Math Expressions 4th and 5th Grade

Multiplication and Division Strategies

Mrs. Gortsema (4th) & Mrs. Eding (5th)

Tonight's Goals

- To explain the various methods of multiplication and division so parents understand the "method behind the madness."
- To give parents more tools to support their child at home.

Multiplication

Common Core State Standards for Multiplication

- Fourth Grade: Multiply a whole number of up to four digits by a one-digit number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

- Fifth Grade: Fluently multiply multi-digit whole numbers using the standard algorithm.

Multiplication Fact Fluency

- Encourage your child to practice multiplication facts at home frequently

- Websites: Xtramath.com, ictgames.com, illuminations.com, multiplication.com/games

- Flash Cards: known & unknown

Rectangle Sections Method
Multiplication

4 x 237 = 948

237 =	200	+	30	+	7	
4	4 × 200 = 800		4 × 30 = 120		4 × 7 = 28	4

800
120
+ 28
948

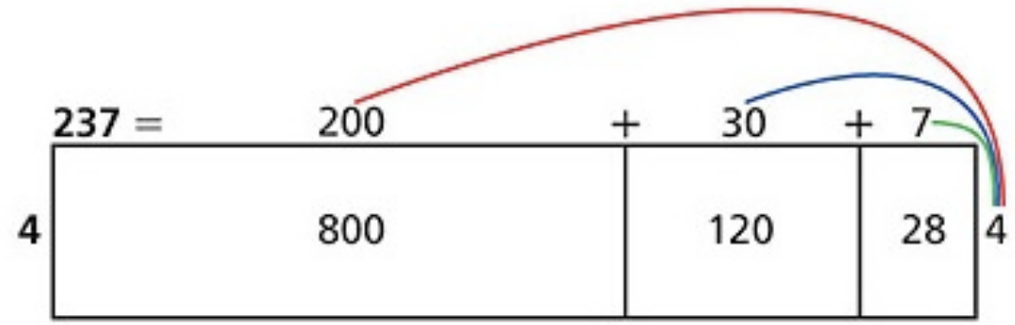
43 x 67 = 2,881

67 =	60	+	7	
43 = 40 + 3	40 × 60 = 2,400		40 × 7 = 280	40
	3 × 60 = 180		3 × 7 = 21	3
	60	+	7	

40 × 60 = 2,400
40 × 7 = 280
3 × 60 = 180
3 × 7 = 21
2,881

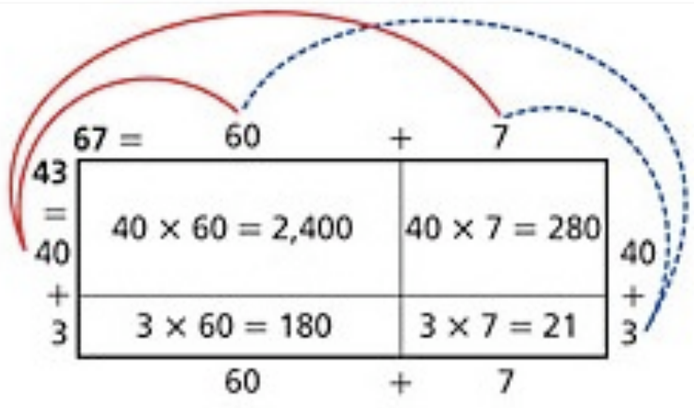
Expanded Notation Method
Multiplication

4 x 237 = 948



$$
\begin{array}{r}
237 = 200 + 30 + 7 \\
\times\ 4 = \qquad\qquad\quad 4 \\
\hline
4 \times 200 = 800 \\
4 \times 30 = 120 \\
4 \times 7 = \ 28 \\
\hline
948
\end{array}
$$

43 x 67 = 2,881



$$
\begin{array}{r}
67 \qquad 60 + 7 \\
\times\ 43 = 40 + 3 \\
\hline
40 \times 60 = \ 2{,}400 \\
40 \times \ \ 7 = \ \ 280 \\
3 \times 60 = \ \ 180 \\
3 \times \ \ 7 = \ \ \ 21 \\
\hline
2{,}881
\end{array}
$$

Short Cut Method
(Traditional Multiplication Method)

4 x 237 = 948

Step 1	Step 2	Step 3
$\overset{2}{237}$	$\overset{12}{237}$	$\overset{12}{237}$
$\times\ 4$	$\times\ 4$	$\times\ 4$
8	48	948

43 x 67 = 2,881

Step 1	Step 2	Step 3	Step 4	Step 5
$\overset{2}{67}$	$\overset{2}{67}$	$\overset{2}{\overset{2}{67}}$	$\overset{2}{\overset{2}{67}}$	$\overset{2}{\overset{2}{67}}$
$\times\ 43$	$\times\ 43$	$\times\ 43$	$\times\ 43$	$\times\ 43$
1	201	201	201	201
		8	268	$+\ 268$
				2,881

Division

Common Core State Standards for Division

- Fourth Grade: Find whole number quotients and remainders with up to four-digit dividends and **one-digit** divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

- Fifth Grade: Find whole number quotients of whole numbers with up to four-digit dividends and **two-digit** divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

- Sixth Grade: Fluently divide multi-digit numbers using the standard algorithm.

