

STAAR CONNECTION™

Developmental Series™

Math
4
teacher



KAMICO®
Instructional Media, Inc.

STAAR CONNECTION™

Math
4
teacher

Developmental Series™

XIX/x/MMXX
Version 1



KAMICO®
Instructional Media, Inc.

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KAMICO® Instructional Media, Inc.
STAAR CONNECTION™
Introduction

KAMICO® Instructional Media's program is validated by scientifically based research. **STAAR CONNECTION™ Diagnostic Series™** and **Developmental Series™** can be used in tandem to ensure mastery of Texas reporting categories and TEKS. The *Diagnostic Series™* consists of a bank of assessments. Each assessment covers a mixture of reporting categories and TEKS. This research-based format provides continual reinforcement for and ensures retention of mastered concepts. To take full advantage of this series, administer an assessment to students. After they have completed the assessment, use it as an instructional tool. Go over each item with the class, discussing all correct and incorrect answers. Then, use the assessment as a diagnostic tool to determine a standard for which students need remediation. Find that standard in the *Developmental Series™*.

Each book in the *STAAR CONNECTION™ Developmental Series™* consists of isolated activities and assessments to allow for the development of specific TEKS. For every TEKS, there is at least one individual or group activity. The activities provide a fun, challenging, yet nonthreatening, way to develop mastery of the TEKS. In addition to these activities, each *Developmental Series™* book has assessments on isolated standards to be used to identify mastery or the need for further skill development or reinforcement. Continue to alternate between the *STAAR CONNECTION™ Diagnostic Series™* and the *Developmental Series™*.

KAMICO's **DATA CONNECTION®** software prints student answer sheets on plain paper using a standard laser printer, scans answer sheets using a TWAIN-compliant scanner, scores assessments, and disaggregates student academic data, showing which goals and objectives are mastered and which goals and objectives are in need of reinforcement. The software is preprogrammed to work with all KAMICO® assessments. It is easily customized to work with other instructional materials and assessments as well as teacher-, school-, district-, or state-created assessments. **DATA CONNECTION®** analyzes academic data from individual students, classes, grade levels, and demographic groups. Reports are presented in tabular and graphic form. Item analysis is provided to help determine the most effective method of instruction.

KAMICO® Instructional Media, Inc., supports efforts to ensure adequate yearly progress and eliminate surprises in high-stakes test results.

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Grade 4 Mathematics
Reporting Categories and Related TEKS

Reporting Category 1:
Numerical Representations and Relationships

The student will demonstrate an understanding of how to represent and manipulate numbers and expressions.

| | | TE | SE |
|---|---------------------------------|-----|----|
| (4.2) Number and operations. The student applies mathematical process standards to represent, compare, and order whole numbers and decimals and understand relationships related to place value. The student is expected to | | | |
| (A) interpret the value of each place-value position as 10 times the position to the right and as one-tenth of the value of the place to its left; <i>Supporting Standard</i> | Values of Place Value | 13 | 5 |
| | Assessment | 23 | 21 |
| (B) represent the value of the digit in whole numbers through 1,000,000,000 and decimals to the hundredths using expanded notation and numerals; <i>Readiness Standard</i> | Match Those Numbers! | 28 | 28 |
| | Assessment | 54 | 26 |
| (C) compare and order whole numbers to 1,000,000,000 and represent comparisons using the symbols $>$, $<$, or $=$; <i>Supporting Standard</i> | Comparison Face-Off | 57 | 29 |
| | Assessment | 61 | 38 |
| (D) round whole numbers to a given place value through the hundred thousands place; <i>Supporting Standard</i> | Rounding Cups | 67 | 44 |
| | Assessment | 71 | 45 |
| (E) represent decimals, including tenths and hundredths, using concrete and visual models and money; <i>Supporting Standard</i> | Deriving Decimals | 75 | 49 |
| | I Have/Who Has | 81 | |
| | Assessment | 91 | 50 |
| (F) compare and order decimals using concrete and visual models to the hundredths; <i>Supporting Standard</i> | Fun Fact Comparisons | 96 | |
| | Marathon Mice | 98 | 56 |
| | Assessment | 121 | 58 |

| | | TE | SE |
|--|----------------------------------|-----------|-----------|
| (G) relate decimals to fractions that name tenths and hundredths; <i>Readiness Standard</i> | | | |
| | Fractions and Decimals | 127 | 64 |
| | Assessment | 134 | 65 |
| (H) determine the corresponding decimal to the tenths or hundredths place of a specified point on a number line. <i>Supporting Standard</i> | | | |
| | Points in Space | 138 | 69 |
| | Assessment | 147 | |
| (4.3) Number and operations. The student applies mathematical process standards to represent and generate fractions to solve problems. The student is expected to | | | |
| (A) represent a fraction a/b as a sum of fractions $1/b$, where a and b are whole numbers and $b > 0$, including when $a > b$; <i>Supporting Standard</i> | | | |
| | Fruit Fractions | 151 | 73 |
| | Assessment | 155 | 85 |
| (B) decompose a fraction in more than one way into a sum of fractions with the same denominator using concrete and pictorial models and recording results with symbolic representations; <i>Supporting Standard</i> | | | |
| | Decomposing Fractions | 159 | 89 |
| | Assessment | 163 | 99 |
| (C) determine if two given fractions are equivalent using a variety of methods; <i>Supporting Standard</i> | | | |
| | Equivalent Fractions | 169 | 105 |
| | Assessment | 183 | 107 |
| (D) compare two fractions with different numerators and different denominators and represent the comparison using the symbols $>$, $=$, or $<$; <i>Readiness Standard</i> | | | |
| | Fraction Fever | 189 | |
| | Fraction Inspection | 198 | 113 |
| | Assessment | 217 | 115 |
| (G) represent fractions and decimals to the tenths or hundredths as distances from zero on a number line. <i>Supporting Standard</i> | | | |
| | Point the Way! | 222 | |
| | Match Point | 224 | 120 |
| | Assessment | 226 | 123 |

Reporting Category 2:
Computations and Algebraic Relationships

The student will demonstrate an understanding of how to perform operations and represent algebraic relationships.

