involving AM and PM
- 73 Calculating elapsed time in minutes across the 12 on the clock

TIME - CALENDAR

- 7 Computing the date
- 7 Learning $7 \text{ days} = 1 \text{ week}$
- 7 Learning the abbreviations for days and months
- 7 Learning the number of days in each month

Concepts Listed by Group with Lesson Numbers

- 7 Learning 1 year = 12 months
- 51 Learning the equivalent for one year in days and in weeks
- 51 Learning about leap year
- 51 Calculating elapsed time crossing months

ODD AND EVEN NUMBERS

- 9 Recognizing odd and even numbers less than 100
- 87 Recognizing three-digit odd and even numbers

WORD PROBLEMS

- 2 Solving multi-step word problems using addition and subtraction
- 4 Solving word problems involving money
- 10 Solving word problems using deductive reasoning
- 10 Determining if there is sufficient information to answer the question
- 10 Determining what information is needed to answer the question in a word problem
- 10 Solving word problems using reasoning
- 16 Solving word problems involving multiplication and division
- 25 Estimating the answers for addition, subtraction and multiplication word problems using rounding
- 25 Estimating range for an answer
- 29 Solving word problems involving division with remainders
- 32 Selecting the correct equation
- 55 Calculating the answer to a word problem using 2 to 1 and 5 to 1 ratios
- 58 Solving word problems by listing the possibilities
- 63 Solving word problems involving area and perimeter
- 70 Determining the question when given the information and the answer
- 70 Estimating which answer is most reasonable
- 74 Calculating distance, time and speed in word problems
- 82 Estimating answers to problems involving numbers with up to nine digits
- 97 Calculating cost per unit
- 100 Solving word problems involving decimals
- 102 Calculating averages
- 103 Continued — Calculating averages
- 114 Reading maps drawn to scale
- 115 Calculating the mean, median and mode
- 130 Solving word problems involving percent
- 133 Solving word problems involving the multiplication of fractions
- 135 Calculating averages involving decimals or fractions

MEASUREMENTS

- 12 Estimating standard measurements
- 12 Reading measuring devices
- 17 Learning the equivalents for feet, inches and yards
- 48 Learning measurement equivalents for centimeters, meters, kilometers, kilograms, liters, milliliters, millimeters, gallons, pounds, tons and dozens
- 48 Converting measurements using multiplication
- 48 Determining the measurement that is longer or shorter or heavier or lighter
- 54 Learning length abbreviations
- 58 Converting measurements using division
- 67 Comparing U.S. customary and metric units
- 103 Learning the abbreviations for quarts, gallons, kilograms, grams, pounds, ounces, liters, milliliters and millimeters

Concepts Listed by Group with Lesson Numbers

GEOMETRY

- 17 Measuring line segments to the nearest half inch, quarter inch and half centimeter
- 20 Recognizing three-dimensional figures - sphere, cube, cone, cylinder; rectangular, square and triangular pyramid; rectangular and triangular prism
- 20 Learning the terminology of flat and curved faces, vertices and edges
- 30 Measuring angles
- 30 Learning the sum of the angles for triangles and rectangles
- 30 Recognizing right, obtuse and acute angles
- 30 Recognizing equilateral, isosceles and scalene triangles
- 35 Learning the terminology of parallel, intersecting and perpendicular, plane figure, polygon, quadrilateral, parallelogram and diagonal
- 42 Recognizing patterns
- 42 Learning the terminology of pentagon, hexagon and octagon
- 42 Determining figures that do or do not belong in a set
- 45 Recognizing when figures are similar or congruent
- 45 Recognizing flips, slides and turns
- 45 Recognizing lines of symmetry
- 45 Recognizing bilateral and rotational symmetry
- 45 Recognizing the symbol for a triangle
- 54 Calculating perimeters
- 56 Calculating the area of a rectangle
- 63 Solving word problems involving area and perimeter
- 71 Learning the terminology of rhombus and trapezoid
- 72 Calculating the volume of a rectangular prism with one or more layers of cubes
- 75 Recognizing parts of a circle
- 75 Calculating the diameter given the radius
- 75 Associating the 360 degrees in a circle with one-quarter, one-half, three-quarter and full turns
- 84 Calculating the volume of a rectangular prism using the formula $L \times W \times H$
- 86 Recognizing the pattern in a sequence of figures or pattern of shading
- 95 Calculating area and perimeter given coordinates on a coordinate grid
- 95 Calculating the perimeter of an irregular figure
- 134 Calculating the area of a parallelogram
- 137 Calculating the surface area of a rectangular prism
- 144 Calculating the area of a triangle
- 145 Calculating the circumference and area of a circle
- 145 Recognizing π (pi) and squared
- 152 Calculating the area of an irregular figure

ESTIMATING

- 25 Rounding to the nearest ten, hundred or thousand
- 25 Estimating the answers for addition, subtraction and multiplication word problems using rounding
- 25 Estimating range for an answer
- 25 Rounding numbers so there is only one non-zero digit
- 41 Rounding to the nearest dollar
- 67 Comparing U.S. customary and metric units
- 70 Estimate which answer is most reasonable
- 82 Estimating answers to problems involving numbers with up to nine digits
- 92 Estimating to the nearest dollar or whole number
- 121 Rounding decimal numbers to the nearest tenth or hundredth

PRE-ALGEBRA

- 6 Recognizing the symbols $<$ less than and $>$ greater than
- 13 Completing patterns in a chart
- 14 Filling in a missing number in an equation

Concepts Listed by Group with Lesson Numbers

- 14 Determining the value of a letter that has been substituted for a number
- 14 Solving algebraic equations
- 14 Selecting the correct operation
- 18 Filling in missing numbers in equations with parentheses
- 18 Learning the order of operations when solving an equation
- 19 Changing a number sentence from \neq to $=$
- 19 Finding the value of an unknown by performing the same operation on both sides of an equation
- 32 Selecting the correct equation
- 37 Recognizing true and not true number sentences
- 37 Selecting the correct symbol for a number sentence
- 37 Using trial and error to replace unknowns in an equation
- 52 Determining coordinate points
- 53 Using Venn Diagrams to understand the union and intersection of sets
- 55 Recognizing multiplication without the "x" symbol
- 64 Measuring vertical and horizontal lines by subtracting X- and Y-coordinates
- 77 Recognizing division without the "÷" symbol
- 82 Solving equations involving decimals
- 89 Comparing positive and negative numbers
- 90 Determining if coordinate points are on a given line
- 91 Determining numbers that are multiples of one number and factors of another
- 96 Learning the Property of One and Zero Property
- 123 Determining negative numbers using coordinate points
- 124 Determining the equation that represents a problem and the equation that solves it
- 138 Calculating using exponents
- 140 Identifying the equation that represents a line on a coordinate graph
- 143 Determining the rule that creates a pattern
- 150 Adding positive and negative integers
- 151 Continued – Adding positive and negative integers
- 154 Subtracting positive and negative integers
- 155 Continued – Subtracting positive and negative integers

PROBABILITY

- 60 Determining the probability of an event
- 117 Writing probabilities as lowest-terms fractions
- 142 Computing expected numbers based on probabilities

GRAPHS

- 5 Interpreting circle graphs, picture graphs, bar graphs and line graphs
- 40 Comparing two or more sets of data using bar or line graphs
- 40 Interpreting information given in a histogram
- 116 Solving problems using data displayed as percent pie graphs

STATISTICS

- 102 Calculating averages
- 103 Continued – Calculating averages
- 115 Calculating the mean, median and mode
- 115 Using stem and leaf plots
- 135 Calculating averages involving decimals or fractions

HOW THIS GUIDE WORKS

We have reproduced the content of the 5th grade daily Excel Math Lessons 1-20. The lesson material taught to your student occupies either the front left side of the Lesson Sheet or the entire front.

