Chapter 3

Name _____

Multiply by 2-Digit Numbers

Show What You Know

Practice Multiplication Facts

Find the product.

1. $8 \times 7 =$ _____
   $7 \times 8 =$ _____

2. $3 \times (2 \times 4) =$ _____
   $(3 \times 2) \times 4 =$ _____

2-Digit by 1-Digit Multiplication

Find the product.

3. $\begin{array}{r} 28 \\ \times\ 3 \\ \hline \end{array}$

4. $\begin{array}{r} 56 \\ \times\ 6 \\ \hline \end{array}$

5. $\begin{array}{r} 71 \\ \times\ 5 \\ \hline \end{array}$

6. $\begin{array}{r} 69 \\ \times\ 8 \\ \hline \end{array}$

7. $\begin{array}{r} 36 \\ \times\ 4 \\ \hline \end{array}$

3- Digit by 1-Digit Multiplication

Find the product.

8. $\begin{array}{r} 672 \\ \times\ \ 4 \\ \hline \end{array}$

9. $\begin{array}{r} 456 \\ \times\ \ 5 \\ \hline \end{array}$

10. $\begin{array}{r} 804 \\ \times\ \ 7 \\ \hline \end{array}$

11. $\begin{array}{r} 341 \\ \times\ \ 9 \\ \hline \end{array}$

12. $\begin{array}{r} 165 \\ \times\ \ 6 \\ \hline \end{array}$

13. $\begin{array}{r} 392 \\ \times\ \ 8 \\ \hline \end{array}$

14. $\begin{array}{r} 782 \\ \times\ \ 6 \\ \hline \end{array}$

15. $\begin{array}{r} 292 \\ \times\ \ 5 \\ \hline \end{array}$

16. $\begin{array}{r} 584 \\ \times\ \ 7 \\ \hline \end{array}$

17. $\begin{array}{r} 837 \\ \times\ \ 4 \\ \hline \end{array}$

MATH in the Real World

Yellowstone National Park, which is located in Wyoming, Montana, and Idaho, was America's first National Park. The park has over 500 geysers. Grand Geyser erupts about every 8 hours.

Based on this estimate, how many times would you see this geyser erupt if you could watch it for 1 year? There are 24 hours in a day and 365 days in a year.

Vocabulary Builder

Go Online For more help

Visualize It

Complete the H-diagram using the words with a ✓.

Multiplication Words		Estimation Words

Connect to Vocabulary

Review Words

- Associative Property of Multiplication
- Commutative Property of Multiplication
- ✓ estimate
- ✓ factor
- ✓ partial product
- ✓ place value
- ✓ product
- regroup
- ✓ round

Preview Words

- ✓ compatible numbers

Understand Vocabulary

Draw a line to match each word or phrase with its definition.

Word	Definition
1. Commutative Property of Multiplication	• a number that is multiplied by another number to find a product
2. estimate	• to exchange amounts of equal value to rename a number
3. compatible numbers	• to find an answer that is close to the exact amount
4. factor	• numbers that are easy to compute mentally
5. regroup	• the property that states when the order of two factors is changed, the product is the same.

Name _____

Multiply by Tens

I Can use different strategies to multiply by tens.

Florida's B.E.S.T.

- **Number Sense & Operations** 4.NSO.2.2, 4.NSO.2.5
- **Mathematical Thinking & Reasoning** MTR.2.1, MTR.3.1, MTR.4.1, MTR.6.1

UNLOCK the Problem Real World

Animation for a computer-drawn cartoon requires about 20 frames per second. How many frames would need to be drawn for a 30-second cartoon?

- The phrase "20 frames per second" means 20 frames are needed for each second of animation. How does this help you know what operation to use?

_____

_____

One Way Use place value.

Multiply. 30×20

You can think of 20 as 2 tens.

$30 \times 20 = 30 \times$ _____ tens

$=$ _____ tens

$= 600$

Remember

The Associative Property of Multiplication states that you can group factors in different ways and get the same product. Use parentheses to group the factors you multiply first.

Another Way Use the Associative Property.

You can think of 20 as 2×10.

$30 \times 20 = 30 \times (2 \times 10)$

$= (30 \times 2) \times 10$

$=$ _____ $\times$ _____

$=$ _____

So, _____ frames would need to be drawn.

Math Talk

MTR 4.1 Engage in discussions on mathematical thinking.

How can you use place value to tell why $60 \times 10 = 600$?

- Compare the number of zeros in each factor to the number of zeros in the product. What do you notice?

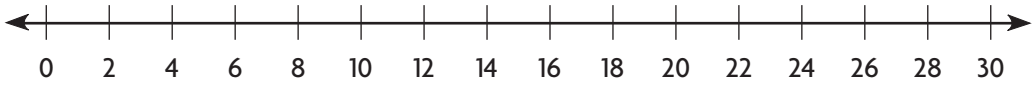
_____

_____

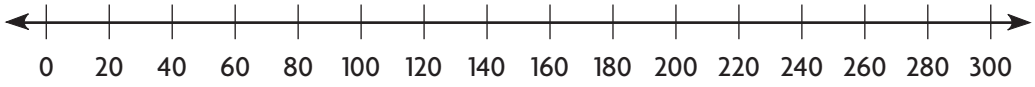
Other Ways

A **Use a number line and a pattern to multiply 15 × 20.**

Draw jumps to show the product.



$15 \times 2 =$ _____



$15 \times 20 =$ _____

B **Use mental math to find 14 × 30.**

Use the halving-and-doubling strategy.

STEP 1 Find half of 14 to make the problem simpler.

Think: To find half of a number, divide by 2.

$14 \div 2 =$ _____

STEP 2 Multiply.

$7 \times 30 =$ _____

STEP 3 Double 210.

Think: To double a number, multiply by 2.

$2 \times 210 =$ _____

So, $14 \times 30 = 420$.

Try This! Multiply.

Use mental math to find 12 × 40.

Use place value to find 12 × 40.

Share and Show

Math Board

1. Find 20×27. Tell which method you chose. Explain what happens in each step.

_____

_____

Name _____

Choose a method. Then find the product.

2. 10×12

3. 20×20

4. 40×24

5. 11×60

Math Talk

MTR 3.1 Complete tasks with mathematical fluency.

How can you use $30 \times 10 = 300$ to find 30×12?

On Your Own

Choose a method. Then find the product.

6. 70×55

7. 17×30

8. 30×60

9. 12×90

MTR **Find the unknown digit in the number.**

10. $64 \times 40 = 2{,}56\square$

$\square$ = _____

11. $29 \times 50 = 1{,}\pentagon 50$

$\pentagon$ = _____

12. $3\diamond \times 47 = 1{,}410$

$\diamond$ = _____

13. Carmen packs 12 jars of jam in a box. She has 40 boxes. She has 542 jars of jam. How many jars of jam will she have left when all the boxes are full?

_____

14. Adelita is preparing for a math contest. Each day, she works on multiplication problems for 20 minutes and division problems for 10 minutes. How many minutes does Adelita practice multiplication and division problems in 15 days?

_____

Problem Solving · Applications

Use the table for 15–16.

Animated Productions

Title	Date Released	Frames per Second
The Enchanted Drawing©	1900	20
Little Nemo©	1911	16
Snow White and the Seven Dwarfs©	1937	24
Pinocchio©	1940	19
The Flintstones™	1960–1966	24

15. MTR How many frames did it take to produce 50 seconds of *Pinocchio*?

16. Are there fewer frames in 10 seconds of *The Flintstones* or in 14 seconds of *The Enchanted Drawing?* What is the difference in the number of frames?

17. The product of my number and twice my number is 128. What is half my number? Explain how you solved the problem.

MATH on the Spot

18. Tanya says that the product of a multiple of ten and a multiple of ten will always have only one zero. Is she correct? Explain.

