

Warm Up

Grade 8

Multiply

a) 7×23

$$\begin{array}{r} \times 23 \\ 7 \\ \hline 161 \end{array}$$

b) 45×17

$$\begin{array}{r} \times 17 \\ 45 \\ \hline 315 \\ + 450 \\ \hline 765 \end{array}$$

Warm Up

Grade 8

Sep 16

Multiply

a) 7×23

Handwritten multiplication of 7×23 . The numbers are written as $\begin{array}{r} 23 \\ \times 7 \\ \hline \end{array}$. Above the 2 is a red '2' (tens place), and above the 3 is a green '3' (ones place). A blue arrow points from the 2 to the 3, and a red arrow points from the 3 to the 7. The product is 161 , with the 1 in the ones place colored red, the 6 in the tens place colored blue, and the 1 in the hundreds place colored green.

b) 45×17

Handwritten multiplication of 45×17 . The numbers are written as $\begin{array}{r} 45 \\ \times 17 \\ \hline \end{array}$. Above the 4 is a blue '3' (hundreds place), above the 5 is a red '5' (tens place), and above the 1 is a green '1' (ones place). A blue arrow points from the 4 to the 5, a red arrow points from the 5 to the 7, and a green arrow points from the 1 to the 7. The first partial product is 315 , with the 3 colored blue, the 1 colored red, and the 5 colored green. The second partial product is 450 , with the 4 colored blue, the 5 colored red, and the 0 colored green. The final sum is 765 .

KEY

2-Digit by 1-Digit Multiplication (A)

Use the grid to help you multiply each pair of factors.