We provide a few teaching hints in this reference guide to help you understand and communicate the concepts in the lesson. The hints appear with a shaded background, like this.

Most of the lessons designed for the 5th day of the week are longer than normal. They occupy the entire width of the page and contain more teaching material. These lessons do not have the LEARNING TIPS section.

The lesson is usually taught in a group setting by the classroom teacher. Some lessons include problems that the teacher reads aloud to the class. We have printed those problems in this guide. The answers that are shown in this book are for problems that students will do in class but they are not graded.

Homework, guided practice and tests are NOT included.

NOTE: This guide is not a substitute for the Teacher Edition, which is a 500 page publication containing full teaching instructions, a complete answer key, and additional activities and graphics. Please contact Excel Math if you are homeschooling and wish to purchase a Teacher Edition.

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Lesson 3

Subtracting four-digit numbers with regrouping; recognizing money number words; recognizing the dollar symbol and decimal point; regrouping with money amounts when adding, subtracting or multiplying money amounts

Check each subtraction problem with addition.

<p>①</p> $\begin{array}{r} 3 \text{ } 9 \text{ } 16 \\ 4,006 \\ -1,237 \\ \hline 2,769 \end{array}$	<p>②</p> $\begin{array}{r} 4 \text{ } 9 \text{ } 9 \\ 5,000 \\ -1,535 \\ \hline 3,465 \end{array}$	<p>③</p> $\begin{array}{r} 6,004 \\ -5,694 \\ \hline 310 \end{array}$
<p>④</p> $\begin{array}{r} 3,000 \\ -1,492 \\ \hline 1,508 \end{array}$	<p>⑤</p> $\begin{array}{r} 1,492 \\ +1,508 \\ \hline 3,000 \end{array}$	<p>⑥</p> $\begin{array}{r} 5,694 \\ +310 \\ \hline 6,004 \end{array}$

When writing money amounts, the **decimal** separates the whole dollar from parts of a dollar. \$3.42 is more than three dollars but less than four dollars. The word "and" shows where the decimal should be. If the amount does not include cents, the word "and" is not needed.

three dollars and six cents \$3.06 four dollars \$4.00



The cent symbol (¢) is used for amounts under a dollar. We never use the cents symbol with the dollar symbol (\$) and the decimal (.). You can write 93¢ or \$.93 but not \$.93¢.

When adding or subtracting money amounts, always line up the decimals. Also be sure to show the dollar symbol and the decimal in your answer. When writing a problem, notice that the dollar symbol is only written with the top number and with the answer.

<p>⑦</p> $\begin{array}{r} 1 \text{ } 1 \\ \$23.41 \\ +16.21 \\ \hline \$42.37 \end{array}$	<p>⑧</p> $\begin{array}{r} 110 \\ \$4.20 \\ - .17 \\ \hline \$4.03 \end{array}$	<p>⑨</p> $\begin{array}{r} 2 \text{ } 1 \\ \$2.73 \\ \times 4 \\ \hline \$10.92 \end{array}$	<p>⑩</p> $\begin{array}{r} 1 \\ \$.24 \\ + 1.39 \\ \hline \$1.63 \end{array}$	<p>⑪</p> $\begin{array}{r} 4 \text{ } 117 \\ \$5.27 \\ - .29 \\ \hline \$4.98 \end{array}$	<p>⑫</p> $\begin{array}{r} 1 \text{ } 2 \\ \$7.49 \\ \times 3 \\ \hline \$22.47 \end{array}$
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Lesson 4

Learning change equivalents up to \$1.00; recognizing coins; solving word problems involving money; calculating change using the least number of coins

<p>①</p> <p>40¢ = <u>4</u> dimes</p>	<p>②</p> <p>75¢ = <u>15</u> nickels</p>	<p>③</p> <p>\$1.00 = <u>20</u> nickels</p>
<p>④</p> <p>70¢ = <u>7</u> dimes</p>	<p>⑤</p> <p>\$1.00 = <u>4</u> quarters</p>	<p>⑥</p> <p>\$1.00 = <u>2</u> half-dollars</p>

<p>⑦</p> <p>A picture frame costs 51¢. Amber gave the clerk a dollar. How much was her change?</p> $\begin{array}{r} \$1.00 \\ - .51 \\ \hline \$.49 \end{array}$	<p>⑧</p> <p>Carlos bought a cookie that cost 22¢. He gave the clerk a quarter. How much was his change?</p> $\begin{array}{r} 25¢ \\ - 22¢ \\ \hline 3¢ \end{array}$	<p>⑨</p> <p>Eddie has 8 nickels, 6 dimes and 3 quarters. How much money does he have?</p> $\begin{array}{r} \$.40 \\ .60 \\ + .75 \\ \hline \$1.75 \end{array}$
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Change can be given in several different combinations of coins. For example, 15¢ can be 3 nickels or 1 dime and 1 nickel. If you want to use the fewest coins, your choice would be 1 dime and 1 nickel.

To calculate the fewest coins, start with the largest coin and work down to pennies, adding until your sum equals the given amount. Fill in the blank with the number of coins requested. Do not include half dollar coins in your calculations.

<p>⑩</p> <p>Using the fewest coins, how many dimes are there in 23¢?</p> $\begin{array}{r} 10¢ \\ 10¢ \\ + 3¢ \\ \hline 23¢ \end{array}$ <p><u>2</u></p>	<p>⑪</p> <p>Using the fewest coins, how many nickels are there in 43¢?</p> $\begin{array}{r} 25¢ \\ 10¢ \\ 5¢ \\ + 3¢ \\ \hline 43¢ \end{array}$ <p><u>1</u></p>	<p>⑫</p> <p>Using the fewest coins, how many quarters are there in 58¢?</p> $\begin{array}{r} 25¢ \\ 25¢ \\ 5¢ \\ + 3¢ \\ \hline 58¢ \end{array}$ <p><u>2</u></p>
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LEARNING TIPS:

When a money amount is less than one dollar, it can be written with the cent (¢) symbol.

Amounts over 99¢ are written with a decimal point and a dollar symbol (\$). Both 10¢ and \$.10 are equal to one dime. The cent symbol is not used together with the dollar symbol. You can write \$.10 or 10¢ but not \$.10¢.

Because the decimal separates whole dollars from parts of dollars, it is important to line up the decimal points when dollar amounts are added or subtracted.

Problems #7 and #8 demonstrate lining up the decimal.

LEARNING TIPS:

Count by fives or tens to find how many nickels or dimes are in each amount.

Problems #5 and #6 relate quarters and half dollars to parts of a whole (1/4, 1/2).

Problems #10 – #12 demonstrate combining coins that add up to the given amount using the fewest number of coins.

Start with the largest possible coin. When adding another of same coin takes you over the given amount, stop and drop down to the next smaller value coin. Repeat until you have the total amount.

When you add coins, you can check your work by writing an addition problem.

Lesson 5
 Interpreting circle graphs, picture graphs, bar graphs and line graphs

Circle or pie graphs are used primarily to organize data. Picture graphs use symbols and pictures to compare data. Bar graphs also compare data. Line graphs are used to show change.