19. For numbers 19a–19e, select Yes or No to tell whether the answer is correct.

19a. $28 \times 10 = 280$ ○ Yes ○ No

19b. $15 \times 20 = 300$ ○ Yes ○ No

19c. $17 \times 10 = 17$ ○ Yes ○ No

19d. $80 \times 10 = 800$ ○ Yes ○ No

19e. $16 \times 30 = 1{,}800$ ○ Yes ○ No

Show the Math

Demonstrate Your Thinking

Name _____

Multiply by Tens

Go Online
Interactive Examples

Choose a method. Then find the product.

1. 16×60

Use the halving-and-doubling strategy.

Find half of 16: $16 \div 2 = 8$.

Multiply 60 by this number: $8 \times 60 = 480$.

Double this result: $2 \times 480 = 960$.

960

2. 80×22

3. 30×52

4. 60×20

Problem Solving Real World

5. Octavio bought 20 packs of baseball cards. There are 12 cards in each pack. How many cards did Octavio buy?

6. The Hart family drove 10 hours to their vacation spot. They drove an average of 48 miles each hour. How many miles did they drive?

7. WRITE Math Write the steps for how to use a number line to multiply a 2-digit number by 20. Give an example.

Lesson Check

8. For the school play, 40 rows of chairs are set up. There are 22 chairs in each row. How many chairs are there?

9. At West School, there are 20 classrooms. Each classroom has 20 students. How many students are at West School?

Spiral Review

10. Samira has 48 stickers. This is 6 times the number of stickers Max has. How many stickers does Max have?

11. Ali's dog weighs 8 times as much as her cat. Together, the two pets weigh 54 pounds. How much does Ali's dog weigh?

12. Trinity has 3 containers with 25 crayons in each. She also has 4 boxes of markers with 12 markers in each box. She gives 10 crayons to a friend. How many crayons and markers does Trinity have now?

13. The state of Utah covers 82,144 square miles. The state of Montana covers 145,552 square miles. What is the total area of the two states?

Name _____

Estimate Products by 2-Digit Numbers

I Can use different strategies to estimate products.

Florida's B.E.S.T.

- **Number Sense & Operations** 4.NSO.1.4, 4.NSO.2.5
- **Mathematical Thinking & Reasoning** MTR.2.1, MTR.3.1, MTR.4.1, MTR.5.1, MTR.6.1

UNLOCK the Problem Real World

On average, the Smith family opens the door of their refrigerator 32 times each day. There are 31 days in May. About how many times is the refrigerator door opened in May?

- Underline any information you will need.

One Way Use rounding and mental math.

Estimate. 31 × 32

STEP 1 Round each factor.

31 × 32

↓ ↓

30 × 30

STEP 2 Use mental math.

3 × 3 = 9 ←basic fact

30 × 30 = _____

So, the Smith family opens the refrigerator door about 900 times during the month of May.

Math Talk

MTR 4.1 Engage in discussions on mathematical thinking.

Is the exact product greater than or less than 900? Explain.

1. On average, a refrigerator door is opened 38 times each day. About how many fewer times in May is the Smith family's refrigerator door opened than the average refrigerator door?

WRITE *Math*

All 24 light bulbs in the Saidi family's home are CFL light bulbs. Each CFL light bulb uses 28 watts to produce light. About how many watts will the light bulbs use when turned on all at the same time?

Another Way Use mental math and compatible numbers.

Compatible numbers are numbers that are easy to compute mentally.

Estimate. 24×28

STEP 1 Use compatible numbers.

24×28

25×30 Think: $25 \times 3 = 75$

STEP 2 Use mental math.

$25 \times 3 = 75$

$25 \times 30 =$ _____

So, about 750 watts are used.

Try This! Estimate $26 \times \$79$.

A Round to the nearest ten

26 × $79

_____ × _____ = _____

26 × $79 is about _____.

B Compatible numbers

26 × $79 Think: How can you use $25 \times 4 = 100$ to help find 25×8?

25 × $80 = _____

26 × $79 is about _____.

2. Explain why $2,400 and $2,000 are both reasonable estimates.

_____

_____

3. In what situation might you choose to find an estimate rather than an exact answer?

_____

_____

Share and Show Math Board

1. To estimate the product of 62 and 28 by rounding, how would you round the factors? What would the estimated product be?

_____

Name _____

Estimate the product. Choose a method.

2. 96×34

3. $47 \times \$39$

4. 78×72

Math Talk

MTR 4.1 Engage in discussions on mathematical thinking.

How do you know if an estimated product will be greater than or less than the exact answer?

On Your Own

Estimate the product. Choose a method.

5. 41×78

6. 51×73

7. 34×80

8. 61×31

9. 52×68

10. 26×44

11. $57 \times \$69$

Find two possible factors for the estimated product.

12. 2,800

13. 8,100

14. 5,600

15. 2,400

16. Mr. Molefe jogs for 35 minutes each day. He jogs 5 days in week 1, 6 days in week 2, and 7 days in week 3. About how many minutes does he jog?

17. There are 48 beads in a package. Akelah bought 4 packages of blue, 9 packages of gold, 6 packages of red, and 2 packages of silver beads. About how many beads did Akelah buy?

Problem Solving · Applications Real World

18. On average, a refrigerator door is opened 38 times each day. Kyler has two refrigerators in his house. Based on this average, about how many times in a 3-week period are the refrigerator doors opened?

_____

19. The cost to run a refrigerator is about $57 each year. About how much will it have cost to run by the time it is 15 years old?

_____

20. If Mel opens his refrigerator door 36 times every day, about how many times will it be opened in April? Will the exact answer be more than or less than the estimate? Explain.

MATH on the Spot

_____

_____

_____

_____

21. MTR What question could you write for this answer? The estimated product of two numbers, that are not multiples of ten, is 2,800.

_____

_____

Show the Math

Demonstrate Your Thinking

22. For numbers 22a–22d, select True or False for each sentence.

22a. 26×48 is about 25×50. ○ true ○ false

22b. 21×22 is about 20×30. ○ true ○ false

22c. 28×21 is about 30×30. ○ true ○ false

22d. 51×26 is about 50×25. ○ true ○ false

Name _____

Estimate Products by 2-Digit Numbers

Go Online
Interactive Examples

Estimate the product. Choose a method.

1. 38×21

38×21
$\downarrow \quad \downarrow$
40×20

800

2. 63×19

_____

3. $27 \times \$42$

_____

4. 73×67

_____

5. $37 \times \$44$

_____

6. 45×22

_____

Problem Solving Real World

7. A dime has a diameter of about 18 millimeters. About how many millimeters long would a row of 34 dimes be?

_____

8. A half-dollar has a diameter of about 31 millimeters. About how many millimeters long would a row of 56 half-dollars be?

_____

9. WRITE Math Describe a real-life multiplication situation for which an estimate makes sense. Explain why it makes sense.

_____

_____

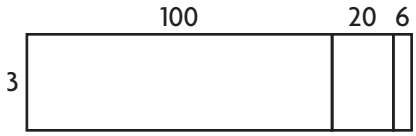
Lesson Check

10. What is a reasonable estimate for the product of 43 and 68?

11. Marissa burns 93 calories each time she plays fetch with her dog. She plays fetch with her dog once a day. About how many calories will Marissa burn playing fetch with her dog in 28 days?

Spiral Review

12. Use the model to find 3×126.



13. A store sold a certain brand of jeans for $38. One day, the store sold 6 pairs of jeans of that brand. How much did the 6 pairs of jeans cost?

14. The Gateway Arch in St. Louis, Missouri, weighs about 20,000 tons. Write an amount that could be the exact number of tons the Arch weighs.

15. What is another name for 23 ten thousands?

Name _____

Area Models and Partial Products

Florida's B.E.S.T.