| | TE | SE |
|---|-----|-----|
| (4.3) Number and operations. The student applies mathematical process standards to represent and generate fractions to solve problems. The student is expected to | | |
| (E) represent and solve addition and subtraction of fractions with equal denominators using objects and pictorial models that build to the number line and properties of operations; <i>Readiness Standard</i> | | |
| Denominator Dominoes | 231 | 128 |
| Assessment | 237 | 130 |
| (F) evaluate the reasonableness of sums and differences of fractions using benchmark fractions 0, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, and 1, referring to the same whole. <i>Supporting Standard</i> | | |
| Benchmark Fractions | 243 | 136 |
| Assessment | 245 | 140 |
| (4.4) Number and operations. The student applies mathematical process standards to develop and use strategies and methods for whole number computations and decimal sums and differences in order to solve problems with efficiency and accuracy. The student is expected to | | |
| (A) add and subtract whole numbers and decimals to the hundredths place using the standard algorithm; <i>Readiness Standard</i> | | |
| Adding and Subtracting Across Texas . | 251 | 146 |
| Assessment | 259 | 148 |
| (B) determine products of a number and 10 or 100 using properties of operations and place value understandings; <i>Supporting Standard</i> | | |
| Shifting Sands | 262 | 151 |
| Assessment | 272 | |
| (C) represent the product of 2 two-digit numbers using arrays, area models, or equations, including perfect squares through 15 by 15; <i>Supporting Standard</i> | | |
| Multi-Match | 275 | |
| Assessment | 293 | 154 |

| | | TE | SE |
|-------|---|-----|-----|
| (D) | use strategies and algorithms, including the standard algorithm, to multiply up to a four-digit number by a one-digit number and to multiply a two-digit number by a two-digit number. Strategies may include mental math, partial products, and the commutative, associative, and distributive properties; <i>Supporting Standard</i> | | |
| | Major League Multiplication Methods | 299 | 160 |
| | Assessment | 316 | 169 |
| (E) | represent the quotient of up to a four-digit whole number divided by a one-digit whole number using arrays, area models, or equations; <i>Supporting Standard</i> | | |
| | Quotient Touchdown | 320 | 173 |
| | Assessment | 335 | |
| (F) | use strategies and algorithms, including the standard algorithm, to divide up to a four-digit dividend by a one-digit divisor; <i>Supporting Standard</i> | | |
| | Quotient Connection | 341 | 179 |
| | Assessment | 346 | 181 |
| (G) | round to the nearest 10, 100, or 1,000 or use compatible numbers to estimate solutions involving whole numbers; <i>Supporting Standard</i> | | |
| | Estimation Sensation | 349 | 184 |
| | Round and Round and Round We Go (multiplication and division) | 357 | |
| | (addition, subtraction, multiplication, and division) | 358 | 187 |
| | Assessment | 369 | 188 |
| (H) | solve with fluency one- and two-step problems involving multiplication and division, including interpreting remainders. <i>Readiness Standard</i> | | |
| | Playground Path | 372 | 192 |
| | Assessment | 383 | 194 |
| (4.5) | Algebraic reasoning. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to | | |
| (A) | represent multi-step problems involving the four operations with whole numbers using strip diagrams and equations with a letter standing for the unknown quantity; <i>Readiness Standard</i> | | |
| | Wood Ya? | 386 | 197 |
| | Assessment | 389 | 201 |

| | | |
|--|------------|------------|
| <p>(B) represent problems using an input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship of the values in the resulting sequence and their position in the sequence. <i>Readiness Standard</i></p> <p style="text-align: right;">Table Time 394 You Can Count on It 396 Assessment 406</p> | TE | SE |
| Reporting Category 3: Geometry and Measurement | | |
| <p>The student will demonstrate an understanding of how to represent and apply geometry and measurement concepts.</p> | | |
| <p>(4.5) Algebraic reasoning. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to</p> <p>(D) solve problems related to perimeter and area of rectangles where dimensions are whole numbers. <i>Readiness Standard</i></p> <p style="text-align: right;">Measure Scavenger Hunt 411 Assessment 434</p> | 218 | 224 |
| <p>(4.6) Geometry and measurement. The student applies mathematical process standards to analyze geometric attributes in order to develop generalizations about their properties. The student is expected to</p> <p>(A) identify points, lines, line segments, rays, angles, and perpendicular and parallel lines; <i>Supporting Standard</i></p> <p style="text-align: right;">It's Classified Information 439 Assessment 443</p> | 229 | 234 |
| <p>(B) identify and draw one or more lines of symmetry, if they exist, for a two-dimensional figure; <i>Supporting Standard</i></p> <p style="text-align: right;">Mirror, Mirror 449 Assessment 456</p> | 240 | |
| <p>(C) apply knowledge of right angles to identify acute, right, and obtuse triangles; <i>Supporting Standard</i></p> <p style="text-align: right;">Triangle Time 462 Assessment 464</p> | 246 | 249 |
| <p>(D) classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size. <i>Readiness Standard</i></p> <p style="text-align: right;">Tubing Down Polygon River 467 Assessment 479</p> | 252 | |

| | | TE | SE |
|-------|---|-----|-----|
| (4.7) | Geometry and measurement. The student applies mathematical process standards to solve problems involving angles less than or equal to 180 degrees. The student is expected to | | |
| | (C) determine the approximate measures of angles in degrees to the nearest whole number using a protractor; | | |
| | <i>Readiness Standard</i> | | |
| | Measure That Angle! | 482 | 255 |
| | Assessment | 484 | 257 |
| | (D) draw an angle with a given measure; | | |
| | <i>Supporting Standard</i> | | |
| | Angle Art | 490 | |
| | Assessment | 491 | 263 |
| | (E) determine the measure of an unknown angle formed by two non-overlapping adjacent angles given one or both angle measures. <i>Supporting Standard</i> | | |
| | Adjacent Angles of Athens | 497 | 269 |
| | Assessment | 500 | 281 |
| (4.8) | Geometry and measurement. The student applies mathematical process standards to select appropriate customary and metric units, strategies, and tools to solve problems involving measurement. The student is expected to | | |
| | (A) identify relative sizes of measurement units within the customary and metric systems; <i>Supporting Standard</i> | | |
| | Sizing Up | 505 | 286 |
| | Assessment | 508 | 290 |
| | (B) convert measurements within the same measurement system, customary or metric, from a smaller unit into a larger unit or a larger unit into a smaller unit when given other equivalent measures represented in a table; | | |
| | <i>Supporting Standard</i> | | |
| | Conversion Construction | 511 | |
| | Assessment | 521 | 293 |
| | (C) solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate. | | |
| | <i>Readiness Standard</i> | | |
| | A Trip to the Zoo | 526 | 298 |
| | Assessment | 539 | 302 |

Reporting Category 4:
Data Analysis and Personal Financial Literacy

The student will demonstrate an understanding of how to represent and analyze data and how to describe and apply personal financial concepts.

