Grade 5 Unit 4 Module 3
Practice Pages for Math at Home

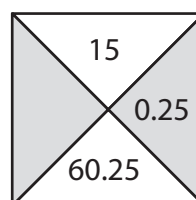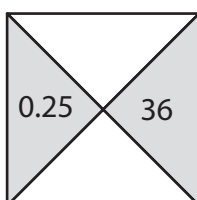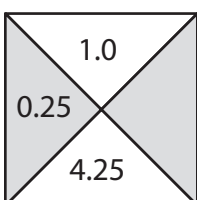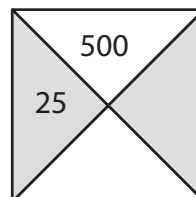**NAME** _____ | **DATE** _____

🔲 More About Quarters

1 Fill in the blanks to complete each of the box challenge puzzles below. Remember that the number at the top is the *product* of the two numbers in the middle, and the number at the bottom is the *sum* of the two numbers in the middle.

2 Jami is completing the following box challenge and says that the missing number on the right is 100 and the missing number on the bottom is $100\frac{1}{4}$. Do you agree or disagree? Explain why.
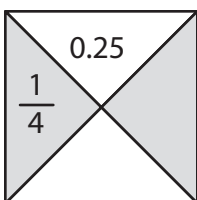
3 Find the product or quotient.

    a $30 \times 25 =$

    b $750 \div 25 =$

    c $7500 \div 25 =$

    d $7550 \div 25 =$

4 Tell how you used one of the combinations in problem 3 to help solve another one of the combinations in that problem.

NAME | **DATE**

Reasonable Estimates & Partial Products

1 Circle the most reasonable estimate for each multiplication problem.

a 23×21	400	600	4,000	6,000
b 31×19	600	700	6,000	7,000
c 312×18	600	800	6,000	10,000
d 96×33	270	1,000	3,000	27,000

2 Use partial products to solve each problem below. Draw lines between the digits to show which numbers you multiplied.

ex
```
      63
      ⋈
   × 21
   20 × 60 = 1,200
   20 × 3  =   60
    1 × 60 =   60
    1 × 3  =    3
            1,323
```

a
```
    27
  × 46
```

b
```
    36
  × 43
```

c
```
    29
  × 67
```

d
```
    37
  × 59
```

e
```
    47
  × 56
```

NAME |DATE

Bottom to Top, Right to Left

1 For each problem below, sketch and label a 4-part area model. Then list the partial products in order from bottom right corner to top left corner, and add them to get the total.

ex 23×27		27
		$\times\,23$
		$\underline{3 \times 7} = \underline{21}$
		$\underline{3 \times 20} = \underline{60}$
		$\underline{20 \times 7} = \underline{140}$
		$\underline{20 \times 20} = \underline{400}$
		Total = $\underline{621}$
a 24×35		35
		$\times\,24$
		$\underline{\qquad} = \underline{\qquad}$
		$\underline{\qquad} = \underline{\qquad}$
		$\underline{\qquad} = \underline{\qquad}$
		$\underline{\qquad} = \underline{\qquad}$
		Total = $\underline{\qquad}$
b 26×43		43
		$\times\,26$
		$\underline{\qquad} = \underline{\qquad}$
		$\underline{\qquad} = \underline{\qquad}$
		$\underline{\qquad} = \underline{\qquad}$
		$\underline{\qquad} = \underline{\qquad}$
		Total = $\underline{\qquad}$

2 Practice listing and adding the partial products in the same order as you did above, without the labeled sketches.

$$38 \qquad\qquad 29 \qquad\qquad 65 \qquad\qquad 48$$
$$\underline{\times\,43} \qquad\quad \underline{\times\,29} \qquad\quad \underline{\times\,54} \qquad\quad \underline{\times\,37}$$

$3 \times 8 = 24$
$3 \times 30 = 90$
$40 \times 8 = 320$
$40 \times 30 = 1200$
Total = 1634

140

NAME | **DATE**

Al's Practice Sheet

1 For each problem below:

- Use the standard algorithm to get the answer.
- Then complete the area model for the problem by labeling each region.
- Finally, write out the four partial products and add them to double-check your work with the standard algorithm.

Standard Algorithm	Area Model	Four Partial Products
$\begin{array}{r} 3\ 9 \\ \times\ 3\ 9 \\ \hline \end{array}$	30 9 D C 30 9 B A	$\begin{array}{r} 39 \\ \times\ 39 \\ \hline \end{array}$ A _____ = ____ B _____ = ____ C _____ = ____ D _____ = ____ Total = ____
$\begin{array}{r} 2\ 8 \\ \times\ 2\ 8 \\ \hline \end{array}$	20 8 D C 20 8 B A	$\begin{array}{r} 28 \\ \times\ 28 \\ \hline \end{array}$ A _____ = ____ B _____ = ____ C _____ = ____ D _____ = ____ Total = ____

2 Al is using the standard multiplication algorithm, but he hasn't filled in all the numbers. Help him complete each problem by filling in the gray boxes correctly.