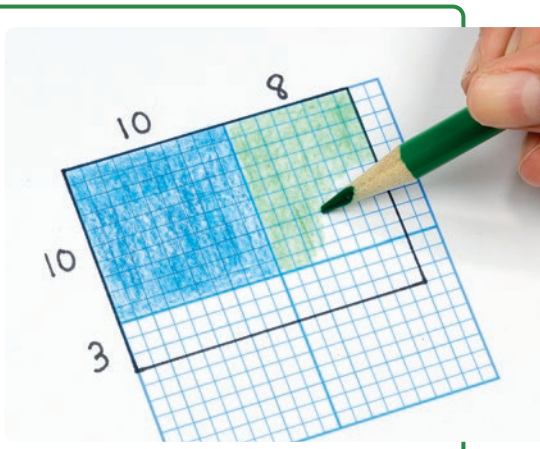
- **Number Sense & Operations** 4.NSO.2.2, 4.NSO.2.5
- **Mathematical Thinking & Reasoning** MTR.2.1, MTR.3.1, MTR.4.1, MTR.5.1, MTR.7.1

I Can use area models and partial products to multiply by 2-digit numbers.

Investigate

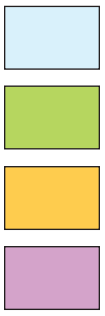
Materials ■ color pencils

How can you use a model to break apart factors and make them easier to multiply?



A. Outline a rectangle on the grid to model 13×18. Break apart the model into smaller rectangles to show factors broken into tens and ones. Label and shade the smaller rectangles. Use the colors below.

B. Find the product of each smaller rectangle. Then, find the sum of the partial products. Record your answers.



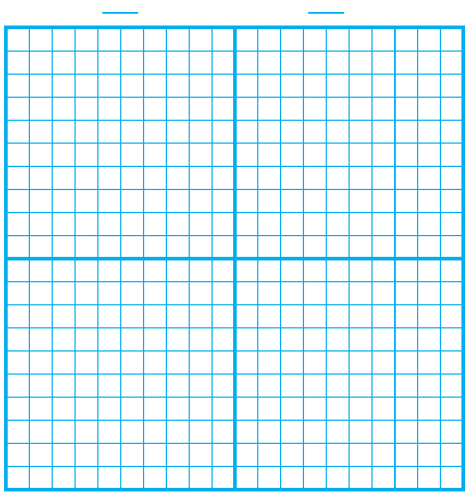
$= 10 \times 10$

$= 10 \times 8$

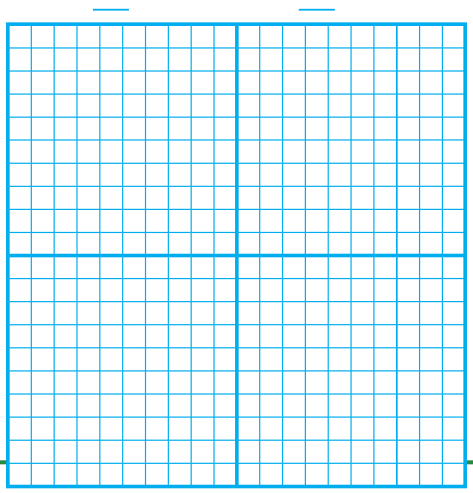
$= 3 \times 10$

$= 3 \times 8$

100 + _____ + _____ + _____ = _____



C. Draw the model again. Break apart the whole model to show factors different from those shown the first time. Label and shade the four smaller rectangles and find their products. Record the sum of the partial products to represent the product of the whole model.



_____ + _____ + _____ + _____ = _____

Draw Conclusion

1. Explain how you found the total number of squares in the whole model.

2. Compare the two models and their products. What can you conclude? Explain.

3. To find the product of 10 and 33, which is the easier computation, $(10 \times 11) + (10 \times 11) + (10 \times 11)$ or $(10 \times 30) + (10 \times 3)$? Explain.

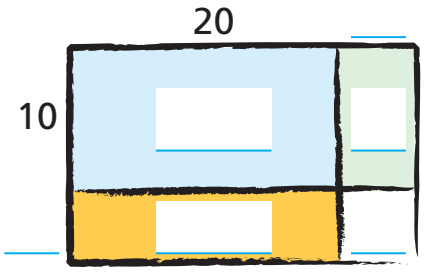
Make Connections

You can draw a simple diagram to model and break apart factors to find a product. Find 15×24.

Remember

24 is 2 tens 4 ones.

STEP 1 Draw a model to show 15×24. Break apart the factors into tens and ones to show the partial products.



STEP 2 Write the product for each of the smaller rectangles.

$(10 \times 2 \text{ tens})$	$(10 \times 4 \text{ ones})$	$(5 \times 2 \text{ tens})$	$(5 \times 4 \text{ ones})$
(10×20)	(10×4)	(5×20)	(5×4)
____	____	____	____

STEP 3 Add to find the product for the whole model.

____ + ____ + ____ + ____ = ____

So, $15 \times 24 = 360$.

The model shows four parts. Each part represents a partial product. The partial products are 200, 40, 100, and 20.

Math Talk

MTR 4.1 Engage in discussions on mathematical thinking.

How does breaking apart the factors into tens and ones make finding the product easier?

Name _____

Share and Show Math Board

Find the product.

1. $216 \times 19 =$ _____

	10	9
200	2,000	1,800
10	100	90
6	60	54

2. $18 \times 26 =$ _____

	20	6
10		
8		

3. $27 \times 39 =$ _____

	30	9
20		
7		

Draw a model to represent the product.
Then record the product.

4. $14 \times 16 =$ _____

5. $123 \times 25 =$ _____

On Your Own

6. MTR Explain how modeling partial products can be used to find the products of greater numbers.

_____

_____

7. Alleta bought 16 packages of rolls for a party. There were 12 rolls in a package. After the party there were 8 rolls left over. How many rolls were eaten? Explain.

_____

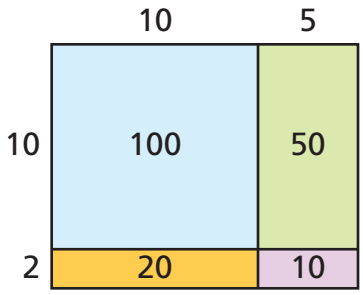
_____

Sense or Nonsense?

MATH on the Spot

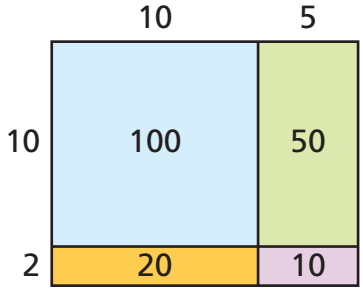
8. Jamal and Kim used different ways to solve 12×15 by using partial products. Whose answer makes sense? Whose answer is nonsense? Explain your reasoning.

Jamal's Work



$100 + 20 + 10 = 130$

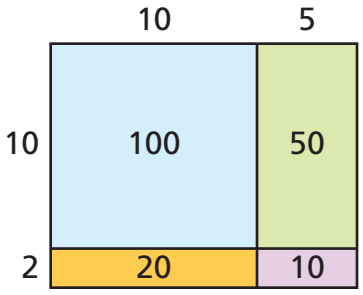
Kim's Work



$120 + 60 = 180$

a. For the answer that is nonsense, write an answer that makes sense.

b. Look at Kim's method. Can you think of another way Kim could use the model to find the product? Explain.



9. Look at the model in 8b. How would the partial products change if the product was 22×15? Explain why you think the products changed.

Name _____

Area Models and Partial Products

Go Online
Interactive Examples

Draw a model to represent the product.
Then record the product.

1. 13×42

	40	2
10	400	20
3	120	6

$400 + 20 + 120 + 6 = \underline{546}$

2. 418×34

_____

3. 22×326

_____

Problem Solving Real World

4. Kalani made the following model to find the product of 17×24.

	20	4
10	200	40
7	14	28

$200 + 40 + 14 + 28 = 282$

Is his model correct? Explain.

_____

_____

5. Each student in Ms. Haji's kindergarten class has a box of crayons. Each box has 36 crayons. If there are 18 students in Ms. Haji's class, how many crayons are there?