- (4.9) **Data analysis.** The student applies mathematical process standards to solve problems by collecting, organizing, displaying, and interpreting data. The student is expected to

| | | |
|---|-----------|-----------|
| (A) represent data on a frequency table, dot plot, or stem-and-leaf plot marked with whole numbers and fractions; <i>Readiness Standard</i> | TE | SE |
| Data Miners | 542 | 305 |
| Assessment | 546 | 308 |
| | | |
| (B) solve one- and two-step problems using data in whole number, decimal, and fraction form in a frequency table, dot plot, or stem-and-leaf plot. <i>Supporting Standard</i> | | |
| Data Refiners | 553 | |
| Assessment | 555 | 315 |
| | | |
| (4.10) Personal financial literacy. The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to | | |
| | | |
| (A) distinguish between fixed and variable expenses; <i>Supporting Standard</i> | | |
| Decisions, Decisions | 561 | |
| Assessment | 572 | 321 |
| | | |
| (B) calculate profit in a given situation; and <i>Supporting Standard</i> | | |
| Profit or Loss? Ask the Boss | 577 | |
| Assessment | 583 | 326 |
| | | |
| (E) describe the basic purpose of financial institutions, including keeping money safe, borrowing money, and lending. <i>Supporting Standard</i> | | |
| Why Bank? | 586 | |
| Assessment | 589 | 329 |
| | | |
| Answer Key | 592 | |
| Student Bubble Answer Sheet | | 332 |
| Bubble Answer Key | 613 | |
| STAAR Grade 4 Mathematics Reference Materials | 618 | 337 |
| KAMICO® Product Information | 621 | |

Reporting Category 2: Computations and Algebraic Relationships TEKS 4.4D

Use strategies and algorithms, including the standard algorithm, to multiply up to a four-digit number by a one-digit number and to multiply a two-digit number by a two-digit number. Strategies may include mental math, partial products, and the commutative, associative, and distributive properties.

ACTIVITY Major League Multiplication Methods

Materials

For each student

Major League Multiplication Methods standard algorithm—display

Major League Multiplication Methods crossed lines—display

Major League Multiplication Methods mental math—display

Major League Multiplication Methods partial products—display

Major League Multiplication Methods commutative, associative, and distributive properties—display



For class display

Major League Multiplication Methods standard algorithm activity sheet (student edition)

Major League Multiplication Methods crossed lines activity sheet (student edition)

Major League Multiplication Methods mental math activity sheet (student edition)

Major League Multiplication Methods partial products activity sheet (student edition)

Major League Multiplication Methods commutative, associative, and distributive properties activity sheet (student edition)

Standard Algorithm

Display *Major League Multiplication Methods* standard algorithm. As a class, solve both problems, discussing each step.

Answer Key: $5,738 \times 7 = 40,166$

$$96 \times 48 = 4,608$$

Students turn to the *Major League Multiplication Methods* standard algorithm activity sheet in their student editions and solve these problems with a partner or individually. After all students have finished, as a class discuss each problem, verifying answers. Discuss any discrepancies.

Crossed Lines

Display *Major League Multiplication Methods* crossed lines with 4 digit by 1 digit. As a class, work through each step of solving the problem through the use of crossed lines.

Students turn to the *Major League Multiplication Methods* crossed lines activity sheet in their student editions. Students solve the first problem ($2,063 \times 4$) with a partner and the second problem ($3,462 \times 3$) individually.

Display *Major League Multiplication Methods* crossed lines with 2 digits by 2 digits. As a class, work through each step of solving the problem through the use of crossed lines.

Students turn to the *Major League Multiplication Methods* crossed lines with 2 digits by 2 digits activity sheet in their student editions. Students work the first problem (26×32) with their partners and the second problem (43×17) individually. After students have finished, as a class discuss each problem verifying answers. Discuss any discrepancies.

Mental Math

Display *Major League Multiplication Methods* mental math. As a class, discuss and solve the problems using mental math.

Students turn to the *Major League Multiplication Methods* mental math activity sheet in their student editions. Students work the first 4 problems with their partners and the last 4 problems individually. After students have finished, as a class discuss each problem, verifying answers. Discuss any discrepancies.

Partial Products

Display *Major League Multiplication Methods* partial products. As a class, solve each problem.

Students turn to the *Major League Multiplication Methods* partial products activity sheet in their student editions. Students work the first two problems with their partners and the last two problems individually. After students have finished, as a class discuss each problem, verifying answers. Discuss any discrepancies.

Commutative, Associative, and Distributive Property

Display *Major League Multiplication Methods* commutative property, associative property, and distributive property. As a class, discuss and compare examples of each property.

Students turn to the *Major League Multiplication Methods* commutative property, associative property, and distributive property activity sheet in their student editions. With their partners, students complete the problems using the designated properties. After students have finished, as a class discuss each problem, verifying answers. Discuss any discrepancies.