$\begin{array}{r} \overset{2}{} \\ 3\ 4 \\ \times\ 2\ 6 \\ \hline 2\ 0\ \\ +\ 6\ \ 0 \\ \hline \ 8\ 4 \end{array}$
$\qquad$
$\begin{array}{r} \overset{7}{} \\ 1\ 9 \\ \times\ 1\ 8 \\ \hline \ 2 \\ +\ 1\ 9\ \\ \hline 3\ \ 2 \end{array}$
$\qquad$
$\begin{array}{r} \overset{1}{\cancel{4}} \\ 5\ 6 \\ \times\ 2\ 7 \\ \hline 3\ 9 \\ +\ 1\ \ 2\ 0 \\ \hline 1\ 5\ 1\ \end{array}$

NAME | **DATE**

🏠 Alex & the Algorithm

1 Alex is practicing solving problems using the standard algorithm for multiplication. He knows the first step, but then he gets stuck. Finish these problems Alex started.

$$
\begin{array}{r}
\overset{5}{28} \\
\times\, 67 \\
\hline
6
\end{array}
\qquad
\begin{array}{r}
\overset{2}{93} \\
\times\, 87 \\
\hline
1
\end{array}
\qquad
\begin{array}{r}
\overset{4}{56} \\
\times\, 48 \\
\hline
448
\end{array}
$$

2 When using the algorithm, Alex doesn't understand why he needs to write a zero in the ones place of the second partial product.

a Explain to Alex why he needs to do this.

b What would happen if Alex did not place a zero there?

$$
\begin{array}{r}
\overset{1}{\cancel{4}} \\
37 \\
\times\, 26 \\
\hline
222 \\
+\, 740 \longleftarrow \\
\hline
962
\end{array}
$$

3 Fill in the boxes to complete the problems.

$$
\begin{array}{r}
1\,2\,3 \\
\times \quad\ 5\,6 \\
\hline
7\ \boxed{}\ 8 \\
+\ \boxed{}\,,1\ \boxed{}\ 0 \\
\hline
\boxed{}
\end{array}
\qquad
\begin{array}{r}
7\,8\,9 \\
\times \qquad 1\,2 \\
\hline
1,5\ \boxed{}\ 8 \\
+\,7,\boxed{}\ 9\ \boxed{} \\
\hline
\boxed{}\,,4\,6\,8
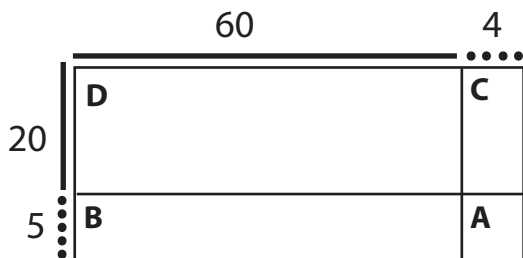\end{array}
$$

NAME _____ | **DATE** _____

25 × 64

Use each of the strategies below to solve 25 × 64.

$$\begin{array}{r} 25 \\ \times\ 64 \\ \hline \end{array}$$

1 **Area Model & Four Partial Products**

60	4
D	C
B	A

20

5

A _____ = _____

B _____ = _____

C _____ = _____

D _____ = _____

Total = _____

2 **Doubling & Halving**

25 × 64 = _____ × _____ = _____ × _____ = _____

3 **Ratio Table**

64							
1							

4 **Using Quarters**

a $64 \times \frac{1}{4} =$ _____

b $64 \times 0.25 =$ _____

c How can you use these results to find 25 × 64?

5 **The Standard Multiplication Algorithm**

a Solve the problem.

$$\begin{array}{r} 6\ 4 \\ \times\ 2\ 5 \\ \hline \end{array}$$

b Which strategy do you think is best for this combination? Why?

NAME | **DATE**

Leah's Problems

1 Leah needs to solve the three problems below. She has to use the standard algorithm for multiplication at least once. For each problem, decide which strategy Leah should use and then solve the problem.

$$541 \times 32$$ $$58 \times 25$$ $$199 \times 65$$

Strategy	Strategy	Strategy

2 Leah solved 302 × 67 by multiplying 300 by 60 and 2 by 7 and adding those products together. Did she get the right answer? Why or why not?

Review

3 What is $\frac{3}{4}$ of 96?

4 What is $\frac{4}{5}$ of 80?

5 What is $\frac{2}{3}$ of 45?

NAME | **DATE**

🏠 **Using Quarters** page 1 of 2

Here is an array of quarters.

1   What is the total amount of money in this array? Use numbers, words, or labeled sketches to explain your answer.

2   Use the array to help solve these multiplication problems.

a $4 \times 25 =$ **b** $10 \times 25 =$

c $6 \times 25 =$ **d** $12 \times 25 =$

e $8 \times 25 =$ **f** $14 \times 25 =$

3   Rosie says she can solve 24×25 using the information above. Do you agree with her? Why or why not?

(continued on next page)

NAME | DATE

Using Quarters page 2 of 2

4 Use what you know about adding and multiplying money to help solve the multiplication problems below.

> **ex**
> $$\begin{array}{r} 25 \\ \times\,36 \\ \hline 900 \end{array}$$
>
> I know there are four 25s in 100 (four quarters in a dollar). 36 is equal to 9 groups of 4. So, 36×25 is like 9×100.

a
$$\begin{array}{r} 25 \\ \times\,24 \\ \hline \end{array}$$

b
$$\begin{array}{r} 25 \\ \times\,32 \\ \hline \end{array}$$

c
$$\begin{array}{r} 25 \\ \times\,40 \\ \hline \end{array}$$

d
$$\begin{array}{r} 25 \\ \times\,34 \\ \hline \end{array}$$

e
$$\begin{array}{r} 50 \\ \times\,\;2 \\ \hline \end{array}$$

f
$$\begin{array}{r} 50 \\ \times\,16 \\ \hline \end{array}$$

g
$$\begin{array}{r} 50 \\ \times\,24 \\ \hline \end{array}$$

h
$$\begin{array}{r} 50 \\ \times\,32 \\ \hline \end{array}$$

i
$$\begin{array}{r} 50 \\ \times\,33 \\ \hline \end{array}$$

j
$$\begin{array}{r} 50 \\ \times\,17 \\ \hline \end{array}$$

k
$$\begin{array}{r} 75 \\ \times\,\;2 \\ \hline \end{array}$$

l
$$\begin{array}{r} 75 \\ \times\,16 \\ \hline \end{array}$$

Challenge

m
$$\begin{array}{r} 100 \\ \times\,0.25 \\ \hline \end{array}$$

n
$$\begin{array}{r} 600 \\ \times\,0.25 \\ \hline \end{array}$$

o
$$\begin{array}{r} 240 \\ \times\,0.75 \\ \hline \end{array}$$

p
$$\begin{array}{r} 360 \\ \times\,0.75 \\ \hline \end{array}$$

NAME _____ | **DATE** _____

🏠 Multiplication Models & More page 1 of 2

There are a variety of ways to multiply 2-digit by 2-digit numbers. Use the model or strategy described in each box to solve the multiplication combination in that box.