_____

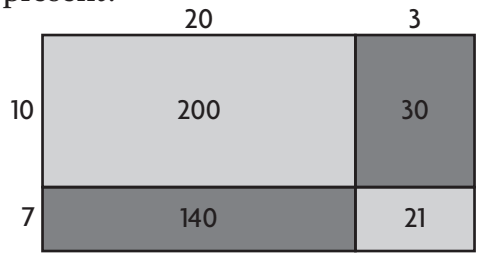
6. WRITE Math Describe how to model 2-digit by 2-digit multiplication using an area model.

_____

_____

Lesson Check

7. What product does the model below represent?



_____

8. Find the product 524×63. Use an area model.

_____

Spiral Review

9. Beulah builds a tabletop using square tiles. There are 12 rows of tiles and 30 tiles in each row. How many tiles does Beulah use?

_____

10. Asher bakes 8 batches of biscuits, with 14 biscuits in each batch. He sets aside 4 biscuits from each batch for a bake sale and puts the rest in a container. How many biscuits does Asher put in the container?

_____

11. Li feeds her dog 3 cups of food each day. About how many cups of food does her dog eat in 28 days?

_____

_____

12. What is the product?

$5{,}798 \times 6$

_____

_____

Name _____

Multiply Using Partial Products

Florida's B.E.S.T.

- **Number Sense & Operations** 4.NSO.2.2, 4.NSO.2.5
- **Mathematical Thinking & Reasoning** MTR.2.1, MTR.3.1, MTR.6.1, MTR.7.1

I Can use partial products to multiply.

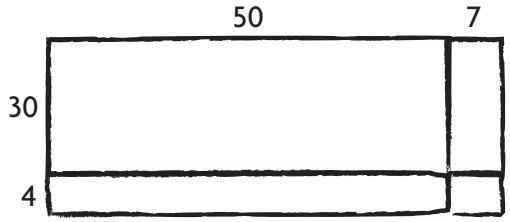
UNLOCK the Problem Real World

You know how to break apart a model to find partial products. How can you use what you know to find and record a product?

Multiply. 34×57 **Estimate.** $30 \times 60 =$ _____

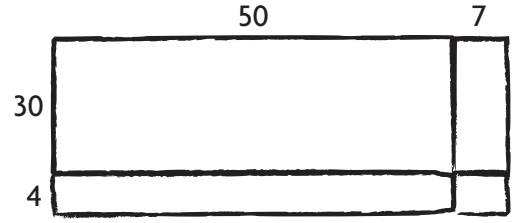
SHADE THE MODEL | **THINK AND RECORD**

STEP 1



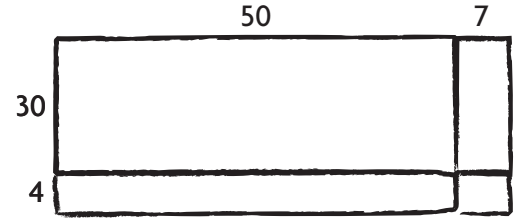
57
× 34
_____ ← Multiply the tens by the tens.
30 × 5 tens = 150 tens

STEP 2



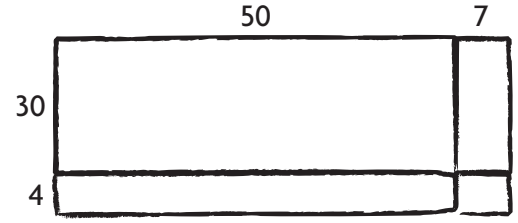
57
×34
1,500 ← Multiply the ones by the tens.
30 × 7 ones = 210 ones

STEP 3



57
×34
1,500
210 ← Multiply the tens by the ones.
4 × 5 tens = 20 tens

STEP 4



57
×34
1,500
210
200
\+ _____ ← Multiply the ones by the ones.
4 × 7 ones = 28 ones
← Add the partial products.

So, $34 \times 57 = 1{,}938$. Since 1,938 is close to the estimate of 1,800, it is reasonable.

Math Talk **MTR 3.1** Complete tasks with mathematical fluency.

You can write 10×4 ones $= 40$ ones as $10 \times 4 = 40$. What is another way to write 10×3 tens $= 30$ tens?

Example

The apples from each tree in an orchard can fill 23 bushel baskets. If 1 row of the orchard has 48 trees, how many baskets of apples can be filled?

Multiply. 48×23 **Estimate.** $50 \times 20 =$ _____

THINK	RECORD
STEP 1 Multiply the tens by the tens.	23 × 48 ← 40 × _____ tens = _____ tens
STEP 2 Multiply the ones by the tens.	23 × 48 800 ← 40 × _____ ones = _____ ones
STEP 3 Multiply the tens by the ones.	23 × 48 800 120 ← 8 × _____ tens = _____ tens
STEP 4 Multiply the ones by the ones. Then add the partial products.	23 × 48 800 120 160 + _____ ← 8 × _____ ones = _____ ones

So, 1,104 baskets can be filled.

Math Talk

MTR 6.1 Assess reasonableness of solutions.

How do you know your answer is reasonable?

Share and Show

Math Board

1. Find 24×34.

	30	4
20	600	80
4	120	16

			3	4	
		×	2	4	

Name _____

Record the product.

2. $\begin{array}{r} 12 \\ \times\ 12 \\ \hline \end{array}$

3. $\begin{array}{r} 31 \\ \times\ 24 \\ \hline \end{array}$

4. $\begin{array}{r} 525 \\ \times\ 43 \\ \hline \end{array}$

5. $\begin{array}{r} 437 \\ \times\ 26 \\ \hline \end{array}$

On Your Own

Record the product.

6. $\begin{array}{r} 54 \\ \times\ 15 \\ \hline \end{array}$

7. $\begin{array}{r} 87 \\ \times\ 16 \\ \hline \end{array}$

8. $\begin{array}{r} 962 \\ \times\ 56 \\ \hline \end{array}$

9. $\begin{array}{r} 749 \\ \times\ 63 \\ \hline \end{array}$

10. 38×47

11. 46×27

12. 724×53

13. 98×169

14. 53×682

15. 976×84

16. 92×48

17. 37×79

MTR **Find the unknown digits. Complete the problem.**

18. $\begin{array}{r} \square 6 \\ \times\ \square 4 \\ \hline 1{,}400 \\ 120 \\ 280 \\ +\ \ 24 \\ \hline \square \end{array}$

19. $\begin{array}{r} \square 2 \\ \times\ \square 7 \\ \hline 7{,}200 \\ 180 \\ 560 \\ +\ \ 14 \\ \hline \square \end{array}$

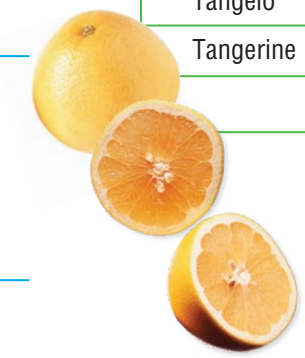
20. $\begin{array}{r} \square 6 \\ \times 5\square \\ \hline 1{,}500 \\ 300 \\ 90 \\ +\ \ 18 \\ \hline \square \end{array}$

21. $\begin{array}{r} 3\square \\ \times\ \square 8 \\ \hline 600 \\ 80 \\ 240 \\ +\ \ 32 \\ \hline \square \end{array}$

Problem Solving · Applications

Use the pictograph for 22–24.

Pounds of Citrus Fruit per Box	
Citrus Fruit	**Weight per Box (in pounds)**
Grapefruit	● ● ● ● ● ● ● ● ◗
Orange	● ● ● ● ● ● ● ● ●
Tangelo	● ● ● ● ● ● ● ● ●
Tangerine	● ● ● ● ● ● ● ● ● ◗
Key: Each ● = 10 pounds.	



22. MTR A fruit-packing warehouse is shipping 15 boxes of grapefruit to a store in Santa Rosa, California. What is the total weight of the shipment?

_____

23. How much less do 13 boxes of tangelos weigh than 18 boxes of tangerines?

_____

24. What is the weight of 12 boxes of oranges?

_____

Show the Math

Demonstrate Your Thinking

25. Each person in the United States eats about 65 fresh apples each year. Based on this estimate, how many apples do 3 families of 4 eat each year?