Activity Components Provided in Student Edition with answer key

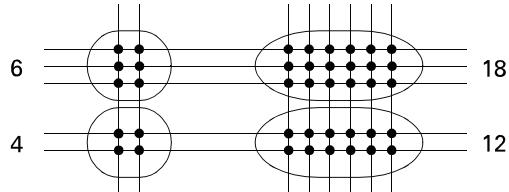
| | | | | | | | | | |
|---|---|---|--|---|---|--|---|---|---|
| <p style="text-align: center;">Major League Multiplication Methods Standard Algorithm activity sheet</p> <p style="text-align: right;">RC2 TEKS 4.4D</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 50%; padding: 10px;"> $\begin{array}{r} 3,267 \\ \times \quad 6 \\ \hline 19,602 \end{array}$  </td> <td style="width: 50%; padding: 10px;"> $\begin{array}{r} 7,619 \\ \times \quad 4 \\ \hline 30,476 \end{array}$  </td> </tr> <tr> <td style="width: 50%; padding: 10px;"> $\begin{array}{r} 4,053 \\ \times \quad 2 \\ \hline 8,106 \end{array}$  </td> <td style="width: 50%; padding: 10px;"> $\begin{array}{r} 480 \\ \times \quad 8 \\ \hline 3,840 \end{array}$  </td> </tr> </table> <p style="text-align: center;">© KAMICO® Instructional Media, Inc. All Rights Reserved.</p> | $\begin{array}{r} 3,267 \\ \times \quad 6 \\ \hline 19,602 \end{array}$  | $\begin{array}{r} 7,619 \\ \times \quad 4 \\ \hline 30,476 \end{array}$  | $\begin{array}{r} 4,053 \\ \times \quad 2 \\ \hline 8,106 \end{array}$  | $\begin{array}{r} 480 \\ \times \quad 8 \\ \hline 3,840 \end{array}$  | <p style="text-align: right;">RC2 TEKS 4.4D</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 50%; padding: 10px;"> $\begin{array}{r} 58 \\ \times 27 \\ \hline 406 \\ 116 \\ \hline 1,566 \end{array}$  </td> <td style="width: 50%; padding: 10px;"> $\begin{array}{r} 96 \\ \times 34 \\ \hline 384 \\ 288 \\ \hline 3,264 \end{array}$  </td> </tr> <tr> <td style="width: 50%; padding: 10px;"> $\begin{array}{r} 21 \\ \times 80 \\ \hline 1,680 \end{array}$  </td> <td style="width: 50%; padding: 10px;"> $\begin{array}{r} 77 \\ \times 8 \\ \hline 616 \end{array}$  </td> </tr> </table> <p style="text-align: center;">© KAMICO® Instructional Media, Inc. All Rights Reserved.</p> | $\begin{array}{r} 58 \\ \times 27 \\ \hline 406 \\ 116 \\ \hline 1,566 \end{array}$  | $\begin{array}{r} 96 \\ \times 34 \\ \hline 384 \\ 288 \\ \hline 3,264 \end{array}$  | $\begin{array}{r} 21 \\ \times 80 \\ \hline 1,680 \end{array}$  | $\begin{array}{r} 77 \\ \times 8 \\ \hline 616 \end{array}$  |
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| <p style="text-align: center;">Major League Multiplication Methods Crossed Lines activity sheet</p> <p style="text-align: right;">RC2 TEKS 4.4D</p> <p>Work with your partner to use the crossed line method to solve the following problem.</p> <p>$2,063 \times 4$</p> <p style="text-align: center;"></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 33%; padding: 10px;"> $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ </td> <td style="width: 33%; padding: 10px;"> $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ </td> <td style="width: 33%; padding: 10px;"> $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ </td> </tr> </table> <p style="text-align: center;">8 thousands 24 tens 12 ones</p> <p style="text-align: center;">8 thousands 25 tens 2 ones</p> <p style="text-align: center;">8 thousands 2 hundreds 5 tens 2 ones</p> <p style="text-align: center;">8 2 5 2</p> <p style="text-align: center;">8,252</p> <p style="text-align: center;">© KAMICO® Instructional Media, Inc. All Rights Reserved.</p> | $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ | $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ | $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ | <p style="text-align: right;">RC2 TEKS 4.4D</p> <p>Use the crossed line method to solve the following problem.</p> <p>$3,462 \times 3$</p> <p style="text-align: center;"></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 25%; padding: 10px;"> $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ </td> <td style="width: 25%; padding: 10px;"> $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ </td> <td style="width: 25%; padding: 10px;"> $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ </td> <td style="width: 25%; padding: 10px;"> $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ </td> </tr> </table> <p style="text-align: center;">9 thousands 12 hundreds 18 tens 6 ones</p> <p style="text-align: center;">9 thousands 13 hundreds 8 tens 6 ones</p> <p style="text-align: center;">10 thousands 3 hundreds 8 tens 6 ones</p> <p style="text-align: center;">10 3 8 6</p> <p style="text-align: center;">10,386</p> <p style="text-align: center;">© KAMICO® Instructional Media, Inc. All Rights Reserved.</p> | $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ | $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ | $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ | $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ | |
| $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ | $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ | $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ | | | | | | | |
| $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ | $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ | $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ | $\begin{array}{ c c c c } \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline & \cdot & \cdot & \cdot \\ \hline \end{array}$ | | | | | | |

Major League Multiplication Methods
Crossed Lines activity sheet

RC2 TEKS 4.4D

Work with your partner to use the crossed line method to solve the following problem.

$$26 \times 32$$



6 hundreds $8 + 4$ tens 12 ones

6 hundreds 23 tens 2 ones

8 hundreds 3 tens 2 ones

8 3 2

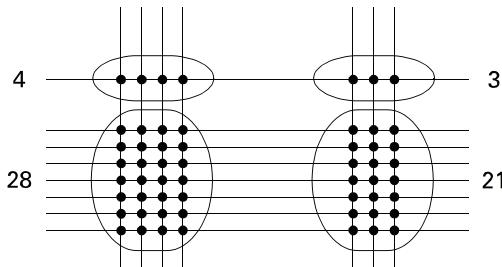
832

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RC2 TEKS 4.4D

Use the crossed line method to solve the following problem.

$$43 \times 17$$



4 hundreds $28 + 3$ tens 21 ones

4 hundreds 33 tens 1 one

7 hundreds 3 tens 1 one

7 3 1

731

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Major League Multiplication Methods
Mental Math activity sheet

RC2 TEKS 4.4D

$$35 \times 6 = 210$$

$$125 \times 8 = 1,000$$

$$320 \times 5 = 1,600$$

$$425 \times 4 = 1,700$$

$$45 \times 11 = 495$$

$$81 \times 11 = 891$$

$$93 \times 11 = 1,023$$

$$82 \times 11 = 902$$

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Major League Multiplication Methods
Partial Products activity sheet

RC2 TEKS 4.4D

$$5,482 \times 7$$

Multiply by the thousands: $7 \times 5,000 = 35,000$
Multiply by the hundreds: $7 \times 400 = 2,800$
Multiply by the tens: $7 \times 80 = 560$
Multiply by the ones: $7 \times 2 = 14$

Add all the numbers to arrive at the product. 38,374

$$8,915 \times 9$$

Multiply by the thousands: $9 \times 8,000 = 72,000$
Multiply by the hundreds: $9 \times 900 = 8,100$
Multiply by the tens: $9 \times 10 = 90$
Multiply by the ones: $9 \times 5 = 45$