1 Make an easier combination by doubling one factor and halving the other.

ex $25 \times 48 = 50 \times 24 = 100 \times 12 = 1,200$

a $25 \times 72 =$ _____ $\times$ _____ $=$ _____ $\times$ _____ $=$ _____

2 Use an area model divided into four regions.
14 × 27

$$\begin{array}{r} 27 \\ \times\ 14 \\ \hline \end{array}$$

3 Use an area model divided into two regions.
13 × 34

$$\begin{array}{r} 34 \\ \times\ 13 \\ \hline \end{array}$$

4 Multiply to get four partial products and add them up.

$$\begin{array}{r} 35 \\ \boxtimes \\ \times\ 28 \\ \hline \end{array}$$

$20 \times 30 =$ _____
$20 \times 5 =$ _____
$8 \times 30 =$ _____
$8 \times 5 =$ _____

5 Multiply by the tens and then by the ones. Add the partial products to get the answer.

$$\begin{array}{r} 25 \\ \times\ 23 \\ \hline \end{array}$$

$20 \times 25 =$ _____
$3 \times 25 =$ _____

NAME | DATE

Multiplication Models & More page 2 of 2

Making an estimate before solving a problem can help you decide if your answer is reasonable. Make an estimate, solve the problem, and then use your estimate to help decide if your answer makes sense.

6 The school got new dictionaries for the third, fourth, and fifth graders this year. They got 32 boxes, and there were 16 dictionaries in each box. How many dictionaries did they get altogether?

a Use rounding or another strategy to decide which estimate below is best. Circle the best estimate.

fewer than 350 dictionaries   about 600 dictionaries   more than 350 but fewer than 450 dictionaries

b Solve the problem. Show all your work.

c Is your answer reasonable? How can you tell?

7 Solve these multiplication problems.

2,000	300	300	4,000	20,000
× 14	× 70	× 12	× 4,000	× 21

Maria's Multiplication page 1 of 2

1 Maria is practicing solving problems using the standard algorithm for multiplication. She knows the first step, but then she gets stuck. Finish these problems Maria started.

$$\begin{array}{r} {\scriptstyle 6} \\ 38 \\ \times\,28 \\ \hline 4 \end{array} \qquad \begin{array}{r} {\scriptstyle 2} \\ 84 \\ \times\,37 \\ \hline 8 \end{array} \qquad \begin{array}{r} {\scriptstyle 4} \\ 26 \\ \times\,97 \\ \hline 182 \end{array}$$

2 Fill in the boxes to complete the problems.

$$\begin{array}{r} 23 \\ \times\ \ 11 \\ \hline \square\,3 \\ +\,\square\square\square \\ \hline \rule{2cm}{0.4em} \end{array} \qquad \begin{array}{r} 15 \\ \times\ \ 12 \\ \hline \square\,0 \\ +\ 1\,\square\,0 \\ \hline \rule{2cm}{0.4em} \end{array}$$

3 Conrad always likes to use the standard algorithm. He has to solve 99 × 38. Can you recommend another strategy to Conrad that might be more efficient? Explain.

4 **CHALLENGE** Lydia also likes to use the standard algorithm for multiplication. She has to solve 32 × 8.25. Recommend another strategy to Lydia, and show her how to use that strategy to solve this problem.

(continued on next page)

79

NAME _____ | DATE _____

Maria's Multiplication page 2 of 2

Review

5 Finish the number pattern for the rule: $2n + 1$

3, 5, _____, _____, _____, _____, _____, _____, _____, _____

6 Finish the number pattern for the rule: $4n + 1$

5, 9, _____, _____, _____, _____, _____, _____, _____, _____

7 What do you notice about the two number patterns you just completed? How are they similar? How are they different?

8 Multiply:

   a $8.7 \times 10 =$ _____

   b $8.7 \times 100 =$ _____

   c $8.7 \times 1{,}000 =$ _____

   d $8.7 \times 0.1 =$ _____

   e $8.7 \times 0.01 =$ _____

   f Look at the zeroes and the decimal points in your answers. What do you notice?

NAME _____ | **DATE** _____

🏠 Skills Review page 1 of 2

1 Solve each problem below using the standard multiplication algorithm.

$$
\begin{array}{r}
706 \\
\times\, 28 \\
\hline
\end{array}
\qquad
\begin{array}{r}
519 \\
\times\, 37 \\
\hline
\end{array}
\qquad
\begin{array}{r}
405 \\
\times\, 46 \\
\hline
\end{array}
$$

2 Fill in the boxes in the problems below.

a

$$
\begin{array}{r}
\boxed{}\,^5 \\
367 \\
\times\ \ \boxed{} \\
\hline
2{,}936
\end{array}
$$

b

$$
\begin{array}{r}
\boxed{} \\
^5 \\
2\,\boxed{}\,8 \\
\times\ \ \ 37 \\
\hline
1{,}45\,\boxed{} \\
+6{,}24\,\boxed{} \\
\hline
7{,}6\,\boxed{}\,6
\end{array}
$$

c

$$
\begin{array}{r}
\boxed{} \\
^3 \\
84 \\
\times\ \ \ 5\,\boxed{} \\
\hline
7\,\boxed{}\,6 \\
+4{,}2\,\boxed{}\,0 \\
\hline
4{,}\boxed{}\,56
\end{array}
$$

Review

3 Alexis has a treasure box. The treasure box is a rectangular prism that measures 8 inches by 12 inches by 25 inches. Use the standard algorithm to determine the volume of the box. Show your work and include units in your final answer.

