Horizons
Math Sampler

Welcome,

I gladly welcome you to AOP's *Horizons Math Sampler*. I am hopeful that you will find the information here to be enlightening and rewarding. We pledge to do our utmost to maximize your product training time by providing you with carefully selected materials that describe the curriculum. Our experienced personnel are available and eager to help answer your questions.

This booklet is intended to help you find your way within the product. I have spent a number of years writing, designing, editing and improving the Horizons materials. Information and materials have been assembled in this booklet to describe and illustrate the distinguishing features of Horizons Math. If I were to approach a potential user with the objective of introducing and convincing them that Horizons Math is a great product, I would want to know the information that is given here.

Our entire staff looks forward to a long and rewarding relationship as we work together in meeting the educational needs of today's youth. We are interested in any suggestions that you might have to help us better improve the services and products that we offer. We encourage you to take a few minutes of your time to let us know how we are doing. Thank you for your confidence in our ability to inform you and for taking this time to explore the Horizons Math curriculum; we look forward to seeing you successfully use and promote these materials.

Also we would like to make the same commitment to you that we have made to the thousands of schools, parents and students who have chosen us in the past: to provide you with superior curriculum options and service beyond your expectations.

Thanks for choosing Horizons Math,

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Horizons
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Contents

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Horizons™

Alpha Omega Publications ®

What Makes Horizons MATH Effective?

Horizons Math is a carefully designed curriculum which makes elementary math easy and enjoyable for both teachers and students. Brightly illustrated lessons and a variety of activities make learning fun. Complete Teacher materials make it easy to plan and monitor your student's progress. Since teacher/student interaction is an integral part of this program, both the teacher and student materials are necessary for a comprehensive exposure to concepts. Each grade consists of 160 lessons divided into two student books and a Teacher's Handbook with a complete daily lesson guide, worksheet masters, and answer keys.

CREATED TO HELP CHILDREN EXCEL, the Horizons math curriculum instills the fundamentals of basic educational skills into young people so they can be prepared for greater endeavors. Horizons Math presents a unique blend of learning styles and concept development for the critical first years of school. Some curriculums major in drilling students into boredom. Others challenge students through reasoning to the point of frustration. Still others abandon all academics to major only on learning-by-doing. Since not every child learns easily with one given method of presentation, the Horizons line incorporates a balance of the best aspects of all of these learning styles without overemphasizing one particular style of learning. Reasoning, manipulatives, and rote memory all play an important role…

Higher Reasoning Abilities

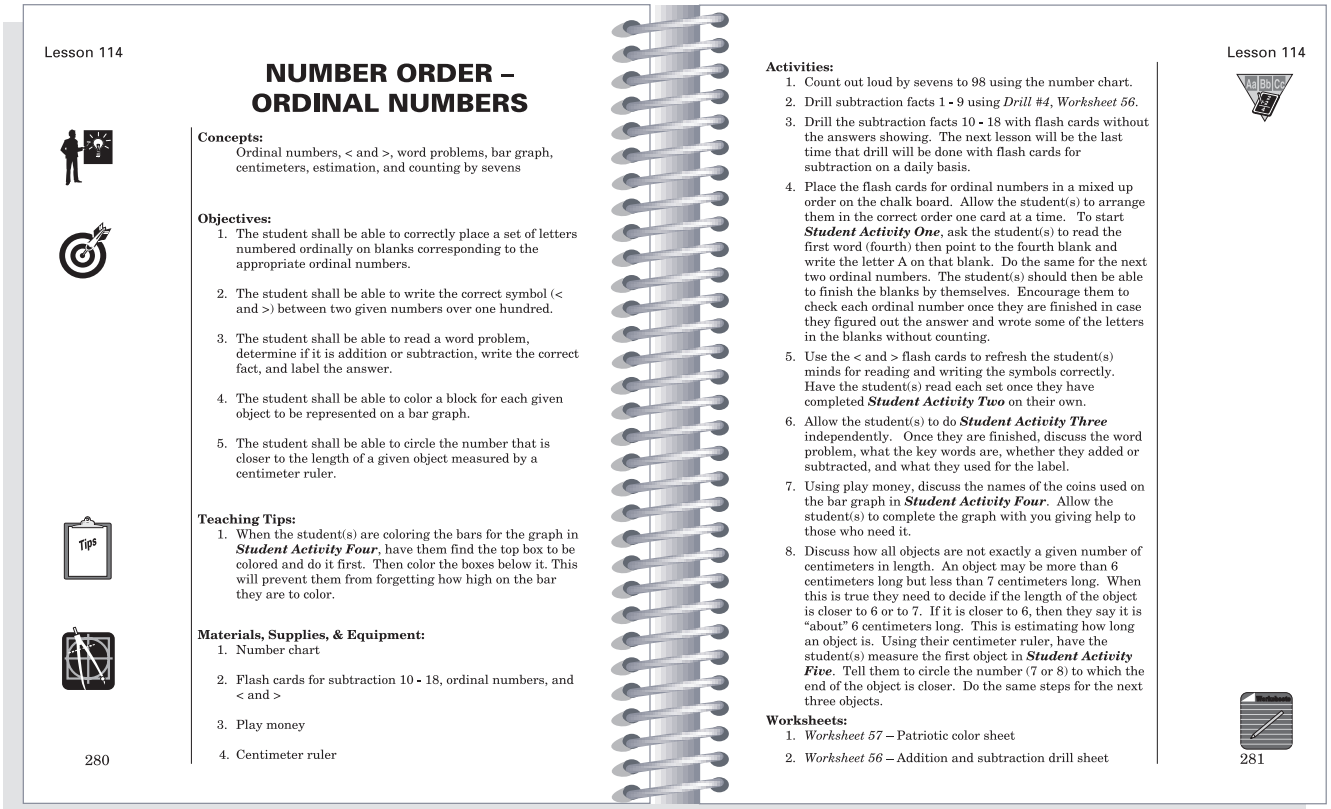
Analytical reasoning skills are used in making daily decisions. Beginning with the introduction of each concept, Horizons teaches these thinking skills to help students gain a complete understanding of the concept. Students begin to reason from the principles taught in Horizons lessons and apply them to real-life situations.

"Hands-On" Learning (Manipulatives)

Some students can better visualize the application of principles by physically demonstrating them. Hands-on learning, or tactile memory, is included in every Horizons lesson through the use of manipulatives. The Teacher's Guide contains daily lists of activities and inexpensive materials which can be used for hands-on learning.

Memorization and Drill

Horizons Math stresses memorization of basic math facts and computational skills. Students will progress rapidly when they can instantly recall basic math facts. A built in repetition/review cycle makes the process simple to follow. Drill is used to reinforce the concepts being introduced.



Lesson 114

NUMBER ORDER – ORDINAL NUMBERS

Concepts:
Ordinal numbers, < and >, word problems, bar graph, centimeters, estimation, and counting by sevens

Objectives:
1. The student shall be able to correctly place a set of letters numbered ordinally on blanks corresponding to the appropriate ordinal numbers.
2. The student shall be able to write the correct symbol (< and >) between two given numbers over one hundred.
3. The student shall be able to read a word problem, determine if it is addition or subtraction, write the correct fact, and label the answer.
4. The student shall be able to color a block for each given object to be represented on a bar graph.
5. The student shall be able to circle the number that is closer to the length of a given object measured by a centimeter ruler.

Teaching Tips:
1. When the student(s) are coloring the bars for the graph in ***Student Activity Four***, have them find the top box to be colored and do it first. Then color the boxes below it. This will prevent them from forgetting how high on the bar they are to color.

Materials, Supplies, & Equipment:
1. Number chart
2. Flash cards for subtraction 10 - 18, ordinal numbers, and < and >
3. Play money
4. Centimeter ruler

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Lesson 114

Activities:
1. Count out loud by sevens to 98 using the number chart.
2. Drill subtraction facts 1 - 9 using *Drill #4*, *Worksheet 56*.
3. Drill the subtraction facts 10 - 18 with flash cards without the answers showing. The next lesson will be the last time that drill will be done with flash cards for subtraction on a daily basis.
4. Place the flash cards for ordinal numbers in a mixed up order on the chalk board. Allow the student(s) to arrange them in the correct order one card at a time. To start ***Student Activity One***, ask the student(s) to read the first word (fourth) then point to the fourth blank and write the letter A on that blank. Do the same for the next two ordinal numbers. The student(s) should then be able to finish the blanks by themselves. Encourage them to check each ordinal number once they are finished in case they figured out the answer and wrote some of the letters in the blanks without counting.
5. Use the < and > flash cards to refresh the student(s) minds for reading and writing the symbols correctly. Have the student(s) read each set once they have completed ***Student Activity Two*** on their own.
6. Allow the student(s) to do ***Student Activity Three*** independently. Once they are finished, discuss the word problem, what the key words are, whether they added or subtracted, and what they used for the label.
7. Using play money, discuss the names of the coins used on the bar graph in ***Student Activity Four***. Allow the student(s) to complete the graph with you giving help to those who need it.
8. Discuss how all objects are not exactly a given number of centimeters in length. An object may be more than 6 centimeters long but less than 7 centimeters long. When this is true they need to decide if the length of the object is closer to 6 or to 7. If it is closer to 6, then they say it is "about" 6 centimeters long. This is estimating how long an object is. Using their centimeter ruler, have the student(s) measure the first object in ***Student Activity Five***. Tell them to circle the number (7 or 8) to which the end of the object is closer. Do the same steps for the next three objects.

Worksheets:
1. *Worksheet 57* – Patriotic color sheet
2. *Worksheet 56* – Addition and subtraction drill sheet

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What Makes the Horizons Math Teacher's Guide So Unique?

The Teacher's Guide is Complete and User-friendly

The sequence of each Horizons Teacher's Guide will take you step-by-step through an entire year. It contains activities not found in the student texts that are important for the accomplishment of the curriculum objectives. It also contains many extra features that you can choose to customize or adapt to your own style of teaching.

Concepts and Objectives are Clearly Defined and Simply Stated

The concepts covered in each lesson are defined and listed in the order in which they appear. Expectations for student performance and progress are given for each lesson. Should a student fall behind, diagnosis and remedy are easily accomplished. There are even helps like the Appearance of Concepts table to tell you exactly where each concept is used.

Readiness Evaluation Test Included

A readiness evaluation test is included in the Teacher Handbook for Grades 1–6. This test is designed to help you know the strengths and weaknesses of each student at the beginning of each grade level.

Complete Daily Lesson Guides Eliminate Teacher Guesswork

Each Activities section provides detailed instructions that take the guesswork out of teaching. The items in this section of the Teacher's Guide correlate to the activities in the student book. Instructional examples are provided for activities. Materials and equipment needed to teach are clearly listed.

Teaching Tips Help the Veteran and the Novice Teacher

Any teacher can be a "pro" by using these step-by-step tips on activities for each lesson. Whether you're an experienced teacher, or a novice, you'll appreciate the hours of time-saving organization this resource provides.

Worksheets Provide Proper Drill and Practice

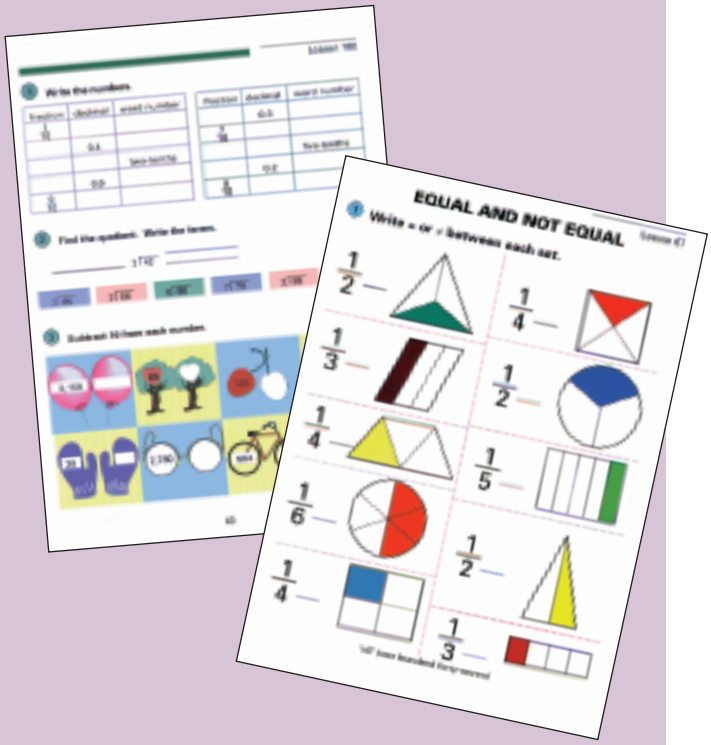
Reproducible worksheets provide drill for initial learning, extra practice, or individual challenges. Easy access to answers for the student lessons is provided in a handy format in your Teacher's Guide.

Horizons Math for Grades K-6

Horizons Math provides a balanced and well organized approach to primary math through analytical reasoning, manipulatives (hands-on learning), memorization and drill. Every concept, from addition and subtraction to graphs and estimation, follows a deliberate pattern of introduction and gradual development to ensure student success. Fundamental concepts already learned in earlier units are reviewed in subsequent grade levels for true mastery. Every math concept follows a deliberate pattern of gradual development in each grade level, as well as throughout all seven grade levels.

What makes Horizons Math so effective?

- Effective use of manipulatives
- Looking at concepts "from all angles"
- Systematic practice with variety
- Each lesson begins with a new concept or an expansion of a previously covered concept
- Full color illustrations help with understanding abstract material
- Method of study is consistent throughout the program



KINDERGARTEN

- Counting by 1's, 5's, 10's, 2's, 4's, to 100
- Recognition of all families to 100
- Writing of all families to 100
- Value of all single-digit numbers
- Naming the number that comes after for all families to 100
- Naming the number that comes before for all families to 100
- Naming the number that comes between for all families to 100
- Place value for ones, tens
- Recognition of ordinal numbers, even and odd numbers

- Adding a single digit to all families without regrouping
- Subtracting a single digit from all families without regrouping

- Recognition, value, and use of the penny, nickel, dime, quarter, half dollar, and dollar
- Naming time on the hour, half-hour, quarter-hour and 5 minutes. Recognition of digital time hours and minutes
- Naming the days of the week, the months of the year and the seasons
- Reading lengths in inches and centimeters, perimeter in inches
- Identify and count cup, quart, gallon and liter

- Comparisons of items and quantities that are different, pairs, twins, belong together, tall, short, long, larger number and smaller number
- Recognition of whole, 1/2, 1/3 and 1/4

- Recognition of black, yellow, green, red, blue, brown, orange, and purple
- Recognition of circle, square, triangle, rectangle, octagon, cone, sphere and cylinder
- Recognition of the direction and position of right, left, up, down, top, bottom, middle, inside, outside, first, next, last, front and back

- Read and complete bar graphs and pictographs
- Determine what comes next

GRADE 1	GRADE 2	
• Counting by 1's, 2's, 5's, 10's, 3's, 6's, 9's, 4's, 8's, and 7's to 100; by 1's from 100-200; even and odd numbers; tally marks; word numbers to 100; one-to-one correspondence • Ordinal numbers to 10; the number that comes between, after, or before a given number • Distinguish between big and little, large and small, tall and short, less than and greater than, long and short, equal and not equal • Place value for ones, tens, hundreds	• Counting by 1's, 5's, 10's, 2's, 3's, 6's, 9's, 4's, 8's, and 7's to 100; by 1's from 100-999; even and odd numbers; tally marks; word numbers to 999; Roman numerals • Ordinal number to 100; the number that comes between, after, or before a given number • Distinguish between greater than and less than, equal and not equal • Place value for ones, tens, hundreds, thousands	**Numbers, Order, & Value**
• Facts from 1-18, two double and triple digit numbers, three single and double digit numbers, horizontal and vertical addition, addition with carrying in 1's, word problems • Facts from 1-18, two double and triple digit numbers without borrowing, horizontal and vertical subtraction, word problems	• Carrying in 1's, 10's, and 100's columns; two and three numbers single, double, triple, and four digit; four numbers, single and double digit; horizontal and vertical addition; word problems; word sentences; equations • Borrowing in the 1's and 10's columns; two single, double, triple, and four digit numbers; horizontal and vertical subtraction; word problems and sentences; equations	**Addition & Subtraction**
• Months of the year and days of the week • Hour, half hour, quarter hour • Penny, nickel, dime, quarter, dollar, adding • Inches, centimeters, dozen, ounce, cup, pint, quart, gallon, and pound	• Months of the year, days of the week, abbreviations • Hour, half hour, quarter hour, five minutes, equivalents • Penny, nickel, dime, quarter, half dollar; one, fine, ten, and twenty dollar bills; counting, adding, subtracting, and multiplying money • Inches, centimeters, linear equivalents, English weights equivalents, liquid measure equivalents, dozen, optical illusion, map reading • Fahrenheit thermometer	**Ratios, Measurement, & Decimals**
• 1/2, 1/3, 1/4, 1/5, 1/6, 1/8 • Groups	• Fractional part of whole, fractional part of a set, fraction words • Groups • Comparison of two numbers	**Fractions & Comparison**
• Circle, square, triangle, oval, diamond, octagon, sphere, cylinder, cube, cone	• Circle, square, triangle, rectangle, oval, diamond, octagon, pentagon, hexagon, sphere, cylinder, cube, cone, pyramid, and symmetry • Recognize and find area, perimeter, volume	**Equations, Colors, & Geometry**
• Bar graphs • Numbers, events • Rounding number on number line, height, length, quantity	• Bar graphs, line graphs, pictographs, grids • Numbers, shapes, objects, events • Rounding number, height, length, and time	**Graphs, Estimation, & Solving**
	• Multiplication facts 0-10, word problems	**Multiplication & Division**