_____

26. The product 26×493 is greater than 25×493. How much greater? Explain how you know without multiplying.

_____

_____

_____

27. Moesha wants to use partial products to find 22×17. Write the numbers in the boxes to show 22×17.

$$(\square \times \square) + (\square \times \square) + (\square \times \square) + (\square \times \square)$$

Name _____

Multiply Using Partial Products

Go Online
Interactive Examples

Record the product.

1.
$$\begin{array}{r} 23 \\ \times\ 79 \\ \hline 1{,}400 \\ 210 \\ 180 \\ +\ 27 \\ \hline 1{,}817 \end{array}$$

2.
$$\begin{array}{r} 56 \\ \times\ 32 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 87 \\ \times\ 64 \\ \hline \end{array}$$

4.
$$\begin{array}{r} 633 \\ \times\ 25 \\ \hline \end{array}$$

5.
$$\begin{array}{r} 294 \\ \times\ 12 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 651 \\ \times\ 77 \\ \hline \end{array}$$

7.
$$\begin{array}{r} 69 \\ \times\ 49 \\ \hline \end{array}$$

Problem Solving Real World

8. Evelyn drinks 8 glasses of water a day, which is 56 glasses of water a week. How many glasses of water does she drink in a year? (1 year = 52 weeks)

_____

9. Cato wants to use the Hiking Club's funds to purchase new walking sticks for each of its 19 members. The sticks cost $26 each. The club has $480. Is this enough money to buy each member a new walking stick? If not, how much more money is needed?

_____

10. WRITE Math Explain why it works to break apart a number by place values to multiply.

_____

_____

_____

_____

Lesson Check

11. A carnival snack booth made $76 selling popcorn in one day. It made 22 times as much selling cotton candy. How much money did the snack booth make selling cotton candy?

_____

12. List the partial products of 242 and 28.

_____

Spiral Review

13. Last year, the city library collected 117 used books for its shelves. This year, it collected 3 times as many books. How many books did it collect this year?

_____

14. Washington Elementary has 232 students. Washington High has 6 times as many students. How many students does Washington High have?

_____

15. List the partial products of 35 and 7.

_____

16. Camille has ten $5 bills and thirteen $10 bills. How much money does Camille have in all?

_____

Name _____

Multiply with Regrouping

I Can use regrouping to multiply whole numbers.

Florida's B.E.S.T.

- **Number Sense & Operations** 4.NSO.2.2, 4.NSO.2.5
- **Mathematical Thinking & Reasoning** MTR.2.1, MTR.3.1, MTR.4.1, MTR.5.1, MTR.6.1, MTR.7.1

UNLOCK the Problem Real World

By 1914, Henry Ford had streamlined his assembly line to make a Model T Ford car in 93 minutes. How many minutes did it take to make 25 Model Ts?

▲ The first production Model T Ford was assembled on October 1, 1908.

Use place value and regrouping.

Multiply. 93×25 **Estimate.** $90 \times 30 =$ _____

THINK	RECORD
STEP 1 • Think of 93 as 9 tens and 3 ones. • Multiply 25 by 3 ones.	$\begin{array}{r} {\scriptstyle 1} \\ 25 \\ \times\ 93 \\ \hline \\ \end{array}$ ← 3×25
STEP 2 • Multiply 25 by 9 tens.	$\begin{array}{r} {\scriptstyle 4} \\ {\scriptstyle 1} \\ 25 \\ \times\ 93 \\ \hline 75 \\ \end{array}$ ← 90×25
STEP 3 • Add the partial products.	$\begin{array}{r} {\scriptstyle 4} \\ {\scriptstyle 1} \\ 25 \\ \times\ 93 \\ \hline 75 \\ +2{,}250 \\ \hline \end{array}$

So, 93×25 is 2,325. Since _____ is close to the estimate of _____, the answer is reasonable.

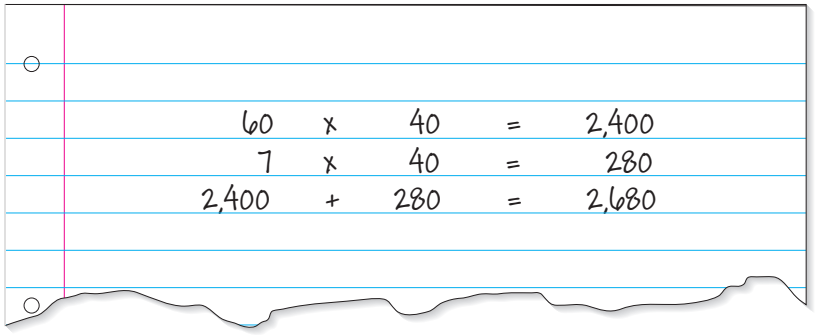
Math Talk

MTR 4.1 Engage in discussions on mathematical thinking.

Why do you get the same answer whether you multiply 93×25 or 25×93?

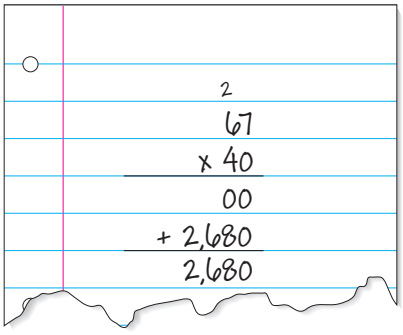
Different Ways to Multiply You can use different ways to multiply and still get the correct answer. Cyrus and Kasra both solved 67×40 correctly, but they used different ways.

Look at Cyrus' paper.



So, Cyrus' answer is $67 \times 40 = 2{,}680$.

Look at Kasra's paper.



So, Kasra also found $67 \times 40 = 2{,}680$.

1. What method did Cyrus use to solve the problem?

_____

2. What method did Kasra use to solve the problem?

_____

Share and Show

Math Board

1. Look at the problem. Complete the sentences.

Multiply _____ and _____ to get 0.

Multiply _____ and _____ to get 1,620.

Add the partial products.

$0 + 1{,}620 =$ _____

$$\begin{array}{r} {\scriptstyle 4\ \ } \\ 27 \\ \times 60 \\ \hline 0 \\ +1{,}620 \\ \hline \end{array}$$

Name _____

Estimate. Then find the product.

2. Estimate: _____

$$\begin{array}{r} 68 \\ \times\ 53 \\ \hline \end{array}$$

3. Estimate: _____

$$\begin{array}{r} 61 \\ \times\ 54 \\ \hline \end{array}$$

4. Estimate: _____

$$\begin{array}{r} 190 \\ \times\ 27 \\ \hline \end{array}$$

Math Talk

MTR 3.1 Complete tasks with mathematical fluency.

Why can you omit zeros of the first partial product when you multiply 20×34?

On Your Own

Estimate. Then find the product.

5. Estimate: _____

$$\begin{array}{r} 30 \\ \times\ 47 \\ \hline \end{array}$$

6. Estimate: _____

$$\begin{array}{r} 278 \\ \times\ 56 \\ \hline \end{array}$$

7. Estimate: _____

$$\begin{array}{r} 27 \\ \times\ 25 \\ \hline \end{array}$$

8. 34×65 **9.** $142 \times \$13$ **10.** 60×17 **11.** 462×45 **12.** $57 \times \$98$

MTR Write a rule for the pattern. Use your rule to find the unknown numbers.

13.

Hours	*h*	5	10	15	20	25
Minutes	*m*	300	600	900		

Rule: _____

14. Owners of a summer camp are buying new cots for their cabins. There are 16 cabins. Each cabin needs 6 cots. Each cot costs $92. How much will the new cots cost?

_____

15. A theater has 28 rows of 38 seats downstairs and 14 rows of 26 seats upstairs. How many seats does the theater have?

_____

Problem Solving · Applications

16. Machine A can label 11 bottles in 1 minute. Machine B can label 12 bottles in 1 minute. How many bottles can both machines label in 15 minutes?