(continued on next page)

NAME _____ | DATE _____

Skills Review page 2 of 2

4 Fill in the blanks.

a $\frac{1}{2}$ of 84 = _____   **b** $\frac{1}{4}$ of 84 = _____   **c** $\frac{1}{8}$ of 84 = _____

d $\frac{1}{2}$ of _____ = 62   **e** $\frac{1}{4}$ of _____ = 31

5 True or False?

a $\frac{1}{4}$ of 28 = $\frac{1}{8}$ of 14   **b** $\frac{1}{8}$ of 32 = $\frac{1}{4}$ of 16   **c** $\frac{1}{2}$ of 56 = $\frac{1}{4}$ of 28

6 Add or subtract. Use the space below to show your work if necessary.

$\frac{1}{2} + \frac{5}{8} =$ _____	$2\frac{1}{6} - \frac{7}{12} =$ _____	$8\frac{3}{4} + 1\frac{5}{12} =$ _____
$6.89 + 8.12 =$ _____	$10.01 - 3.72 =$ _____	$3.12 - 2.76 =$ _____
$\frac{2}{3} +$ _____ $= 1\frac{4}{9}$	$4.08 -$ _____ $= 2.99$	$5\frac{1}{2} -$ _____ $= 2\frac{3}{4}$

7 **CHALLENGE** Randall has $5.00 to spend on snacks at the movies. Use the table to figure out three snacks Randall can buy for $5.00. Show your thinking. Is that the only combination of three snacks Randall can buy? How do you know?

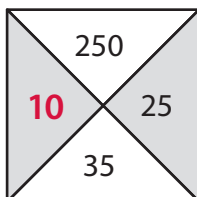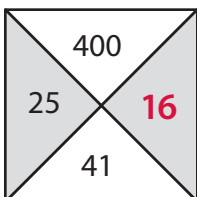|	
Popcorn - small	$2.75
Popcorn - medium	$2.99
Popcorn - large	$3.49
Cookie	$2.25
Lemonade	$1.19
Candy Bar	$1.29
Granola Bar	$0.89

Answer Keys

NAME _____ | **DATE** _____

🗒 More About Quarters

1 Fill in the blanks to complete each of the box challenge puzzles below. Remember that the number at the top is the *product* of the two numbers in the middle, and the number at the bottom is the *sum* of the two numbers in the middle.

400 / 25 × **16** / 41	250 / **10** × 25 / 35	500 / 25 × **20** / **45**
1.0 / 0.25 × **4.0** / 4.25	**9** / 0.25 × 36 / **36.25**	15 / **60** × 0.25 / 60.25

2 Jami is completing the following box challenge and says that the missing number on the right is 100 and the missing number on the bottom is $100\frac{1}{4}$. Do you agree or disagree? Explain why.

0.25 / $\frac{1}{4}$ ×
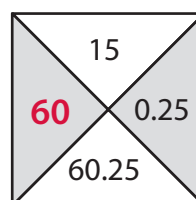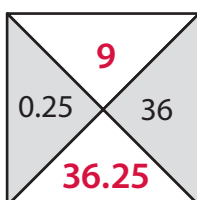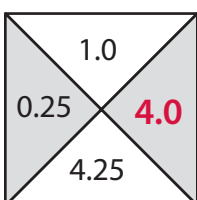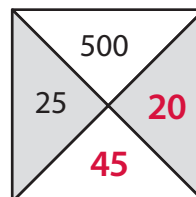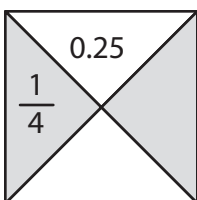
Jami is incorrect; explanations will vary. (The missing number on the right is 1, and the missing number on the bottom is 1 ¼.)

3 Find the product or quotient.

a $30 \times 25 =$ **750**

b $750 \div 25 =$ **30**

c $7500 \div 25 =$ **300**

d $7550 \div 25 =$ **302**

4 Tell how you used one of the combinations in problem 3 to help solve another one of the combinations in that problem.

Explanations will vary

NAME | DATE

Reasonable Estimates & Partial Products

1 Circle the most reasonable estimate for each multiplication problem.

a	23×21	(400)	600	4,000	6,000
b	31×19	(600)	700	6,000	7,000
c	312×18	600	800	(6,000)	10,000
d	96×33	270	1,000	(3,000)	27,000

2 Use partial products to solve each problem below. Draw lines between the digits to show which numbers you multiplied.

ex
$$63$$
$$\times 21$$
$20 \times 60 = 1,200$
$20 \times 3 = 60$
$1 \times 60 = 60$
$1 \times 3 = \underline{\quad 3}$
$1,323$

a
$$27$$
$$\times 46$$
$40 \times 20 = 800$
$40 \times 7 = 280$
$6 \times 20 = 120$
$6 \times 7 = \underline{\quad 42}$
$1,242$

b
$$36$$
$$\times 43$$
$40 \times 30 = 1,200$
$40 \times 6 = 240$
$3 \times 30 = 90$
$3 \times 6 = \underline{\quad 18}$
$1,548$

c
$$29$$
$$\times 67$$
$60 \times 20 = 1200$
$60 \times 9 = 540$
$7 \times 20 = 140$
$7 \times 9 = \underline{\quad 63}$
$1,943$

d
$$37$$
$$\times 59$$
$50 \times 30 = 1,500$
$50 \times 7 = 350$
$9 \times 30 = 270$
$9 \times 7 = \underline{\quad 63}$
$2,183$
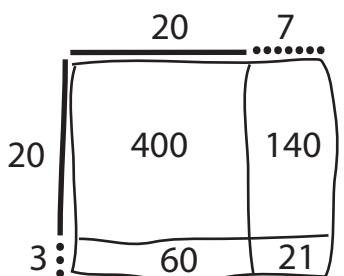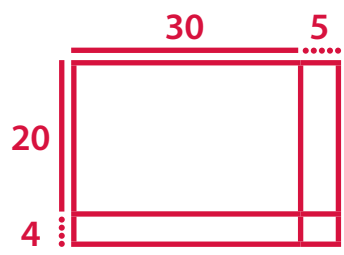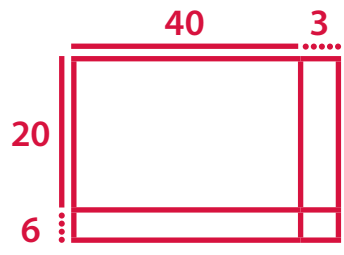
e
$$47$$
$$\times 56$$
$50 \times 40 = 2,000$
$50 \times 7 = 350$
$6 \times 40 = 240$
$6 \times 7 = \underline{\quad 42}$
$2,632$