① **Balls in the Equipment Box**
 If a student takes a ball from the equipment box at random, which ball has the lowest probability of being selected?
 basketballs, soccer balls, footballs, baseballs
 Answer: **baseballs**

② **Taking Photographs**
 Who took fewer than four photographs?
 Carly, Barry, Lupe, Ruthie, Glen
 Answer: **Ruthie and Glen**
 How many more photos does Glen need to take to catch up with Barry?
 Answer: **6 more photos**

③ **Jumping Rope**
 For how many minutes did Gary and Delia jump rope?
 Answer: **55 minutes**
 According to the chart, which two children jumped rope for the same number of minutes?
 Answer: **Hunter and Martin**

④ **Daily High Temperature**
 Notice that the numbers along the left side do not start at zero. Since the numbers from zero to 29 are not needed, starting with 30 avoids wasting space.
 What was the temperature change from the 6th day to the 7th day?
 Answer: **4°**
 How many days was the daily high temperature above 33°?
 Answer: **2 days, 1st and 7th**

⑤ Select the data to be collected, choose the type of graph and then draw the graph below.

LEARNING TIPS:
 Math is a system of rules that allows us to compare various things. Today we look at the symbols for less than and greater than.
 To put numbers in order from least to greatest, compare values in the thousands place first, then hundreds and ones.
 The second concept deals with sequences of numbers that count up or down. We want students to see if numbers decrease or increase in value. Then they look for the difference between each number in the sequence. In problem #8 the difference is 9.
 Students should always check to see if the differences are the same in each sequence.
 On the final problems, we ask them to determine in what direction the sequence is counting (+ or -), by what number it's counting and what the missing number in the sequence will be.

Lesson 6
 Recognizing the symbols < less than and > greater than; arranging 4 four-digit numbers in order from least to greatest and from greatest to least; filling in missing numbers in sequences counting by 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10

The symbols "<" (less than) and ">" (greater than) are used to compare two numbers. Each symbol points to the smaller of the two numbers.
 Draw the correct symbol between each pair of numbers.
 ① 4,351 > 4,308 ② 2,165 < 6,125 ③ 4,434 < 4,443

Put each set of numbers in order from least to greatest.
 ④ (6,469; 6,649; 6,369; 6,138) ⑤ (5,843; 5,814; 5,238; 5,641)
6,138 6,369 6,469 6,649 5,238 5,641 5,814 5,843

Put each set of numbers in order from greatest to least.
 ⑥ (5,219; 5,285; 5,261; 5,291) ⑦ (3,424; 3,224; 3,442; 3,242)
5,291 5,285 5,261 5,219 3,442 3,424 3,242 3,224

By what number is each series counting?
 ⑧ (72, 81, 90, 99, 108) ⑨ (46, 53, 60, 67, 74)
 counting up by **9** counting up by **7**

For each number series, indicate by what number you are counting and fill in the missing number.
 ⑩ (65, 73, 81, 89, **97**) ⑪ (**72**, **65**, 58, 51, 44, 37)
 counting up by **8** counting down by **7**

7

Lesson 7

Computing the date; learning 7 days = 1 week; learning the abbreviations for days and months; learning the number of days in each month; learning 1 year = 12 months

① Today is Wed, Jul 8. Two weeks from this Friday will be Jul 24 .

W	Th	F	10
8	9	10	+ 14
			<u>24</u>

② Today is Tues, May 19. May 10 was on Sunday .

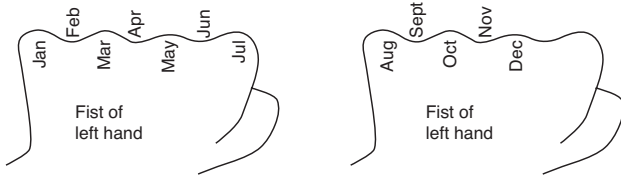
19	S	M	T
- 7	10	11	12
<u>12</u>			

Here are the abbreviations for the days and months:

Sunday (**Sun**) Monday (**Mon**) Tuesday (**Tues**) Wednesday (**Wed**) Thursday (**Thur**)
 Friday (**Fri**) Saturday (**Sat**)
 January (**Jan**) February (**Feb**) March (**Mar**) April (**Apr**) May (**May**) June (**Jun**) July (**Jul**)
 August (**Aug**) September (**Sept**) October (**Oct**) November (**Nov**) December (**Dec**)

The calendar we use is called the Gregorian calendar (after Pope Gregory). It was introduced in 1582. You might look up the Julian calendar which was used before 1582. It was named after Julius Caesar. See how it differs from the Gregorian calendar.

Here is one way to determine how many days are in each of the 12 months in a year.



Make a fist with your left hand. With the back of your left hand facing you, list the months of the year starting with January on the knuckle of your little finger. Continue through July using the space between each knuckle and the knuckle itself. Start again with August at the same place you used for January. The months that land up high on a knuckle have 31 days, while the others down between the knuckles have 30 days (except February). February has 28 or 29 days, depending on whether it is a leap year or not. Determining leap year is discussed in another lesson.

LEARNING TIPS:

Here's a simple rhyme that might help you remember the number of days in each month:

Thirty days hath September,
 April, June, and November;
 All the rest have thirty-one
 Excepting February alone:
 Which has but twenty-eight, it's fine,
 'Til leap year gives it twenty-nine.

Here's a variation that doesn't rhyme as well but seems to be what we remember:

Thirty days hath September,
 April, June, and November;
 All the rest have just one more
 Except February has twenty-eight
 or twenty-nine.

8

Lesson 8

Telling time to the minute; recognizing a quarter past or before the hour or half past the hour; calculating minutes before the hour; learning 60 minutes = 1 hour; calculating elapsed time

The longer hand is the minute hand and the shorter hand is the hour hand. If you draw a straight line between the 12 and the 6, the face of the clock is divided in half. If you draw another line between the 3 and the 9, the clock face is divided into quarters.

As the minute hand moves around the clock, the hour hand moves from one hour mark to the next. A colon (:) is used to separate the hour on the left from the minutes on the right. Each hour mark on the face also represents 5 minutes. The clock on the right can be read as 2:35, or 35 minutes after 2, or since there are 60 minutes in each hour, 25 minutes before 3.



③ It is 5:43. What time was it 2 hours and 30 minutes ago?

$$\begin{array}{r} 5:43 \\ - 2:30 \\ \hline 3:13 \end{array}$$

④ It is 2:04. What time will it be in 4 hours and 25 minutes?

$$\begin{array}{r} 2:04 \\ + 4:25 \\ \hline 6:29 \end{array}$$

⑤ Dean arrived at 3:20. He left at 8:40. How long was he here?

$$\begin{array}{r} 8:40 \\ - 3:20 \\ \hline 5:20 \end{array}$$

5 hours and 20 minutes

⑥ It is 21 minutes before 9 o'clock.

$$\begin{array}{r} 60 \\ - 39 \\ \hline 21 \end{array}$$

⑦ It is 46 minutes before 2 o'clock.

$$\begin{array}{r} 60 \\ - 14 \\ \hline 46 \end{array}$$

LEARNING TIPS:

The long hand indicates minutes before or after an hour. The hour hand points directly at a numeral when it is exactly on the hour. Otherwise it is between two numerals.

If the minute hand is straight up, the time is on the hour with 0 minutes.

As the minute hand moves around the clock face, the hour hand will slowly move to the next hour mark. Each hour mark also represents five minutes (even if minute numbers are not shown).

Count the hour marks and multiply by 5 to see how many minutes there are in an hour.

Some clock faces show the minutes and not the hours. The hours can be determined by dividing each minute number by 5.

Some clock faces have no numbers at all. We have to imagine them.

LEARNING TIPS:

All even numbers have a 0, 2, 4, 6 or 8 in the ones place and all odd numbers have a 1, 3, 5, 7 or 9 in the ones place.

“Even” numbers can be divided into two equal groups with nothing left over.

“Two equal groups” means there will be the same number in each group.

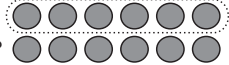
The number 11 cannot be divided into two equal groups because it is an “odd” number.