	GRADE 3	GRADE 4
Numbers, Order, & Value	• Word numbers to 1,000,000; expanded and standard form; counting by 1's, 2's,'3's, etc.; Roman numerals; properties of one and zero • Ordinal numbers, before and after, greater than and less than, equal and not equal, estimation, rounding number to ten and hundred, order principle, parenthesis, distributive property, positive and negative numbers • Place value for ones, tens, hundreds, thousands, ten thousands, hundred thousands, millions	• Word numbers through hundred billion; expanded form; even and odd numbers; roman numeral; divisibility; prime and composite; prime factorization • Place value for ones, tens, hundreds, thousands, ten thousands, hundred thousands, millions, ten millions, hundred millions, billions, ten billions, hundred billions • Ordinal numbers through 100; rounding to the nearest tenth, hundreth, thousandth; greater than and less than; equal and not equal
Addition & Subtraction	• Addend, sum, carrying to four digits, estimate answers, word problems and sentences, equations • Difference, minuend, subtrahend, borrowing, estimate answers, word problems, equations	• Addition properties and terms; addition with two, three, four, five and six-digit numbers with carrying; equations; horizontal to vertical; column addition; missing addends; estimating; and adding money • Subtraction properties and terms; subtraction with two, three, four, five and six-digit numbers with borrowing; equations; horizontal to vertical; estimating; subtracting money
Ratios, Measurement, & Decimals	• Months of the year, days of the week, abbreviations, and word problems • Hour, half hour, quarter hour, five minutes, minute, a.m. and p.m., equivalents, estimate time, word problems, elapsed time • Penny, nickel, dime, quarter, half dollar; one, five, ten, twenty dollar bills; count, adding, subtracting, multiplying; add and subtract horizontally and vertically; round; word problems • English linear, liquid, weight and equivalents; Metric linear, liquid, weight and equivalents; dozen, map reading • Fahrenheit and Celsius • Decimal expressed in the tenths; relationship of fraction, mixed number, and decimal; add and subtract horizontal to vertical; multiply single digit multiplier by dollars and cents	• Review telling time; A.M. and P.M.; Determine century; time equivalents; elapsed time; calendar; time zones • Standard and metric linear, liquid, and weight equivalents; temperature reading and understanding Fahrenheit and Celsius; millimeter, centimeter, decimeter, meter, decameter, hectometer, kilometer • Fractions to decimals; word numbers to hundredth's place; comparing and ordering decimals; adding decimals vertically and horizontally; subtracting decimals; estimating decimals; estimating decimals with money • Definition of a ratio; writing simple ratios; multiply and divide to find equal ratios
Fractions & Comparison	• Fractional part of whole, fractional part of a set, fraction words, equivalent fractions, mixed numbers, renaming • Comparison of two numbers and word problems	• Fractional part of a whole; word fractions; part of a set; equivalent fractions; reducing fractions; adding and subtracting fractions with like and unlike denominators; adding and subtracting mixed numbers
Equations, Colors, & Geometry	• Circle, square, triangle, rectangle, oval, diamond, octagon, pentagon, hexagon, sphere, cylinder, cube, cone, pyramid, trapezoid, rhombus, parallelogram, rectangular prism; symmetry, congruent and similar shapes, line, line segment, endpoint, ray, angles • Recognize and find perimeter, area of rectangle, square • Find volume of cube, rectangular prism	• Shapes and solids; symmetry; congruent and similar figures • Lines: line segment, ray, endpoint, parallel, intersecting, perpendicular lines • Angles: rays, vertex, acute, obtuse, right • Circles: diameter, radius • Finding the perimeter, area and volume of an object • Addition, subtraction, multiplication, and division of equations
Graphs, Estimation, & Solving	• Bar graphs, line graphs, pictographs, circle graphs, grids	• Bar, line, pictographs, circle • Coordinate graphs • Comparing graphs
Multiplication & Division	• Multiplication facts 1-10; word problems; multiplicand, multiplier, product and factor; two, three, and four digit multiplicand with single digit multiplier with and without carrying; multiplying by ten, hundred, and thousand • Division facts 1-10, one and two digit quotients without and with regrouping, with and without remainder	• Multiplication properties and terms; 3-digit times a single digit; multiplying by 10's, 100's, and 1000's; 2-digit times a 2 digit and 3-digit times a 3-digit number; missing factors; money by 2-digit number; estimating products • Division properties and terms; 1-digit divisor, 1-digit quotient with and without remainders; zeros in the quotient; averaging

GRADE 5	GRADE 6	
• Number theory through hundred billion; review expanded form through hundred billion; review Roman numbers; divisibility; prime and composite; prime factorization; introduction to factor trees and exponents • Place value to hundred billions • Rounding to the nearest tenth, hundreth, and thousandth; greater than and less than; equal and not equal	• Word numbers through hundred trillion; scientific notation; base 2 numbers; order of operations; square roots • Integers on a number line; opposite integers; comparing integers; adding integers; subtracting integers; multiplying integers; dividing integers • Rounding to 10, 100 and 1,000	**Numbers, Order, & Value**
• Addition properties, terms, and facts; addition with two, three, four, five and six-digit numbers; equations; column addition; missing addends; estimating; adding money; more than one operation • Subtraction properties, terms, and facts; subtraction with two, three, four, five and six-digit numbers; equations; estimating; subtracting money; more than one operation	• Addition properties, terms, and facts; addition with 2, 3, 4, 5 and 6 digits; missing addends • Subtraction properties, terms, and facts; subtraction with 2, 3, 4, 5 and 6 digits • Adding and subtracting money • Counting change • Adding and subtracting equations	**Addition & Subtraction**
• Time; A.M. and P.M.; Century; equivalents; elapsed time; calendar; time zones • Counting change • Standard and metric linear, liquid, and weight equivalent; temperature reading and understanding Fahrenheit and Celsius; millimeter, centimeter, decimeter, meter, decameter, hectometer, kilometer • Understanding percentages; finding percents; percents and decimals; percents and fractions; discount and sales tax; fractions as percent • Writing simple ratios	• Standard and metric linear, liquid, and weight equivalent; temperature reading and understanding; Fahrenheit and Celsius; millimeter, centimeter, decimeter, meter, decameter, hectometer, kilometer • Word numbers to hundred thousandths; extend quotient to tenths, hundredth's place, thousandths; interpret the remainder; divide by a decimal; divide and multiply by 10, 100, 1,000; repeating decimals • Write simple ratios; cross products; use cross products to solve for n; ratio as a percent; equal ratios	**Ratios, Measurement, & Decimals**
• Least common multiples; adding and subtracting fractions with unlike denominators; adding and subtracting mixed numbers; renaming; multiplying and dividing fractions; multiplying and dividing two fractions; reducing	• Simplify before you multiply reciprocals; divide a whole number by a fraction; round an estimate with fractions; divide a fraction by a whole number; divide by a mixed number	**Fractions & Comparison**
• Shapes, solids and diagonals; symmetry; congruent and similar figures; congruent segments and angles • Circles: diameter, radius, and chord • Compass; protractor; types of triangles; classifying polygons • Perimeter, area, volume, and surface area • Addition, subtraction, multiplication, and division of equations	• Construct a perpendicular bisector; bisect an angle; construct a regular hexagon; construct an equilateral triangle; construct a right triangle; construct a square; construct a parallelogram • Writing equations for word problems	**Equations, Colors, & Geometry**
• Mean, mode, and median • Problem Solving; logical reasoning; choosing an operation • Probability with one variable • Calculator math	• Mean, mode, median; graphing in all four quadrants • Choosing an operation; multiple step problems; draw a picture; find a pattern; use a chart, table, menu, schedule • Writing checks, budgeting, banking, savings, understanding interest; using charts and tables	**Graphs, Estimation, & Solving**
• Multiplication terms, facts and properties; 3-digit times 3-digit numbers; exponents; missing factors; money by two digit number; multiplying by 10, 100, and 1000 • Division terms, facts, and properties; 3-digit quotients with remainders; averaging with remainders; dividing money; estimating quotients; zeros in the quotient	• Multiplication properties, terms and facts; missing factors; exponents; 4-digit by 4-digit; 5-digit by 5-digit • Division properties, terms, and facts; estimating quotients; averaging with remainders; 4-digit divisor	**Multiplication & Division**

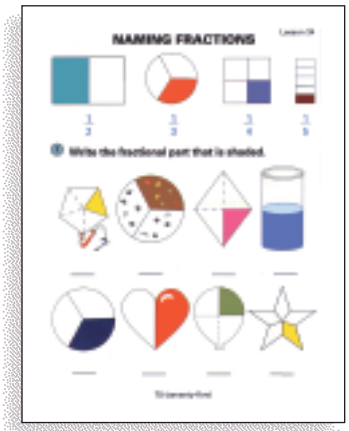
Horizons Math Promotes Concept Mastery

Every concept in Horizons math follows a deliberate pattern of introduction and gradual development to ensure that the student masters the concept. All too often students learn a concept only to forget it a few weeks after the test. It is one thing to be successful on a day-to-day basis with a focused study of a single topic but it is much more complex to skillfully approach topics that have been unseen for a longer period of time.

In Horizons math, fundamental concepts already learned in earlier units are reviewed in subsequent grade levels for true mastery. Every math concept follows a deliberate pattern of gradual development in each grade level, as well as throughout all seven grade levels. The example here shows a few of the pages that develop the concept of fractions from grades one through three.

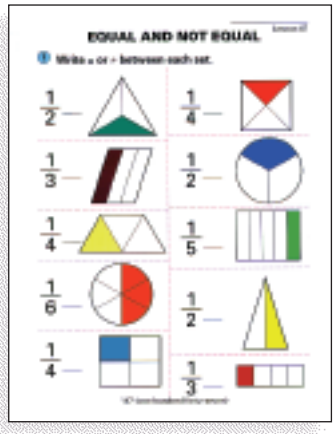
1 Definition is accomplished by the teacher in an introductory lesson. Simple directions are found in the Teacher's Handbook.

Grade 1, Book One



2 Reading unit fractions

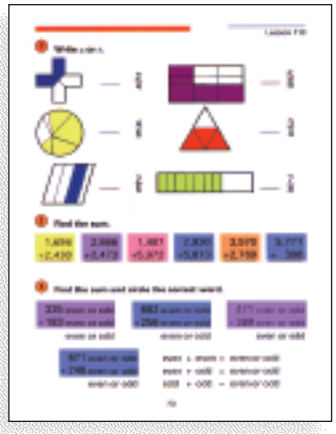
Grade 1, Book One



3 Identifying fractional part of whole

4 Identifying fractional part of set

Grade 2, Book Two

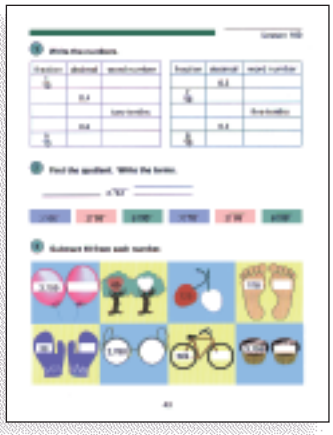


5 Comparison of fractions

Grade 3, Book Two

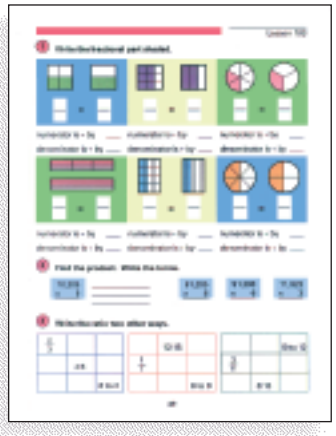
6 Review of steps 2–5

Grade 3, Book Two



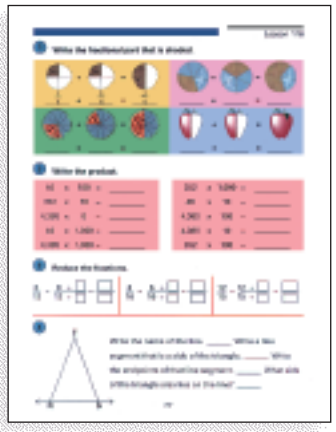
7 Comparison of mixed numbers, improper fractions, and decimals

Grade 3, Book Two



8 Reducing fractions

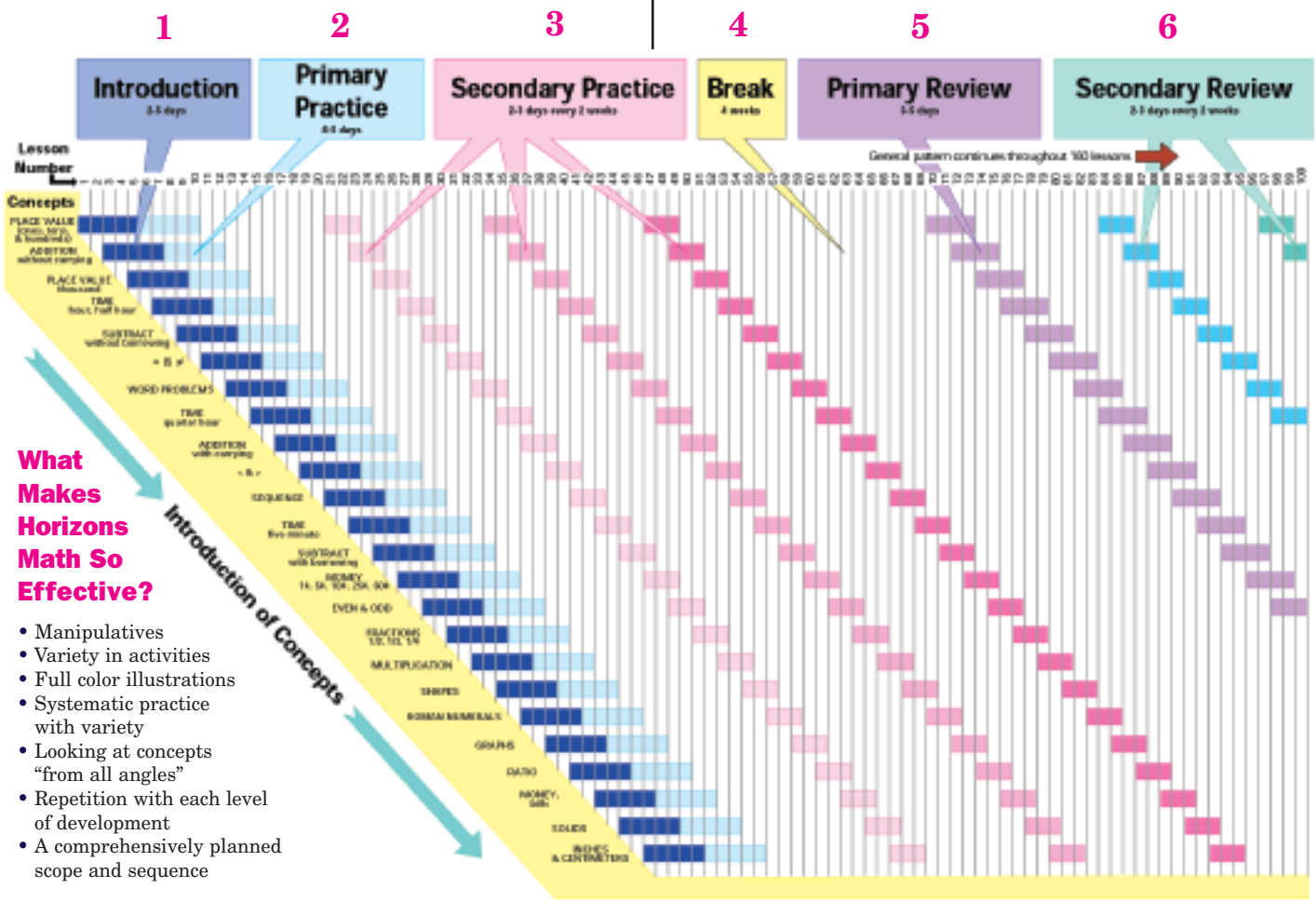
Grade 3, Book Two



9 Adding and subtracting like fractions and mixed numbers

Six-Step Horizons Math Concept Development

Horizons Math combines the best of unit study and review to provide a detailed concept introduction, development, and review cycle. The Development of Concepts chart below illustrates this cycle. Horizons Math builds comprehension by gradually introducing and reviewing each concept. The result is orderly learning from the simple to the complex.



What Makes Horizons Math So Effective?

- Manipulatives
- Variety in activities
- Full color illustrations
- Systematic practice with variety
- Looking at concepts "from all angles"
- Repetition with each level of development
- A comprehensively planned scope and sequence

Horizons Math Kindergarten

Horizons Math K lays a foundation for order, exactness, and absolute truth. The daily practice in the student books teaches the recognition and printing of the numerals from 0–100, simple addition and subtraction facts, and multiple counting by 1's, 10's, 5's, 2's, 3's, and 4's. Principles of place value, measurement, calendar use, telling time, and money concepts are also introduced.

Includes 2 student books and 1 Teacher's Guide. 160 two-page lessons, 40 worksheets*, reduced student pages with answers and all instructional material is in the THB. There is no Bible content.

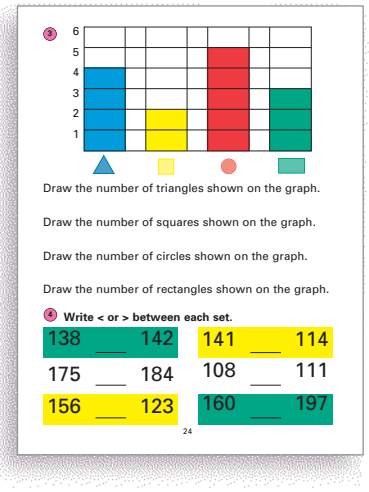
**Reproducible masters are in Teacher's Guide or may be ordered separately.*

Sample page from Horizons Math K

First Grade

Horizons Math 1 carefully builds on the excellent foundation laid in kindergarten. Students not only become proficient with the familiar concepts of counting, addition, and subtraction, but also begin to relate these basics to more challenging concepts such as time, fractions, sets, graphs, sequence, estimation, and units of measure.

Includes 2 student books and 1 Teacher's Guide (split). 160 two-page lessons, 16 tests, 80 worksheets*, readiness tests, reduced student pages with answers and all instructional material is in the THB. There is no Bible content.

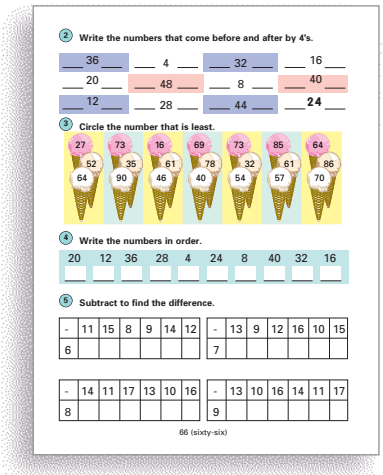

3
6
5
4
3
2
1
Draw the number of triangles shown on the graph.
Draw the number of squares shown on the graph.
Draw the number of circles shown on the graph.
Draw the number of rectangles shown on the graph.
4 Write < or > between each set.
138 ___ 142
141 ___ 114
175 ___ 184
108 ___ 111
156 ___ 123
160 ___ 197
24

Sample page from Horizons Math 1

Second Grade

Horizons Math 2 continues to build on the concepts previously taught in kindergarten and first grade. Complex addition and subtraction problems, American measure (linear, weights, and liquid), Fahrenheit thermometer, ratio, decimals, calculation of area, perimeter and volume, and multiplication are stressed throughout the year.

Includes 2 student books and 1 Teacher's Guide (split). 160 two-page lessons, 16 tests, 80 worksheets*, readiness tests, reduced student pages with answers and all instructional material is in the THB. There is no Bible content.