$$\begin{array}{r} 2 \\ 53 \\ \times 9 \\ \hline 477 \end{array}$$

$$\begin{array}{r} 93 \\ \times 3 \\ \hline 279 \end{array}$$

$$\begin{array}{r} 4 \\ 89 \\ \times 5 \\ \hline 445 \end{array}$$

$$\begin{array}{r} 2 \\ 73 \\ \times 7 \\ \hline 511 \end{array}$$

$$\begin{array}{r} 90 \\ \times 4 \\ \hline 360 \end{array}$$

$$\begin{array}{r} 3 \\ 37 \\ \times 5 \\ \hline 185 \end{array}$$

$$\begin{array}{r} 7 \\ 59 \\ \times 8 \\ \hline 472 \end{array}$$

$$\begin{array}{r} 4 \\ 36 \\ \times 8 \\ \hline 288 \end{array}$$

$$\begin{array}{r} 1 \\ 92 \\ \times 7 \\ \hline 644 \end{array}$$

$$\begin{array}{r} 4 \\ 97 \\ \times 7 \\ \hline 679 \end{array}$$

$$\begin{array}{r} 3 \\ 15 \\ \times 6 \\ \hline 90 \end{array}$$

$$\begin{array}{r} 6 \\ 97 \\ \times 9 \\ \hline 873 \end{array}$$

$$\begin{array}{r} 2 \\ 24 \\ \times 7 \\ \hline 168 \end{array}$$

$$\begin{array}{r} 21 \\ \times 2 \\ \hline 42 \end{array}$$

$$\begin{array}{r} 1 \\ 16 \\ \times 3 \\ \hline 48 \end{array}$$

$$\begin{array}{r} 4 \\ 46 \\ \times 7 \\ \hline 322 \end{array}$$

$$\begin{array}{r} 21 \\ \times 3 \\ \hline 63 \end{array}$$

$$\begin{array}{r} 3 \\ 95 \\ \times 6 \\ \hline 570 \end{array}$$

$$\begin{array}{r} 1 \\ 22 \\ \times 8 \\ \hline 176 \end{array}$$

$$\begin{array}{r} 1 \\ 66 \\ \times 3 \\ \hline 198 \end{array}$$

$$\begin{array}{r} 40 \\ \times 3 \\ \hline 120 \end{array}$$

$$\begin{array}{r} 43 \\ \times 3 \\ \hline 129 \end{array}$$

$$\begin{array}{r} 2 \\ 34 \\ \times 6 \\ \hline 204 \end{array}$$

$$\begin{array}{r} 2 \\ 59 \\ \times 3 \\ \hline 177 \end{array}$$

$$\begin{array}{r} 8 \\ 59 \\ \times 9 \\ \hline 531 \end{array}$$

$$\begin{array}{r} 5 \\ 48 \\ \times 7 \\ \hline 336 \end{array}$$

$$\begin{array}{r} 3 \\ 87 \\ \times 5 \\ \hline 435 \end{array}$$

$$\begin{array}{r} 61 \\ \times 3 \\ \hline 183 \end{array}$$

$$\begin{array}{r} 2 \\ 15 \\ \times 4 \\ \hline 60 \end{array}$$

$$\begin{array}{r} 3 \\ 17 \\ \times 5 \\ \hline 85 \end{array}$$

2-Digit by 2-Digit Multiplication (A)

KEY

Use the grid to help you multiply each pair of factors.

		8	2
	×	4	1
		8	2
+	3	2	8
	3	3	6

		4	4
	×	4	2
		8	8
+	1	7	6
	1	8	4

		2	5
	×	1	0
		0	0
+	2	5	0
	2	5	0

		9	3
	×	8	6
		5	5
+	7	4	4
	7	9	9

		7	2
	×	8	7
		5	0
+	5	7	6
	6	2	6

		4	3
	×	1	0
		0	0
+	4	3	0
	4	3	0

		6	2
	×	5	2
		1	2
+	3	1	0
	3	2	2

		5	6
	×	9	6
		3	3
+	5	0	4
	5	3	7

		9	1
	×	4	7
		6	3
+	3	6	4
	4	2	7

		9	4
	×	8	3
		2	8
+	7	5	2
	7	8	0

		7	5
	×	1	3
		2	2
+	7	5	0
	9	7	5

		3	4
	×	9	8
		2	7
+	3	0	6
	3	3	3

		2	3
	×	4	8
		1	8
	9	2	0
	1	1	0

		4	4
	×	6	2
		8	8
+	2	6	4
	2	7	2

		7	9
	×	9	7
		5	5
+	7	1	1
	7	6	6

		9	9
	×	6	5
		4	9
+	5	9	4
	6	4	3

2-Digit by 2-Digit Multiplication (A)

Name: _____

Key

Date: _____

Score: _____ /20

Calculate each product.

$$\begin{array}{r} \overset{3}{14} \\ \times 83 \\ \hline 42 \\ 1120 \\ \hline 1162 \end{array}$$

$$\begin{array}{r} \overset{1}{93} \\ \times 65 \\ \hline 465 \\ 5580 \\ \hline 6045 \end{array}$$

$$\begin{array}{r} \overset{1}{82} \\ \times 60 \\ \hline 00 \\ 4920 \\ \hline 4920 \end{array}$$

$$\begin{array}{r} \overset{1}{77} \\ \times 11 \\ \hline 77 \\ 770 \\ \hline 847 \end{array}$$

$$\begin{array}{r} \overset{1}{52} \\ \times 80 \\ \hline 00 \\ 4160 \\ \hline 4160 \end{array}$$

$$\begin{array}{r} \overset{3}{24} \\ \times 83 \\ \hline 72 \\ 1920 \\ \hline 1992 \end{array}$$

$$\begin{array}{r} \overset{4}{49} \\ \times 55 \\ \hline 245 \\ 2450 \\ \hline 2695 \end{array}$$

$$\begin{array}{r} \overset{2}{13} \\ \times 18 \\ \hline 104 \\ 130 \\ \hline 234 \end{array}$$

$$\begin{array}{r} \overset{3}{35} \\ \times 61 \\ \hline 35 \\ 2100 \\ \hline 2135 \end{array}$$

$$\begin{array}{r} \overset{2}{15} \\ \times 51 \\ \hline 15 \\ 750 \\ \hline 765 \end{array}$$

$$\begin{array}{r} 92 \\ \times 32 \\ \hline 184 \\ 2760 \\ \hline 2944 \end{array}$$