Add all the numbers to arrive at the product. 80,235

$$94 \times 87$$

Multiply the tens by the tens: $90 \times 80 = 7,200$
Multiply the first tens by the second ones: $90 \times 7 = 630$
Multiply the first ones by the second tens: $4 \times 80 = 320$
Multiply the ones by the ones: $4 \times 7 = 28$

Add all the numbers to arrive at the product. 8,178

$$82 \times 54$$

Multiply the tens by the tens: $80 \times 50 = 4,000$
Multiply the first tens by the second ones: $80 \times 4 = 320$
Multiply the first ones by the second tens: $2 \times 50 = 100$
Multiply the ones by the ones: $2 \times 4 = 8$

Add all the numbers to arrive at the product. 4,428

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Major League Multiplication Methods
Commutative, Associative, and Distributive Properties activity sheet

Look at each multiplication expression and the corresponding property.
 Solve the expression by using the property.



| | | | | |
|--------------|--|--|--|--|
| Commutative | $\begin{array}{r} 18 \\ \times 49 \\ \hline \end{array}$ | \longrightarrow | $\begin{array}{r} 49 \\ \times 18 \\ \hline \end{array}$ | 882 |
| Commutative | $\begin{array}{r} 71 \\ \times 72 \\ \hline \end{array}$ | \longrightarrow | $\begin{array}{r} 72 \\ \times 71 \\ \hline \end{array}$ | 5,122 |
| Commutative | $\begin{array}{r} 22 \\ \times 53 \\ \hline \end{array}$ | \longrightarrow | $\begin{array}{r} 53 \\ \times 22 \\ \hline \end{array}$ | 1,166 |
| Associative | $25 \times 4 \times 10 =$ | $\begin{array}{r} (25 \times 4) \times 10 \\ 100 \times 10 \\ \hline 1,000 \end{array}$ | or | $\begin{array}{r} 25 \times (4 \times 10) \\ 25 \times 40 \\ \hline 1,000 \end{array}$ |
| Associative | $35 \times 2 \times 12 =$ | $\begin{array}{r} (35 \times 2) \times 12 \\ 70 \times 12 \\ \hline 840 \end{array}$ | or | $\begin{array}{r} 35 \times (2 \times 12) \\ 35 \times 24 \\ \hline 840 \end{array}$ |
| Associative | $18 \times 10 \times 3 =$ | $\begin{array}{r} (18 \times 10) \times 3 \\ 180 \times 3 \\ \hline 540 \end{array}$ | or | $\begin{array}{r} 18 \times (10 \times 3) \\ 18 \times 30 \\ \hline 540 \end{array}$ |
| Distributive | $3 \times 42 =$ | $\begin{array}{r} 3 \times (40 + 2) \\ (3 \times 40) + (3 \times 2) \\ 120 + 6 \\ \hline 126 \end{array}$ | | |
| Distributive | $8 \times 86 =$ | $\begin{array}{r} 8 \times (80 + 6) \\ (8 \times 80) + (8 \times 6) \\ 640 + 48 \\ \hline 688 \end{array}$ | | |
| Distributive | $5 \times 92 =$ | $\begin{array}{r} 5 \times (90 + 2) \\ (5 \times 90) + (5 \times 2) \\ 450 + 10 \\ \hline 460 \end{array}$ | | |

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Major League Multiplication Methods
Standard Algorithm Display

$$\begin{array}{r} 5,738 \\ \times \quad 7 \\ \hline \end{array}$$



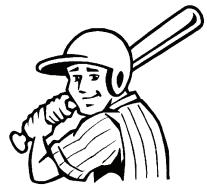
$$\begin{array}{r} 96 \\ \times 48 \\ \hline \end{array}$$



Major League Multiplication Methods

Crossed Lines with 4 Digits by 1 Digit

Display

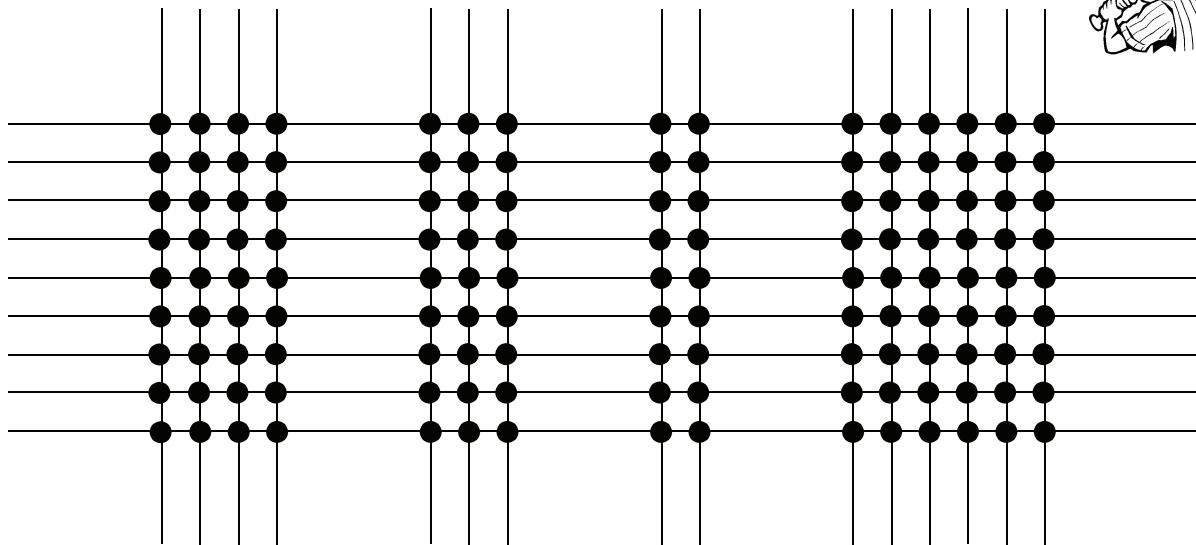


$$4,326 \times 9$$

First - Draw lines to represent each place value in the first product.

Second - Draw horizontal lines to represent second product.

Third - Mark with a dot each place that the lines intersect.



