

STAAR CONNECTION™ Developmental Series™

Math
4
teacher



KAMICO®
Instructional Media, Inc.

STAAR CONNECTION™

Math
4
teacher

Developmental Series™

XXIII/xii/MMXXII
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; Supporting Standard		
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; Readiness Standard		
Match Those Numbers!	28	
Assessment	54	26
(C) compare and order whole numbers to 1,000,000,000 and represent comparisons using the symbols $>$, $<$, or $=$; Supporting Standard		
Comparison Face-Off	57	29
Assessment	61	38
(D) round whole numbers to a given place value through the hundred thousands place; Supporting Standard		
Rounding Cups	67	44
Assessment	71	45
(E) represent decimals, including tenths and hundredths, using concrete and visual models and money; Supporting Standard		
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; Supporting Standard		
Fun Fact Comparisons	96	
Marathon Mice	98	56
Assessment	121	58

	TE	SE
(G) relate decimals to fractions that name tenths and hundredths; Readiness Standard		
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. Supporting Standard		
Points in Space	138	
Assessment	147	69
(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 $a > b$; Supporting Standard		
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; Supporting Standard		
Decomposing Fractions	159	89
Assessment	163	99
(C) determine if two given fractions are equivalent using a variety of methods; Supporting Standard		
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 $<$; Readiness Standard		
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. Supporting Standard		
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, 1/4, 1/2, 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	
Assessment	272	151
(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; Supporting Standard		
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; Supporting Standard		
Quotient Touchdown	320	
Assessment	335	173
(F) use strategies and algorithms, including the standard algorithm, to divide up to a four-digit dividend by a one-digit divisor; Supporting Standard		
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; Supporting Standard		
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. Readiness Standard		
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; Readiness Standard		
Wood Ya?	386	197
Assessment	389	201

(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. Readiness Standard		TE	SE
	Table Time	394	
	You Can Count on It	396	206
	Assessment	406	213

**Reporting Category 3:
Geometry and Measurement**

The student will demonstrate an understanding of how to represent and apply geometry and measurement concepts.

(4.5) Algebraic reasoning. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to			
(D) solve problems related to perimeter and area of rectangles where dimensions are whole numbers. Readiness Standard			
	Measure Scavenger Hunt	411	218
	Assessment	434	224
(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			
(A) identify points, lines, line segments, rays, angles, and perpendicular and parallel lines; Supporting Standard			
	It's Classified Information	439	229
	Assessment	443	234
(B) identify and draw one or more lines of symmetry, if they exist, for a two-dimensional figure; Supporting Standard			
	Mirror, Mirror	449	
	Assessment	456	240
(C) apply knowledge of right angles to identify acute, right, and obtuse triangles; Supporting Standard			
	Triangle Time	462	246
	Assessment	464	249
(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. Readiness Standard			
	Tubing Down Polygon River	467	
	Assessment	479	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; Readiness Standard		
Measure That Angle!	482	255
Assessment	484	257
(D) draw an angle with a given measure; Supporting Standard		
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. Supporting Standard		
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; Supporting Standard		
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; Supporting Standard		
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. Readiness Standard		
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; Readiness Standard	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. Supporting Standard		
	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; Supporting Standard		
	Decisions, Decisions	561	
	Assessment	572	321
	(B) calculate profit in a given situation; and Supporting Standard		
	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. Supporting Standard		
	Why Bank?	586	
	Assessment	589	329
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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

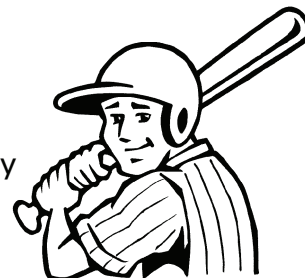
Major League Multiplication Methods standard algorithm—display

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





RC2 TEKS 4.4D

**Major League Multiplication Methods
Standard Algorithm activity sheet**

$\begin{array}{r} 3,267 \\ \times \quad 6 \\ \hline 19,602 \end{array}$	$\begin{array}{r} 7,619 \\ \times \quad 4 \\ \hline 30,476 \end{array}$
	
$\begin{array}{r} 4,053 \\ \times \quad 2 \\ \hline 8,106 \end{array}$	$\begin{array}{r} 480 \\ \times \quad 8 \\ \hline 3,840 \end{array}$
	