Lesson 9

Computing one half of a group; recognizing **odd** and **even** numbers less than 100

If a group is divided in half, the two parts will have exactly the same number of items.

Jess has 12 marbles.
One-half of the marbles are red.
How many red marbles does he have?



One-half of 12 is 6.

This problem can also be solved using division.

$12 \div 2$ means 12 divided into 2 equal parts.

$12 \div 2 = 6$ red marbles

Instead of Jess having 12 marbles, he has 11. Can 11 marbles be divided into two equal groups?

 No

Draw pictures if you need to in order to answer the questions.

Numbers that cannot be divided into two equal groups are called **odd numbers**.
Numbers that can be divided into two equal groups are called **even numbers**.

What digits will be in the ones place if it is an even number? **0, 2, 4, 6, 8**

What digits will be in the ones place if it is an odd number? **1, 3, 5, 7, 9**

- ① Circle the set with one odd and one even number. ② Circle the set with 2 even numbers. ③ Circle the set with 2 odd numbers.
- (78, 24) (95, 19) (76, 49) (13, 98) (28, 95) (61, 37)
- (88, 35) (67, 9) (66, 37) (4, 58) (10, 73) (45, 2)

LEARNING TIPS:

Deductive reasoning problems can be solved in several ways. Our first example shows how to use a drawing to find the answer.

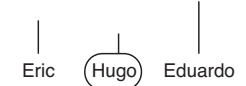

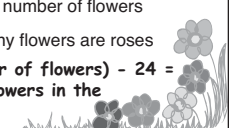
- Eduardo is older than Eric. Draw 2 vertical lines. The line over Eduardo must be higher than the line over Eric.
- Hugo is younger than Eric. The line for Hugo is shorter than the line over Eric.
- Hugo’s line is shortest, so Hugo is youngest.

Two-part problems require two calculations. On problem 2 we don’t need the lines, but in order to calculate how late Tia was, you need to learn how late Will was. Here’s how to do it:

- Don was 13 minutes late.
- Will arrived five minutes earlier than Don. Will arrived eight minutes late ($13 - 5 = 8$).
- Tia arrived 3 minutes later than Will, so she was 11 minutes late ($8 + 3 = 11$).

Lesson 10

Solving word problems using **deductive reasoning**; determining if there is sufficient information to answer the question; determining what information is needed to answer the question in a word problem; solving word problems using **reasoning**

- ① Eric, Eduardo and Hugo are brothers. Eduardo is older than Eric. Hugo is younger than Eric. Who is the youngest?
- 
- Eric Hugo Eduardo
- ② Tia, Will and Don were late to school. Don arrived 13 minutes late. Will was 5 minutes earlier than Don. Tia was 3 minutes later than Will. How many minutes late was Tia?
13 Don - 5 earlier = 8 Will
8 Will + 3 later = 11 Tia
11 minutes
- ③ Lawrence has 2 aunts and an uncle. Raquel has aunts and uncles. How many more uncles does Raquel have than Lawrence?
A. enough information
B. not enough information
- ④ Oliver and Bob were playing basketball. Oliver made five baskets. Bob made four more baskets than Oliver. How many baskets did Bob make?
A. enough information
B. not enough information
- 
- ⑤ Sherry painted 5 more pictures than her friend did. What information is needed to find out the number of pictures her friend painted?
a. total number of pictures painted
b. time it took to paint each picture
c. number of pictures Sherry painted
- ⑥ Tristan has two flower gardens in his yard. In one garden he has 24 flowers. What information is needed to find out how many flowers are in the other garden?
a. how much he paid for the flowers
b. the total number of flowers
c. how many flowers are roses
- 
- (Sherry's pictures) - 5 = pictures her friend painted
- (Total number of flowers) - 24 = number of flowers in the other garden

11

Lesson 11

Learning division facts with dividends up through 30 and dividends that are multiples of 5 (to 45), 10 (to 90), 11 (to 99) or 12 (to 48); recognizing **multiplication and division fact families**; learning the terminology for multiplication and division

Division problems can be read two different ways, both resulting in the same answer.

$$12 \div 3 = 4$$

12 divided into 3 equal groups will result in 4 in each group.



12 divided into groups of 4 will result in 3 equal groups.



For each multiplication fact that is given, write the other multiplication and division facts that go with it.

①	$\begin{array}{r} 8 \\ \times 3 \\ \hline 24 \end{array}$	$\begin{array}{r} 3 \\ \times 8 \\ \hline 24 \end{array}$	$3 \overline{)24}$	$8 \overline{)24}$	②	$\begin{array}{r} 4 \\ \times 6 \\ \hline 24 \end{array}$	$\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$	$4 \overline{)24}$	$6 \overline{)24}$
③	$\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array}$	$\begin{array}{r} 9 \\ \times 3 \\ \hline 27 \end{array}$	$3 \overline{)27}$	$9 \overline{)27}$	④	$\begin{array}{r} 7 \\ \times 4 \\ \hline 28 \end{array}$	$\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$	$4 \overline{)28}$	$7 \overline{)28}$
⑤	$\begin{array}{r} 12 \\ \times 3 \\ \hline 36 \end{array}$	$\begin{array}{r} 3 \\ \times 12 \\ \hline 36 \end{array}$	$3 \overline{)36}$	$12 \overline{)36}$	⑥	$\begin{array}{r} 10 \\ \times 6 \\ \hline 60 \end{array}$	$\begin{array}{r} 6 \\ \times 10 \\ \hline 60 \end{array}$	$6 \overline{)60}$	$10 \overline{)60}$

Parts of a multiplication problem

multiplicand (factor)
x multiplier (factor)
product

Parts of a division problem

quotient + remainder
divisor **dividend**

Use the examples on the right to identify each part.

⑦	product <u>35</u>	⑧	multiplier <u>7</u>	$\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array}$	$4 \overline{)32}$ $\underline{-32}$ 0
⑨	quotient <u>8</u>	⑩	dividend <u>32</u>		
⑪	multiplicand <u>5</u>	⑫	divisor <u>4</u>		

LEARNING TIPS:

Just as subtraction is the inverse or opposite of addition, division is the inverse of multiplication.

By recognizing the relationships in multiplication and division fact families, you can remember four different basic facts by memorizing just one.

For example, if students know

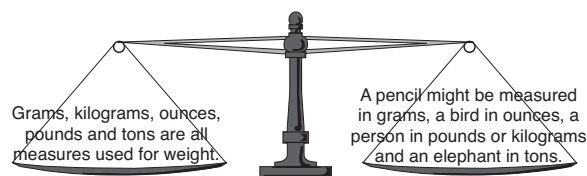
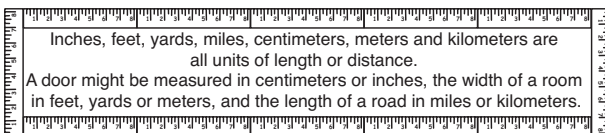
$2 \times 6 = 12$, they will also know
 $6 \times 2 = 12$,
 $12 \div 6 = 2$ and
 $12 \div 2 = 6$.

12

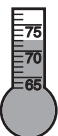
Lesson 12

Estimating standard measurements; reading measuring devices

Over time, standard units of measure have been developed, so we can describe the size of various items. Each sort of item is described by a different set of units.

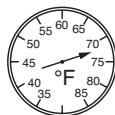


Cups, pints, quarts, gallons, milliliters and liters are all units of volume.
 A thimble filled with water might be measured in milliliters. If you fill up the gas tank of a car, it might be measured in gallons or liters.
 Milk is sold by the pint, quart or gallon.