Count the dots

36

27

18

54

Regroup. 54 ones = 5 tens and 4 ones

$$\begin{array}{r} \underline{36} & \underline{27} & \underline{18} & 4 \\ & 2 & + 5 \\ & \cancel{\times 3} \end{array}$$

23 tens = 2 hundreds and 3 tens

$$\begin{array}{r} \underline{36} & \underline{27} & \underline{3} & 4 \\ 2 & + 2 \\ \cancel{\times 9} \end{array}$$

29 hundreds = 2 thousands and 9 hundreds

$$\begin{array}{r} \underline{36} & \underline{9} & \underline{3} & 4 \\ + 2 \\ \hline 38 \end{array}$$

38 thousands = 3 ten thousands and 8 thousands

$$\begin{array}{r} \underline{3} \quad \underline{8} \quad \underline{9} \quad \underline{3} \quad 4 \end{array}$$

$$4,326 \times 9 = 38,934$$

Major League Multiplication Methods

Crossed Lines with 2 Digits by 2 Digits

Display

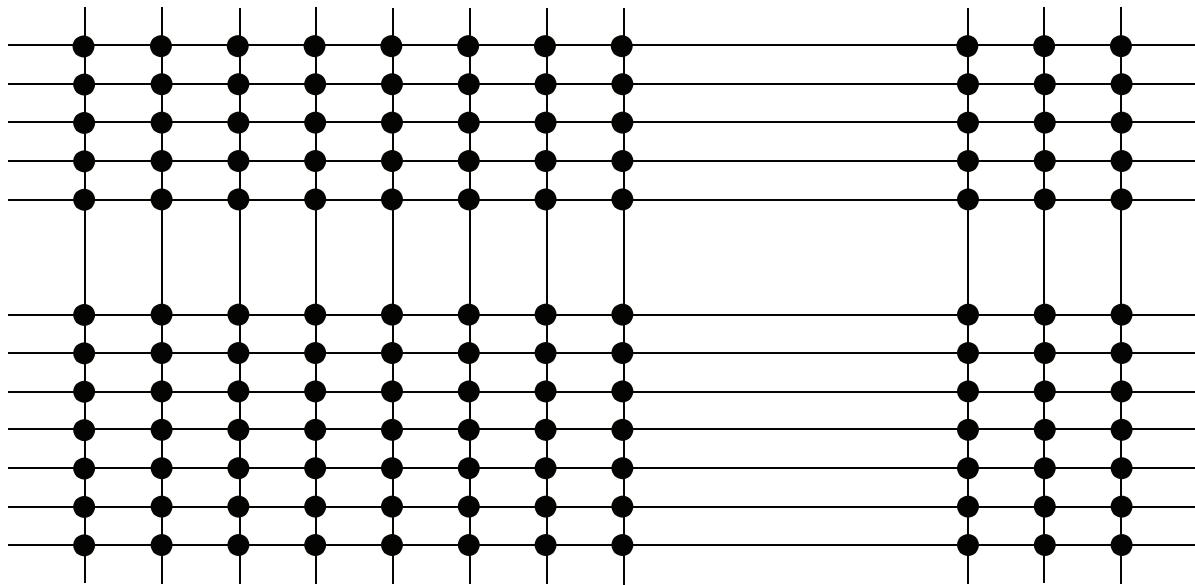


83 × 57

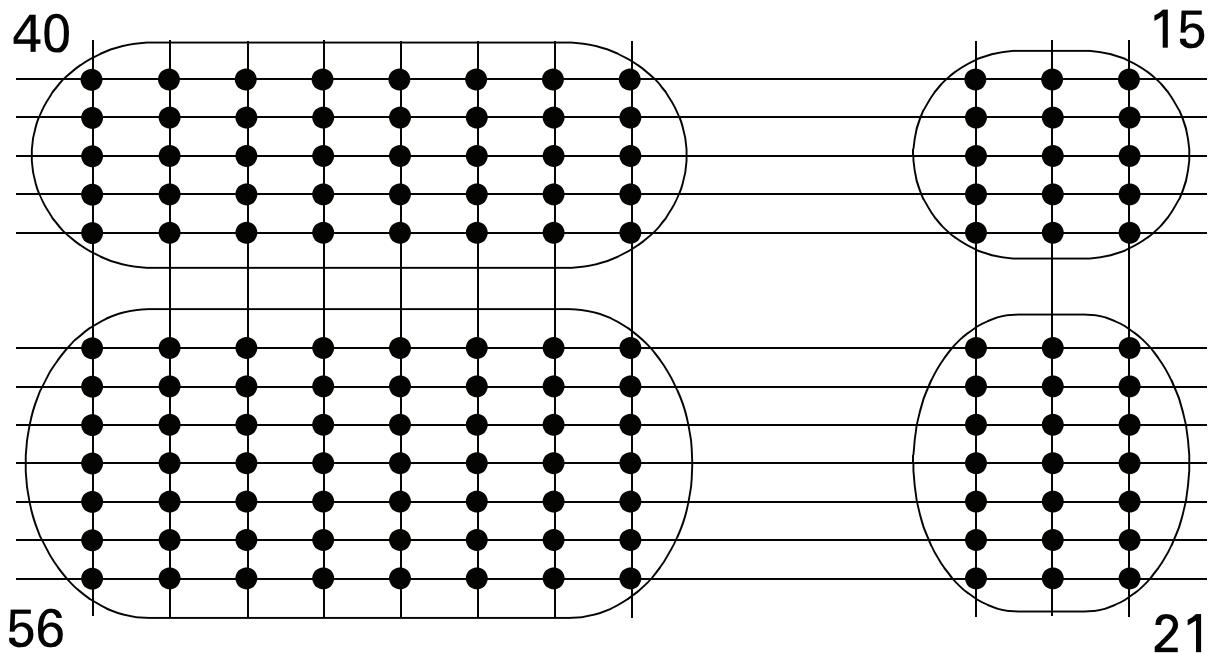
First - Draw lines to represent each place value in the first product.

Second - Draw horizontal lines to represent each place value in the second product.

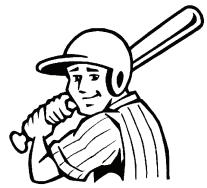
Third - Mark with a dot each place that the lines intersect.



Fourth - Count the dots in each section and write the number beside each section.



Fifth



How many

40
hundreds

15 + 56
tens

21
ones

Regroup

21 ones = 2 tens and 1 one

Add tens $15 + 56 + 2 = \underline{73}$

Regroup

73 tens = 7 hundreds and 3 tens

Add hundreds $40 + 7 = \underline{47}$

Regroup

47 hundreds = 4 thousands and 7 hundreds

Total $4,731$

$83 \times 57 = 4,731$

Major League Multiplication Methods

Mental Math Display



Sometimes, you can double one number and take half of the other to make the problem easier.