NAME | DATE

🎴 Bottom to Top, Right to Left

1 For each problem below, sketch and label a 4-part area model. Then list the partial products in order from bottom right corner to top left corner, and add them to get the total.

ex 23×27	
	$\begin{array}{r} 27 \\ \times\ 23 \end{array}$ $3 \times 7 = 21$ $3 \times 20 = 60$ $20 \times 7 = 140$ $20 \times 20 = 400$ Total $= 621$
a 24×35	
	$\begin{array}{r} 35 \\ \times\ 24 \end{array}$ $4 \times 5 = 20$ $4 \times 30 = 120$ $20 \times 5 = 100$ $20 \times 30 = 600$ Total $= 840$
b 26×43	
	$\begin{array}{r} 43 \\ \times\ 26 \end{array}$ $6 \times 3 = 18$ $6 \times 40 = 240$ $20 \times 3 = 60$ $20 \times 40 = 800$ Total $= 1{,}118$

2 Practice listing and adding the partial products in the same order as you did above, without the labeled sketches.

$\begin{array}{r} 38 \\ \times\ 43 \end{array}$	$\begin{array}{r} 29 \\ \times\ 29 \end{array}$	$\begin{array}{r} 65 \\ \times\ 54 \end{array}$	$\begin{array}{r} 48 \\ \times\ 37 \end{array}$
$3 \times 8 = 24$	$9 \times 9 = 81$	$4 \times 5 = 20$	$7 \times 8 = 56$
$3 \times 30 = 90$	$9 \times 20 = 180$	$4 \times 60 = 240$	$7 \times 40 = 280$
$40 \times 8 = 320$	$20 \times 9 = 180$	$50 \times 5 = 250$	$30 \times 8 = 240$
$40 \times 30 = 1200$	$20 \times 20 = 400$	$50 \times 60 = 3{,}000$	$30 \times 40 = 1{,}200$
Total $= 1634$	Total $= 841$	Total $= 3{,}510$	Total $= 1{,}776$

NAME _____ | **DATE** _____

🏛 Al's Practice Sheet

1 For each problem below:

- Use the standard algorithm to get the answer.
- Then complete the area model for the problem by labeling each region.
- Finally, write out the four partial products and add them to double-check your work with the standard algorithm.

Standard Algorithm	Area Model	Four Partial Products
$\begin{array}{r} 39 \\ \times\ 39 \\ \hline 351 \\ +\ 1170 \\ \hline 1521 \end{array}$	30 9 D: 900 C: 270 (30) B: 270 A: 81 (9)	$\begin{array}{r}39\\ \times\ 39\end{array}$ A 9×9 = 81 B 9×30 = 270 C 30×9 = 270 D 30×30 = 900 Total = 1,521
$\begin{array}{r} 28 \\ \times\ 28 \\ \hline 224 \\ +\ 560 \\ \hline 784 \end{array}$	20 8 D: 400 C: 160 (20) B: 160 A: 64 (8)	$\begin{array}{r}28\\ \times\ 28\end{array}$ A 8×8 = 64 B 8×20 = 160 C 20×8 = 160 D 20×20 = 400 Total = 784

2 Al is using the standard multiplication algorithm, but he hasn't filled in all the numbers. Help him complete each problem by filling in the gray boxes correctly.

$\begin{array}{r} \overset{2}{}\ \ \\ 3\ 4 \\ \times\ 2\ 6 \\ \hline 2\ 0\ 4 \\ +\ 6\ 8\ 0 \\ \hline 8\ 8\ 4 \end{array}$

$\begin{array}{r} \overset{7}{}\ \ \\ 1\ 9 \\ \times\ 1\ 8 \\ \hline 1\ 5\ 2 \\ +\ 1\ 9\ 0 \\ \hline 3\ 4\ 2 \end{array}$

$\begin{array}{r} \overset{1}{4}\ \ \\ 5\ 6 \\ \times\ 2\ 7 \\ \hline 3\ 9\ 2 \\ +\ 1\ 1\ 2\ 0 \\ \hline 1\ 5\ 1\ 2 \end{array}$

NAME _____ | **DATE** _____

📐 Alex & the Algorithm

1 Alex is practicing solving problems using the standard algorithm for multiplication. He knows the first step, but then he gets stuck. Finish these problems Alex started.

$$
\begin{array}{r}
\overset{5}{2}8 \\
\times\ 67 \\
\hline
19^6 \\
+\ 1{,}680 \\
\hline
1{,}876
\end{array}
\qquad\qquad
\begin{array}{r}
\overset{2}{9}3 \\
\times\ 87 \\
\hline
65^1 \\
+\ 7{,}440 \\
\hline
8{,}091
\end{array}
\qquad\qquad
\begin{array}{r}
\overset{4}{5}6 \\
\times\ 48 \\
\hline
448 \\
+\ 2{,}240 \\
\hline
2{,}688
\end{array}
$$

2 When using the algorithm, Alex doesn't understand why he needs to write a zero in the ones place of the second partial product.

a Explain to Alex why he needs to do this.   **Explanations will vary.**

b What would happen if Alex did not place a zero there?