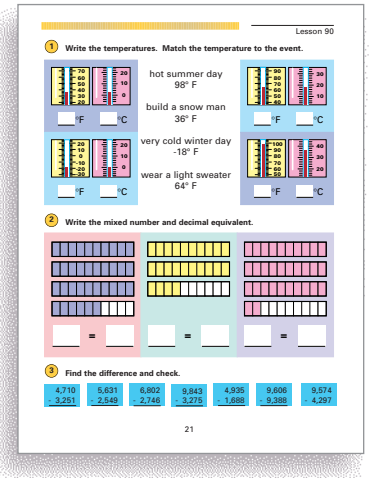

2 Write the numbers that come before and after by 4's.
___36___ ___4___ ___32___ ___16___
___20___ ___48___ ___8___ ___40___
___12___ ___28___ ___44___ ___24___
3 Circle the number that is least.
27 73 16 69 73 85 64
52 35 61 78 32 61 86
64 90 46 40 54 57 70
4 Write the numbers in order.
20 12 36 28 4 24 8 40 32 16
5 Subtract to find the difference.
- 11 15 8 9 14 12
6
- 13 9 12 16 10 15
7
- 14 11 17 13 10 16
8
- 13 10 16 14 11 17
9
66 (sixty-six)

Sample page from Horizons Math 2

Third Grade

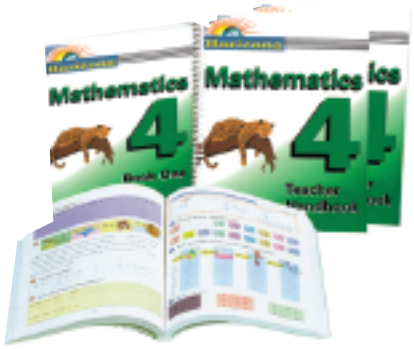
Horizons Math 3 keeps student confidence high by building on the now familiar concepts taught in previous grades. Multiplication and division are thoroughly covered, and new concepts such as simple geometry, map reading, temperature in Fahrenheit and Celsius, and the Metric system present new challenges to your students.

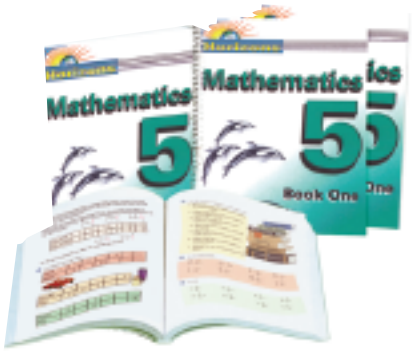
Includes 2 student books and 1 Teacher's Guide (split). 160 two-page lessons, 16 tests, 80 worksheets*, readiness tests, reduced student pages with answers and all instructional material is in the THB. There is no Bible content.

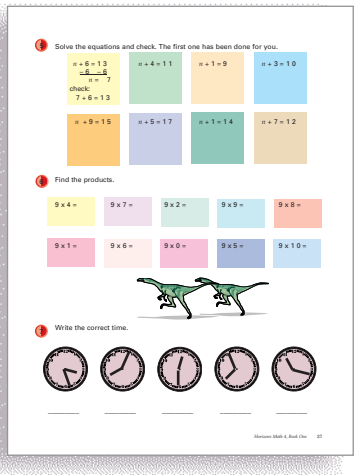

Lesson 90
1 Write the temperatures. Match the temperature to the event.
hot summer day 98° F
build a snow man 36° F
very cold winter day -18° F
wear a light sweater 64° F
2 Write the mixed number and decimal equivalent.
3 Find the difference and check.
4,710 − 3,251
5,631 − 2,549
6,802 − 2,746
9,843 − 3,275
4,935 − 1,688
9,606 − 9,388
9,574 − 4,297
21

Sample page from Horizons Math 3

**Reproducible masters are in Teacher's Guide or may be ordered separately.*



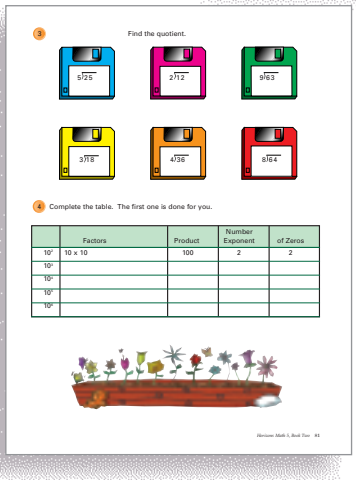



Solve the equations and check. The first one has been done for you.

Find the products.

Write the correct time.

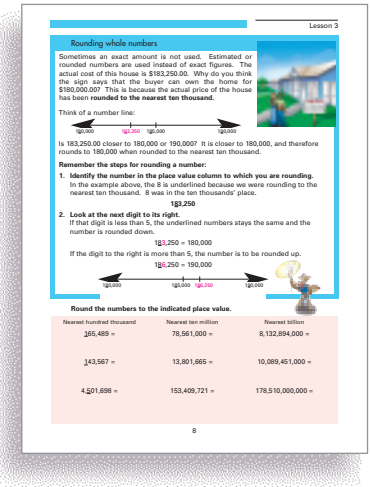
Sample page from Horizons Math 4


Find the quotient.

Complete the table. The first one is done for you.

	Factors	Product	Number Exponent	of Zeros
10^2	10 x 10	100	2	2
10^3				
10^4				
10^5				
10^6				

Sample page from Horizons Math 5


Lesson 3

Rounding whole numbers

Sometimes an exact amount is not used. Estimated or rounded numbers are used instead of exact figures. The actual cost of this house is $183,250.00. Why do you think the sign says that the buyer can own the home for $180,000.00? This is because the actual price of the house has been **rounded to the nearest ten thousand.**

Think of a number line:

Is 183,250.00 closer to 180,000 or 190,000? It is closer to 180,000, and therefore rounds to 180,000 when rounded to the nearest ten thousand.

Remember the steps for rounding a number:

1. **Identify the number in the place value column to which you are rounding.** In the example above, the 8 is underlined because we were rounding to the nearest ten thousand. 8 was in the ten thousands' place.
   1**8**3,250
2. **Look at the next digit to its right.** If that digit is less than 5, the underlined numbers stays the same and the number is rounded down.
   1**8**3,250 = 180,000
   If the digit to the right is more than 5, the number is to be rounded up.
   1**8**6,250 = 190,000

Round the numbers to the indicated place value.

Nearest hundred thousand	Nearest ten million	Nearest billion
165,489 =	78,561,000 =	8,132,894,000 =
143,567 =	13,801,665 =	10,089,451,000 =
4,501,698 =	153,409,721 =	178,510,000,000 =

8

Sample page from Horizons Math 6

Fourth Grade

Horizons Math 4 reviews and expands previous coverage of addition, subtraction, multiplication, and division. Core concept mastery is the basis for learning more advanced math. New concepts introduced in fourth grade include multiplication of 2-digit times 2-digit with carrying, division with 2-digit divisor and quotient, addition/subtraction of unlike fractions, pre-algebra concepts, ratios, and more.

Includes 2 student books and 1 Teacher's Guide. 160 three-page lessons, 16 regular tests and 4 nine-week tests, 80 worksheets*, readiness tests, list type answer keys for all exercises and lesson plans in THB, each student lesson page begins with a brief explanation of the new concept. There is basic Bible content in puzzles and problems taken from several Bible versions.

Fifth Grade

Horizons Math 5 continues to practice and develop the four basic math operations and applies them in depth to fractions, decimals, and percent. New concepts introduced include exponents, cross products, mean, mode, median, and angle measure.

Includes 2 student books and 1 Teacher's Guide. 160 three-page lessons, 16 regular tests and 4 nine-week tests, 80 worksheets*, readiness tests, list type answer keys for all exercises and lesson plans in THB, each student lesson page begins with a brief explanation of the new concept. There is basic Bible content in puzzles and problems taken from several Bible versions.

Sixth Grade

Horizons Math 6 reviews and builds upon the four basic math operations. New concepts covered include word numbers through hundred trillion, scientific notation, base 2, 4-digit by 4-digit multiplication, division up to 5- and 6-digit quotients, perimeter, area, volume, ratios, graphs, and equation.

Includes 2 student books and 1 Teacher's Guide. 160 three-page lessons, 16 regular tests and 4 nine-week tests, 80 worksheets*, readiness tests, list type answer keys for all exercises and lesson plans in THB, each student lesson page begins with a brief explanation of the new concept. There is basic Bible content in puzzles and problems taken from several Bible versions.

**Reproducible masters are in Teacher's Guide or may be ordered separately.*

Readiness Evaluation Test Included

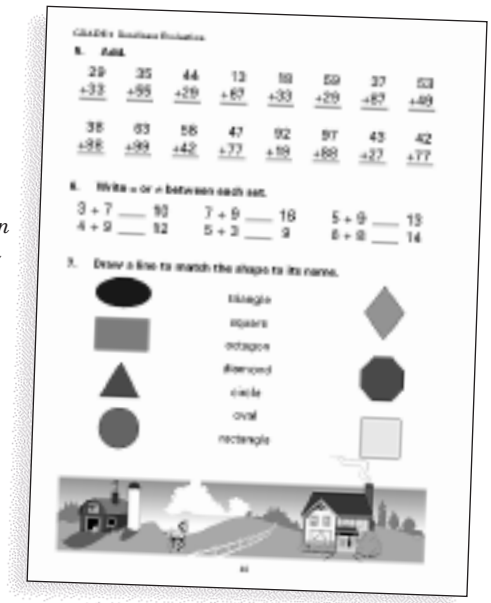
A readiness evaluation test is included in the Teacher's Guide for Grades 1–6. This test is designed to help you know the strengths and weaknesses of each student at the beginning of each grade level.

Answer Keys are Clear and Easy to Use

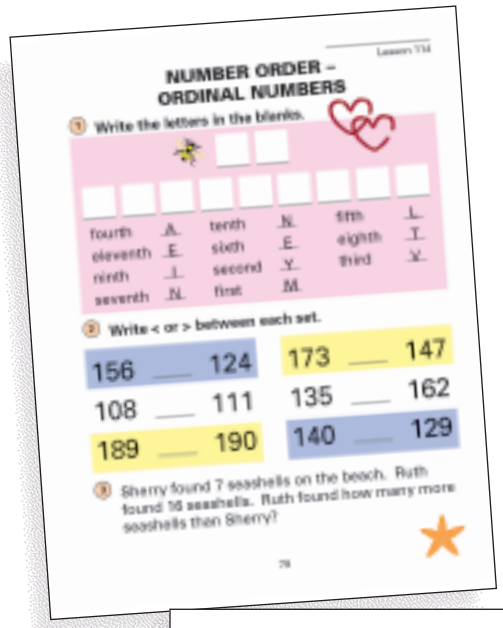
Ready access to answers for the student lessons is provided in a handy format in your Teacher's Guide.

Worksheets Provide Proper Drill and Practice

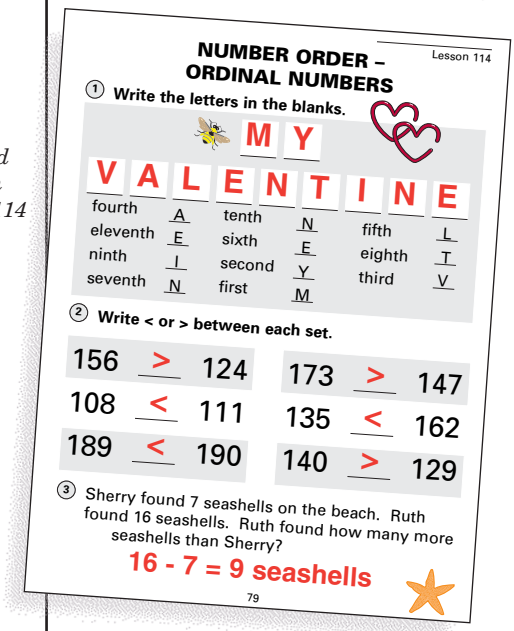
Reproducible worksheets provide drill for initial learning, extra practice, or individual challenges. Answer keys for the worksheets are provided in an easy to use format.

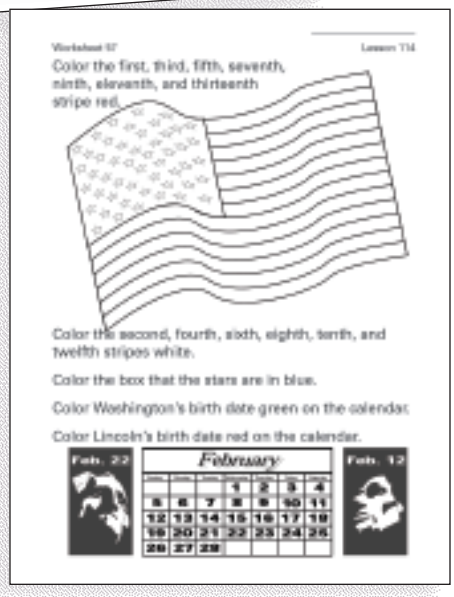


Readiness Evaluation from Horizons Math Grade 2



Lesson Page, Answer Key, and Worksheet from Grade 1, Lesson 114





"I liked the way new concepts were presented and then reviewed in later lessons. The ideas for teaching the lesson, the objectives, and the materials that were needed for each lesson were presented in a clear and easy-to-use fashion."

Horizons Math Framework

In the early 1990's the academic leadership at AOP recognized the need to develop a new math program. No, this was not intended to be "new math" but was to be an innovative approach to the teaching of mathematics. AOP had a long history of experience with the LIFEPAC math program. This experience revealed that not every student approaches the study of math from the same perspective. So began the Horizons journey. Today, the Horizons name is not only associated with one of the finest math programs available, but it is also associated with an excellent phonics program, a wonderful penmanship program and an exceptional spelling program. What is it that makes Horizons so unique? Hopefully the answer to this question will be explained for you on the following pages.

At the time Horizons math was developed the state of math instruction in the U.S. was at an all time low. This prompted the author to begin the Teacher's Handbook with the following:

The challenge

Today's average high school graduate knows and can do less math than their counterpart of ten, fifteen, or twenty years ago. Basic math skills have deteriorated to the point that many wonder if this country can continue to be a leader in shaping the technology of the future. Unfortunately, the general trend of modern education of all types is downward. Students in private education, while they score higher overall than public school students, still do poorly in math computation skills.

The goal

The goal of this curriculum is to provide the parent and teacher with a tool that will help them effectively combat this deterioration of math skills by raising the level of student performance. Research of the content and methods of other existing curriculums, the concepts evaluated by achievement tests, and typical courses of study resulted in selection of the Scope and Sequence. This curriculum was not planned around any particular group of students. Rather, it was determined that the material in this curriculum constituted a reasonable level of performance for students at the grade levels for which it is intended. The curriculum is designed so that the teacher can adapt its use to student(s) of widely varying ability. In other words, the curriculum is a tool that is capable of performing well over a broad range of student ability to help them achieve a higher minimum level of proficiency

The Learning Sequence

The most unique and unusual feature of the Horizons program is not the academic content. As they say, "two plus two always equals four." Addition problems are addition problems, and subtraction problems are subtraction problems. The feature that sets Horizons apart is the sequence in which the material is presented. The math problems are essentially the same as any found in other materials. The amount of practice and the order in which concepts are taught would also be very similar. The key distinctives of the Horizons scope & sequence are *what level*, *how much*, and *how often*.

Jerome Bruner in his book The Process of Education, 1961, says that instruction should address four major aspects. They are:

1. Predisposition towards learning;
2. The ways in which a body of knowledge can be structured so that it can be most readily grasped by the learner;
3. The most effective sequences in which to present material;
4. The nature and pacing of rewards and punishments.

Predisposition: Young children especially are attracted to things that are bright and colorful. Horizon's makes learning attractive by the effective use of color and engaging illustrations. Students are drawn to the material because it looks like fun and not so much like a math textbook. They want to learn.

Structure-*what level*: Except for Kindergarten, each level of Horizons Math has a readiness test to help determine if a child is ready for the content of a particular grade level. This insures that the student is working on material that they can grasp and understand. When new concepts are introduced it is at a very rudimentary level. Only enough information is presented to enable the student to successfully complete the rather short number of practice exercises that are presented the first time. The difficulty of the concept then slowly matures as the students continue the practice for about a two-week time period.

Sequence-*how much*: Careful thought and planning has gone into the order in which the material is presented. One concept builds until it reaches a level where the next concept can be logically presented. Review is often, cyclical and in short chunks rather than in pages of "drill and kill."

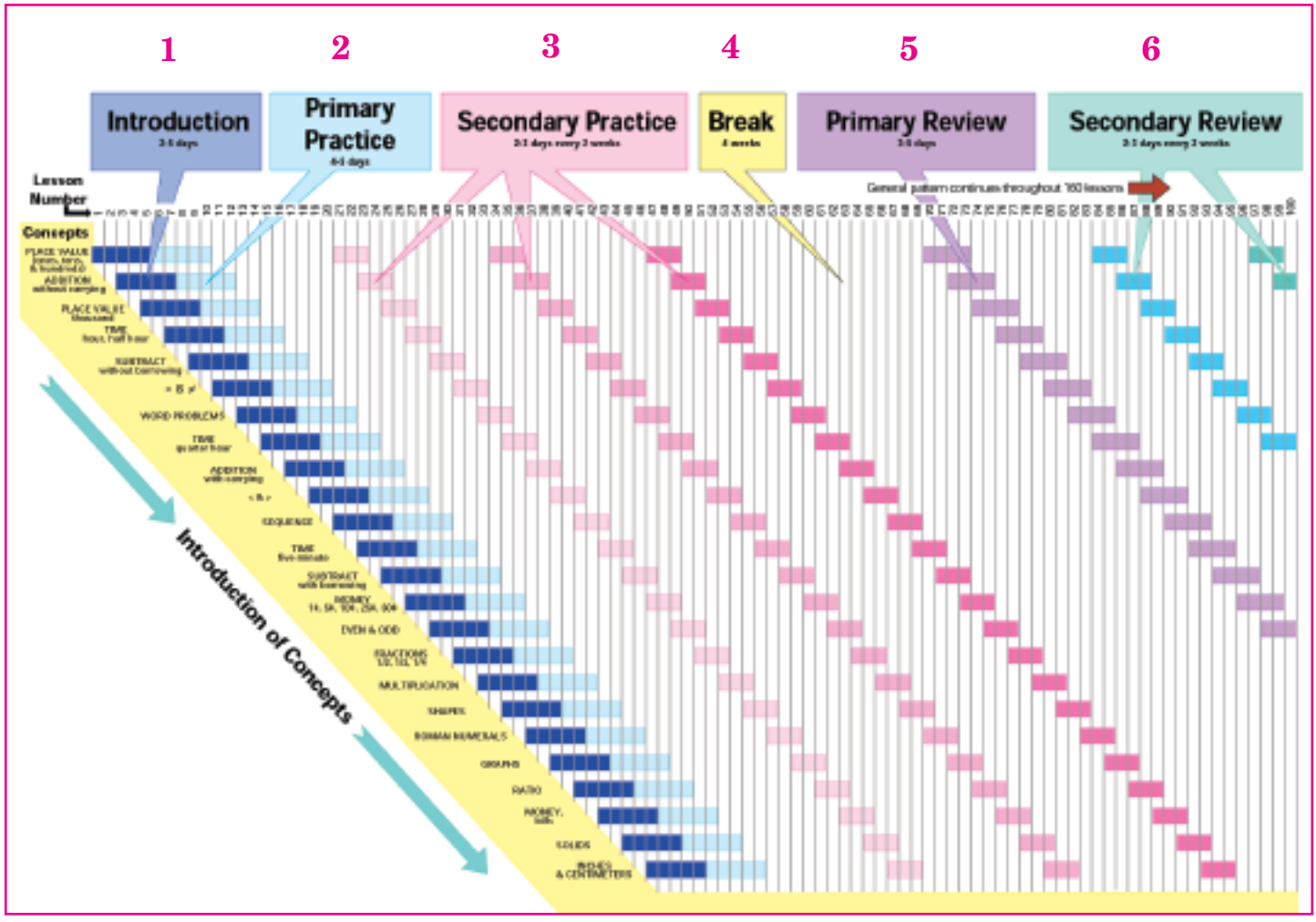
Rewards-*how often*: Rewards are a daily occurrence for most students because they practice several different concepts each day. Some are at a very basic level and others are drill of previously mastered concepts. In other words, daily there are at least one or two sections of problems that the student can successfully answer.