Temperature is measured using a thermometer. Degrees **Fahrenheit** (F) or **Celsius** (C) are the terms used to describe how hot or cold it is. The symbol ° represents the word "degrees".

The temperature is 72 ° F.



LEARNING TIPS:

People have developed units of measure to help understand and compare things.

English standard units are related to the length of a (human) foot or stride. Metric units tend to be related to the length of a more consistent standard. A meter was originally 1 ten-millionth of the meridian of the earth. Now it's defined as the distance that a beam of light travels through a vacuum in a fraction of a second.

In the case of temperature, our two most common scales are named after the scientists who developed them - Fahrenheit and Celsius.

We need to know both English and metric units of measure and what things they are used to measure. Sometimes we need to convert from one system of measurement to another. This is usually done by multiplying or dividing.

LEARNING TIPS:

Math is a tool we use to understand relationships between things in the world around us.

Sometimes relationships can be seen most clearly when they are expressed in a table, where we can compare the values shown in columns and rows.

This lesson illustrates how you can find missing numbers by looking at relationships between the numbers shown in a table.

Ordinal numbers show the place or position of an object. Here's a way to remember what ordinals mean:

The **third** object always comes after first and second, and before fourth.

The number 3 doesn't always come before 4 and isn't always third in a number.

Lesson 13

Completing number patterns in a chart; recognizing **ordinal** number words up to 100

For each of these charts, what is each row counting by and what is the missing number?

①	hours spent babysitting	3	4	5	6	7	counting by	<u>1</u>
	dollars earned	\$15	\$20	\$25	\$30	\$35		<u>\$5</u>



②	rows of seats	2	3	4	5	6		<u>1</u>
	number of chairs	12	18	24	30	36		<u>6</u>

Ordinal numbers are used to indicate where an item is located in relation to others in the same set.

③ Felipe was waiting in line at the movie theater. He counted the number of people ahead of him in the line. He was the fifty-third person in line. How many people were ahead of him?

52 people

④ In Terri's graduating class she was the eighty-seventh student to get her diploma. How many students received their diplomas before Terri did?

86 students



LEARNING TIPS:

Equations are number sentences with an equal sign. Sometimes a value in the sentence is missing. By moving other numbers around we can determine the missing value.

We may need to multiply, divide, add or subtract to understand what is missing. As long as we do the same thing to each side of the equation, the number we are seeking will not be affected.

The challenge is to know which operation to perform. During the year, we will practice many ways of solving for an unknown value.

Lesson 14

Determining whether statements are true; filling in a missing number in an equation; determining the value of a letter that has been substituted for a number; solving algebraic equations; selecting the correct operation

The equal symbol (=) means "is equal to".

The not equal symbol (\neq) means "is not equal to".

$7 = 7$ 7 is equal to 7.

$6 \neq 3$ 6 is not equal to 3.

Equation is the term used for a number sentence with an equal symbol. If you are having trouble with the not equal symbol, put your finger over the symbol and then decide which symbol, = or \neq , is correct. If the correct symbol is there, the sentence is true. Otherwise, it is not true.

For a statement with an equal symbol (=) in it to be true, what is on the right side must equal what is on the left side. For each of these statements, circle the ones that are true and put an "X" on the ones that are not true.

① $4 + 5 = 2 + 7$ ② $8 - 3 = 2 + 2$ ③ $3 + 6 = 9 - 0$ ④ $8 - 6 = 3 + 4$

For each of these problems, replace the letter or the blank space with the number that will make the equation true.

⑤ $3 + 7 = \underline{8} + 2$ ⑥ $2 \times N = 9 - 3$ ⑦ $3 + 4 = \underline{\quad} - 2$
 $10 = 8 + 2$ $2 \times 3 = 6$ $7 = 9 - 2$

⑧ $15 \div R = 9 - 6$ ⑨ $\underline{\quad} - 4 = 9 - 3$ ⑩ $T + 4 = 5 + 5$
 $R = 5$ $10 - 4 = 6$ $T = 6$

For each of these statements, the operation or process symbol (+, -, x, \div) is missing. Put the correct symbol in each box.

⑪ $8 \boxed{-} 3 = 5$ ⑫ $2 \boxed{\times} 3 = 6$ ⑬ $8 \boxed{\div} 2 = 4$


15


Lesson 15

Defining **numerator** and **denominator**; determining the fractional part of a group of items when modeled or given in words, including extraneous information or the word "not"; learning that the whole is the sum of its parts; adding and subtracting fractions

The bottom portion of a fraction refers to the total number of parts in the group and is called the **denominator**. The top portion of the fraction is the part of the total group that you are referring to and is called the **numerator**.

For each problem, fill in the numerator and the denominator and then select the correct fraction from the choices.

①  $\frac{\boxed{2}}{\boxed{6}}$ are shaded. $\frac{2}{4}$ $\frac{4}{6}$ $\frac{2}{6}$

②  $\frac{\boxed{2}}{\boxed{5}}$ of the figures are circles. $\frac{2}{3}$ $\frac{2}{5}$ $\frac{3}{5}$

When writing fractions in words,

$\frac{3}{5}$ is written **three-fifths**.

$\frac{7}{13}$ is written **seven-thirteenths**.

③ Nine children are playing. $\frac{3}{9}$ of them are boys. How many girls are playing?

④ Corina has 15 apples. Seven-fifteenths of them are red. How many of her apples are not red?

$$9 - 3 = 6$$

$$15 - 7 = 8$$

6 girls

8 apples are not red

⑤ Rusty has 15 pets. Three-fifteenths are frogs. Two-fifteenths are lizards. Six-fifteenths are snakes and four-fifteenths are turtles. Rusty has

$$\begin{array}{r} 15 \\ - 4 \\ \hline 11 \end{array}$$



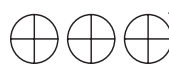
6 snakes, 3 frogs and 11 pets that are not turtles.

Draw pictures and use addition or multiplication to compute the answers.

⑥ How many fourths are there in 3 wholes?

$$4 + 4 + 4 = 12$$

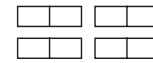
$$3 \times 4 = 12$$



12 fourths

⑦ Four strips of ribbon are cut into halves. How many pieces will there be?

$$2 + 2 + 2 + 2 = 8$$



$$4 \times 2 = 8$$

8 pieces

You can think of fractional parts as pieces. They can be added or subtracted.

⑧ 3 fourths - 2 fourths = 1 fourth



⑨ 5 sixths - 2 sixths = 3 sixths



⑩ $\frac{4 \text{ sevenths} + 2 \text{ sevenths}}{6 \text{ sevenths}}$

⑪ $\frac{4 \text{ eighths} - 3 \text{ eighths}}{1 \text{ eighth}}$

⑫ $\frac{4 \text{ fifths} - 2 \text{ fifths}}{2 \text{ fifths}}$

⑬ $\frac{3 \text{ tenths} + 4 \text{ tenths}}{7 \text{ tenths}}$

Fill in the missing number.

⑭ $\frac{3}{4} - \frac{2}{4} = \frac{\boxed{1}}{4}$

⑮ $\frac{3}{10} + \frac{4}{10} = \frac{\boxed{7}}{10}$

⑯ $\frac{4}{8} - \frac{3}{8} = \frac{\boxed{1}}{8}$

⑰ $\frac{5}{6} - \frac{2}{6} = \frac{\boxed{3}}{6}$

⑱ $\frac{4}{7} + \frac{2}{7} = \frac{\boxed{6}}{7}$

⑲ $\frac{4}{5} - \frac{2}{5} = \frac{\boxed{2}}{5}$

16

Lesson 16

Solving word problems involving multiplication and division; learning **multiplication facts** with products up to 50

For each problem, decide which operation (+, -, x or ÷) will be used. Then write a statement to solve the problem.