MATH on the Spot

a. What do you need to know? _____

_____

b. What numbers will you use? _____

c. Tell why you might use more than one operation to solve the problem.

_____

_____

_____

d. Solve the problem.

So, both machines can label _____ bottles in _____ minutes.

17. MTR A toy company makes wooden blocks. A carton holds 85 blocks. How many blocks can 19 cartons hold?

_____

18. A company is packing cartons of candles. Each carton can hold 75 candles. So far, 50 cartons have been packed, but only 30 cartons have been loaded on a truck. How many more candles are left to load on the truck?

_____

19. Mr. Garcia's class raised money for a field trip to the zoo. There are 23 students in his class. The cost of the trip will be $17 for each student. What is the cost for all the students? Explain how you found your answer.

_____

_____

Name _____

Multiply with Regrouping

Go Online
Interactive Examples

Estimate. Then find the product.

1. Estimate: 2,700

$$\begin{array}{r} {\scriptstyle 2\ 1} \\ 87 \\ \times\ 32 \\ \hline 174 \\ +\ 2{,}610 \\ \hline 2{,}784 \end{array}$$

Think: 87 is close to 90 and 32 is close to 30.

$90 \times 30 = 2{,}700$

2. Estimate: _____

$$\begin{array}{r} 673 \\ \times\ 28 \\ \hline \end{array}$$

3. Estimate: _____

$$\begin{array}{r} 48 \\ \times\ 38 \\ \hline \end{array}$$

4. Estimate: _____

$$\begin{array}{r} 359 \\ \times\ 52 \\ \hline \end{array}$$

Problem Solving Real World

5. Baseballs come in cartons of 84 baseballs. A team orders 18 cartons of baseballs. How many baseballs does the team order?

_____

6. There are 16 tables in the school lunch room. Each table can seat 22 students. How many students can be seated at lunch at one time?

_____

7. WRITE Math Write about which method you prefer to use to multiply two 2-digit numbers—regrouping, partial products, or breaking apart a model. Explain why.

_____

_____

_____

_____

Lesson Check

8. The art teacher has 48 boxes of crayons. There are 64 crayons in each box. How many crayons does the teacher have?

_____

9. A basketball team scored an average of 52 points in each of 15 games. Based on the average, how many points did the team score in all?

_____

Spiral Review

10. One Saturday, an orchard sold 83 bags of apples. There are 27 apples in each bag. About how many apples were sold?

_____

11. Deja has a grid of squares that has 12 rows with 15 squares in each row. She colors 5 rows of 8 squares in the middle of the grid blue. She colors the rest of the squares red. How many squares does Deja color red?

_____

12. Gabriella has 4 times as many erasers as Leona. Leona has 8 erasers. How many erasers does Gabriella have?

_____

13. Jun has 3 times as many rocks as Heechul. Together, they have 48 rocks. How many more rocks does Jun have than Heechul?

_____

Name _____

Choose a Multiplication Method

Florida's B.E.S.T.

- **Number Sense & Operations** 4.NSO.2.2, 4.NSO.2.5, 4.NSO.2.3
- **Mathematical Thinking & Reasoning** MTR.2.1, MTR.3.1, MTR.4.1, MTR.5.1, MTR.7.1

I Can use multiple strategies to multiply 2-digit and 3-digit numbers by 2-digit numbers.

UNLOCK the Problem Real World

Did you know using math can help prevent you from getting a sunburn?

The time it takes to burn without sunscreen multiplied by the SPF, or sun protection factor, is the time you can stay in the sun safely with sunscreen.

If today's UV index is 8, Hua will burn in 15 minutes without sunscreen. If Hua puts on lotion with an SPF of 25, how long will she be protected?

- Underline the sentence that tells you how to find the answer.
- Circle the numbers you need to use. What operation will you use?

_____

▲ Sunscreen helps to prevent sunburn.

One Way Use partial products to find 15 × 25.

$$\begin{array}{r} 25 \\ \times\ 15 \\ \hline \square \quad \leftarrow 10 \times 2 \text{ tens} = 20 \text{ tens} \\ \square \quad \leftarrow 10 \times 5 \text{ ones} = 50 \text{ ones} \\ \square \quad \leftarrow 5 \times 2 \text{ tens} = 10 \text{ tens} \\ +\ \square \quad \leftarrow 5 \times 5 \text{ ones} = 25 \text{ ones} \\ \hline \square \quad \leftarrow \text{Add.} \end{array}$$

Draw a picture to check your work.

So, if Hua puts on lotion with an SPF of 25, she will be protected for 375 minutes.

Math Talk

MTR 4.1 Engage in discussions on mathematical thinking.

Explain how it was easier to find the product using partial products.

Another Way Use regrouping to find 15 × 25.

Estimate. 20 × 20 = _____

STEP 1

Think of 15 as 1 ten 5 ones.
Multiply 25 by 5 ones, or 5.

$$\begin{array}{r} {\scriptstyle 2}\,25 \\ \times\ 15 \\ \hline \square \end{array} \leftarrow 5 \times 25$$

STEP 2

Multiply 25 by 1 ten, or 10.

$$\begin{array}{r} {\scriptstyle 2}\,25 \\ \times\ 15 \\ \hline 125 \\ \square \end{array} \leftarrow 10 \times 25$$

STEP 3

Add the partial products.

$$\begin{array}{r} {\scriptstyle 2}\,25 \\ \times\ 15 \\ \hline 125 \\ +\ 250 \\ \hline \square \end{array}$$

Try This! Multiply. 57 × $43

Estimate. 57 × $43

Use partial products.

				$	4	3	
			×		5	7	

Use regrouping.

			$	4	3		
		×		5	7		

1. How do you know your answer is reasonable?

_____

_____

2. Look at the partial products and regrouping methods above. How are the partial products 2,000 and 150 related to 2,150?

_____

How are the partial products 280 and 21 related to 301?

_____

Name _____

Share and Show

Math Board

1. Find the product.

			5	4	
	×		2	9	

Math Talk

MTR 4.1 Engage in discussions on mathematical thinking.

Why do you begin with the ones place when you use the regrouping method to multiply?

Estimate. Then choose a method to find the product.

2. Estimate: _____

$$\begin{array}{r} 236 \\ \times\ 14 \\ \hline \end{array}$$

3. Estimate: _____

$$\begin{array}{r} 63 \\ \times\ 42 \\ \hline \end{array}$$

4. Estimate: _____

$$\begin{array}{r} 384 \\ \times\ 53 \\ \hline \end{array}$$

5. Estimate: _____

$$\begin{array}{r} 71 \\ \times\ 13 \\ \hline \end{array}$$

On Your Own

Estimate. Find the product.

6. $129 \times \$82$

7. 357×79

8. 80×27

9. $32 \times \$75$

10. 655×48

11. $19 \times \$82$

12. $925 \times \$25$

13. 41×98

MTR **Use mental math to find the number.**

14. $30 \times 14 = 420$, so $30 \times 15 =$ _____.

15. $25 \times 12 = 300$, so $25 \times$ _____ $= 350$.

16. **MTR** The town conservation manager bought 16 maple trees for $26 each. She paid with five $100 bills. How much change will the manager receive? Explain.

_____

_____

17. Each of 25 students in Group A read for 45 minutes. Each of 21 students in Group B read for 48 minutes. Which group read for more minutes? Explain.

_____

_____

Problem Solving · Applications

Real World

MATH on the Spot

18. Martin collects stamps. He counted 48 pages in his collector's album. The first 20 pages each have 35 stamps in 5 rows. The rest of the pages each have 54 stamps. How many stamps does Martin have in his album?

a. What do you need to know? _____

_____

b. How will you use multiplication to find the number of stamps? _____

_____

c. Tell why you might use addition and subtraction to help solve the problem.

_____

_____

d. Show the steps to solve the problem.

e. Complete the sentences.

Martin has a total of _____ stamps on the first 20 pages.

There are _____ more pages after the first 20 pages in Martin's album.

There are _____ stamps on the rest of the pages.