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RC2 TEKS 4.4D

$\begin{array}{r} 58 \\ \times 27 \\ \hline 406 \\ 116 \\ \hline 1,566 \end{array}$	$\begin{array}{r} 96 \\ \times 34 \\ \hline 384 \\ 288 \\ \hline 3,264 \end{array}$
	
$\begin{array}{r} 21 \\ \times 80 \\ \hline 1,680 \end{array}$	$\begin{array}{r} 77 \\ \times \quad 8 \\ \hline 616 \end{array}$
	

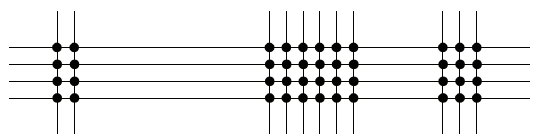
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RC2 TEKS 4.4D

**Major League Multiplication Methods
Crossed Lines activity sheet**

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

$2,063 \times 4$



8 thousands	24 tens	12 ones	
8 thousands	25 tens	2 ones	
8 thousands 2 hundreds	5 tens	2 ones	
8	2	5	2

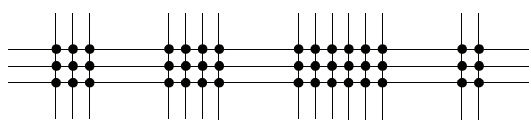
8,252

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RC2 TEKS 4.4D

Use the crossed line method to solve the following problem.

$3,462 \times 3$



9 thousands	12 hundreds	18 tens	6 ones
9 thousands	13 hundreds	8 tens	6 ones
10 thousands	3 hundreds	8 tens	6 ones
10	3	8	6

10,386

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RC2 TEKS 4.4D

Major League Multiplication Methods
Crossed Lines activity sheet

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

26×32

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.

43×17

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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RC2 TEKS 4.4D

Major League Multiplication Methods
Mental Math activity sheet

$35 \times 6 = 210$
$125 \times 8 = 1,000$
$320 \times 5 = 1,600$
$425 \times 4 = 1,700$
$45 \times 11 = 495$
$81 \times 11 = 891$
$93 \times 11 = 1,023$
$82 \times 11 = 902$

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RC2 TEKS 4.4D

Major League Multiplication Methods
Partial Products activity sheet

$5,482 \times 7$ 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. <u>38,374</u>
$8,915 \times 9$ 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. <u>80,235</u>
94×87 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. <u>8,178</u>
82×54 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. <u>4,428</u>

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

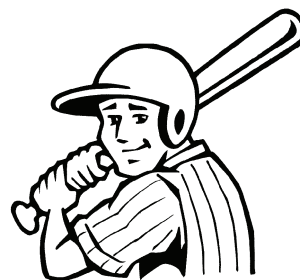
Look at each multiplication expression and the corresponding property.
 Solve the expression by using the property.



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	$25 \times 4 \times 10 = \begin{array}{r} (25 \times 4) \times 10 \\ 100 \times 10 \\ 1,000 \end{array} \quad \text{or} \quad \begin{array}{r} 25 \times (4 \times 10) \\ 25 \times 40 \\ 1,000 \end{array}$	
Associative	$35 \times 2 \times 12 = \begin{array}{r} (35 \times 2) \times 12 \\ 70 \times 12 \\ 840 \end{array} \quad \text{or} \quad \begin{array}{r} 35 \times (2 \times 12) \\ 35 \times 24 \\ 840 \end{array}$	
Associative	$18 \times 10 \times 3 = \begin{array}{r} (18 \times 10) \times 3 \\ 180 \times 3 \\ 540 \end{array} \quad \text{or} \quad \begin{array}{r} 18 \times (10 \times 3) \\ 18 \times 30 \\ 540 \end{array}$	
Distributive	$3 \times 42 = \begin{array}{r} 3 \times (40 + 2) \\ (3 \times 40) + (3 \times 2) \\ 120 + 6 \\ 126 \end{array}$	
Distributive	$8 \times 86 = \begin{array}{r} 8 \times (80 + 6) \\ (8 \times 80) + (8 \times 6) \\ 640 + 48 \\ 688 \end{array}$	
Distributive	$5 \times 92 = \begin{array}{r} 5 \times (90 + 2) \\ (5 \times 90) + (5 \times 2) \\ 450 + 10 \\ 460 \end{array}$	