$$
\begin{array}{r}
\overset{1}{\cancel{4}} \\
37 \\
\times\ 26 \\
\hline
222 \\
+\ 740 \longleftarrow\ \text{———} \\
\hline
962
\end{array}
$$

3 Fill in the boxes to complete the problems.

$$
\begin{array}{r}
1\,2\,3 \\
\times\quad\ 5\,6 \\
\hline
7\,\boxed{3}\,8 \\
+\ \boxed{6}{,}1\,\boxed{5}\,0 \\
\hline
6{,}\boxed{888}
\end{array}
\qquad\qquad
\begin{array}{r}
7\,8\,9 \\
\times\quad\ 1\,2 \\
\hline
1{,}5\,\boxed{7}\,8 \\
+\ 7{,}\boxed{8}\,9\,\boxed{0} \\
\hline
\boxed{9}{,}4\,6\,8
\end{array}
$$

25 × 64

Use each of the strategies below to solve 25 × 64.

$$\begin{array}{r} 25 \\ \times\ 64 \end{array}$$

1 **Area Model & Four Partial Products**
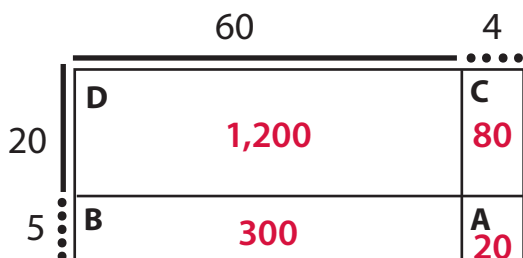
A ___ 5×4 ___ = ___ **20**

B ___ 5×60 ___ = ___ **300**

C ___ 20×4 ___ = ___ **80**

D ___ 20×60 ___ = **1,200**

Total = **1,600**

2 **Doubling & Halving**

$25 \times 64 =$ __**50**__ × __**32**__ = __**100**__ × __**16**__ = **1,600**

3 **Ratio Table**   **Use of ratio table will vary. Example:**

64	640	1280	320	1,600			
1	10	20	5	25			

4 **Using Quarters**

a $64 \times \frac{1}{4} =$ __**16**__

b $64 \times 0.25 =$ __**16**__

c   How can you use these results to find 25 × 64?

**Answers will vary. Example: Multiply the answer to
64 × 0.25 by 100 because 25 is 100 times more than 0.25**

5 **The Standard Multiplication Algorithm**

a   **Solve the problem.**

b   Which strategy do you think is best
for this combination? Why?

Responses will vary.

NAME _____ | **DATE** _____

Leah's Problems

1 Leah needs to solve the three problems below. She has to use the standard algorithm for multiplication at least once. For each problem, decide which strategy Leah should use and then solve the problem.

$$541 \times 32 = \textbf{17,312}$$

$$58 \times 25 = \textbf{1,450}$$

$$199 \times 65 = \textbf{12,935}$$

Strategy	Strategy	Strategy
	Strategies selected will vary.	

2 Leah solved 302×67 by multiplying 300 by 60 and 2 by 7 and adding those products together. Did she get the right answer? Why or why not?

No; explanations will vary.

Review

3 What is $\frac{3}{4}$ of 96?   **72**

4 What is $\frac{4}{5}$ of 80?   **64**

5 What is $\frac{2}{3}$ of 45?   **30**

NAME | DATE

🏠 Using Quarters page 1 of 2
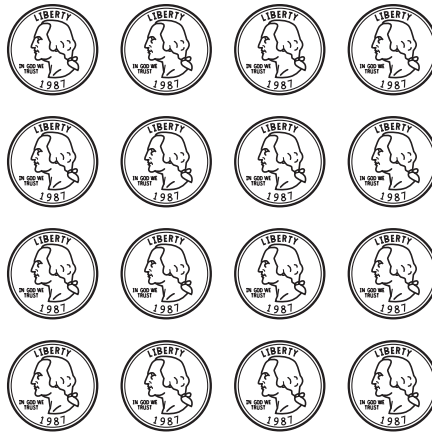
Here is an array of quarters.

1 What is the total amount of money in this array? Use numbers, words, or labeled sketches to explain your answer.

$4.00

2 Use the array to help solve these multiplication problems.

a $4 \times 25 =$ **100**

b $10 \times 25 =$ **250**

c $6 \times 25 =$ **150**

d $12 \times 25 =$ **300**

e $8 \times 25 =$ **200**

f $14 \times 25 =$ **350**

3 Rosie says she can solve 24×25 using the information above. Do you agree with her? Why or why not?

Responses will vary; students should generally agree, as Rosie could double 12×25 or think about 24×25 as six groups of 4×25.

(continued on next page)

NAME | DATE

Using Quarters page 2 of 2

4 Use what you know about adding and multiplying money to help solve the multiplication problems below.

ex	
$\begin{array}{r} 25 \\ \times\ 36 \\ \hline 900 \end{array}$	I know there are four 25s in 100 (four quarters in a dollar). 36 is equal to 9 groups of 4. So, 36×25 is like 9×100.