① Henry walked 4 miles a day for 3 days. How far did he walk in all?

$$\begin{array}{r} 4 \\ \times 3 \\ \hline 12 \end{array} \quad \begin{array}{r} 4 \\ + 4 \\ \hline 12 \end{array}$$

x or + 12 miles

② Fifteen cookies were divided equally among 3 children. How many cookies did each child get?

$$15 \div 3 = 5$$

÷ (or -) 5 cookies

③ Four friends each mailed 5 letters. How many letters did they mail in all?

$$\begin{array}{r} 5 \\ \times 4 \\ \hline 20 \end{array} \quad \begin{array}{r} 5 \\ + 5 \\ \hline 20 \end{array}$$

x (or +) 20 letters

④ Five brothers caught a total of 10 frogs. If they each caught the same number, how many frogs did they each catch?

$$10 \div 5 = 2$$

÷ (or -) 2 frogs

Write the multiplication problem for each addition problem.

⑤ $\begin{array}{r} 6 \\ 6 \\ 6 \\ 6 \\ 6 \\ 6 \\ 6 \\ + 6 \\ \hline 48 \end{array}$

⑥ $\begin{array}{r} 7 \\ 7 \\ 7 \\ 7 \\ 7 \\ 7 \\ 7 \\ + 7 \\ \hline 49 \end{array}$

⑦ $\begin{array}{r} 9 \\ 9 \\ 9 \\ 9 \\ 9 \\ 9 \\ 9 \\ + 9 \\ \hline 36 \end{array}$

⑧ $\begin{array}{r} 6 \\ 6 \\ 6 \\ 6 \\ 6 \\ 6 \\ 6 \\ + 6 \\ \hline 36 \end{array}$

⑨ $\begin{array}{r} 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ + 4 \\ \hline 32 \end{array}$

LEARNING TIPS:

Word problems present a situation to students and ask them to solve a math problem related to that scene.

In the first example, a boy walks a certain distance several times. You can determine the total distance he traveled by multiplication (or by repeated addition, but that is slower).

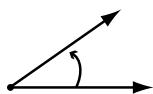
In the second example, a quantity of cookies is split up and given equally to a number of children. The problem can be solved by division (or by repeated subtraction, but that is more work).

Students have to think about the problem and decide which method would be easiest and accurate.

Glossary

Fifth Grade

A



Acute Angle an angle that is less than 90° . [lesson 30]**5069**

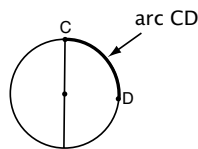
Adjoining Sides sides that meet to form the angles of a figure. [lesson 35]**5081**

AM (ante meridiem) the label for time from 12 midnight up to, but not including, 12 noon. [lesson 57]**5135**

Angle two rays or line segments that intersect or have the same endpoint. [lesson 30]**5069**

Arabic Numerals the digits used in our base ten (decimal) number system. Used to indicate place value. [lesson 108]**5257**

Arabic	1	2	3	4	5	6	7
Roman	I	II	III	IV	V	VI	VII
	8	9	10	50	100	500	1,000
	VIII	IX	X	L	C	D	M



Arc a continuous section of a circle's circumference. [lesson 75]**5177**

Area the size of an enclosed surface, measured in square units. [lesson 56]**5133**

Area of Parallelogram area = base x height. Area of a Parallelogram is measured in square units. [lesson 134]**5319**

Area of a Rectangle area = length x width. Area of a Rectangle is measured in square units. [lesson 56]**5133**

Area of a Triangle area = $1/2 \times$ (base x height). Area of a Triangle is measured in square units. [lesson 144]**5343**

Associative Property of Addition

the sum stays the same when the grouping of addends is changed. [lesson 96]**5229**

Associative Property of Multiplication

the product stays the same even if the grouping of factors is changed. [lesson 96]**5229**

Average a single number that describes a set of values. Normally, it is the mean, but it can also be the median or the mode. [lesson 102]**5243**

B

Bar Graph uses length of solid bars to represent numbers and compare data, such as quantities. [lesson 5]**5009**

Base in a number given in exponential form, the number that is raised to a given exponent. [lesson 138]**5329**

C

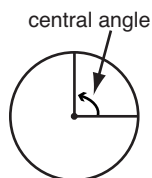
Celsius the metric-system scale for measuring temperature by which there are 100 degrees between the freezing and boiling points of water. [lesson 12]**5027**

Center the point in a circle that is an equal distance from any point on the circumference of the circle. [lesson 75]**5177**

Central Angle an angle formed at the center of a circle. [lesson 75]**5177**

Certain Event an event that will definitely happen. A certain event has a probability of 1. [lesson 60]**5141**

Chord a line segment connecting two points on a circle's circumference. [lesson 75]**5177**



Circle a closed curve having the same distance between the points on its circumference and a fixed point (the center). [lesson 75]5177

Circle Graph visually shows how a whole is broken into parts. Compares each part with the other parts and the whole. Also called a pie graph. [lesson 5]5009

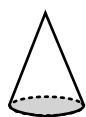
Circular Base a special side of a cone or cylinder that forms a closed curve. In a cylinder, there are two circular bases that are parallel and congruent. [lesson 20]5045

Circumference the perimeter of a circle. [lesson 75]5177

Commutative Property of Addition the sum remains the same when the order of the addends change. [lesson 32]5075

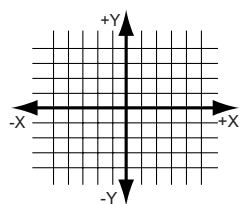
Commutative Property of Multiplication the product remains the same when the order of the factors is changed. [lesson 32]5075

Composite Number a number with more than two factors [lesson 62]5147



Cone a three-dimensional geometric figure with one vertex, one curved edge, one circular base and one curved surface. [lesson 20].5045

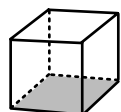
Congruent Figures figures with identical angles and sides of equal lengths. They are same shape and size. [lesson 30]5069



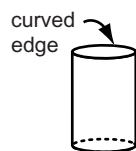
Coordinate Grid grid on which multiple points may be located and referenced by their horizontal and vertical distance from the origin [lesson 52]5123

Coordinate Points a pair of numbers used to reference a point on a coordinate grid. (2, -3) [lesson 52]5123

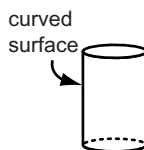
Cost Per Unit the money amount needed to pay for one item. [lesson 97]5231



Cube a three-dimensional figure with 8 vertices, 12 congruent straight edges and 6 congruent square flat faces. [lesson 20]5045



Curved Edge the curved line segment that forms where a curved surface meets a circular base. [lesson 20]5045



Curved Surface the curved region on three-dimensional figures. [lesson 20]5045

Cylinder a three-dimensional figure with 2 curved edges, 2 circular bases and one curved surface. [lesson 20]5045

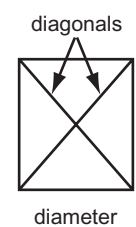
D

Decimal (1) the symbol used to separate whole numbers (dollar amounts) from parts of the whole (cents), (2) a word that refers to 10, or (3) our math system that is based on 10 different digits. [lesson 3]5005

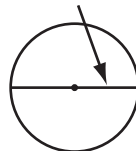
Decimal Number a number with a decimal point. [lesson 65]5153

Deductive Reasoning a logical process that begins with evidence and draws a conclusion. Used in problem solving, as in word problems. [lesson 10]5021

Denominator the portion of a fraction written below the line. It refers to the total number of parts into which a whole number is divided. [lesson 15]5033