There are _____ stamps in the album.

19. Select the expressions that have the same product as 35×17. Mark all that apply.

- ○ $(30 \times 10) + (30 \times 7) + (5 \times 10) + (5 \times 7)$
- ○ $(35 \times 30) + (35 \times 5) + (35 \times 10) + (35 \times 7)$
- ○ $(35 \times 10) + (30 \times 10) + (5 \times 10) + (5 \times 7)$
- ○ $(30 \times 17) + (5 \times 17)$
- ○ $(35 \times 10) + (35 \times 7)$
- ○ $(35 \times 30) + (35 \times 5)$

Name _____

Choose a Multiplication Method

Go Online
Interactive Examples

Estimate. Then choose a method to find the product.

1. Estimate: 1,200

$$\begin{array}{r} 31 \\ \times\ 43 \\ \hline 93 \\ +\ 1{,}240 \\ \hline 1{,}333 \end{array}$$

2. Estimate: _____

$$\begin{array}{r} 67 \\ \times\ 85 \\ \hline \end{array}$$

3. Estimate: _____

$$\begin{array}{r} 368 \\ \times\ 38 \\ \hline \end{array}$$

4. Estimate: _____

$$\begin{array}{r} 95 \\ \times\ 17 \\ \hline \end{array}$$

5. Estimate: _____

$$\begin{array}{r} 449 \\ \times\ 54 \\ \hline \end{array}$$

6. Estimate: _____

$$\begin{array}{r} 91 \\ \times\ 26 \\ \hline \end{array}$$

7. Estimate: _____

$$\begin{array}{r} 282 \\ \times\ 19 \\ \hline \end{array}$$

Problem Solving Real World

8. A movie theatre has 26 rows of seats. There are 18 seats in each row. How many seats are there?

_____

9. Each class at Briarwood Elementary collected at least 54 cans of food during the food drive. If there are 29 classes in the school, what was the least number of cans collected?

_____

10. WRITE Math How is multiplication using partial products different from multiplication using regrouping? How are they similar?

_____

_____

_____

Lesson Check

11. A choir needs new robes for each of its 46 singers. Each robe costs $32. What will be the total cost for all 46 robes?

_____

12. A wall on the side of a building is made up of 152 rows of bricks with 44 bricks in each row. How many bricks make up the wall?

_____

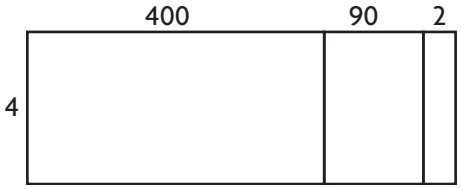
Spiral Review

13. Write an expression that shows how to multiply 4×362 using place value and expanded form.

_____

_____

14. Use the model below. What is the product of 4×492?



_____

_____

15. What is the sum $13{,}094 + 259{,}728$?

_____

16. During the 2019–2020 season, there were 18,391 people who attended the home hockey games in Philadelphia. There were 14,606 people who attended the home hockey games in Phoenix. How much greater was the home attendance in Philadelphia than in Phoenix that season?

_____

Name _____

Multiply by 2-Digit Numbers

I Can solve real-world problems using multiplication.

Florida's B.E.S.T.

- **Algebraic Reasoning** 4.AR.1.1
- **Number Sense & Operations** 4.NSO.2.3
- **Mathematical Thinking & Reasoning** MTR.2.1, MTR.4.1, MTR.6.1, MTR.7.1

UNLOCK the Problem Real World

During the 2010 Great Backyard Bird Count, an average of 42 bald eagles were counted in each of 20 locations throughout Alaska. In 2009, an average of 32 bald eagles were counted in each of 26 locations throughout Alaska. Based on this data, how many more bald eagles were counted in 2010 than in 2009?

Use the graphic organizer to help you solve the problem.

Read the Problem

What do I need to find?

I need to find _____ bald eagles were counted in 2010 than in 2009.

What information do I need to use?

In 2010, _____ locations counted an average of _____ bald eagles each.

In 2009, _____ locations counted an average of _____ bald eagles each.

How will I use the information?

I can solve simpler problems.

Find the number of bald eagles counted in _____.

Find the number of bald eagles counted in _____.

Then draw a bar model to compare the _____ count to the _____ count.

Solve the Problem

- First, find the total number of bald eagles counted in 2010.

  _____ × _____

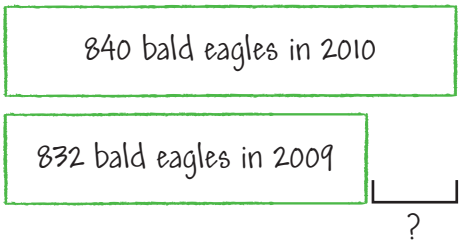
  = _____ bald eagles counted in 2010

- Next, find the total number of bald eagles counted in 2009.

  = _____ × _____

  = _____ bald eagles counted in 2009

- Last, draw a bar model. I need to subtract.



840 − 832 = _____

So, there were _____ more bald eagles counted in 2010 than in 2009.

Try Another Problem

Prescott Valley, Arizona, reported a total of 29 mourning doves in the Great Backyard Bird Count. Mesa, Arizona, reported 20 times as many mourning doves as Prescott Valley. If Chandler reported a total of 760 mourning doves, how many more mourning doves were reported in Chandler than in Mesa?

Mourning dove ▶

Read the Problem	Solve the Problem
What do I need to find?	
What information do I need to use?	760 mourning doves in Chandler 580 mourning doves in Mesa
How will I use the information?	?

- Is your answer reasonable? Explain. _____

_____

_____

Math Talk

MTR 4.1 Engage in discussions on mathematical thinking.

What is another way you could solve this problem?

Name _____

Share and Show Math Board

1. An average of 74 reports with bird counts were turned in each day in June. An average of 89 were turned in each day in July. How many reports were turned in for both months? (Hint: There are 30 days in June and 31 days in July.)

First, write the problem for June.

_____

Next, write the problem for July.

_____

Last, find and add the two products.

_____ reports were turned in for both months.

2. What if an average of 98 reports were turned in each day for the month of June? How many reports were turned in for June? Describe how your answer for June would be different.

_____

_____

_____

3. There are 48 crayons in a box. There are 12 boxes in a carton. Mr. Chou ordered 11 cartons of crayons for the school. How many crayons did he get?

_____

4. MTR Each of 8 bird-watchers reported seeing 15 roseate spoonbills in a day. If they each reported seeing the same number of roseate spoonbills over 14 days, how many would be reported?

_____

Show the Math

Demonstrate Your Thinking

On Your Own

5. On each of Maggie's bird-watching trips, she has seen at least 24 birds. If she has taken 4 of these trips each year over the past 16 years, at least how many birds has Maggie seen?

MATH on the Spot

_____

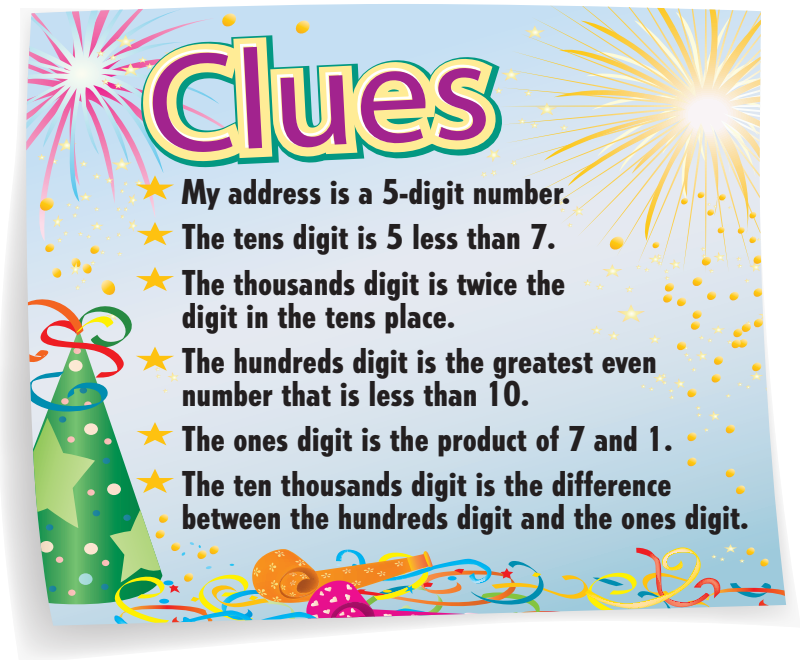
6. MTR There are 12 inches in a foot. In September, Mrs. Baeza orders 64 feet of ribbon for the Crafts Club. In January, she orders 9 feet less. How many inches of ribbon does Mrs. Baeza order? Explain how you found your answer.