Rectangle Sections Method
Division

3,822 / 7 = 546

	500		500 + 40		500 + 40 + 6 = 546		
7	3,822		3,822	322	3,822	322	42
	−3,500	Build a new section with each leftover amount.	−3,500	−280	−3,500	−280	−42
	322		322	42	322	42	

2,048 / 32 = 64

Rectangle Sections

	60	60	60 +	60 + 4
32		2,048	2,048	2,048
(30)	2,048	−1,920	1,920	−1,920
		128	128	128
	Round the divisor and estimate the first number.	Multiply and subtract.	Make a new section.	Estimate the next number, and multiply and subtract.

Expanded Notation Method
Division

3,822 / 7 = 546

Expanded Notation

$$7\overline{)3{,}822}$$
$$-3{,}500$$
$$322$$

500

Show the zeros in the place values.

$$7\overline{)3{,}822}$$
$$-3{,}500$$
$$322$$
$$-280$$
$$42$$

40
500

$$7\overline{)3{,}822}$$
$$-3{,}500$$
$$322$$
$$-280$$
$$42$$
$$-42$$

6
40
500 } 546

2,048 / 32 = 64

Expanded Notation

$$32\overline{)2{,}048}$$
(30)

Round the divisor.

$$32\overline{)2{,}048}$$
(30)

Estimate the first number:

30 goes into 2,000 about 60 times.

$$32\overline{)2{,}048}$$
(30)–1,920
128

Multiply and subtract. 60 × 32 = 1,920

$$32\overline{)2{,}048}$$
(30)–1,920
128
–128

4
60 } 64

Estimate the next number and multiply.

Digit-by-Digit Method (Traditional Long Division)

3,822 / 7 = 546

$$\begin{array}{r} 5 \\ 7\overline{)3{,}822} \\ -3{,}5 \\ \hline 32 \end{array}$$

Put in only one digit at a time.

$$\begin{array}{r} 54 \\ 7\overline{)3{,}822} \\ -3{,}5 \\ \hline 32 \\ -28 \\ \hline 42 \end{array}$$

$$\begin{array}{r} 546 \\ 7\overline{)3{,}822} \\ -3{,}5 \\ \hline 32 \\ -28 \\ \hline 42 \\ -42 \\ \hline \end{array}$$

2,048 / 32 = 64

Step 1

Digit-by-Digit

$$32\overline{)2{,}048}$$
$$(30)$$

Round the divisor.

Step 2

$$\begin{array}{r} 6 \\ 32\overline{)2{,}048} \\ (30) \end{array}$$

Estimate the first digit:

30 goes into 2,000 about 6 times.

Step 3

$$\begin{array}{r} 6 \\ 32\overline{)2{,}048} \\ (30)\ -1\ 92 \\ \hline 128 \end{array}$$

Multiply and subtract. Bring down 8 ones.

Step 4

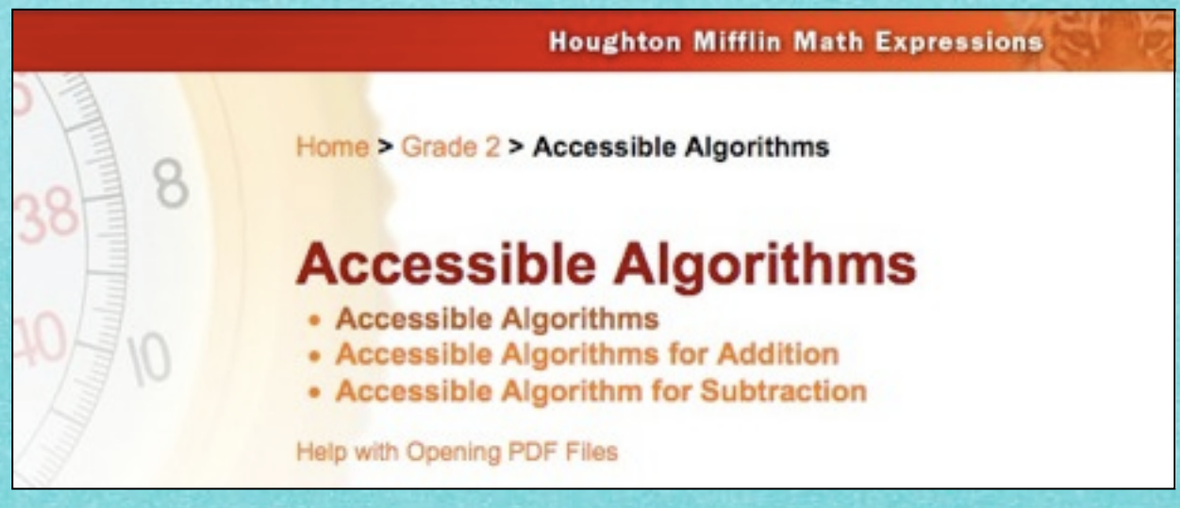
$$\begin{array}{r} 64 \\ 32\overline{)2{,}048} \\ (30)\ -1\ 92 \\ \hline 128 \\ -128 \\ \hline \end{array}$$

Estimate the next digit and multiply.

Support Resources

- Add any web-based resources here (Apps or websites)

- Accessible Algorithms (Math Expressions Web Site)
  http://www.eduplace.com/math/mthexp/g4/algorithms/,
  http://www.eduplace.com/math/mthexp/g5/algorithms/



QUESTIONS