$$\begin{array}{r} \overset{3}{25} \\ \times 65 \\ \hline 125 \\ 1500 \\ \hline 1625 \end{array}$$

$$\begin{array}{r} \overset{3}{25} \\ \times 67 \\ \hline 175 \\ 1500 \\ \hline 1675 \end{array}$$

$$\begin{array}{r} \overset{4}{96} \\ \times 17 \\ \hline 672 \\ 960 \\ \hline 1632 \end{array}$$

$$\begin{array}{r} 24 \\ \times 11 \\ \hline 24 \\ 240 \\ \hline 264 \end{array}$$

$$\begin{array}{r} 60 \\ \times 21 \\ \hline 60 \\ 1200 \\ \hline 1260 \end{array}$$

$$\begin{array}{r} \overset{2}{13} \\ \times 34 \\ \hline 52 \\ 390 \\ \hline 442 \end{array}$$

$$\begin{array}{r} \overset{4}{28} \\ \times 53 \\ \hline 84 \\ 1400 \\ \hline 1484 \end{array}$$

$$\begin{array}{r} \overset{4}{37} \\ \times 76 \\ \hline 222 \\ 2590 \\ \hline 2812 \end{array}$$

$$\begin{array}{r} \overset{3}{57} \\ \times 57 \\ \hline 399 \\ 2850 \\ \hline 3249 \end{array}$$

3-Digit by 2-Digit Multiplication (A)

Name: _____

Key

Date: _____

Score: _____ /20

Calculate each product.

$$\begin{array}{r} 435 \\ \times 72 \\ \hline 870 \\ 30450 \\ \hline 31320 \end{array}$$

$$\begin{array}{r} 325 \\ \times 54 \\ \hline 1300 \\ 16250 \\ \hline 17550 \end{array}$$

$$\begin{array}{r} 804 \\ \times 79 \\ \hline 7236 \\ 56280 \\ \hline 63516 \end{array}$$

$$\begin{array}{r} 908 \\ \times 47 \\ \hline 6356 \\ 36320 \\ \hline 42676 \end{array}$$

$$\begin{array}{r} 905 \\ \times 80 \\ \hline 000 \\ 72400 \\ \hline 72400 \end{array}$$

$$\begin{array}{r} 394 \\ \times 71 \\ \hline 394 \\ 27580 \\ \hline 27974 \end{array}$$

$$\begin{array}{r} 977 \\ \times 45 \\ \hline 4885 \\ 39080 \\ \hline 43965 \end{array}$$

$$\begin{array}{r} 256 \\ \times 32 \\ \hline 512 \\ 7680 \\ \hline 8192 \end{array}$$

$$\begin{array}{r} 989 \\ \times 55 \\ \hline 4945 \\ 49450 \\ \hline 54395 \end{array}$$

$$\begin{array}{r} 284 \\ \times 81 \\ \hline 284 \\ 22720 \\ \hline 23004 \end{array}$$

$$\begin{array}{r} 183 \\ \times 38 \\ \hline 1464 \\ 5490 \\ \hline 6954 \end{array}$$

$$\begin{array}{r} 592 \\ \times 78 \\ \hline 4736 \\ 41440 \\ \hline 46176 \end{array}$$

$$\begin{array}{r} 501 \\ \times 36 \\ \hline 3006 \\ 15030 \\ \hline 18036 \end{array}$$

$$\begin{array}{r} 428 \\ \times 57 \\ \hline 2996 \\ 21400 \\ \hline 24396 \end{array}$$

$$\begin{array}{r} 640 \\ \times 54 \\ \hline 2560 \\ 32000 \\ \hline 34560 \end{array}$$

$$\begin{array}{r} 788 \\ \times 49 \\ \hline 7092 \\ 31520 \\ \hline 38612 \end{array}$$

$$\begin{array}{r} 205 \\ \times 15 \\ \hline 1025 \\ 2050 \\ \hline 3075 \end{array}$$

$$\begin{array}{r} 422 \\ \times 97 \\ \hline 2954 \\ 37980 \\ \hline 40934 \end{array}$$

$$\begin{array}{r} 169 \\ \times 48 \\ \hline 1352 \\ 6760 \\ \hline 8112 \end{array}$$

$$\begin{array}{r} 891 \\ \times 87 \\ \hline 6237 \\ 71280 \\ \hline 77517 \end{array}$$