Diagonal a line segment connecting two nonadjacent vertices of a polygon. A diagonal must be completely inside the figure. [lesson 35]5081



Diameter a line segment that passes through the center of the circle and connects to either side of the circle. [lesson 75]5177

Distributive Property of Multiplication a sum being multiplied by another number will have the same result if the addends are multiplied and then totaled. [lesson 96] ..5229

Dividend a quantity to be divided (by a divisor) [lesson 11]5025

Divisor the quantity by which the dividend is to be divided. [lesson 11]5025

E

Edge the line segment where two faces on a three-dimensional figure meet. It may be flat or curved. [lesson 20]5045

Empty Set a set containing no items. Also called a null set. [lesson 53]5125

Equally Likely having the same chance or probability. [lesson 60]5141

Equation a number sentence that includes an equal symbol (=). [lesson 14] 5031

Equilateral Triangle a triangle having 3 sides of equal length. [lesson 30]5069

Equivalent Fractions fractions that have the same value but are expressed with different numbers. For example, $\frac{4}{8}$ is equivalent to $\frac{2}{4}$ and $\frac{1}{2}$. [lesson 31]5073

Estimate to calculate a number close to the exact answer. [lesson 25]5057

Even Numbers numbers that can be divided into two equal groups. [lesson 9]5019

Exponent in a number given in exponential form, the number that tells how many times the base is used as a factor. [lesson 138]5329

Exponential Form a way of writing a number using exponents when the same factor is used more than once. [lesson 138]5329

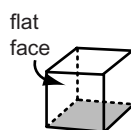
F

Face a plane figure that is one side of a three-dimensional figure. [lesson 20] 5045

Fact Family the related addition and subtraction or multiplication and division facts involving the same numbers. [lesson 1]5001

Factor a number that divides evenly into another number. [lesson 11] 5025

Fahrenheit (F) a temperature scale where the freezing point of water is 32° and the boiling point is 212° . Daniel Gabriel Fahrenheit (1686-1736) invented the Fahrenheit scale and the mercury thermometer. [lesson 12]5027



Flat Face a two-dimensional polygon that forms one of the sides of a three-dimensional figure. [lesson 20]5045

Flip the change in location of a figure over a line that results in a mirror image. See **Reflection**. [lesson 45]5105

Formula a mathematical statement or rule used in calculations. [lesson 54]5127

G

Greater Than describes a number of higher, or larger, value than another number. The symbol for this concept is " $>$ ". [lesson 6] ..5013

Greatest Common Factor the largest factor of two or more numbers. [lesson 88] 5209

Greatest to Least the arrangement of numbers from highest value to lowest value. [lesson 6]5013

H

Height the vertical dimension of a 2- or 3-dimensional figure. [lesson 56]5133

Hexagon a polygon with exactly six sides. [lesson 42]5099

Histogram a graph in which the labels for the bars are numerical intervals. Used to compare data. [lesson 40]5093

I

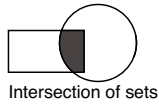
Impossible Event an event with the probability of zero. [lesson 60]5141

Improper Fraction a fraction in which the numerator is greater than or equal to the denominator. [lesson 68]5161

Inequality a number sentence that compares two unequal expressions. [lesson 19]5043

Integers whole numbers and their opposites. (-2,-1,0,1,2) [lesson 150]5357

Intersecting Lines lines that cross at some point. [lesson 35]5081



Intersection of Sets the set of values or items that are within all the sets being evaluated. [lesson 53] **5125**

Isoceles Triangle a triangle having only 2 sides of equal length. [lesson 30] **5069**

J K L

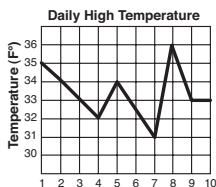
Leap Year a year in the Gregorian calendar in which February has 29 days, resulting in a 366-day year. [lesson 51] **5121**

Least to Greatest the arrangement of numbers from lowest value to highest value. [lesson 6] **5013**

Length the distance along a figure from one point to another. [lesson 56] **5133**

Less Than describes a number of smaller, or lesser, value than another number. The symbol for this concept is " $<$ ". [lesson 6] **5013**

Line a two-dimensional straight path that extends in both directions without any endpoints. [lesson 17] **5039**



Line Graph a diagram upon which plotted points from a set of data form a line that shows change over time. [lesson 5] **5009**

Line Segment a portion of a line that has two endpoints. [lesson 17] **5039**

Line of Symmetry a line that divides a figure so each half is a mirror image of the other. [lesson 45] **5105**

Lowest Common Multiple the multiple of two or more numbers having the least value. [lesson 38] **5089**

M

Mean a description of a set of values that is calculated by adding the values and dividing that sum by the number of items in the set. Commonly called average. [lesson 115] ... **5273**

Median a description of a set of values that is obtained by putting the values in order from least to greatest and selecting the middle value for an odd number of items or by calculating the mean of the two middle values for an even number of items. [lesson 115] **5273**

Mixed Number a number consisting of a whole number and a fraction. [lesson 23] .. **5053**

Mode a description of a set of values that is obtained by selecting the value within the set that occurs most frequently. A set of values may have more than one mode. [lesson 115] ... **5273**

Multiple the product of two whole numbers. [lesson 28] **5065**

Multiplicand the factor being multiplied in a multiplication problem. [lesson 11] **5025**

Multiplication Fact a problem in which a multiplicand is multiplied by a multiplier to form a product. [lesson 2] **5003**

Multiplier the factor being multiplied by in a multiplication problem. [lesson 11] **5025**


N

Negative Number a number less than zero. [lesson 89] **5211**

Null Set a set containing no items. Also called an empty set. [lesson 53] **5125**

Numerator the portion of the fraction written above the line. It represents parts of the whole. [lesson 15] **5033**

O

 **Obtuse Angle** an angle that measures more than 90° and less than 180° . [lesson 30] **5069**

Octagon a polygon with exactly eight sides. [lesson 42] **5099**

Odd Number a number that cannot be divided into two equal groups. [lesson 9] **5019**

Ordered Pair a pair of numbers used to locate a point on a coordinate grid. The horizontal (x-coordinate) is given first and the vertical (y-coordinate) is last. [lesson 52] **5123**

Order of Operations the rules describing what sequence to use when adding, subtracting, multiplying or dividing. [lesson 18] **5041**

Order of Symmetry the number of points around which a figure can have rotational symmetry. [lesson 45] **5105**

Ordinal Numbers a whole number that indicates position in a sequence: first, second, etc. [lesson 13] **5029**

Origin the intersection of the x- and y-axes on a coordinate grid. Its designation is (0, 0). [lesson 52] **5123**

P

Parallel Lines lines that never cross, no matter how far they extend. They are always the same distance apart. [lesson 35] **5081**

Parallelogram a quadrilateral in which opposite sides are parallel and congruent. [lesson 35] **5081**

Pattern a regularly repeated arrangement of letters, numbers, shapes, etc. [lesson 42] .. **5099**

Pentagon a polygon with exactly five sides. [lesson 42] **5099**

Percent a ratio that compares a number to 100 using the % symbol. [lesson 83] **5197**

Perimeter the distance around a closed figure. [lesson 54] **5127**

Perpendicular Lines lines that intersect to form "square corners" or right angles (90°) where they cross. [lesson 35] **5081**

Pi (π) the ratio of the circumference of a circle to its diameter. Pi is approximately equal to 3.14, or $22/7$. [lesson 145] **5345**

Picture Graph a graph in which symbols and pictures are used to represent and compare data. [lesson 5] **5009**

Plane Figure any two-dimensional figure. [lesson 20] **5045**

PM (post meridiem) the label for time from 12 noon up to, but not including, 12 midnight. [lesson 57] **5135**