a
$\begin{array}{r} 25 \\ \times\ 24 \\ \hline \mathbf{600} \end{array}$

b
$\begin{array}{r} 25 \\ \times\ 32 \\ \hline \mathbf{800} \end{array}$

c
$\begin{array}{r} 25 \\ \times\ 40 \\ \hline \mathbf{1,000} \end{array}$

d
$\begin{array}{r} 25 \\ \times\ 34 \\ \hline \mathbf{850} \end{array}$

e
$\begin{array}{r} 50 \\ \times\ 2 \\ \hline \mathbf{100} \end{array}$

f
$\begin{array}{r} 50 \\ \times\ 16 \\ \hline \mathbf{800} \end{array}$

g
$\begin{array}{r} 50 \\ \times\ 24 \\ \hline \mathbf{1,200} \end{array}$

h
$\begin{array}{r} 50 \\ \times\ 32 \\ \hline \mathbf{1,600} \end{array}$

i
$\begin{array}{r} 50 \\ \times\ 33 \\ \hline \mathbf{1,650} \end{array}$

j
$\begin{array}{r} 50 \\ \times\ 17 \\ \hline \mathbf{850} \end{array}$

k
$\begin{array}{r} 75 \\ \times\ 2 \\ \hline \mathbf{150} \end{array}$

l
$\begin{array}{r} 75 \\ \times\ 16 \\ \hline \mathbf{1,200} \end{array}$

Challenge

m
$\begin{array}{r} 100 \\ \times\ 0.25 \\ \hline \mathbf{25} \end{array}$

n
$\begin{array}{r} 600 \\ \times\ 0.25 \\ \hline \mathbf{150} \end{array}$

o
$\begin{array}{r} 240 \\ \times\ 0.75 \\ \hline \mathbf{180} \end{array}$

p
$\begin{array}{r} 360 \\ \times\ 0.75 \\ \hline \mathbf{270} \end{array}$

NAME _____ | **DATE** _____

🏠 **Multiplication Models & More** page 1 of 2

There are a variety of ways to multiply 2-digit by 2-digit numbers. Use the model or strategy described in each box to solve the multiplication combination in that box.

1 Make an easier combination by doubling one factor and halving the other.

ex $25 \times 48 = 50 \times 24 = 100 \times 12 = 1{,}200$

a $25 \times 72 = \underline{\textbf{50}} \times \underline{\textbf{36}} = \underline{\textbf{100}} \times \underline{\textbf{18}} = \textbf{1{,}800}$

2 Use an area model divided into four regions. **Work may vary slightly.**

14×27

	20	**7**
10	**200**	**70**
4	**80**	**28**

```
  200
   70
   80
+  28
  378
```

```
    27
 ×  14
   378
```

3 Use an area model divided into two regions. **Work may vary slightly.**

13×34

	30	**4**
13	**390**	**52**

```
  390
+  52
  442
```

```
    34
 ×  13
   442
```

4 Multiply to get four partial products and add them up.

```
        35
        ⋈
      × 28
```
$20 \times 30 = \underline{\textbf{600}}$
$20 \times 5 = \underline{\textbf{100}}$
$8 \times 30 = \underline{\textbf{240}}$
$8 \times 5 = \underline{\textbf{40}}$
$\quad\quad\quad\quad \boxed{\textbf{980}}$

5 Multiply by the tens and then by the ones. Add the partial products to get the answer.

```
        25
      × 23
```
$20 \times 25 = \underline{\textbf{500}}$
$3 \times 25 = \underline{\textbf{75}}$
$\quad\quad\quad\quad \boxed{\textbf{575}}$

(continued on next page)

NAME | DATE

Multiplication Models & More page 2 of 2

Making an estimate before solving a problem can help you decide if your answer is reasonable. Make an estimate, solve the problem, and then use your estimate to help decide if your answer makes sense.

6 The school got new dictionaries for the third, fourth, and fifth graders this year. They got 32 boxes, and there were 16 dictionaries in each box. How many dictionaries did they get altogether?

a Use rounding or another strategy to decide which estimate below is best. Circle the best estimate.

fewer than 350
dictionaries

about 600 dictionaries

more than 350 but fewer
than 450 dictionaries

b Solve the problem. Show all your work.

512 dictionaries. Work will vary.

c Is your answer reasonable? How can you tell?

Explanations will vary.

7 Solve these multiplication problems.

2,000	300	300	4,000	20,000
× 14	× 70	× 12	× 4,000	× 21
28,000	**21,000**	**3,600**	**16,000,000**	**420,000**

Maria's Multiplication page 1 of 2

1 Maria is practicing solving problems using the standard algorithm for multiplication. She knows the first step, but then she gets stuck. Finish these problems Maria started.

$$
\begin{array}{r}
\overset{1}{\cancel{6}} \\
38 \\
\times\ 28 \\
\hline
304 \\
+\ \ 760 \\
\hline
1{,}064
\end{array}
$$

$$
\begin{array}{r}
\overset{1}{\cancel{2}} \\
84 \\
\times\ 37 \\
\hline
588 \\
+\ 2520 \\
\hline
3{,}108
\end{array}
$$

$$
\begin{array}{r}
\overset{5}{\cancel{4}} \\
26 \\
\times\ 97 \\
\hline
182 \\
+\ 2340 \\
\hline
2{,}522
\end{array}
$$

2 Fill in the boxes to complete the problems.

$$
\begin{array}{r}
23 \\
\times\quad 11 \\
\hline
\mathbf{2}3 \\
+\mathbf{2\ 3\ 0} \\
\hline
\mathbf{2\ 5\ 3}
\end{array}
$$

$$
\begin{array}{r}
15 \\
\times\quad 12 \\
\hline
\mathbf{2}0 \\
+\ 1\mathbf{5}0 \\
\hline
\mathbf{1\ 7\ 0}
\end{array}
$$

3 Conrad always likes to use the standard algorithm. He has to solve 99×38. Can you recommend another strategy to Conrad that might be more efficient? Explain.

Students' choices of strategies and work will vary. Example:
He could multiply 38 by 100 instead and then subtract 38.
$$99 \times 38 = (100 - 1) \times 38 = 38 \times 100 - 38$$
$$= 3{,}800 - 38 = 3{,}762$$

4 **CHALLENGE** Lydia also likes to use the standard algorithm for multiplication. She has to solve 32×8.25. Recommend another strategy to Lydia, and show her how to use that strategy to solve this problem.