840×5 Think: You can take half of 840 _____, and double 5 _____.

$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

450×6 Think: You can double 450 _____, and take half of 6 _____.

$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

63×11 There is a shortcut to multiply by 11.

Write the last digit of the first factor _____.

Add the digits of the first factor _____. Moving to the left of the 3, write the sum _____.

To the left of the _____, write the digit located in the highest place value _____.

The product is _____.

$$87 \times 11$$

Write the last digit of the first factor _____.

Add the digits of the first factor _____. Moving to the left, write the last digit of the sum _____, carry the 1 in your head.

Add the 1 to the first digit _____ and, still moving to the left, write the sum _____.

The product is _____.



Major League Multiplication Methods

Mental Math Display Answer Key



Sometimes, you can double one number and take half of the other to make the problem easier.

840×5 Think: You can take half of 840 (420), and double 5 (10).

$$\underline{420} \times \underline{10} = \underline{4,200}$$

450×6 Think: You can double 450 (900), and take half of 6 (3).

$$\underline{900} \times \underline{3} = \underline{2,700}$$

63×11 There is a shortcut to multiply by 11.

Write the last digit of the first factor (3).

Add the digits of the first factor (6 + 3). Moving to the left of the 3, write the sum (9).

To the left of the 9, write the digit located in the highest place value (6).

The product is 693.

87×11

Write the last digit of the first factor (7).

Add the digits of the first factor (8 + 7). Moving to the left, write the last digit of the sum (5), carry the 1 in your head.

Add the 1 to the first digit (8) and, still moving to the left, write the sum (8 + 1 = 9).

The product is 957.



Major League Multiplication Methods
Partial Products
Display



$$6,847 \times 3$$

Multiply by the thousands: _____ = _____

Multiply by the hundreds: _____ = _____

Multiply by the tens: _____ = _____

Multiply by the ones: _____ = _____

Add all the numbers to arrive at the product. _____

$$5,209 \times 4$$

Multiply by the thousands: _____ = _____

Multiply by the hundreds: _____ = _____

Multiply by the tens: _____ = _____

Multiply by the ones: _____ = _____

Add all the numbers to arrive at the product. _____

$$43 \times 48 \text{ Think: } 43 = 40 + 3, \text{ and } 48 = 40 + 8.$$

Multiply the tens by the tens: _____ = _____

Multiply the first tens by the second ones: _____ = _____

Multiply the first ones by the second tens: _____ = _____

Multiply the ones by the ones: _____ = _____

Add all the numbers to arrive at the product. _____

$$86 \times 43 \text{ Think: } 86 = 80 + 6, \text{ and } 43 = 40 + 3.$$

Multiply the tens by the tens: _____ = _____

Multiply the first tens by the second ones: _____ = _____

Multiply the first ones by the second tens: _____ = _____

Multiply the ones by the ones: _____ = _____

Add all the numbers to arrive at the product. _____

Major League Multiplication Methods
Partial Products
answer key



$$6,847 \times 3$$

Multiply by the thousands: $3 \times 6,000 = 18,000$

Multiply by the hundreds: $3 \times 800 = 2,400$

Multiply by the tens: $3 \times 40 = 120$

Multiply by the ones: $3 \times 7 = 21$

Add all the numbers to arrive at the product. 20,541

$$5,209 \times 4$$

Multiply by the thousands: $4 \times 5,000 = 20,000$

Multiply by the hundreds: $4 \times 200 = 800$

Multiply by the tens: $4 \times 0 = 0$

Multiply by the ones: $4 \times 9 = 36$

Add all the numbers to arrive at the product. 20,836

$$43 \times 48 \text{ Think: } 43 = 40 + 3, \text{ and } 48 = 40 + 8.$$

Multiply the tens by the tens: $40 \times 40 = 1,600$

Multiply the first tens by the second ones: $40 \times 8 = 320$

Multiply the first ones by the second tens: $3 \times 40 = 120$

Multiply the ones by the ones: $3 \times 8 = 24$

Add all the numbers to arrive at the product. 2,064

$$86 \times 43 \text{ Think: } 86 = 80 + 6, \text{ and } 43 = 40 + 3.$$

Multiply the tens by the tens: $80 \times 40 = 3,200$

Multiply the first tens by the second ones: $80 \times 3 = 240$

Multiply the first ones by the second tens: $6 \times 40 = 240$

Multiply the ones by the ones: $6 \times 3 = 18$

Add all the numbers to arrive at the product. 3,698

Major League Multiplication Methods
Commutative, Associative, and Distributive Properties
Display



The *commutative property* states that when two factors are multiplied, the order has no effect on the product. Therefore, you can sometimes get an easier problem to solve by reversing the order of the factors.

$$\begin{array}{r} 19 \\ \times 67 \\ \hline \end{array}$$

(If one of the factors has a 1 in it, or one of the factors has a repeated digit, it is easier to multiply by putting it second instead of first.)

The *associative property* states that when three whole numbers are multiplied, they can be multiplied in any order.

Example: $23 \times 6 \times 10$

Whole numbers under the operation of multiplication are *distributive* with respect to addition.

Example: 4×36

Major League Multiplication Methods
Commutative, Associative, and Distributive Properties
Display
answer key



The *commutative property* states that when two factors are multiplied, the order has no effect on the product. Therefore, you can sometimes get an easier problem to solve by reversing the order of the factors.

$$\begin{array}{r} 19 \\ \times 67 \\ \hline \end{array} \quad \begin{array}{r} 67 \\ \times 19 \\ \hline \end{array} = 1,273$$

(If one of the factors has a 1 in it, or one of the factors has a repeated digit, it is easier to multiply by putting it second instead of first.)

The *associative property* states that when three whole numbers are multiplied, they can be multiplied in any order.

Example:

| | |
|--|--|
| $\begin{array}{l} (23 \times 6) \times 10 \\ = 138 \times 10 \\ = 1,380 \end{array}$ | $\begin{array}{l} 23 \times (6 \times 10) \\ \text{or} \\ = 23 \times 60 \\ = 1,380 \end{array}$ |
|--|--|

Whole numbers under the operation of multiplication are *distributive* with respect to addition.