Bruner's work also discusses Three Principles of Instructional Design.

1. Instruction must be concerned with the experiences and contexts that make the student willing and able to learn (readiness).
2. Instruction must be structured so that it can be easily grasped by the student (spiral organization).
3. Instruction should be designed to facilitate extrapolation and or fill in the gaps (going beyond the information given).

Readiness: Previously mentioned were the readiness tests that precede each level of material. These are essential for students entering the Horizons program at a point other than the Kindergarten level. Each year starts with a review of previously covered material but an assumption is made that the student is bringing a certain level of proficiency with them from previous experience. Once a student gets adjusted to the Horizons work-track they should be able to transition from one level to the next without any difficulty. It is just for the student jumping into, for example, the third grade level, for whom a careful assessment and placement needs to take place. In some instances some supplemental tutoring may bring the student up to speed. We have had not only students but also teachers express difficulty in adjusting to the Horizons sequence. Fifth grade instructors have said that this is the first time that they have encountered the geometry content found in Horizons and have themselves needed to get up to speed to be effective instructors.

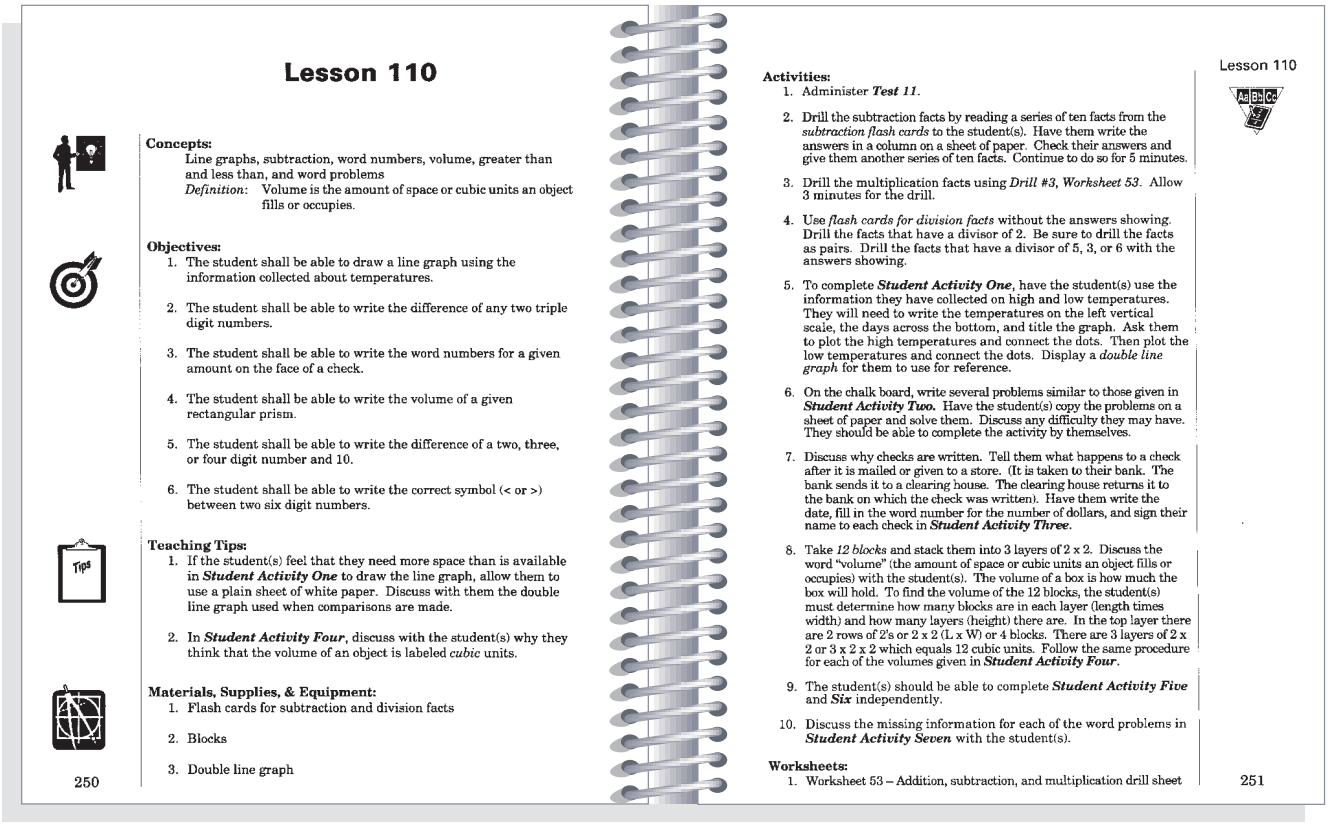
Spiral organization: *The Six-Step Horizons Concept Development*. Horizons combines the best of unit study and review to provide a detailed concept introduction, development, and review cycle. The Development of Concepts chart below illustrates this cycle. Horizons builds comprehension by gradually introducing and reviewing each concept. The result is orderly learning from the simple to the complex.



All concepts are covered in a flexible yet methodical way in this curriculum. The Concept Development Chart illustrates the usual pattern of concept progression through the lesson sequence. In any given lesson you will likely find concepts at various stages of their unfolding for the student. Some concepts will be introduced. These are always the first item on the page. Other concepts will be either in one of the practice phases, the break phase (in which case they do not appear in a lesson) or at one of the review or reinforcement phases. While Lesson 34 consists of two concepts in the secondary practice phase, three concepts in the primary practice phase, and two concepts in the introductory phase, Lesson 50 consists of one concept in the break phase, four concepts in the secondary practice phase, three concepts in the primary practice phase, and one concept in the introductory phase. This repetition insures a thorough coverage over the entire year and is designed to promote comprehensive learning. The Concept Development Chart shows the general pattern followed in creating the lessons. The actual pattern found in the lessons will vary because consideration was given to the relative importance of each concept.

Extrapolation: Each lesson presents practice of several different concepts for the students. This mirrors the real life experiences of the average individual. Today's opportunities require yesterday's experience in working through them. With three or more different concepts being covered in each Horizon's lesson the student must be capable of multitasking and applying previously learned techniques. Connections are more easily seen between different concepts because they are not covered in isolation.

Teacher Role: Horizon's contains a total of 160 lessons and 16 tests (Grades 1-6). Typically, one lesson should be completed each day during the school year. Prepare for each day by carefully reviewing the material provided in the Teacher's Guide. The Overview is a summary of the concepts that will be covered in the lesson. Also review the Scope and Sequence, found in the front of each Teacher's Guide to see what concepts will be taught in future lessons. The Materials and Supplies is a list of what will be needed for the lesson. Get these items assembled before starting class with the students. Since many will be used for several lessons you may choose to hang them on the wall or on a bulletin board. The Teaching Tips are classroom-teaching procedures that give special instructions for each activity of the lesson. Take your time in going over these procedures. Thoroughly think through what you will say and do, so that you have a plan in your mind before teaching the lesson to the students. The Answer Keys for K-3 are reduced student pages with answers. These pages allow you to have both the Teacher Notes and the Student pages in front of as you teach the lesson.



Lesson 110

Concepts:
Line graphs, subtraction, word numbers, volume, greater than and less than, and word problems
Definition: Volume is the amount of space or cubic units an object fills or occupies.

Objectives:
1. The student shall be able to draw a line graph using the information collected about temperatures.
2. The student shall be able to write the difference of any two triple digit numbers.
3. The student shall be able to write the word numbers for a given amount on the face of a check.
4. The student shall be able to write the volume of a given rectangular prism.
5. The student shall be able to write the difference of a two, three, or four digit number and 10.
6. The student shall be able to write the correct symbol (< or >) between two six digit numbers.

Teaching Tips:
1. If the student(s) feel that they need more space than is available in ***Student Activity One*** to draw the line graph, allow them to use a plain sheet of white paper. Discuss with them the double line graph used when comparisons are made.
2. In ***Student Activity Four***, discuss with the student(s) why they think that the volume of an object is labeled *cubic* units.

Materials, Supplies, & Equipment:
1. Flash cards for subtraction and division facts
2. Blocks
3. Double line graph

250

Lesson 110

Activities:
1. Administer ***Test 11***.
2. Drill the subtraction facts by reading a series of ten facts from the *subtraction flash cards* to the student(s). Have them write the answers in a column on a sheet of paper. Check their answers and give them another series of ten facts. Continue to do so for 5 minutes.
3. Drill the multiplication facts using *Drill #3, Worksheet 53*. Allow 3 minutes for the drill.
4. Use *flash cards for division facts* without the answers showing. Drill the facts that have a divisor of 2. Be sure to drill the facts as pairs. Drill the facts that have a divisor of 5, 3, or 6 with the answers showing.
5. To complete ***Student Activity One***, have the student(s) use the information they have collected on high and low temperatures. They will need to write the temperatures on the left vertical scale, the days across the bottom, and title the graph. Ask them to plot the high temperatures and connect the dots. Then plot the low temperatures and connect the dots. Display a *double line graph* for them to use for reference.
6. On the chalk board, write several problems similar to those given in ***Student Activity Two.*** Have the student(s) copy the problems on a sheet of paper and solve them. Discuss any difficulty they may have. They should be able to complete the activity by themselves.
7. Discuss why checks are written. Tell them what happens to a check after it is mailed or given to a store. (It is taken to their bank. The bank sends it to a clearing house. The clearing house returns it to the bank on which the check was written). Have them write the date, fill in the word number for the number of dollars, and sign their name to each check in ***Student Activity Three***.
8. Take *12 blocks* and stack them into 3 layers of 2 x 2. Discuss the word "volume" (the amount of space or cubic units an object fills or occupies) with the student(s). The volume of a box is how much the box will hold. To find the volume of the 12 blocks, the student(s) must determine how many blocks are in each layer (length times width) and how many layers (height) there are. In the top layer there are 2 rows of 2's or 2 x 2 (L x W) or 4 blocks. There are 3 layers of 2 x 2 or 3 x 2 x 2 which equals 12 cubic units. Follow the same procedure for each of the volumes given in ***Student Activity Four***.
9. The student(s) should be able to complete ***Student Activity Five*** and ***Six*** independently.
10. Discuss the missing information for each of the word problems in ***Student Activity Seven*** with the student(s).

Worksheets:
1. Worksheet 53 – Addition, subtraction, and multiplication drill sheet

251

All activities are designed to be teacher directed both in the student lesson and in the Teacher's Guide. Since this handbook was designed as an integral part of the curriculum, it is absolutely necessary to use the handbook. The handbook contains activities not found in the student texts that are essential to the accomplishment of the curriculum objectives. Each lesson is organized into the following sections: Concepts; Objectives; Teaching Tips; Materials, Supplies, and Equipment; Activities; Worksheets; and occasionally a maxim or proverb. The teacher's greatest concentration should be on the Activities section. Here the teacher will find step-by-step directions for teaching each lesson. They will need to use their own judgment concerning how much time is necessary to carry out the activities. Be sure, however, that the student(s) do every problem of every lesson. Each activity is important to the over all scope of the lesson and must be completed. Do not omit any portion of the activities; particularly the multiplication and division drill with flash cards, unless the student(s) have thoroughly mastered the concept being presented. Do not put off looking at the activities in the lesson until actually teaching. Taking time to preview what will be taught is essential. Choose the manipulatives that fit your program best. They will need to be purchased or made by hand before the lesson.

Horizons Math for Grades K-6

Horizons Math provides a balanced and well-organized approach to primary math through analytical reasoning, manipulatives (hands-on learning), memorization and drill. Every concept, from addition and subtraction to graphs and estimation, follows a deliberate pattern of introduction and gradual development to ensure student success. Fundamental concepts already learned in earlier units are reviewed in subsequent grade levels for true mastery. Every math concept follows a deliberate pattern of gradual development in each grade level, as well as throughout all seven grade levels.

Analytical reasoning skills are used in making daily decisions. Beginning with the introduction of each concept, Horizons teaches these thinking skills to help students gain a complete understanding of the concept. Students begin to reason from the principles taught in Horizons lessons and apply them to real-life situations.

Strands:

Numbers, Order & Value: Begins with a strong emphasis on counting and continues with a development of number comparisons, rounding, estimating, order of operations, prime factorization, Roman numbers, scientific notation, base 2 numbers, and integers.

Addition & Subtraction: Starts with adding and subtracting single digits numbers to another number and increases to six-digit by six-digit operations. Also includes addition and subtraction properties, making change, and adding and subtracting equations.

Ratios, Measurement & Decimals: From a foundation in money, time, calendar, dimension and capacity the concepts progress to temperature, unit conversions, ratios, percentages and decimals.

Fractions & Comparison: Concepts of tall, short, long, longer, larger and smaller are extended to parts of a whole and on to addition, subtraction, multiplication and division of mixed numbers.

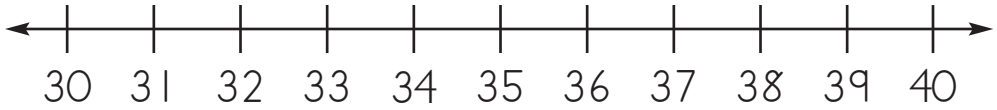
Equations, Colors & Geometry: Recognition of colors, shapes and direction lead to computations involving area, perimeter, volume and surface area. Geometric definitions of point, line, segment, and ray develop into geometric constructions with a compass and straightedge. Equations are manipulated by addition, subtraction, multiplication and division and are written for word problems.

Graphs, Estimation & Solving: Counting images on a pictograph expands to bar graphs, line graphs and coordinate graphs. Rounding of numbers continues to estimating solutions and operations of solving problems. Finding the average of a list of numbers sets the stage for mean, mode, median and probability.

Multiplication and Division: Learning the multiplication facts 1-10 continues with learning multiplication and division terms and properties, to multiplication problems of 5-digits and division problems with a 4-digit divisor.

Lesson 45

1 Write the number between.

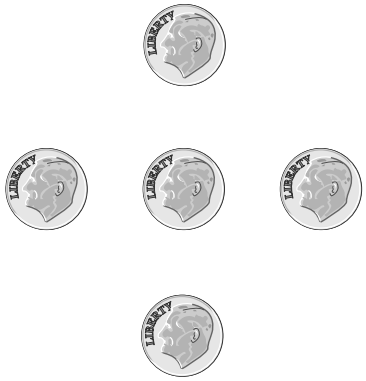


30 ____ 32	36 ____ 38	31 ____ 33
35 ____ 37	32 ____ 34	37 ____ 39

2 Write the number of cents.

____ ¢

____ ¢



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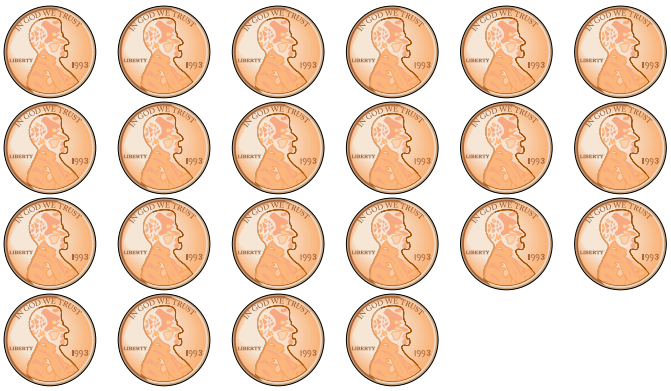
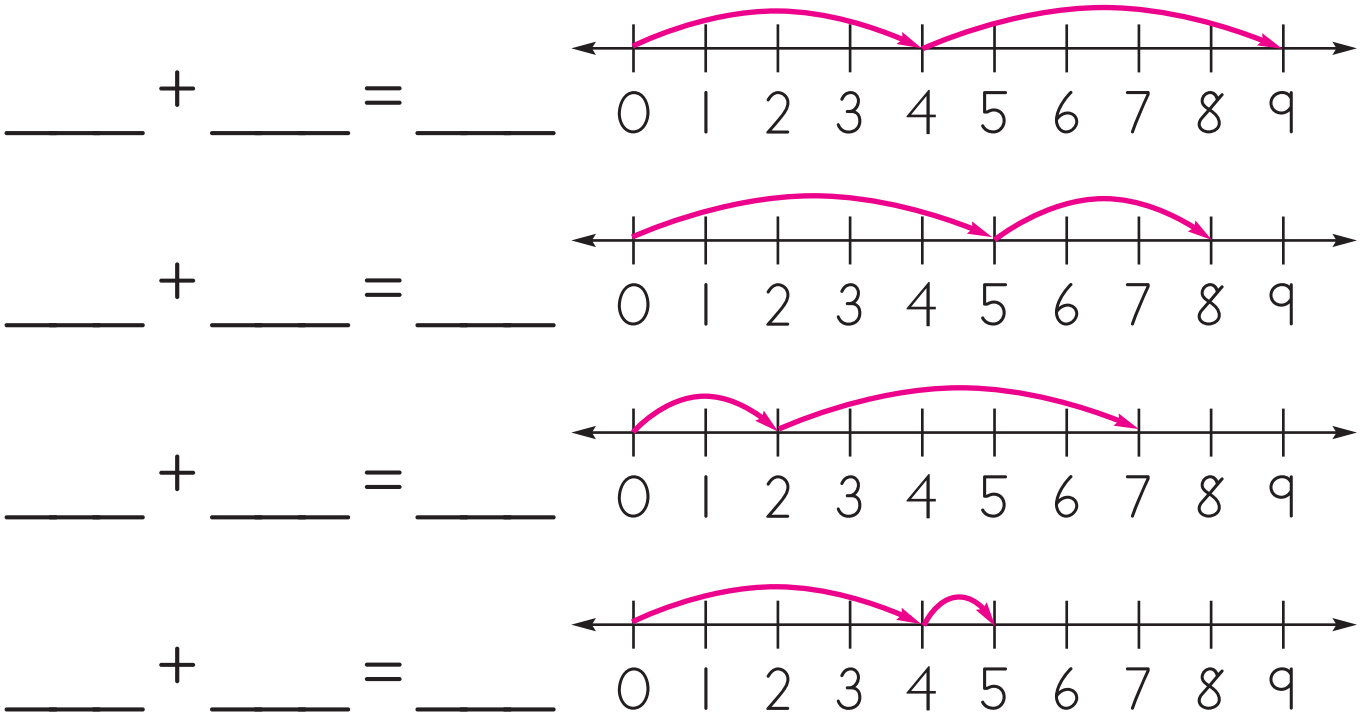
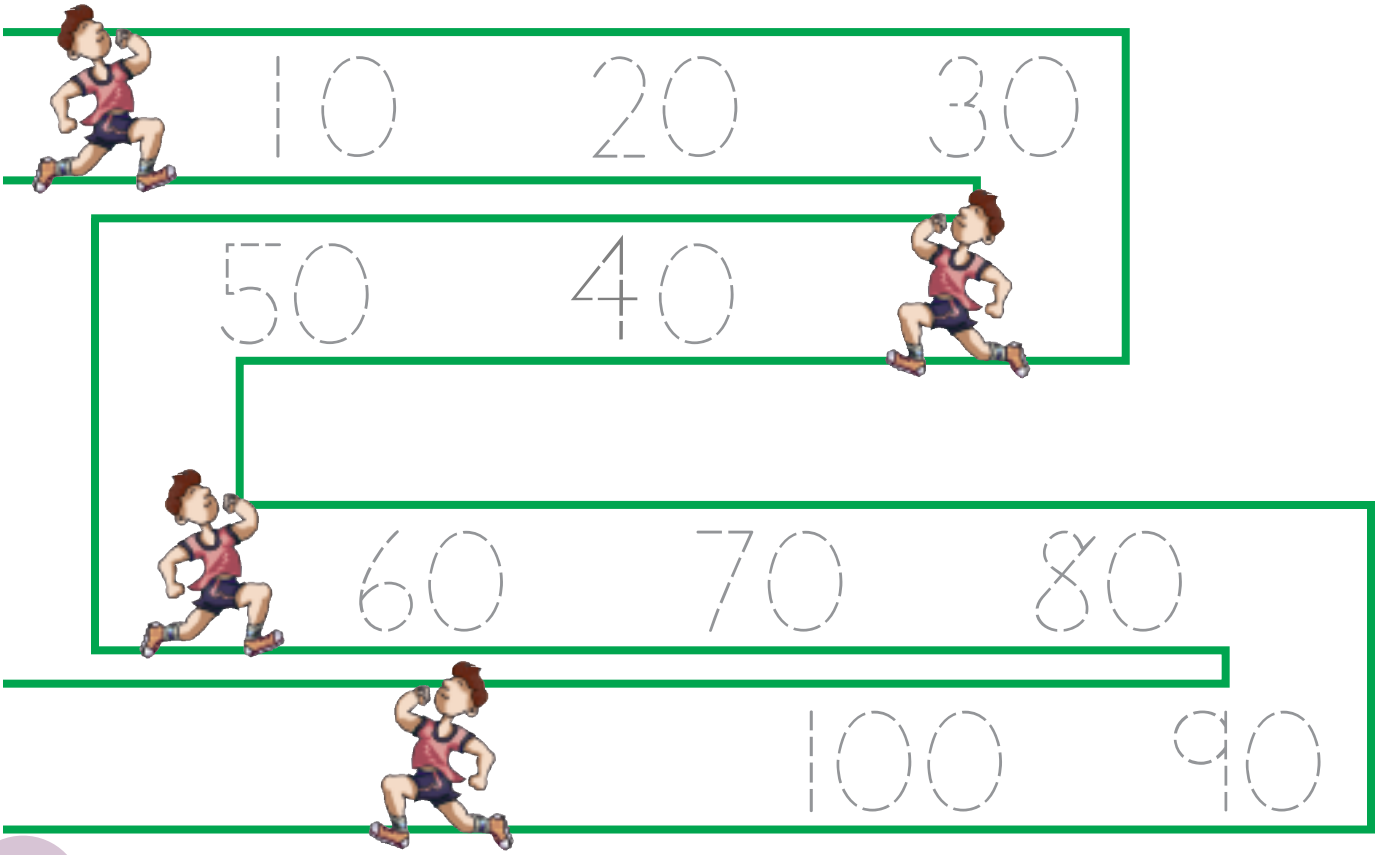