Students' choices of strategies and work will vary. Example:
She could multiply 32 times 8 and then by 0.25 and add.
$$32 \times 8.25 = 32 \times (8 + 0.25) = 32 \times 8 + 32 \times 0.25$$
$$= 256 + 8 = 264$$

(continued on next page)

NAME | DATE

Maria's Multiplication page 2 of 2

Review

5 Finish the number pattern for the rule: $2n + 1$

3, 5, __**7**__, __**9**__, __**11**__, __**13**__, __**15**__, __**17**__, __**19**__, __**21**__

6 Finish the number pattern for the rule: $4n + 1$

5, 9, __**13**__, __**17**__, __**21**__, __**25**__, __**29**__, __**33**__, __**37**__, __**41**__

7 What do you notice about the two number patterns you just completed? How are they similar? How are they different?

Observations will vary. Some possibilities:

They both have only odd numbers.

All of the numbers in the second pattern appear in the first pattern.

Every other number in the first pattern is a number from the second pattern.

In the first pattern you add 2 to get the next number; in the second pattern you add 4.

8 Multiply:

a $8.7 \times 10 =$ __**87**__

b $8.7 \times 100 =$ **870**

c $8.7 \times 1{,}000 =$ **8,700**

d $8.7 \times 0.1 =$ **0.87**

e $8.7 \times 0.01 =$ **0.087**

f Look at the zeroes and the decimal points in your answers. What do you notice?
Observations will vary. Example:

When you multiply by a whole number power of 10 (like 10 or 100) you move the decimal to the right by the number of zeroes in the power of 10. When you multiply by a power of 10 less than 1 (like 0.1 or 0.01) you move the decimal point to the left by the number of digits to the right of the decimal point.

NAME | DATE

📖 Skills Review page 1 of 2

1 Solve each problem below using the standard multiplication algorithm.

$$
\begin{array}{r}
\overset{1}{\underset{4}{\cancel{4}}} \\
706 \\
\times\ 28 \\
\hline
\mathbf{5648} \\
+\ \mathbf{14120} \\
\hline
\mathbf{19{,}768}
\end{array}
\qquad
\begin{array}{r}
\overset{1}{\underset{6}{1\cancel{6}}} \\
519 \\
\times\ 37 \\
\hline
\mathbf{3633} \\
+\ \mathbf{15570} \\
\hline
\mathbf{19{,}203}
\end{array}
\qquad
\begin{array}{r}
\overset{2}{\underset{3}{\cancel{3}}} \\
405 \\
\times\ 46 \\
\hline
\mathbf{2430} \\
+\ \mathbf{16200} \\
\hline
\mathbf{18{,}630}
\end{array}
$$

2 Fill in the boxes in the problems below.

a

$$
\begin{array}{r}
\mathbf{5}_5 \\
367 \\
\times\quad \mathbf{8} \\
\hline
2{,}936
\end{array}
$$

b

$$
\begin{array}{r}
\mathbf{2} \\
{}^{5} \\
2\,\mathbf{0}\,8 \\
\times\quad 37 \\
\hline
1{,}45\,\mathbf{6} \\
+6{,}24\,\mathbf{0} \\
\hline
7{,}6\,\mathbf{9}\,6
\end{array}
$$

c

$$
\begin{array}{r}
\mathbf{2} \\
{}^{3} \\
84 \\
\times\quad 5\,\mathbf{9} \\
\hline
7\,\mathbf{5}\,6 \\
+4{,}2\,\mathbf{0}\,0 \\
\hline
4{,}\mathbf{9}\,56
\end{array}
$$

Review

3 Alexis has a treasure box. The treasure box is a rectangular prism that measures 8 inches by 12 inches by 25 inches. Use the standard algorithm to determine the volume of the box. Show your work and include units in your final answer.
2,400 cubic inches. Work will vary, but students should use the standard algorithm for at least part of the multiplication to be done. For example, a student might multiply 12 × 8 using other strategies to get 96, then multiply 96 × 25 using the standard algorithm.

(continued on next page)

NAME _____ | DATE _____

Skills Review page 2 of 2

4 Fill in the blanks.

a $\frac{1}{2}$ of 84 = **42**   **b** $\frac{1}{4}$ of 84 = **21**   **c** $\frac{1}{8}$ of 84 = **10.5**

d $\frac{1}{2}$ of **124** = 62   **e** $\frac{1}{4}$ of **124** = 31

5 True or False?

a $\frac{1}{4}$ of 28 = $\frac{1}{8}$ of 14 **F**   **b** $\frac{1}{8}$ of 32 = $\frac{1}{4}$ of 16 **T**   **c** $\frac{1}{2}$ of 56 = $\frac{1}{4}$ of 28 **F**

6 Add or subtract. Use the space below to show your work if necessary.

$\frac{1}{2} + \frac{5}{8} =$ **9/8 = 1 1/8**	$2\frac{1}{6} - \frac{7}{12} =$ **1 7/12**	$8\frac{3}{4} + 1\frac{5}{12} =$ **10 1/6**
$6.89 + 8.12 =$ **15.01**	$10.01 - 3.72 =$ **6.29**	$3.12 - 2.76 =$ **0.36**
$\frac{2}{3} +$ **7/9** $= 1\frac{4}{9}$	$4.08 -$ **1.09** $= 2.99$	$5\frac{1}{2} -$ **2 3/4** $= 2\frac{3}{4}$

7 <u>CHALLENGE</u> Randall has $5.00 to spend on snacks at the movies. Use the table to figure out three snacks Randall can buy for $5.00. Show your thinking. Is that the only combination of three snacks Randall can buy? How do you know?

Popcorn - small	$2.75
Popcorn - medium	$2.99
Popcorn - large	$3.49
Cookie	$2.25
Lemonade	$1.19
Candy Bar	$1.29
Granola Bar	$0.89

There are several combinations Randall can buy. A few examples:

Cookie + lemonade + candy bar: $4.73

Cookie + lemonade + granola bar: $4.33

Sm. popcorn + lemonade + granola bar: $4.83

Sm. popcorn + candy bar + granola bar: $4.93