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**



$$4,326 \times 9$$

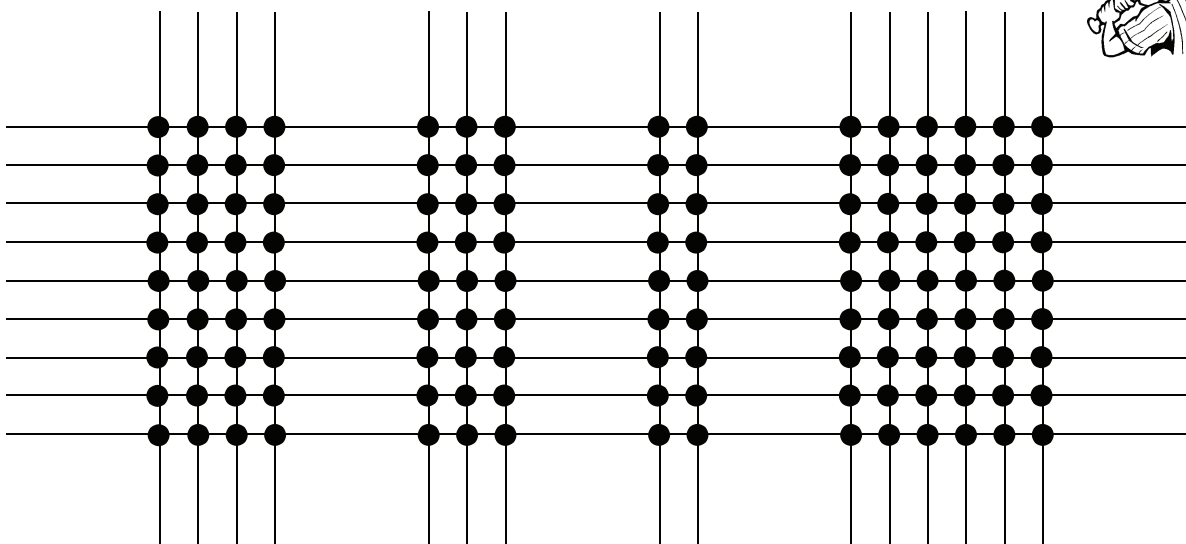
First - Draw lines to represent each place value in the first product.

A grid consisting of 13 vertical lines spaced evenly across the page, intended for drawing horizontal lines to represent place values for the first product.

Second - Draw horizontal lines to represent second product.

A grid consisting of 13 horizontal lines spaced evenly across the page, intended for drawing vertical lines to represent place values for the 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

$$\begin{array}{r} \underline{36} \quad \underline{27} \quad 18 \quad 4 \\ \quad \quad 2 \quad + 5 \\ \quad \quad \quad \underline{23} \end{array}$$

23 tens = 2 hundreds and 3 tens

$$\begin{array}{r} \underline{36} \quad \underline{27} \quad 3 \quad 4 \\ \quad \quad 2 \quad + 2 \\ \quad \quad \quad \underline{29} \end{array}$$

29 hundreds = 2 thousands and 9 hundreds

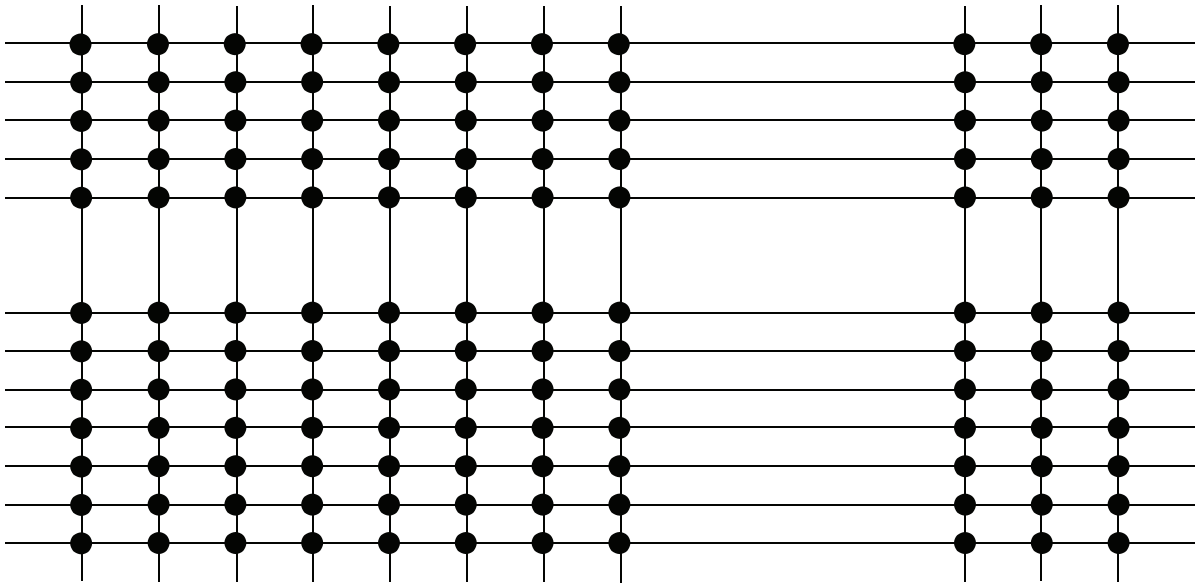
$$\begin{array}{r} \underline{36} \quad \underline{9} \quad \underline{3} \quad 4 \\ + \underline{2} \\ \underline{38} \end{array}$$