____ ¢

3 Add.



4 Count by 10's to 100.



Worksheet 15

Write a row of each of these numbers.

30

31

32

33

34

35

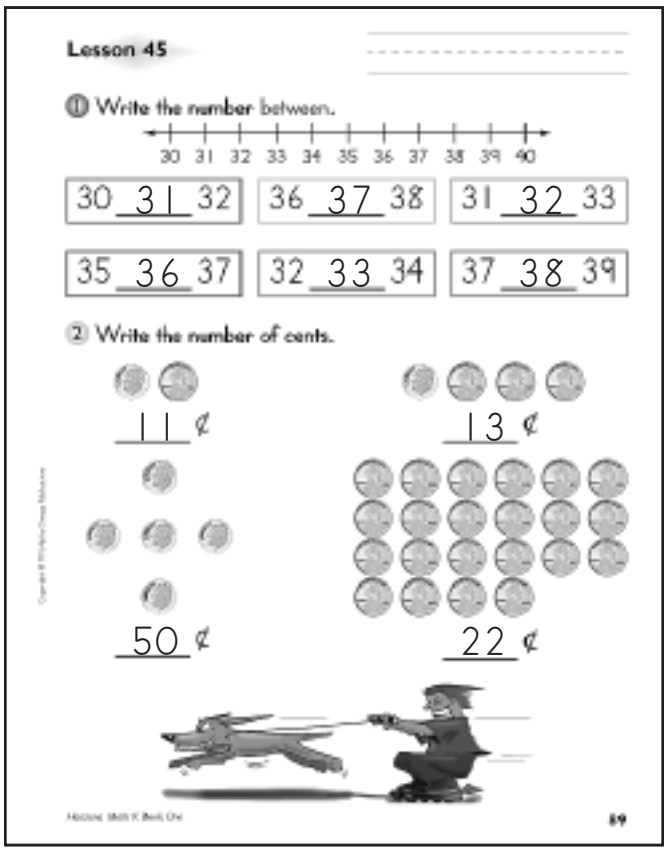
36

37

38

39

Lesson 45 - Number Between 30's



Overview:

- Number between 30's
- Dimes & pennies
- Addition 1's family
- Count by 10's to 100

Materials and Supplies:

- Teacher's Manual & Student Workbook
- White board
- Objects for counters
- Dimes & pennies
- Addition flash cards 1's family
- Number chart
- Count by 10's flash cards
- Shape flash cards
- Number flash cards 1–10

Teaching Tips:

Teach number between 30's.
Review counting by 10's to 100.
Review counting pennies & dimes.
Review addition with a number line.
Review oral counting to 70.

Activities:

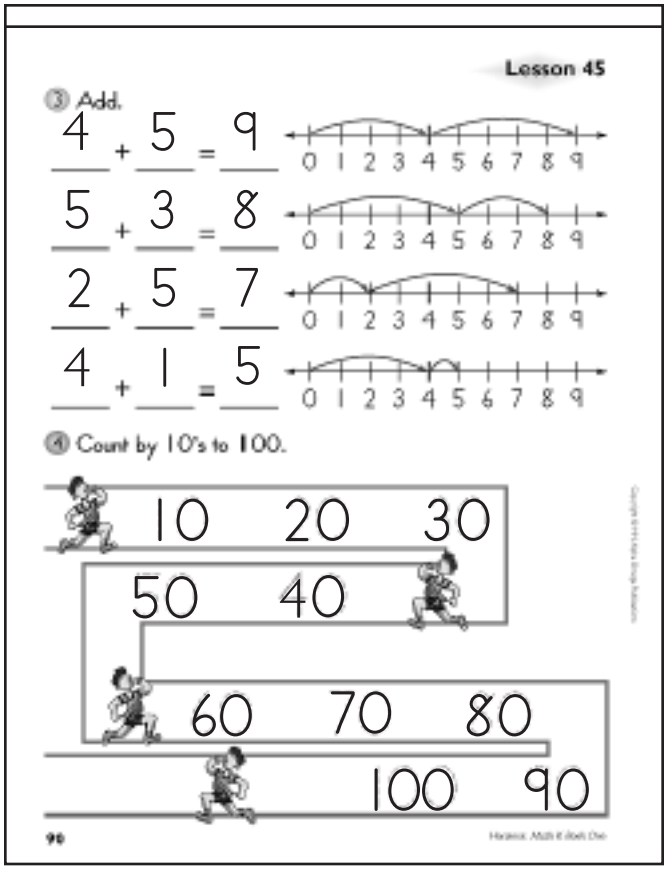
① Review counting by ones with the student(s) as a refresher. To do the problems in this activity they need to count by ones to themselves. The number chart may be a help to the student(s).

② Give each student play money (dimes and pennies). Let them set up a group of dimes and a group of pennies. Count the dimes by tens and the pennies by ones to see the value of the money. Two students may work together, one setting up the sets and the other counting them and vice versa. Read the directions to the activity. Do the first problem together,

then allow the student(s) to work independently, giving help where it is needed.

③ On the white board demonstrate several addition fact (1–9) on the number line. Read the directions to the student(s) in Activity ④. Have them count on the number line to find the first number in the addition fact. Write the number. Then count to find the second and write that number. Write the answer to the addition fact. Do the same for the remaining problems.

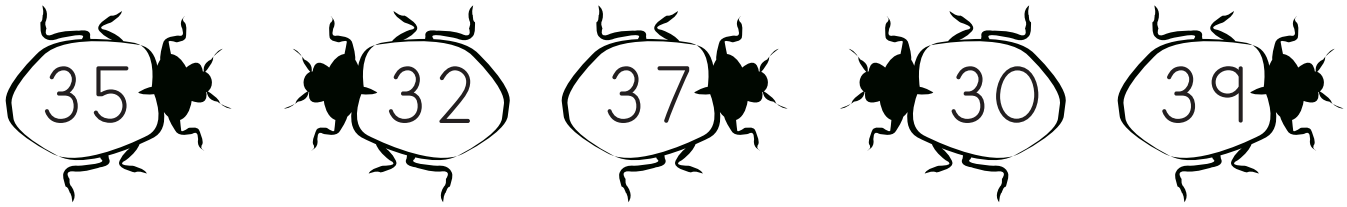
④ Count by tens to 100 as preparation for this activity. The student(s) should count as they trace the numbers.



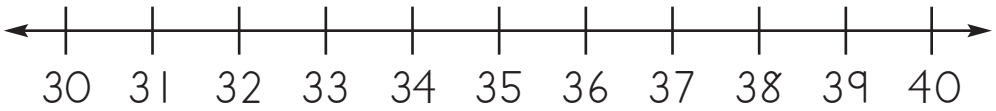
Editor's Note: Worksheets may be used or repeated in any lesson after they are first suggested. Worksheets 15 & 25 were suggested in Lesson 40 and have been carried forward to this sample lesson.

Worksheet 25

① Circle the number your teacher reads.



② Write the number that comes after.



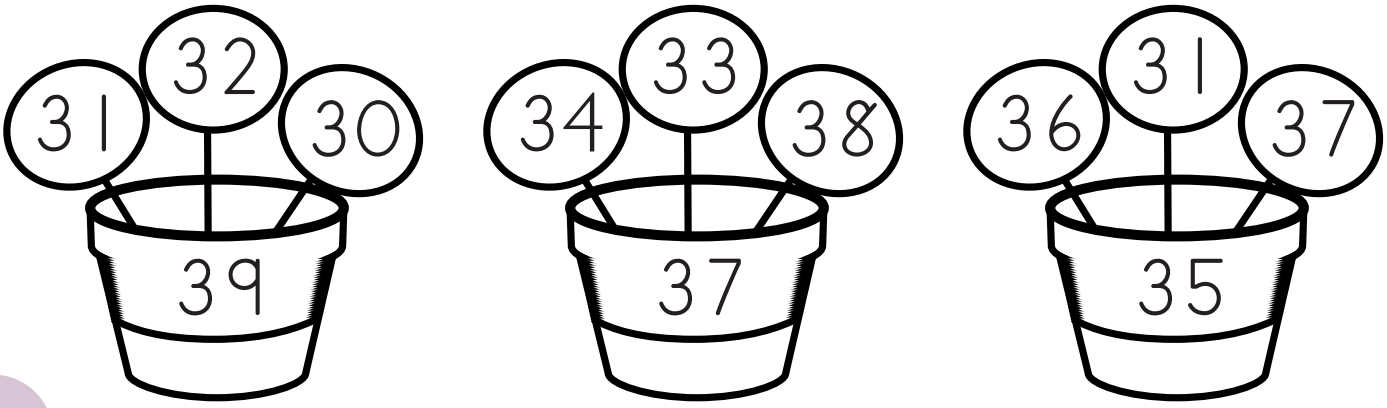
35 _____ 37 _____ 34 _____

33 _____ 30 _____ 32 _____

38 _____ 39 _____ 31 _____

36 _____

③ Circle the number your teacher reads.



ADDITION – THREE NUMBERS

1 **Add the numbers.**

3
2
add 3+2= 5

+1 ⟶ +1
6

2
2
add 2+2= ___

+5 ⟶ +5

1
2
add 1+2= ___

+2 ⟶ +2

4
1
add 4+1= ___

+3 ⟶ +3

4 3 7	1 6 ___	3 1 ___	4 2 ___	7 2 ___	5 3 ___
+1	+2	+2	+2	+1	+2
8					

2 **Draw the short (hour) hand on the clock.**

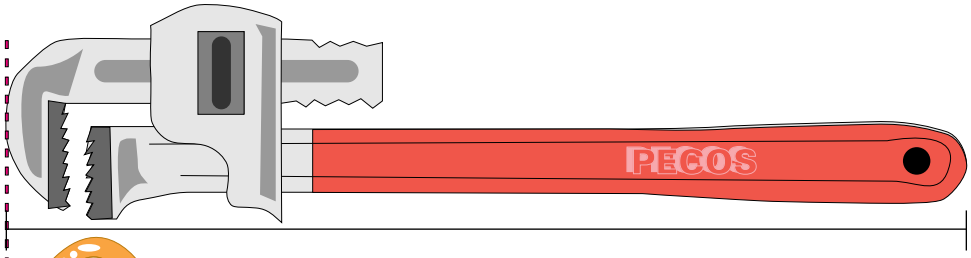
12:15

8:30

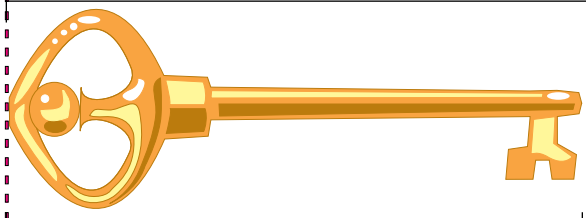
1:45

5:15

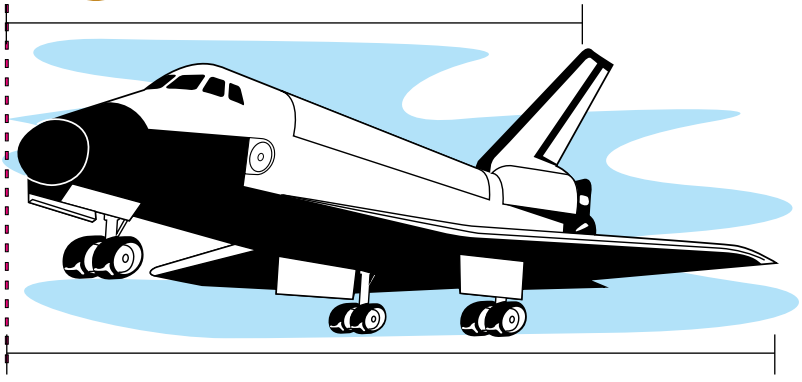
3 **Measure each object with a ruler.**



_____ **inches**



_____ **inches**



_____ **inches**

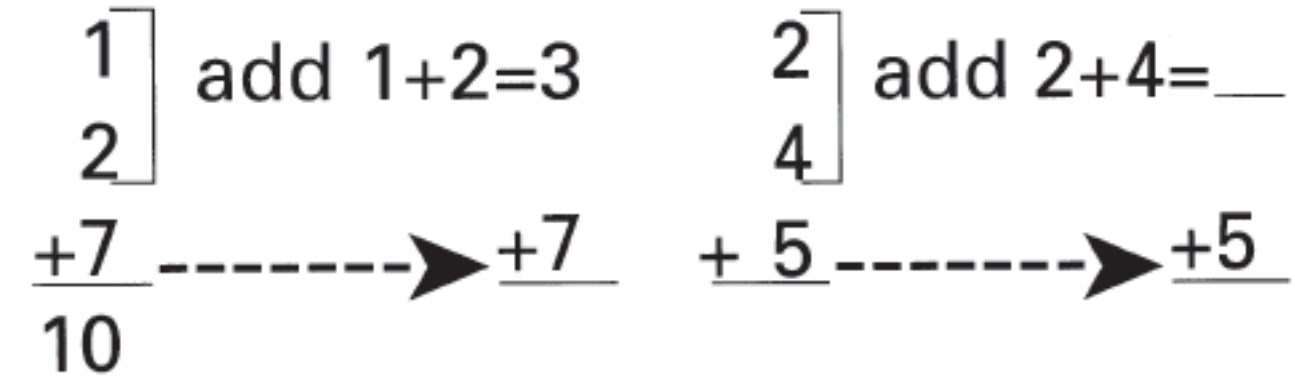
4 Chad had 8 dimes in his left pocket and 6 dimes in his right pocket. Chad had how many dimes altogether? Write the addition fact and label the answer.

_____ + _____ = _____ _____

Worksheet 22

Lesson 45

Add the numbers.



① 6 1 +2 = 7 | 8 1 +2 = __ | 5 3 +6 = __ | 2 6 +3 = __ | 6 3 +4 = __ | 7 2 +6 = __

② 1 6 +2 = __ | 4 2 +7 = __ | 7 1 +5 = __ | 3 4 +5 = __ | 5 1 +4 = __ | 3 2 +6 = __

③ 3 1 +7 = __ | 5 2 +2 = __ | 8 1 +8 = __ | 4 5 +9 = __ | 6 2 +5 = __ | 5 3 +2 = __

Lesson 45

ADDITION – THREE NUMBERS

Concepts:

Addition of three single digit numbers, quarter hour, inches, word problems, and "Thirty Days Hath September"

Objectives:

1. The student shall be able to recite the poem "Thirty Days Hath September" from memory.

2. The student shall be able to write the sum of three single digit numbers correctly.

3. The student shall be able to draw the short (hour) hand on the clock for the quarter hour.

4. The student shall be able to correctly measure the length of a given object with an inch ruler.

5. The student shall be able to correctly identify the numbers to be added for a word problem, write the correct addition fact that answers the word problem, and label the correct answer.

Teaching Tips:

1. When doing activity 2, show the student(s) how they can add from the bottom up as well as from the top down following the same procedures.

2. Let the student(s) use *play money dimes* to demonstrate the sets necessary for writing the correct addition fact to solve the word problem in ***Student Activity Four***.

Materials, Supplies, & Equipment:

1. *Calendar*

2. Clock model and small clock models for student(s)

3. Inch ruler

4. Number chart

5. *Play money*

Activities:

1. Recite "Thirty Days Hath September" with the student(s). Talk about how many days are in the present month according to the poem (or use a *calendar*). Let a student volunteer to say it by himself.

2. Write several addition problems of three single digit numbers on the chalkboard. The first two numbers must come from addition facts 1 - 9. Follow the procedure given at the beginning of ***Student Activity One*** to solve the problems. Then have the student(s) follow along as you go through the steps given in ***Student Activity One***. Notice in the last row, the student(s) are to write the sum of the first two numbers by the bracket and then add the number by the bracket to the last number. Guide them as they complete the activity.

3. Hand out the small clock models to each student. Write several times on the chalk board including hour, half hour and quarter hour. Have the student(s) set their clocks at the given time. Instruct them to place the long (minute) hand first and then place the short (hour) hand. The placement of the hour hand is determined by where the minute hand is located. Then let them hold their clocks up so you can check them. Be sure the student(s) understand they are to draw the **short** hand on the clock when they begin ***Student Activity Two***.