Example:

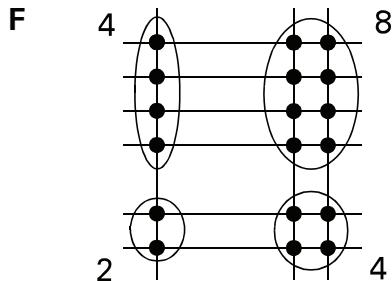
$$\begin{aligned} 4 \times 36 &= 4 \times (30 + 6) \\ &= (4 \times 30) + (4 \times 6) \\ &= 120 + 24 \\ &= 144 \end{aligned}$$

Read each question carefully. For a multiple-choice question, determine the best answer to the question from the four answer choices provided. For a griddable question, determine the best answer to the question. Then fill in the answer on your document.

- 1 In one school district, there are 710 basketball players on high school teams. Each team has the same number of players. Which response could describe the teams of basketball players in this district?

- A 88 teams with 8 players on each team
- B 118 teams with 6 players on each team
- C 142 teams with 5 players on each team
- D 177 teams with 4 players on each team

- 2 A restaurant is divided into 12 sections. Each section has 42 chairs. Which response shows how to find the correct number of chairs in the restaurant?



H

$$\begin{array}{r} 12 \\ \times 42 \\ \hline 24 \\ 48 \\ \hline 72 \end{array}$$

There are 72 chairs.

G $12 \times 42 =$
 $12 \times (40 + 2) =$
 $(12 \times 40) \times (12 \times 2) =$
 $480 \times 24 =$
11,520
There are 11,520 chairs.

J $12 \times 42 =$
 $(10 + 2) \times (40 + 2) =$
 $(10 + 40) \times (2 + 2) =$
 $50 \times 4 =$
200
There are 200 chairs.

- 3 Each of 8 students in an art class made a portfolio. Each of 6 students in another art class made a portfolio. Each portfolio contained 25 works of art. Which shows the correct use of the associative property being used to solve the problem?
- A $8 \times 6 \times 25$
 $8 + (6 \times 25)$
 $8 + 150$
158
- B $8 \times 6 \times 25$
 $(8 \times 6) \times (20 \times 5)$
 48×100
4,800
- C $8 \times 6 \times 25$
 $8 \times (6 \times 25)$
 8×150
1,200
- D $8 \times (6 \times 25)$
 $(8 \times 6) + (8 \times 25)$
 $48 + 200$
248
- 4 Farmer Jameson harvests 68 bushels of corn per acre of land. If Farmer Jameson is harvesting 23 acres, how many total bushels of corn will he harvest?
- F 340 bushels
- G 1,444 bushels
- H 1,564 bushels
- J Not here

- 5 A medical supply company sells 2,304 boxes of gauze to each of 6 hospitals. Which of the following shows how to find the combined number of boxes of gauze that were sold to those hospitals?

A $2,304$

$$\begin{array}{r} \times \quad 6 \\ \hline 24 \quad 6 \times 4 \\ 0 \quad 6 \times 0 \\ 18 \quad 6 \times 3 \\ 12 \quad 6 \times 2 \\ \hline 54 \quad \text{boxes} \end{array}$$

B $2,304$

$$\begin{array}{r} \times \quad 6 \quad \text{think:} \\ \hline 24 \quad 6 \times 4 \text{ ones} \\ 0 \quad 6 \times 0 \text{ tens} \\ 180 \quad 6 \times 3 \text{ hundreds} \\ 1,200 \quad 6 \times 2 \text{ thousands} \\ \hline 1,404 \quad \text{boxes} \end{array}$$

C $2,304$

$$\begin{array}{r} \times \quad 6 \quad \text{think:} \\ \hline 24 \quad 6 \times 4 \text{ ones} \\ 0 \quad 6 \times 0 \text{ tens} \\ 1,800 \quad 6 \times 3 \text{ hundreds} \\ 1,200 \quad 6 \times 2 \text{ thousands} \\ \hline 3,024 \quad \text{boxes} \end{array}$$

D $2,304$

$$\begin{array}{r} \times \quad 6 \quad \text{think:} \\ \hline 24 \quad 6 \times 4 \text{ ones} \\ 0 \quad 6 \times 0 \text{ tens} \\ 1,800 \quad 6 \times 3 \text{ hundreds} \\ 12,000 \quad 6 \times 2 \text{ thousands} \\ \hline 13,824 \quad \text{boxes} \end{array}$$

- 6 Fourth graders need from 9 to 11 hours of sleep every night to feel well rested and to stay healthy. If there are 3,432 students in all the fourth-grade classes in a large city, and if all these students sleep exactly 9 hours tonight, which response correctly shows the combined number of hours that all the students sleep tonight?

F $3,432 \times 9 = 3,432$

$$\begin{array}{r}
 \times \quad 9 \\
 \hline
 18 \quad 9 \times 2 \text{ ones} \\
 270 \quad 9 \times 3 \text{ tens} \\
 3,600 \quad 9 \times 4 \text{ hundreds} \\
 + 2,700 \quad 9 \times 3 \text{ thousands} \\
 \hline
 6,588 \quad \text{hours}
 \end{array}$$

G $3,432 \times 9 = 3,432$

$$\begin{array}{r}
 \times \quad 9 \\
 \hline
 18 \quad 9 \times 2 \text{ ones} \\
 270 \quad 9 \times 3 \text{ tens} \\
 360 \quad 9 \times 4 \text{ hundreds} \\
 + 2,700 \quad 9 \times 3 \text{ thousands} \\
 \hline
 3,348 \quad \text{hours}
 \end{array}$$

H $3,432 \times 9 = 3,432$

$$\begin{array}{r}
 \times \quad 9 \\
 \hline
 18 \quad 9 \times 2 \\
 27 \quad 9 \times 3 \\
 36 \quad 9 \times 4 \\
 + 27 \quad 9 \times 3 \\
 \hline
 108 \quad \text{hours}
 \end{array}$$

J $3,432 \times 9 = 3,432$

$$\begin{array}{r}
 \times \quad 9 \\
 \hline
 18 \quad 9 \times 2 \text{ ones} \\
 270 \quad 9 \times 3 \text{ tens} \\
 3,600 \quad 9 \times 4 \text{ hundreds} \\
 + 27,000 \quad 9 \times 3 \text{ thousands} \\
 \hline
 30,888 \quad \text{hours}
 \end{array}$$

BE SURE YOU HAVE RECORDED ALL OF YOUR ANSWERS
ON THE ANSWER DOCUMENT.