38 thousands = 3 ten thousands and 8 thousands

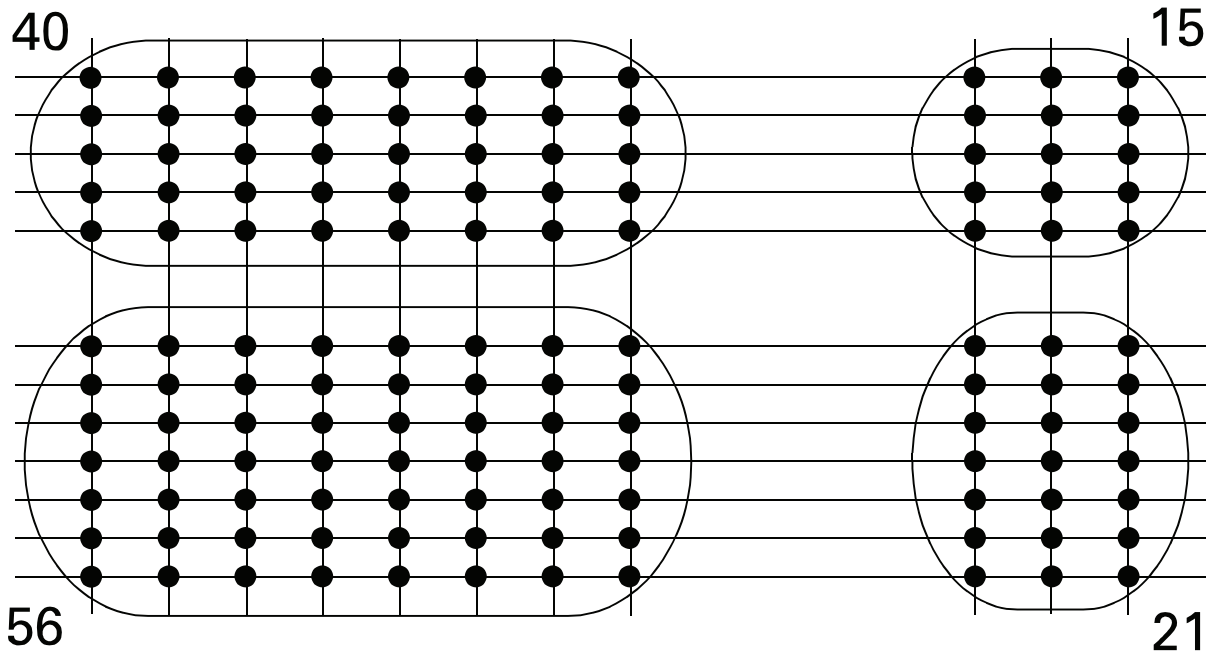
3 8 9 3 4

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

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 _____.

$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

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

$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

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 _____.

87×11

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. _____

43×48 Think: $43 = 40 + 3$, 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. _____

86×43 Think: $86 = 80 + 6$, 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: $3 \times 6,000 = \underline{18,000}$

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

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

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

Add all the numbers to arrive at the product. $\underline{20,541}$

$$5,209 \times 4$$

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

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

Multiply by the tens: $4 \times 0 = \underline{0}$

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

Add all the numbers to arrive at the product. $\underline{20,836}$

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

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

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

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

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

Add all the numbers to arrive at the product. $\underline{2,064}$

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

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

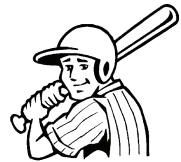
Multiply the first tens by the second ones: $80 \times 3 = \underline{240}$

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

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

Add all the numbers to arrive at the product. $\underline{3,698}$

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.)