4. Draw several straight lines on the chalkboard of various whole number lengths (example: 2", 4", 1"). Have one student at a time come to the chalk board and measure the length of the line with their inch ruler. Be sure to point out that the beginning of the line must be at zero on the ruler. Allow the student(s) to do ***Student Activity Three*** independently.

5. Tell each student to read the word problem to himself in ***Student Activity Four***. After writing the addition fact, the student(s) may need some guidance in labeling their answer. Help them to understand that they must identify the unit of measure they are adding. In this case the unit is dimes.

Worksheets:

1. *Worksheet 22* – Adding three single digit numbers

Lesson 45

ADDITION – THREE NUMBERS

1 Add the numbers.

3 / 2 add 3+2= 5

+1 / 6 ------> +1 / 6

2 / 2 add 2+2= 4

+5 ------> +5 / 9

1 / 2 add 1+2= 3

+2 ------> +2 / 5

4 / 1 add 4+1= 5

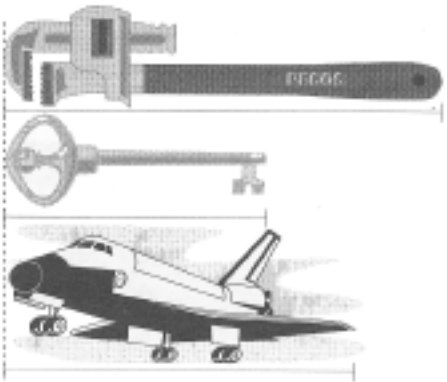
+3 ------> +3 / 8

4 7 / 3	1 7 / 6	3 4 / 1	4 6 / 2	7 9 / 2	5 8 / 3
+1 / 8	+2 / 9	+2 / 6	+2 / 8	+1 / 10	+2 / 10

2 Draw the short (hour) hand on the clock.

12:15 8:30 1:45 5:15

3 Measure each object with a ruler.



5 inches

3 inches

4 inches

4 Chad had 8 dimes in his left pocket and 6 dimes in his right pocket. Chad had how many dimes altogether? Write the addition fact and label the answer.

8 + 6 = 14 dimes

Worksheet 22 Lesson 45

Add the numbers.

1 / 2 add 1+2=3

2 / 4 add 2+4= 6

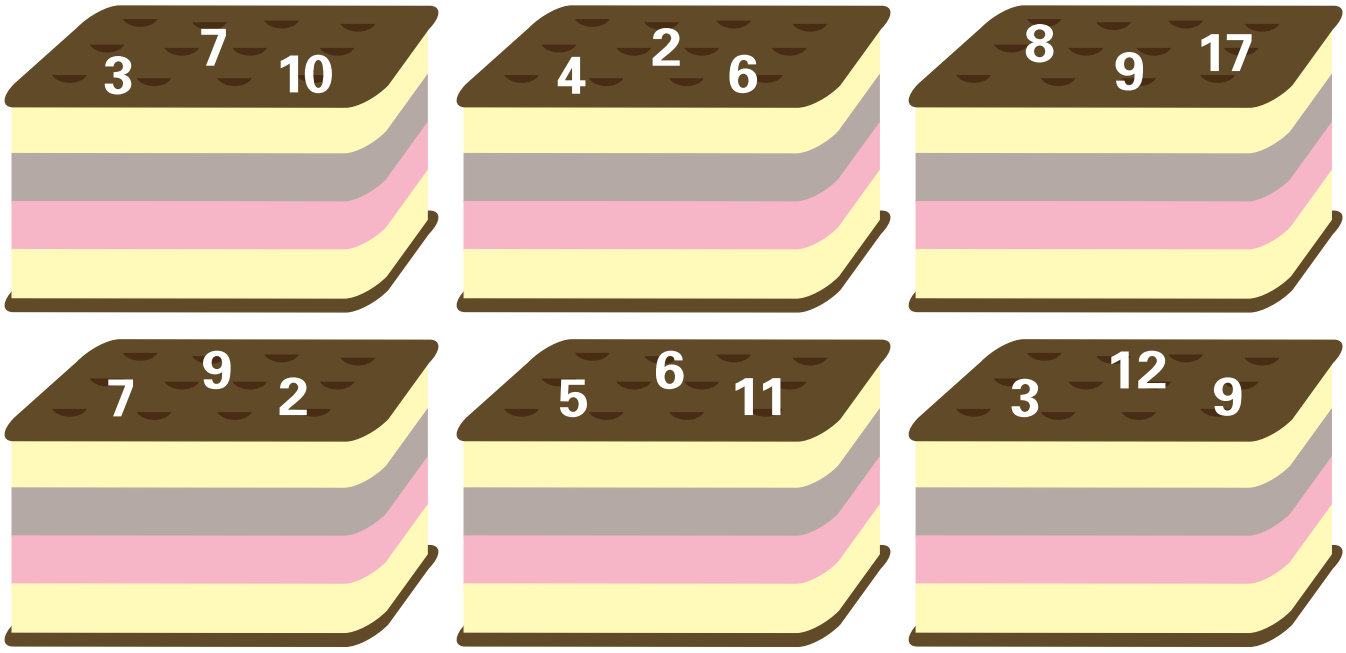
+7 / 10 ------> +7 / 10

+5 / 11 ------> +5 / 11

1 6 7 / 1	8 9 / 1	5 8 / 3	2 8 / 6	6 9 / 3	7 9 / 2
+2 / 9	+2 / 11	+6 / 14	+3 / 11	+4 / 13	+6 / 15
2 1 7 / 6	4 6 / 2	7 8 / 1	3 7 / 4	5 6 / 1	3 5 / 2
+2 / 9	+7 / 13	+5 / 13	+5 / 12	+4 / 10	+6 / 11
3 3 4 / 1	5 7 / 2	8 9 / 1	4 9 / 5	6 8 / 2	5 8 / 3
+7 / 11	+2 / 9	+8 / 17	+9 / 18	+5 / 13	+2 / 10

Lesson 45

1 **Write 2 addition and 2 subtraction facts.**



2 **Write < or >.**

4 + 6 ____ 11	7 + 7 ____ 13	8 + 9 ____ 16
5 + 4 ____ 10	2 + 4 ____ 5	4 + 5 ____ 8
9 + 5 ____ 13	7 + 6 ____ 14	6 + 3 ____ 10
3 + 4 ____ 8	3 + 8 ____ 12	2 + 5 ____ 8

3 **Write the numbers.**

93 = ____ tens + ____ ones = ____ tens + ____ ones

47 = ____ tens + ____ ones = ____ tens + ____ ones

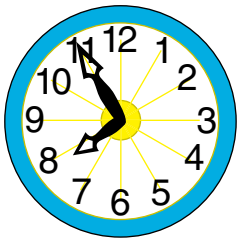
35 = ____ tens + ____ ones = ____ tens + ____ ones

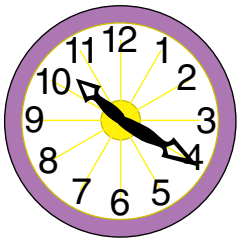
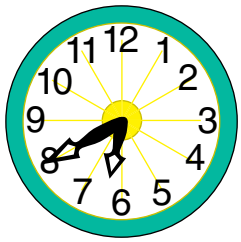
50 = ____ tens + ____ ones = ____ tens + ____ ones

68 = ____ tens + ____ ones = ____ tens + ____ ones

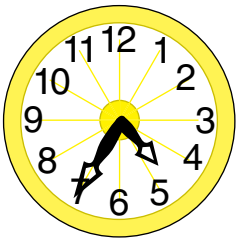
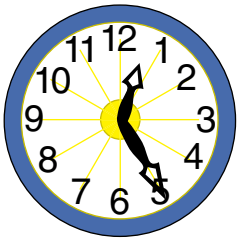
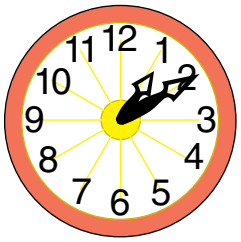
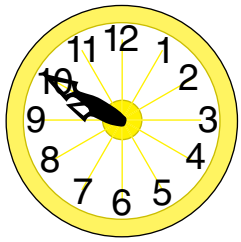
24 = ____ tens + ____ ones = ____ tens + ____ ones

4 **Write the correct time.**



: _____ : _____ : _____ : _____

: _____ : _____ : _____ : _____

5 **Write the next three numbers.**

15	12	9	____	____	____
27	24	21	____	____	____
60	57	54	____	____	____
81	78	75	____	____	____
121	118	115	____	____	____

6 The zookeeper counted 38 monkeys in the cages at the zoo. He had 13 more to join them. How many monkeys are now in the cages at the zoo?

Worksheet 22

Lesson 45

Write the correct time.

: _____

: _____

: _____

: _____

: _____

: _____

: _____

: _____

: _____

: _____

: _____

: _____

: _____

: _____

: _____

: _____

Lesson 45

Concepts:

Greater than and less than, subtraction regrouping, time (5 minutes), number sequence, and word problems

Objectives:

1. The student shall be able to write two addition and two subtraction facts when given three numbers.
2. The student shall be able to write the correct symbol (< or >) between an addition fact and a number.
3. The student shall be able to write the correct regrouping of one ten to ten ones for borrowing in subtraction.
4. The student shall be able to write the correct time displayed on the face of the clock for given five minute increments.
5. The student shall be able to write the next three numbers that come in a given sequence of numbers.

Teaching Tips:

1. If the student(s) have difficulty with ***Student Activity Two***, have them write the answer above the addition fact before they make a comparison to determine which symbol to write.
2. When doing activity 5, ask the student(s) to tell how many minutes it will take for the minute hand to move from 12 to 2, from 12 to 5, from 12 to 9, etc.

Materials, Supplies, & Equipment:

1. Flash cards for addition and subtraction facts
2. Place value materials or straws
3. Clock model
4. Small clock model for student(s)
5. Number chart 0–99

Activities:

1. Have the student(s) take a clean sheet of paper on which to write the answers for their addition and subtraction facts. Take ten *addition flash cards*. Show each card for 5 seconds as the student(s) write the answers in a column. Check the answers before you begin the next set of ten *subtraction flash cards*. Do as many sets as time permits in 7 minutes.

2. Take several *addition flash cards* with the answers showing and have the student(s) tell the other addition and the two subtraction facts that use the same three numbers. Write three numbers "7, 11, and 4" on the chalk board. Have them tell two addition and two subtraction facts using the three numbers. The student(s) should be able to complete ***Student Activity One*** by themselves.

3. As you show the student(s) an *addition flash card* without the answer showing, name a number that is greater or less than the fact. Do several examples having the student(s) tell if one is greater than or less than the other. The student(s) should now be able to complete ***Student Activity Two*** on their own.

4. Write "67 = __ tens + __ ones = __ tens + __ones" on the chalk board. Have the student(s) tell the numbers to write in the blanks. Do as many sentences as are necessary for them to gain understanding. The student(s) should be able to complete ***Student Activity Three*** by themselves.

5. Give the student(s) sm*all clock models*. Write several times for 5 minutes on the chalk board. Have the student(s) set the clocks for each of the given times. Allow them to check their clocks by your *clock model*. Give help where needed as the student(s) complete ***Student Activity Four***.

6. Point to three consecutive numbers used in counting by threes going backwards on the *number chart* (21, 18, and 15). Ask the student(s) what sequence is being used. Then have them name the next three numbers in the sequence. After practicing several sequences by threes backwards, the student(s) should be able to complete ***Student Activity Five*** by themselves.

7. The student(s) should be able to complete ***Student Activity Six*** independently.

Worksheets:

1. *Worksheet 22* – Time for 5 minutes

Lesson 45

1 Write 2 addition and 2 subtraction facts.

3 7 10	4 2 6	8 9 17
3 + 7 = 10	4 + 2 = 6	8 + 9 = 17
7 + 3 = 10	2 + 4 = 6	9 + 8 = 17
10 − 7 = 3	6 − 2 = 4	17 − 9 = 8
10 − 3 = 7	6 − 4 = 2	17 − 8 = 9

7 9 2	5 6 11	3 12 9
7 + 2 = 9	5 + 6 = 11	3 + 9 = 12
2 + 7 = 9	6 + 5 = 11	9 + 3 = 12
9 − 2 = 7	11 − 6 = 5	12 − 9 = 3
9 − 7 = 2	11 − 5 = 6	12 − 3 = 9

2 Write < or >.

4 + 6 < 11	7 + 7 > 13	8 + 9 > 16
5 + 4 < 10	2 + 4 > 5	4 + 5 > 8
9 + 5 > 13	7 + 6 < 14	6 + 3 < 10
3 + 4 < 8	3 + 8 < 12	2 + 5 < 8

3 Write the numbers.

93 = 9 tens + 3 ones = 8 tens + 13 ones
47 = 4 tens + 7 ones = 3 tens + 17 ones
35 = 3 tens + 5 ones = 2 tens + 15 ones
50 = 5 tens + 0 ones = 4 tens + 10 ones
68 = 6 tens + 8 ones = 5 tens + 18 ones
24 = 2 tens + 4 ones = 1 tens + 14 ones

4 Write the correct time.

7:55 | 3:05 | 10:20 | 6:40
4:35 | 12:25 | 1:10 | 9:50

5 Write the next three numbers.

15	12	9	6	3	0
27	24	21	18	15	12
60	57	54	51	48	45
81	78	75	72	69	66
121	118	115	112	109	106

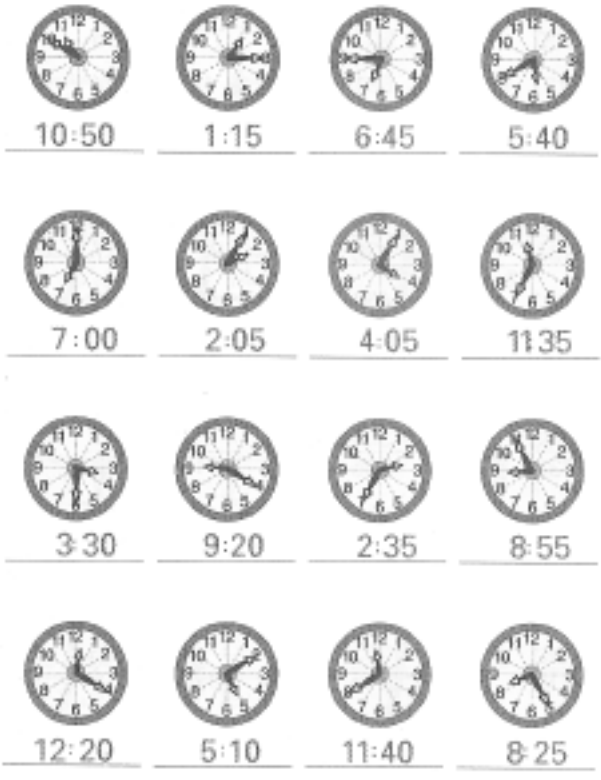
6 The zookeeper counted 38 monkeys in the cages at the zoo. He had 13 more to join them. How many monkeys are now in the cages at the zoo?

38
+ 13
51 monkeys

Worksheet 22

Lesson 45

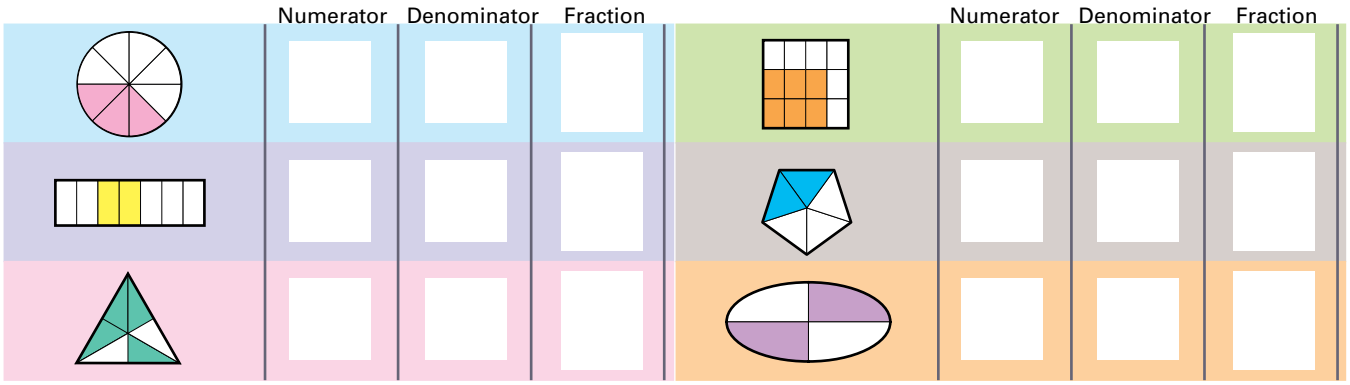
Write the correct time.



10:50 | 1:15 | 6:45 | 5:40
7:00 | 2:05 | 4:05 | 11:35
3:30 | 9:20 | 2:35 | 8:55
12:20 | 5:10 | 11:40 | 8:25

Lesson 45

1 **In the fraction $\frac{3}{4}$, the denominator is a ____ and the numerator is a ____.**



2 **Write the numbers in expanded and standard form.**

4 ten thousands + 7 thousands + 5 hundreds + 2 tens + 8 ones =

(____ x _____) + (____ x _____) + (____ x _____) + (____ x ____) + (____ x ____)

_____ + _____ + _____ + ____ + ____ = _____

8 hundreds + 3 thousands + 1 ten + 6 ten thousands + 0 ones =

(____ x _____) + (____ x _____) + (____ x _____) + (____ x ____) + (____ x ____)

_____ + _____ + _____ + ____ + ____ = _____

6 thousands + 5 tens + 2 ten thousands + 0 hundreds + 7 ones =

(____ x _____) + (____ x _____) + (____ x _____) + (____ x ____) + (____ x ____)

_____ + _____ + _____ + ____ + ____ = _____

3 **Find the product.**

123 x 2	622 x 4	823 x 2	232 x 3	321 x 4	222 x 4	333 x 3	632 x 2	413 x 3
223 x 2	731 x 3	231 x 3	121 x 4	322 x 3	513 x 3	911 x 7	712 x 4	501 x 6

4 **Write < or >.**

15,186 ____ 35,186	73,198 ____ 73,189	27,361 ____ 27,316
42,739 ____ 47,390	30,175 ____ 30,715	54,089 ____ 54,088
62,540 ____ 62,450	82,649 ____ 86,492	93,172 ____ 91,372

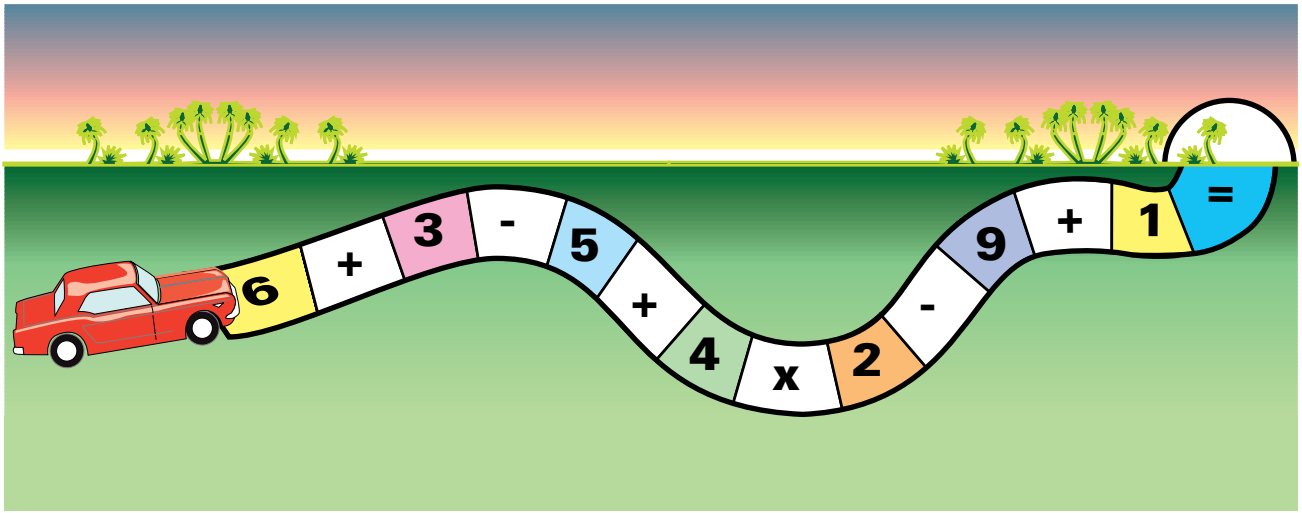
5 **Find the sum and check. Write the terms.**

214 342 129 + 881	313 431 383 + 319	214 301 264 + 434	143 720 422 + 356	311 490 779 + 204	523 274 836 + 102

6 **Write = or ≠.**

69 + 10 ____ 690	126 + 10 ____ 1,260
243 + 10 ____ 233	1,260 + 10 ____ 1,270
75 + 10 ____ 85	5,270 + 10 ____ 5,280
810 + 10 ____ 820	38 + 10 ____ 48
457 + 10 ____ 458	4,280 + 10 ____ 42,890

7 **Find the answer.**



Worksheet 21

Lesson 43

Add to find the sum.