You multiply decimals the same way you multiply whole (LINE UP LAST NUMBER), IGNORE the decimal until the final answer but you have to remember to put the decimal in the proper position in your answer.

$$\begin{array}{r}
 7.25 \rightarrow 2 \text{ decimal places} \\
 \times 1.2 \rightarrow 1 \text{ decimal place} \\
 \hline
 1450 \\
 725 \times \\
 \hline
 8.700 \rightarrow 3 \text{ decimal places}
 \end{array}$$

Note: Zeros on the extreme right of decimal places can be dropped.
 $\Rightarrow 8.7$

Try the following:

(a) 2.46×0.58

$$\begin{array}{r}
 2.46 \\
 \times 0.58 \\
 \hline
 1968 \\
 + 1230 \times \\
 \hline
 1.4268
 \end{array}$$

$\Rightarrow$ (b) 3.68×3.9

$$\begin{array}{r}
 3.68 \\
 \times 3.9 \\
 \hline
 1512 \\
 + 504 \times \\
 \hline
 6.552
 \end{array}$$

7.26 x 1.6

↑↑ ↑

726 x 16

726
x 1.6

4356
+ 7260

11.616

↑↑ ↑ ↑ ↑

Handwritten long division of 121 by 17. The quotient is 7 with a remainder of 8. The division is shown as 121 divided by 17 equals 7 remainder 8. The numbers are written in blue ink. The remainder 8 is written in orange, and the quotient 7 is written in red. There are also green dots and arrows indicating the steps of the division process.

The image displays two handwritten mathematical problems. The top problem is a multiplication of 6.25 by 187, solved using both standard long multiplication and lattice multiplication. The bottom problem is an addition of 11, 3, 2, 2, 4, and 5, also solved using both standard column addition and lattice addition.

Top Problem: Multiplication

Standard Long Multiplication:

$$\begin{array}{r} 187 \\ \times 6.25 \\ \hline \end{array}$$

Lattice Multiplication:

	1	8	7	
6	6	48	42	
2	12	16	14	
5	45	35	35	25

Bottom Problem: Addition

Standard Column Addition:

$$\begin{array}{r} 11 \\ + 3 \\ + 2 \\ + 2 \\ + 4 \\ + 5 \\ \hline \end{array}$$

Lattice Addition:

	1	1	2	2	4	5
1	1	1	2	2	4	5
3	3	3	6	6	12	15
2	2	2	4	4	8	10
2	2	2	4	4	8	10
4	4	4	8	8	16	20
5	5	5	10	10	20	25

Multiplying decimals WS

Not all for Homework. We will work on this again tomorrow

4. Multiply.

a) 4.2×3.7

b) 8.9×0.3

c) 0.6×0.9

5. A rectangular plot of land measures 30.5 m by 5.3 m.

What is the area of the plot?

Estimate to check your answer is reasonable.

7. **Assessment Focus** An area rug is rectangular.

Its dimensions are 3.4 m by 2.7 m.

Show different strategies you can use to find the area of the rug.

Which strategy is best? Justify your answer.



9. The fuel consumption estimates of Josie's car are:

City: 21.2 km/L Highway: 23.3 km/L

The car's gas tank holds 40.2 L of fuel.

a) How far could Josie drive on a full tank of gas on the highway before she runs out of fuel?

b) How far could she drive on a full tank of gas in the city?

What assumptions did you make?

10. Find the cost of each item at the Farmers' Market.
Which strategy will you use? Justify your choice.

a) 4kg of apples at \$0.95/kg

b) 3.2 kg of potatoes at \$1.19/kg

c) 2.5 kg of herbs at \$2.48/kg

12. a) Multiply 18×12 .

b) Use only the result from part a and estimation.
Find each product.

i) 1.8×12

ii) 18×0.12

iii) 0.18×12

iv) 0.18×0.12