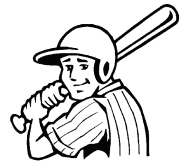
The *associative property* states that when three whole numbers are multiplied, they can be multiplied in any order.

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:

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

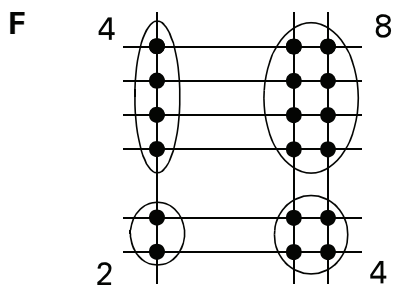
Whole numbers under the operation of multiplication are *distributive* with respect to addition.

Example:

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

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?



504
There are 504 chairs.

H

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

There are 72 chairs.

G

$$\begin{aligned} 12 \times 42 &= \\ 12 \times (40 + 2) &= \\ (12 \times 40) \times (12 \times 2) &= \\ 480 \times 24 &= \\ 11,520 & \\ \text{There are 11,520 chairs.} & \end{aligned}$$

J

$$\begin{aligned} 12 \times 42 &= \\ (10 + 2) \times (40 + 2) &= \\ (10 + 40) \times (2 + 2) &= \\ 50 \times 4 &= \\ 200 & \\ \text{There are 200 chairs.} & \end{aligned}$$

- 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

$$\begin{array}{r} 2,304 \\ \times \quad 6 \\ \hline 24 \\ 0 \\ 18 \\ \underline{12} \\ 54 \end{array} \quad \begin{array}{l} \text{think:} \\ 6 \times 4 \\ 6 \times 0 \\ 6 \times 3 \\ 6 \times 2 \\ \text{boxes} \end{array}$$

B

$$\begin{array}{r} 2,304 \\ \times \quad 6 \\ \hline 24 \\ 0 \\ 180 \\ \underline{1,200} \\ 1,404 \end{array} \quad \begin{array}{l} \text{think:} \\ 6 \times 4 \text{ ones} \\ 6 \times 0 \text{ tens} \\ 6 \times 3 \text{ hundreds} \\ 6 \times 2 \text{ thousands} \\ \text{boxes} \end{array}$$

C

$$\begin{array}{r} 2,304 \\ \times \quad 6 \\ \hline 24 \\ 0 \\ 1,800 \\ \underline{1,200} \\ 3,024 \end{array} \quad \begin{array}{l} \text{think:} \\ 6 \times 4 \text{ ones} \\ 6 \times 0 \text{ tens} \\ 6 \times 3 \text{ hundreds} \\ 6 \times 2 \text{ thousands} \\ \text{boxes} \end{array}$$

D

$$\begin{array}{r} 2,304 \\ \times \quad 6 \\ \hline 24 \\ 0 \\ 1,800 \\ \underline{12,000} \\ 13,824 \end{array} \quad \begin{array}{l} \text{think:} \\ 6 \times 4 \text{ ones} \\ 6 \times 0 \text{ tens} \\ 6 \times 3 \text{ hundreds} \\ 6 \times 2 \text{ thousands} \\ \text{boxes} \end{array}$$

- 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 $3,432 \times 9 =$ $\begin{array}{r} 3,432 \\ \times \quad 9 \\ \hline 18 \\ 270 \\ 3,600 \\ + 2,700 \\ \hline 6,588 \end{array}$ 9×2 ones
 9×3 tens
 9×4 hundreds
 9×3 thousands
6,588 hours

G $3,432 \times 9 =$ $\begin{array}{r} 3,432 \\ \times \quad 9 \\ \hline 18 \\ 270 \\ 360 \\ + 2,700 \\ \hline 3,348 \end{array}$ 9×2 ones
 9×3 tens
 9×4 hundreds
 9×3 thousands
3,348 hours

H $3,432 \times 9 =$ $\begin{array}{r} 3,432 \\ \times \quad 9 \\ \hline 18 \\ 27 \\ 36 \\ + 27 \\ \hline 108 \end{array}$ 9×2
 9×3
 9×4
 9×3
108 hours

J $3,432 \times 9 =$ $\begin{array}{r} 3,432 \\ \times \quad 9 \\ \hline 18 \\ 270 \\ 3,600 \\ + 27,000 \\ \hline 30,888 \end{array}$ 9×2 ones
 9×3 tens
 9×4 hundreds
 9×3 thousands
30,888 hours

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