Drill #1

9 + 7	4 + 6	4 + 9	5 + 7	2 + 6	9 + 0	9 + 4	5 + 2	1 + 8
3 + 3	7 + 9	2 + 3	7 + 0	8 + 7	1 + 6	7 + 6	3 + 6	4 + 5
6 + 7	1 + 3	8 + 4	1 + 5	3 + 7	2 + 2	9 + 1	1 + 9	8 + 0

Subtract to find the difference.

Drill #2

12 - 9	8 - 0	10 - 4	11 - 8	2 - 1	11 - 2	10 - 1	7 - 4	17 - 9
8 - 4	10 - 8	4 - 2	11 - 6	12 - 3	6 - 3	14 - 5	3 - 2	10 - 6
12 - 8	9 - 7	13 - 4	5 - 1	10 - 2	9 - 3	5 - 5	11 - 4	12 - 5

Lesson 45

Concepts:

Counting by eights, fractions, fraction terms, place value, multiplication, greater than and less than, addition, addition terms, and equal and not equal

Objectives:

1. The student shall be able to count out loud by eights to 96.
2. The student shall be able to write the number in the numerator, the denominator, and the fraction represented by a shaded shape.
3. The student shall be able to write the expanded and standard form of a given word number.
4. The student shall be able to write the product of a triple digit number and a single digit number.
5. The student shall be able to write the correct symbol (< or >) between two five digit numbers.
6. The student shall be able to write the terms of an addition problem.
7. The student shall be able to write the sum of four triple digit numbers when all columns have double digit answers.
8. The student shall be able to write the correct symbol (= or ≠) between an addition problem and a standard number.

Teaching Tips:

1. The student(s) may enjoy playing a relay game with the multiplication facts that do not have the answers showing in activity 3.
2. When the student(s) finish with ***Student Activity Four***, have them read the problems with the answers out loud.

Materials, Supplies, & Equipment:

1. Flash cards for addition and multiplication facts

Editor's Note: Worksheets may be used or repeated in any lesson after they are first suggested. Worksheet 21 was suggested in Lesson 43 and has been carried forward to this sample lesson.

Activities:

1. Count out loud with the student(s) by eights to 96.

2. Drill the addition facts by reading a series of ten facts from the *addition flash cards* to the student(s). Have them write the answers in a column on a sheet of paper. Check their answers and give them another series of ten facts. Continue to do so for 5 minutes.

3. Using *flash cards for multiplication facts*, drill 2's and 3's as pairs without the answers showing. Drill 6's, 9's, 4's, and 8's as pairs with the answers showing.

4. Discuss the location of the denominator and the numerator in a fraction. Draw several shapes and divide each into a different number of equal parts. Shade each shape differently. Ask the student(s) what the numerator of the shaded area would be and what the denominator would be. Then do the same for the unshaded area. The student(s) should be able to complete ***Student Activity One*** with little help.

5. On the chalk board, write a problem similar to that given in ***Student Activity Two***. Notice that the second problem and following have the order of the terms changed. Have the student(s) write the expanded form, write the value in the correct order, and then write the number in standard form.

6. Write several triple digit numbers times a single digit number on the chalk board as vertical multiplication problems (without regrouping). On the chalk board find the answer to the first problem with the student(s). Then have them copy the others on a sheet of paper and find the answers on their own. Check their work. The student(s) should be able to complete ***Student Activity Three*** by themselves.

7. Write several five digit numbers on the chalk board for comparison with the < and > symbols. Make some of the numbers have the first digit the same, the first two digits the same, the first three digits the same, etc. Have the student(s) tell which symbols should be placed between the numbers. They should be able to complete ***Student Activity Four*** alone.

8. The student(s) are to write the addition terms on the blanks by the first problem in ***Student Activity Five*** before finishing the activity.

9. Remind the student(s) that in order to add 10 to a number, they should find the tens' digit and increase it by 1. Do several examples on the chalk board. The student(s) should be able to complete ***Student Activity Six*** on their own.

10. The student(s) should be able to complete ***Student Activity Seven*** without assistance.

Lesson 45

① In the fraction $\frac{3}{4}$, the denominator is a 4 and the numerator is a 3

	Numerator	Denominator	Fraction
	3	8	$\frac{3}{8}$
	2	7	$\frac{2}{7}$
	4	6	$\frac{4}{6}$
	6	12	$\frac{6}{12}$
	2	5	$\frac{2}{5}$
	2	4	$\frac{2}{4}$

② Write the numbers in expanded and standard form.

4 ten thousands + 7 thousands + 5 hundreds + 2 tens + 8 ones =

(4 × 10,000) + (7 × 1,000) + (5 × 100) + (2 × 10) + (8 × 1)

40,000 + 7,000 + 500 + 20 + 8 = 47,528

8 hundreds + 3 thousands + 1 ten + 6 ten thousands + 0 ones =

(6 × 10,000) + (3 × 1,000) + (8 × 100) + (1 × 10) + (0 × 1)

60,000 + 3,000 + 800 + 10 + 0 = 63,810

6 thousands + 5 tens + 2 ten thousands + 0 hundreds + 7 ones =

(2 × 10,000) + (6 × 1,000) + (0 × 100) + (5 × 10) + (7 × 1)

20,000 + 6,000 + 000 + 50 + 7 = 26,057

③ Find the product.

123 × 2 = 246	622 × 4 = 2,488	823 × 2 = 1,646	232 × 3 = 696	321 × 4 = 1,284	222 × 4 = 888	333 × 3 = 999	632 × 2 = 1,264	413 × 3 = 1,239
223 × 2 = 446	731 × 3 = 2,193	231 × 3 = 693	121 × 4 = 484	322 × 3 = 966	513 × 3 = 1,539	911 × 7 = 6,377	712 × 4 = 2,848	501 × 6 = 3,006

97

④ Write < or >.

15,186 < 35,186	73,198 > 73,189	27,361 > 27,316
42,739 < 47,390	30,175 < 30,715	54,089 > 54,088
62,540 > 62,450	82,649 < 86,492	93,172 > 91,372

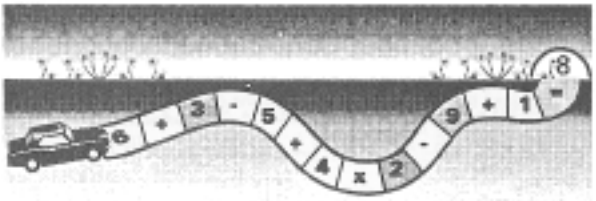
⑤ Find the sum and check. Write the terms.

214	addend	313	214	143	311	523
342	addend	431	301	720	490	274
129	addend	383	264	422	779	836
+ 881	addend	+ 319	+ 434	+ 356	+ 204	+ 102
1,566	sum	1,446	1,213	1,641	1,784	1,735

⑥ Write = or ≠.

89 + 10	≠	690	126 + 10	≠	1,260
243 + 10	≠	233	1,260 + 10	=	1,270
75 + 10	=	85	5,270 + 10	=	5,280
810 + 10	=	820	38 + 10	=	48
457 + 10	≠	458	4,280 + 10	≠	42,890

⑦ Find the answer.



98

Worksheet 21 — Lesson 43

Add to find the sum. Drill #1

9 + 7 = 16	4 + 6 = 10	4 + 9 = 13	5 + 7 = 12	2 + 6 = 8	9 + 0 = 9	9 + 4 = 13	5 + 2 = 7	1 + 8 = 9
3 + 3 = 6	7 + 9 = 16	2 + 3 = 5	7 + 0 = 7	8 + 7 = 15	1 + 6 = 7	7 + 6 = 13	3 + 6 = 9	4 + 5 = 9
6 + 7 = 13	1 + 3 = 4	8 + 4 = 12	1 + 5 = 6	3 + 7 = 10	2 + 2 = 4	9 + 1 = 10	1 + 9 = 10	8 + 0 = 8

Subtract to find the difference. Drill #2

12 - 9 = 3	8 - 0 = 8	10 - 4 = 6	11 - 8 = 3	2 - 1 = 1	11 - 2 = 9	10 - 1 = 9	7 - 4 = 3	17 - 9 = 8
8 - 4 = 4	10 - 8 = 2	4 - 2 = 2	11 - 6 = 5	12 - 3 = 9	6 - 3 = 3	14 - 5 = 9	3 - 2 = 1	10 - 6 = 4
12 - 8 = 4	9 - 7 = 2	13 - 4 = 9	5 - 1 = 4	10 - 2 = 8	9 - 3 = 6	5 - 5 = 0	11 - 4 = 7	12 - 5 = 7

Prime Numbers

Eratosthenes invented a way to find prime numbers long ago. Look at the instructions and table to see how it was done. If you would like to do this exercise yourself, use worksheet 25.

1. 1 is not prime. Cross it out.
2. Circle 2. Use skip counting to find all the numbers having 2 as a factor (4, 6, 8, 10...). Cross out these numbers.
3. Circle 3. Use skip counting to find all the numbers having 3 as a factor (3, 6, 9, 12...). Cross out these numbers.
4. Continue with 5, 7, 11, and so on. All the numbers not crossed out are prime.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

The prime numbers less than 50: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, and 47.

1 Shade all prime numbers to find the MYSTERY message. (There are 21.)

29	43	2	30	29	16	11
13	10	3	40	13	3	20
43	4	5	50	17	12	18
23	8	7	22	31	47	12
17	47	11	25	37	14	31

2 Match each number with its prime factors. Darken the columns with composite numbers to spell a message. The first two have been done for you. (Hint: If you multiply the numbers under the box, you get the numbers in the box: 1 x 13 = 13 and 2 x 2 x 2 x 3 = 24)

17 24 21 36 13 4 5

31 18 20 12 16 29 23

13	24												
1	2	2	17	2	23	2	3	1	2	29	5	2	1
13	2	2	1	2	1	2	7	31	3	1	2	2	5
	2			3		2			3		2	3	
	3			3		2							
T	**G**	**R**	**O**	**E**	**V**	**A**	**T**	**E**	**J**	**R**	**O**	**B**	**O**

3 Find the product. Complete these problems as quickly as possible without making errors.

3	4	2	5	2	4	2	9	2
x 5	x 5	x 9	x 5	x 7	x 9	x 1	x 9	x 3

2	9	2	5	1	6	2	7	2
x 4	x 1	x 5	x 9	x 5	x 5	x 6	x 5	x 8

9	5	5	9	9	2	9	9	1
x 8	x 2	x 8	x 2	x 3	x 2	x 6	x 7	x 9

4 Arrange the numbers from least to greatest and complete the verse: **"Humble yourself before the Lord and…"James 4:10**

22,389	**A**	132,000,049	**Y**	254	**E**	768,984,984	**U**
467,002	**L**	35,789	**L**	1,980	**H**	78,456,902	**T**
1,956,001	**I**	489,980,002	**O**	46	**H**	9,012,456	**F**
541,098,465	**U**	985	**S**	786,894,341	**P**	562,978	**L**

1. _____ ☐
2. _____ ☐
3. _____ ☐
4. _____ ☐
5. _____ ☐
6. _____ ☐
7. _____ ☐
8. _____ ☐
9. _____ ☐
10. _____ ☐
11. _____ ☐
12. _____ ☐
13. _____ ☐
14. _____ ☐
15. _____ ☐
16. _____ ☐

5 Find the sum.

59 + 47	37 + 58	29 + 59	84 + 79	56 + 87

6 Use the clues to find the mystery number (n) in each box.

13	81	48	29	62	47	63	91

1. n is not prime.
2. n is odd.
3. The product of the two digits is 8.
4. The sum of the two digits is 9.
5. The mystery number is _____.

1 **This game will let you find all the prime numbers less than 100.**
(1 is crossed out because prime numbers are greater than 1.)

~~1~~	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Follow these rules.

1. Draw a line through every number greater than 2 that is divisible by 2 (use divisibility rule).
2. Draw a line through every number that is left that is greater than 5 and that is divisible by 5 (use divisibility rule).
3. Draw a line through every number that is left that is greater than 3 and that is divisible by 3 (use divisibility rule).
4. Draw a line through every number that is left that is greater than 7 and that is divisible by 7 (divide by 7).

You should have twenty-five prime numbers that are not crossed out.

2 **Write** *prime* **or** *composite* **by the following numbers.**

13 _____ 67 _____ 76 _____ 91 _____

39 _____ 47 _____ 49 _____ 53 _____

31 _____ 51 _____ 23 _____ 81 _____

Prime number chart.

2	3	5	7	11
13	17	19	23	29
31	37	41	43	47
53	59	61	67	71
73	79	83	89	97

Lesson 45

Concepts:

Prime numbers, prime factors, multiplication, compare and order, addition, mystery numbers

Objectives:

1. The student will be able to use a prime number table to find prime and composite numbers.
2. The student will be able to find prime numbers in a table and shade them in to find a message.
3. The student will be able to find the prime factors of composite numbers.
4. The student will be able to order numbers ranging from two digit to six digit.
5. The student will be able to find the sum or two, two digit numbers.
6. Given clues, the student will be able to use the problem solving skill of elimination and determine the value of a given number.

Teaching Tips:

1. Students who would like to complete a prime number table on their own may use Worksheet 25.

Materials, Supplies, and Equipment:

1. Poster from Lesson 44 Explanation
2. *Worksheet 25*

Activities:

1. Review the poster from **Lesson 44 Explanation** defining prime and composite numbers.
2. Read **Lesson 45 Explanation** with the students.
3. Call out the following numbers one at a time, and have the student tell if they are prime or composite: 3, 4, 6, 10, 11, 12, 13, 15, 17. (They may refer to the chart in **Lesson 45 Explanation** when necessary.)
4. The students should be able to complete **Lesson 45 Practice** independently. Assist the students as they complete **Lesson 45-2 Practice.**

Sticks and stones will break my bones, but words will wound forever.
Author Unknown

Horizons Math 4, Answer Key

Lesson 44

1. 13 x 1; 2 x 6 2 x 2 x 3 3 x 4; 3 x 2 x 2 5 x 5

2. F O R K R O A D
   1 2 3 4 5 6 7 8

3. multiplicand
   multiplier
   72 product; 27; 49; 16; 10; 28; 45; 42
   9; 24; 6; 2; 4; 7; 9; 5; 2; 1

4. ≠; =; =; ≠; =; ≠; ≠; =
5. 96; 137; 129; 145; 102

6. $48.00 + $45.00 + $15.00 = $108.00
   $130 - $108.00 = $22.00
   $15.00 + $6.00 + 2.00 = $23.00
   $25.00 - $23.00 = $2.00

Lesson 45

1. OK

2. 4; 17; 36; 23; 16; 21; 31; 18; 29; 20; 12; 5
   GREAT JOB

3. 15; 20; 18; 25; 14; 36; 2; 81; 6
   8; 9; 10; 45; 5; 30; 12; 35; 16
   72; 10; 40; 18; 27; 4; 54; 63; 9

4. HE SHALL LIFT YOU UP

5. 106; 95; 88; 163; 143

6. 81

Horizons Math 4, Worksheet Key

WORKSHEET 24

2 = 2 • 1; 3 = 3 • 1; 4 = 2 • 2; 5 = 5 • 1; 6 = 3 • 2;

7 = 7 • 1; 8 = 2 • 2 • 2; 9 = 3 • 3; 10 = 5 • 2;

11 = 11 • 1; 12 = 3 • 2 • 2; 13 = 13 • 1; 14 = 7 • 2;

15 = 5 • 3; 16 = 2 • 2 • 2 • 2; 17 = 17 • 1;

18 = 2 • 3 • 3; 19 = 19 • 1 20 = 2 • 2 • 5; 21 = 3 • 7;

22 = 2 • 11; 23 = 23 • 1; 24 = 2 • 2 • 2 • 3; 25 = 5 • 5

WORKSHEET 25

1. Teacher check
2. prime, prime, composite, composite
   composite, prime, composite, prime
   prime, composite, prime, composite

WORKSHEET 26

4, 9, 3, 7, 4, 7, 5, 6

63, 63, 7, 9; 30, 30, 5, 6;

32, 32, 4, 8; 42, 42, 7, 6;

40, 40, 8, 5; 15, 15, 3, 5

Two- and Three-digit Quotient Division

The Crown Chewing Gum Company had 6,646 sticks of gum that needed to be packaged. If each package can hold 9 sticks of gum, how many packages will there be? Will there be any extra sticks left over?

Don't Forget
1. Divide
2. Multiply
3. Subtract
4. Check
5. Bring Down

We Divide:

STEP 1

Think: 66 ÷ 9

Multiply
9 x 7 = 63 → 7

Subtract
66 − 63 = 3

$$\begin{array}{r} 7 \\ 9\overline{)6{,}646} \\ -\,6\;3 \\ \hline 3 \end{array}$$

STEP 2

Think: 34 ÷ 9

$$\begin{array}{r} 73 \\ 9\overline{)6{,}646} \\ -\,6{,}3 \\ \hline 34 \\ -\,27 \\ \hline 7 \end{array}$$

← Multiply 9 x 3 = 27

← Subtract

STEP 3

Think: 76 ÷ 9

$$\begin{array}{r} 738\ \text{R4} \\ 9\overline{)6{,}646} \\ -\,6\;3 \\ \hline 34 \\ -\,27 \\ \hline 76 \\ -\,72 \\ \hline 4 \end{array}$$

← Multiply 9 x 8 = 72

← Subtract 76 − 72 = 4

The factory will need 738 packages. There will be 4 sticks left over.