Polygon a plane figure made up of 3 or more straight lines. [lesson 20] **5045**

Positive Number A number greater than zero. [lesson 89] **5211**

Prime Factor a factor that is also a prime number. [lesson 62] **5147**

Prime Number a number that has itself and one as its only factors. [lesson 62] **5147**

Probability the likelihood that an event will occur. [lesson 60] **5141**

Product the number obtained by multiplying two or more numbers together. [lesson 11] **5025**

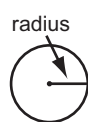
Property of One any number multiplied by one will have itself as the product. [lesson 96] **5229**

Q

Quadrilateral a polygon with 4 sides. [lesson 35] **5081**

Quotient the number obtained by dividing one number by another. [lesson 11] **5025**

R



Radius a line segment from the center of a circle to any point on the circle. [lesson 75] **5177**

Ratio a comparison of two numbers or measures using division. [lesson 55] **5129**



Line



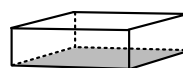
Line Segment



Ray

Ray a part of a line that has only one endpoint and extends indefinitely in only one direction. [lesson 30] ... **5069**

Reasoning mental process by which one draws conclusions from certain information. [lesson 10] .. **5021**



Rectangular Prism a three-dimensional figure with 8 vertices, 12 straight edges and 6 rectangular flat faces. [lesson 20] **5045**

Rectangular Pyramid a three-dimensional figure with 5 vertices, 8 straight edges, 4 triangular flat faces and 1 rectangular base. [lesson 20]**5045**

Reflection the change in location of a figure across a straight line that results in a mirror image. See **Flip**. [lesson 45]**5105**

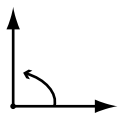
Regular Hexagon a hexagon with all sides the same length and all angles the same measure. [lesson 42]**5099**

Regular Octagon an octagon with all sides the same length and all angles the same measure. [lesson 42]**5099**

Regular Pentagon a pentagon with all sides the same length and all angles the same measure. [lesson 42]**5099**

Remainder the number left over when one number is divided by another. [lesson 11] ..**5025**

Rhombus a parallelogram with all 4 sides the same length. [lesson 71]**5169**



Right Angle an angle that measures exactly 90° . [lesson 30] **5069**

Roman Numerals Numerical symbols system created by the ancient Romans. It uses what we consider letters and is not based on place value. [lesson 108]**5257**

Arabic	1	2	3	4	5	6	7
Roman	I	II	III	IV	V	VI	VII
	8	9	10	50	100	500	1,000
	VIII	IX	X	L	C	D	M

Rotate to turn a figure around a point. See **Turn**. [lesson 45]**5105**

Rotational Symmetry property of a figure that can be rotated less than a full turn around a point and still look identical to the original figure. [lesson 45]**5105**

Rounding process by which digits are changed in a specified place using certain rules. Used for estimating or testing the reasonableness of a mathematical computation. [lesson 25]**5057**

S

Scalene Triangle a triangle that has three sides with different lengths. [lesson 30] ...**5069**

Similar Figures two figures that have the same proportions but are not the same size. [lesson 45]**5105**

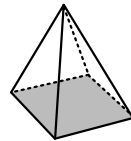
Slide the movement of a geometric figure without changing its appearance. See **Translation** [lesson 45]**5105**

Solid Figure an object that has length, width and height, also called three-dimensional. [lesson 20]**5045**



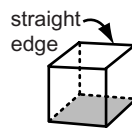
Sphere a three-dimensional figure made up of points on the surface that are all an equal distance from the center. [lesson 20]**5045**

Squared Number a number that is multiplied once by itself. [lesson 145]**5345**



Square Pyramid a three-dimensional figure with 5 vertices, 8 straight edges, 4 triangular flat faces and 1 square base. [lesson 20] ..**5045**

Stem and Leaf Plot organizes the numbers in data so the numbers themselves make the display. Often used when there is a wide range of data. [lesson 115]**5273**



Straight Edge the line segment formed where flat faces meet. [lesson 20]**5045**

Surface area the total area of the faces and curved surfaces of a three-dimensional figure. [lesson 137]**5327**

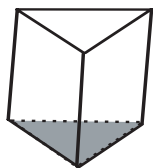
T

Three-Dimensional Figures figures that have length, width and height, also called solids. [lesson 20]**5045**

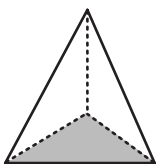
Transformation the movement of every point in a plane figure from one position to another. [lesson 45]**5105**

Translation the movement of a geometric figure without changing its appearance. See **Slide** [lesson 45] **5105**

Trapezoid a quadrilateral with only one pair of parallel sides. [lesson 71] **5169**



Triangular Prism a three-dimensional figure with 6 vertices, 6 straight edges, 3 rectangular flat faces and 2 triangular flat faces. [lesson 20] **5045**

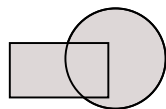


Triangular Pyramid a three-dimensional figure with 4 vertices, 6 straight edges, and 4 triangular flat faces. [lesson 20] **5045**

Turn to rotate a figure around a point. See **Rotate**. [lesson 45] **5105**

Two-Dimensional Figures figures that only have length and width. Also called plane figures. [lesson 20] **5045**

U

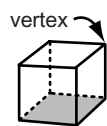


Union of sets

Union of Sets the values or items that are within any of the sets being evaluated. [lesson 53] **5125**

V

Venn Diagram a diagram that shows the relationships among different sets of items. [lesson 53] **5125**



Vertex where at least three straight edges (three-dimensional figures) or two straight lines (two-dimensional figures) come together, plural is vertices. [lesson 20] **5045**

Vertices the plural of vertex. See **Vertex**. [lesson 20] **5045**

Volume a type of measurement that measures the number of cubic units it takes to fill a three-dimensional figure. [lesson 72] **5171**

W

Whole Number any of the numbers 0, 1, 2, 3, etc. [lesson 62] **5147**

Width the horizontal dimension of a 2- or 3-dimensional figure. [lesson 56] **5133**

X

X-Axis on a coordinate grid, the horizontal axis. [lesson 52] **5123**

X-Coordinate in an ordered pair, the value that is written first. [lesson 52] **5123**

Y

Y-Axis on a coordinate grid, the vertical axis. [lesson 52] **5123**

Y-Coordinate in an ordered pair, the value that is written last. [lesson 52] **5123**

Z

Zero Property of Addition any number added to zero will have itself as the sum. [lesson 96] **5229**

Zero Property of Multiplication any number multiplied by zero has a product of zero. [lesson 96] **5229**

Place Value Units

1	3	4	,	2	6	7	,	5	9	0	,	0	8	9	,	7	0	6
hundred trillions	ten trillions	trillions		hundred billions	ten billions	billions		hundred millions	ten millions	millions		hundred thousands	ten thousands	thousands		hundreds	tens	ones
trillions				billions				millions				thousands						

Math Symbols

- + add
- subtract
- x multiply
- ÷ divide
- = equal
- ≠ not equal
- ≈ approximately equal
- ~ similar
- ≅ congruent
- < less than
- > greater than
- ≤ less than or equal
- ≥ greater than or equal
- ± plus or minus
- ∞ infinity
- ∅ null set
- π pi = 3.1416
- ∥ parallel
- ⊥ perpendicular

Punctuation

- % percent
- . decimal point
- , comma (1,000's)
- (open parenthesis
-) close parenthesis
- [open bracket
-] close bracket
- ° degrees
- ' minutes / feet
- " seconds / inches

Currency

- \$ dollar
- ¢ cent
- £ pound
- € euro
- ¥ yen

Integer Number Line