1 Find the quotient.

$7\overline{)2{,}385}$ $7\overline{)3{,}223}$ $6\overline{)4{,}183}$

2 Match the problem and the answer.

285 x 4 =	2,871
475 x 6 =	2,850
319 x 9 =	1,140
562 x 3 =	1,686

3 Find the quotient amount.

$3\overline{)\$1.83}$ $6\overline{)\$25.56}$ $4\overline{)\$23.88}$

$5\overline{)\$55.00}$ $4\overline{)\$1.68}$

4 Match the remainder with the appropriate answer.

$6\overline{)207}$	$7\overline{)394}$	$6\overline{)167}$	$5\overline{)394}$
R4	R2	R3	R5

5 Find the difference. Order the answers from smallest to largest to reveal a message.

439 − 367	75 − 17	93 − 48	981 − 457	44 − 21
C	**A**	**R**	**E**	**G**

___ ___ ___ ___ ___

Proverbs 3:34

6 Solve.

Write the greatest number possible with 5 in the hundred thousands' place using the digits in 347,325,623.

_____

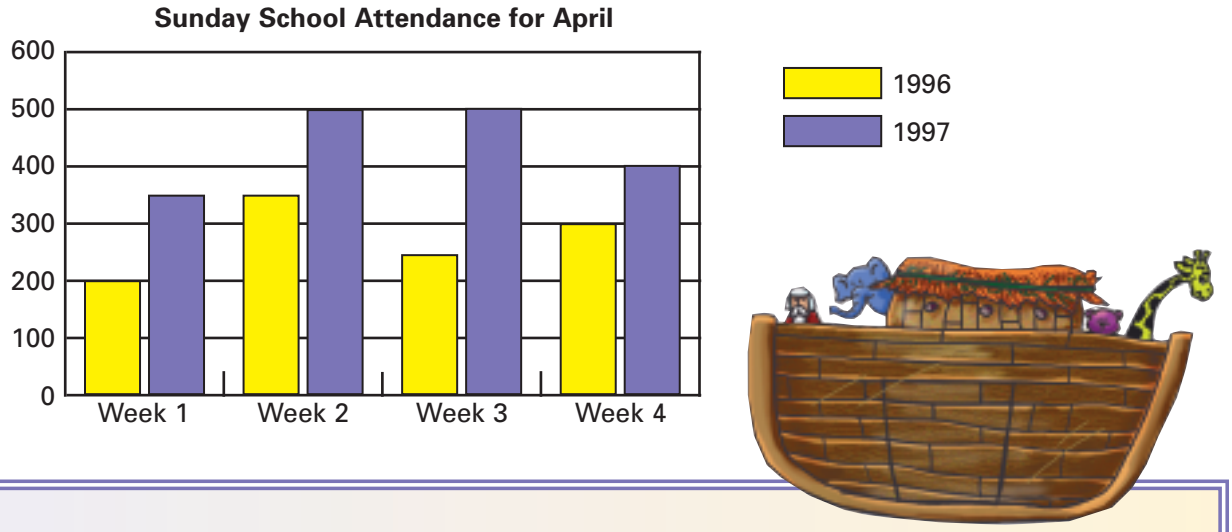
Write the smallest number possible with 1 in the hundred millions' place using the digits in 185,295,237.

_____

Write the largest number possible with 8 in the tens' place using the digits in 638,453,521.

_____

7



1. What was the difference in the total attendance for the entire month of April in 1996 and 1997?

2. Look at week 1 and week 4. What was the total difference in attendance between these two weeks in 1996? In 1997?

3. What is the difference in attendance for each week in 1996 and each week in 1997?

1 **Find the missing number.** Tell what mathematics operation you used on both sides of the equation to find the missing number.

$N \div 5 = 7$ $N =$ 35	Multiply both sides by 5
$N \div 2 = 4$ $N =$ 8	Multiply both sides by 2
$N \div 2 = 9$ $N =$ _____	_____
$N \div 9 = 7$ $N =$ _____	_____
$N \div 4 = 8$ $N =$ _____	_____
$N \div 4 = 6$ $N =$ _____	_____
$N \div 7 = 8$ $N =$ _____	_____
$N \div 7 = 7$ $N =$ _____	_____
$N \div 9 = 4$ $N =$ _____	_____
$N \div 8 = 9$ $N =$ _____	_____
$N \div 4 = 7$ $N =$ _____	_____
$N \div 3 = 9$ $N =$ _____	_____
$N \div 6 = 6$ $N =$ _____	_____

Lesson 45

Concepts:

Two- and three-digit quotient division, division of money, three-digit multiplication, two- and three-digit subtraction, place value, multiple operations

Objectives:

1. The student will be able to complete division problems which contain three-digit quotients with remainders.
2. The student will be able to complete multiplication problems which contain a three-digit multiplier and a one-digit multiplicand.
3. The student will be able to divide money.
4. The student will be able to complete division problems which contain a two-digit quotient with remainders.
5. The student will be able to complete two- and three-digit subtraction problems.
6. The student will be able to identify place value through the billions.
7. The student will be able to complete problems which require the use of more than one operation to solve.

Teaching Tips:

By this time, students should have a basic understanding of the division process and all the steps involved in solving a division problem. Stress that solving a larger division problem simply means that the same division steps (Divide, Multiply, Subtract, Check, Bring Down) used in smaller problems, will be repeated in the larger problem.

Materials, Supplies, and Equipment:

1. Graph paper or lined paper
2. Calculator (for multiplication steps and checking ONLY)

Activities:

1. Remind the students of the steps involved in a division problem (Divide, Multiply, Subtract, Check, Bring Down). Have them repeat the class acronym if needed.
2. Complete the following problems together for review: 212 ÷ 3 =, 302 ÷ 5 = and 363 ÷ 4 = **(Answers: 70 r 2, 60 r 3, and 90 r 3)**. You may wish to have the students play "teacher". Pick a different student to complete each problem. The student must come to the board, work the problem, and explain each step as he completes the problem, just like the teacher would. If the student has difficulty with any portion of the division problem, he may stop at any point and have another student complete the task.
3. Read **Lesson 45 Explanation** together. Work through the sample problem and discuss each step.
4. Use the following problems as additional practice problems, if needed: 2,825 ÷ 3 = 2,457 ÷ 6 = and 2,560 ÷ 4 = **(Answers: 941 r 2, 409 r 3, and 640)**.
5. The student should be able to complete **Lesson 45 Practice** independently. Allow them to use graph paper or lined paper, if necessary, to keep all columns straight. Also allow the students to use calculators for checking and difficult multiplication problems, but not for calculating answers without showing work.

God opposes the proud but gives grace to the humble.
Proverbs 3:34

Editor's Note: Worksheets may be used or repeated in any lesson after they are first suggested. Worksheet 24 was suggested in Lesson 44 and has been carried forward to this sample lesson.

Horizons Math 5, Answer Key

Lesson 45

1. 340 R5; 460 R3; 697 R1

2. 285 x 4 = 1,140
   475 x 6 = 2,850
   319 x 9 = 2,871
   562 x 3 = 1,686

3. $0.61; $4.26; $5.97
   $11.00; $0.42

4. 34 R3; 56 R2; 17 R5; 75 R4

5. 72 C; 58 A; 45 R; 524 E; 23 G
   GRACE

6. 764,533,322
   122,355,789
   655,433,281

7. 1. 1996 – 200 + 350 + 250 + 300 = 1,100
      1997 – 350 + 500 + 500 + 400 = 1,750
      Difference – 1,750 – 1,100 = 650

   2. 300 – 200 = 100
      400 – 350 = 50

   3. Week 1 – 350 – 200 = 150
      Week 2 – 500 – 350 = 150
      Week 3 – 500 – 250 = 250
      Week 4 – 400 – 300 = 100

Horizons Math 5, Worksheet Key

WORKSHEET 23

1. $2.88 $1.30 $1.00 $2.94
   $8.45 $11.00 $7.00 $22.56

   two dollars and eighty-eight cents
   eight dollars and forty-five cents

2 $1.62 $1.79 $ .51 $1.15
   $2.32 $1.89 $2.21 $4.75

   one dollar and sixty-two cents
   two dollars and thirty-two cents

WORKSHEET 24

example
example
18, multiply both sides by 2
63, multiply both sides by 9
32, multiply both sides by 4
24, multiply both sides by 4
56, multiply both sides by 7
49, multiply both sides by 7
36, multiply both sides by 9
72, multiply both sides by 8
28, multiply both sides by 4
27, multiply both sides by 3
36, multiply both sides by 6

WORKSHEET 25

1. a. 12 objects b. 4

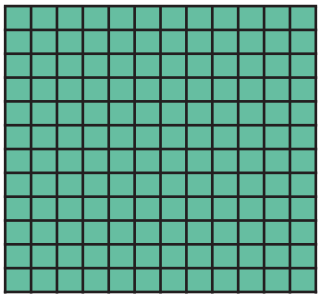
2.

18	3	6
24	3	8
12	4	3
20	4	5
15	3	5
20	4	5

474, 6, 79
76°F
85

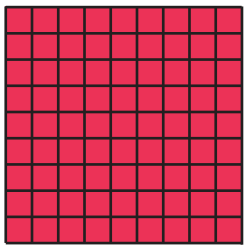
Square Roots

When a number has an exponent of 2, that number is said to be "squared." For example, 12^2 can also be written 12 x 12. 12 x 12 = 144. 4^2 can also be written 4 x 4. 9^2 can also be written 9 x 9. These numbers are perfect squares because they can be illustrated as shown below.



12 x 12 = 144

4 x 4 = 16



9 x 9 = 81

Suppose you were given the number 144 and asked which number multiplied by itself equals 144? Your answer would be 12, because $12^2 = 144$. Therefore, 12 is the **square root** of 144. What would be the square root of 16? 4 would be the square root of 16. What would be the square root of 81? 9 would be the square root of 81.

To find the square root of a given number, you have to make an educated guess based on your knowledge of the multiplication tables. Suppose you are given the number 64. Think through your multiplication tables. Which number, multiplied by itself, will yield an answer close to 64? 7 x 7 = 49, so it must be a number larger than 7. 10 x 10 is 100, so it must be a number lower than 10. 8 x 8 = 64, so $8^2 = 64$.

1 **Complete the table. The first one is done for you.**

Number	Square Root	Multiplication Problem
121	11	11 x 11 = 121 or 11^2
196		
	23	
25		
225		
	4	

2 **Complete the table. The first one is done for you.**

	Factors	Product	Exponent	Number of Zeros
5^2	5 x 5	25	2	Not Applicable
		1,000		
7^4		2,401		
	10 x 10 x 10 x 10 x 10			
9^6				

3 **Complete.**

List all the prime numbers between 1 and 50.

_____

4 **Draw factor trees for the following numbers:**

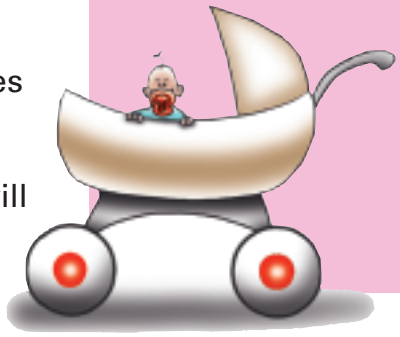
21 45 72 150

5

$$\begin{array}{r} 905,483 \\ -\ 812,582 \\ \hline \end{array} \qquad \begin{array}{r} 450,378 \\ -\ 285,026 \\ \hline \end{array} \qquad \begin{array}{r} 672,601 \\ -\ 486,300 \\ \hline \end{array} \qquad \begin{array}{r} 926,458 \\ -\ 720,462 \\ \hline \end{array}$$

6 **Solve.**

Twice a week, Sabrina, Lois and Kathy walk laps around the neighborhood while pushing their babies in a stroller. Sabrina takes 9 minutes to walk a lap, Lois takes 10 minutes, and Kathy takes 12 minutes. If they all begin walking at 8:00 AM, at what time will they all meet again at the starting point?



	Sabrina	Lois	Kathy
Start	8:00	8:00	8:00
Lap 1	8:09	8:10	8:12
Lap 2			

7 **Find the product.**

15,299	45,089	12,115	42,139
x14,110	x11,111	x 5,226	x10,283

Worksheet 24

The expression 2^2 means two squared or 2×2. $2^2 = 2 \times 2 = 4$

Whenever a number is multiplied by itself, the product is the *square* of the number. 4 is the square of 2.

The number being multiplied is the **square root**. 2 is the square root of 4.

1. Write the square of each number.

3 ____ 4 ____ 5 ____ 6 ____ 7 ____ 8 ____ 9 ____ 10 ____ 11 ____ 12 ____

2. Write the square root of each number.

144 ____ 121 ____ 100 ____ 81 ____ 64 ____ 49 ____ 36 ____ 25 ____ 16 ____ 9 ____

3. Write the …

a. square of each number.

2 _____ 3 _____ 5 _____ 6 _____ 7 _____ 8 _____ 9 _____ 10 _____ 11 _____ 12 _____

b. square root of each number.

144 _____ 121 _____ 100 _____ 81 _____ 64 _____ 49 _____ 36 _____ 25 _____ 9 _____ 4 _____

A **perfect square** is a number with a square root that is a whole number.
Each of the numbers in ex. 3b is a *perfect square*.
The **radical sign** $\sqrt{\ }$ expresses square root. $\sqrt{121} = 11$

4. Circle the perfect squares.

$\sqrt{49}$ $\sqrt{72}$ $\sqrt{81}$ $\sqrt{25}$ $\sqrt{48}$ $\sqrt{21}$ $\sqrt{36}$ $\sqrt{121}$

Lesson 45

Concepts:

Square roots, exponents, prime and composite numbers, factor trees, six digit subtraction, five digit by five digit multiplication, logic problems.

Objectives:

1. The student will be able to write, calculate, and interpret square roots.
2. The student will be able to write, calculate, and interpret exponential information.
3. The student will be able to identify prime and composite numbers.
4. The student will be able to create and complete factor trees for given numbers.
5. The student will be able to subtract six digit numbers.
6. The student will be able to complete multiplication problems which contain five digit factors.
7. The student will be able to correctly complete a given logic problem.

Teaching Tips:

Materials, Supplies, and Equipment:

1. Snap blocks
2. Calculator
3. *Worksheet 24*

Activities:

1. Read **Lesson 45 Explanation** together as a class. Use the snap blocks to demonstrate the sample problems shown in the lesson explanation. Have the students "play" with the snap cubes and find other squares & square roots.
2. Use the calculators at tools to find the square roots of given numbers. Explain the student can make educated guesses when looking for a square root. They can then use the calculator as a resource. For example: When looking for the square root of 121 think about the times tables. If the students know that 10 is the square root of 100, then the square root of 121 should be close to 10. In fact the square root of 121 is 11. Practice find the square root of the following numbers as a class: 289, 324, 10,000 (answers: 17^2, 18^2, 100^2).
3. Assign **Lesson 45-1** as independent work.

Restrain your voice from weeping and your eyes from tears, for your work will be rewarded declares the Lord.
Jeremiah 31:16b

Horizons Math 4, Answer Key

Lesson 45

1.

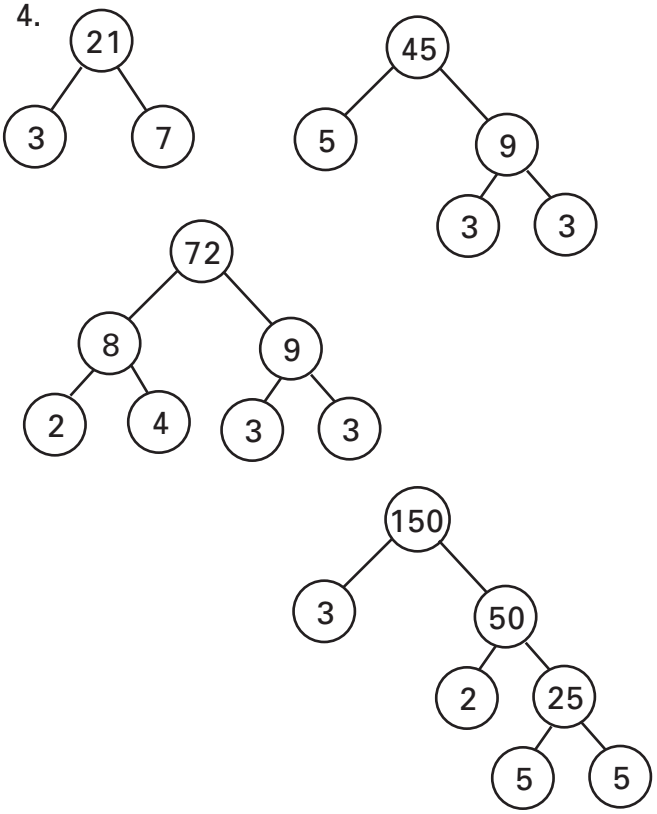
196	14	14 x 14 = 196 or 14^2
529	23	23 x 23 = 529 or 23^2
25	5	5 x 5 = 25 or 5^2
225	15	15 x 15 = 225 or 15^2
16	4	4 x 4 = 16 or 4^2

2.

10^3	10 x 10 x 10	1,000	3	3
7^4	7 x 7 x 7 x 7	2,401	4	N/A
10^5	10 x 10 x 10 x 10 x 10	100,000	5	5
9^6	9 x 9 x 9 x 9 x 9 x 9	531,441	6	N/A

3. Answers:
2, 3, 5, 7, 11, 13, 17, 19, 23, 29
31, 37, 41, 43, 47

4.



5. 92,901 165,352 186,301 205,996

6. They will all meet up at 11:00 AM. The charts below show each walking schedule.

	Sabrina	Lois	Kathy
Lap 1	8:09	8:10	8:12
Lap 2	8:18	8:20	8:24
Lap 3	8:27	8:30	8:36
Lap 4	8:36	8:40	8:48
Lap 5	8:45	8:50	9:00
Lap 6	8:54	9:00	9:12
Lap 7	9:03	9:10	9:24
Lap 8	9:12	9:20	9:36
Lap 9	9:21	9:30	9:48
Lap 10	9:30	9:40	10:00
Lap 11	9:39	9:50	10:12
Lap 12	9:48	10:00	10:24
Lap 13	9:57	10:10	10:36
Lap 14	10:06	10:20	10:48
Lap 15	10:15	10:30	11:00
Lap 16	10:24	10:40	
Lap 17	10:33	10:50	
Lap 18	10:42	11:00	
Lap 19	10:51		
Lap 20	11:00		

7. 215,868,890 500,983,879
63,312,990 433,315,337

Horizons Math 4, Worksheet Key

WORKSHEET 24

1. 9, 16, 25, 36, 49, 64, 81, 100, 121, 144

2. 12, 11, 10, 9, 8, 7, 6, 5, 4, 3

3. a. 4, 9, 25, 36, 49, 64, 81, 100, 121, 144
b. 12, 11, 10, 9, 8, 7, 6, 5, 3, 2

4. $\sqrt{49}$ $\sqrt{81}$ $\sqrt{25}$ $\sqrt{36}$ $\sqrt{121}$

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