_____

_____

_____

7. Ekta is having a party on Saturday. She decides to write a riddle on her invitations to describe her house number on Cypress Street. Use the clues to find Ekta's address.



_____

8. A school is adding 4 rows of seats to the auditorium. There are 37 seats in each row. Each new seat costs $99. What is the total cost for the new seats? Show your work.

_____

Name

Multiply by 2-Digit Numbers

Go Online
Interactive Examples

Solve each problem. Use a bar model to help.

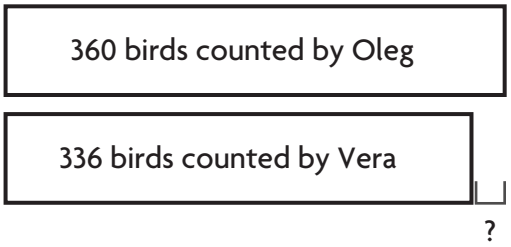
1. Oleg counted an average of 18 birds at his bird feeder each day for 20 days. Vera counted an average of 21 birds at her bird feeder each day for 16 days. How many more birds did Oleg count at his feeder than Vera counted at hers?

   Birds counted by Oleg: **18 × 20 = 360**

   Birds counted by Vera: **21 × 16 = 336**

   Draw a bar model to compare.

   Subtract. **360 − 336 = 24**



So, Oleg counted **24** more birds.

2. The 24 students in Ms. Lee's class each collected an average of 118 cans for recycling. The 21 students in Mr. Galvez's class each collected an average of 125 cans for recycling. How many more cans were collected by Ms. Lee's class than Mr. Galvez's class?

3. At East School, each of the 45 classrooms has an average of 22 students. At West School, each of the 42 classrooms has an average of 23 students. How many more students are at East School than at West School?

4. WRITE Math Draw a bar model that shows how the number of hours in March compares with the number of hours in February of this year.

Lesson Check

5. Ace Manufacturing ordered 17 boxes with 105 ball bearings each. They also ordered 15 boxes with 90 springs each. How many more ball bearings than springs did they order?

_____

6. Elton hiked 16 miles each day on a 12-day hiking trip. Lola hiked 14 miles each day on her 16-day hiking trip. In all, how many more miles did Lola hike than Elton hiked?

_____

Spiral Review

7. An orchard has 24 rows of apple trees. There are 35 apple trees in each row. How many apple trees are in the orchard?

_____

8. An amusement park reported 354,605 visitors last summer. What is this number rounded to the nearest thousand?

_____

9. Attendance at the football game was 102,653. What is the value of the digit 6?

_____

10. Jill's fish weighs 8 times as much as her parakeet. Together, the pets weigh 63 ounces. How much does the fish weigh?

_____

Name _____

Chapter 3

Chapter Review

1. Explain how to find 40×50 using mental math.

2. Mrs. Traynor's class is taking a field trip to the zoo. The trip will cost $26 for each student. There are 22 students in her class.

Part A

Round each factor to estimate the total cost of the students' field trip.

Part B

Use compatible numbers to estimate the total cost of the field trip.

Part C

Which do you think is the better estimate? Explain.

3. For Problems 3a–3e, select Yes or No to show if the answer is correct.

3a.	$35 \times 10 = 350$	○ Yes	○ No
3b.	$19 \times 20 = 380$	○ Yes	○ No
3c.	$12 \times 100 = 120$	○ Yes	○ No
3d.	$70 \times 100 = 7{,}000$	○ Yes	○ No
3e.	$28 \times 30 = 8{,}400$	○ Yes	○ No

4. There are 23 boxes of pencils in Mr. Shaw's supply cabinet. Each box contains 100 pencils. How many pencils are in the supply cabinet?

_____ pencils

5. Which would provide a reasonable estimate for each product? Write the estimate beside the product. An estimate may be used more than once.

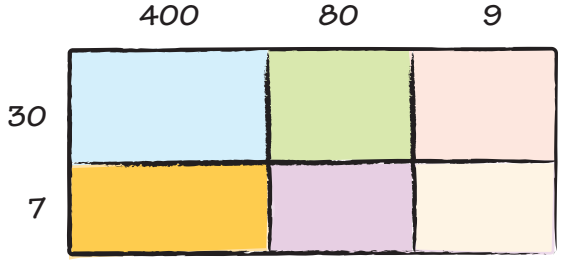
50×20	25×40	30×30

23×38 ☐ 46×18 ☐

31×32 ☐ 39×21 ☐

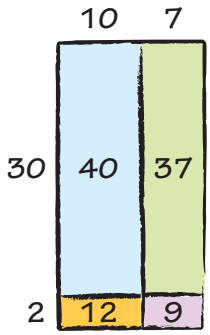
6. There are 26 baseball teams in the league. Each team has 18 players. Write an equation that will provide a reasonable estimate for the number of players in the league. Explain how you found your estimate.

7. The model shows 489×37. Write the partial products.



Name _____

8. Jess made this model to find the product of 32×17. Her model is incorrect.



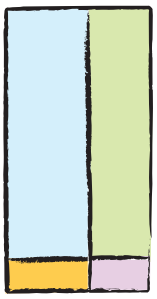
$32 \times 17 = 98$

Part A

What did Jess do wrong?

Part B

Redraw the model so that it is correct.



Part C

What is the actual product of 32×17?

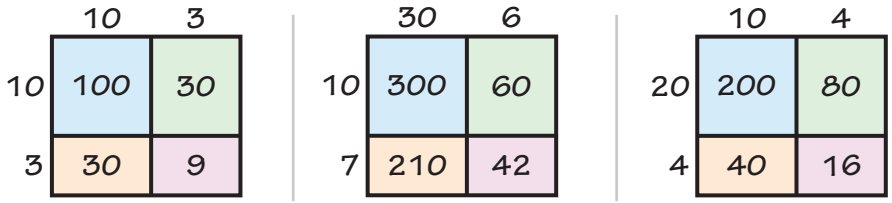
_____

9. Tatum wants to use partial products to find 15×32. Write the numbers in the boxes to show 15×32.

$$(\square \times \square) + (\square \times \square) + (\square \times \square) + (\square \times \square)$$

10. Which product is shown by the model? Write the letter of the product on the line below the model.

Ⓐ 17×36 Ⓑ 24×14 Ⓒ 13×13



_____ _____ _____

11. Mrs. Jones places 3 orders for school T-shirts. Each order has 16 boxes of shirts, and each box holds 17 shirts. How many T-shirts does Mrs. Jones order? Use partial products to help you.

12. Write the unknown digits. Use each digit exactly once.

1	2	4	6	8

$$\begin{array}{r} 46 \\ \times\ 93 \\ \hline 3,\square 00 \\ 5\square 0 \\ \square 20 \\ +\ 1\square \\ \hline 4,\square 78 \end{array}$$

13. Mohammed has logged 216 minutes in the school-wide reading competition. Francisco has 17 times as many minutes as Mohammed does. How many minutes does Francisco have?

_____ minutes

14. Multiply.

$436 \times 28 =$ _____

Name _____

15. A farmer planted 42 rows of tomatoes with 13 plants in each row. He planted 23 rows of corn with 21 plants in each row. How many more tomato plants did he plant than corn plants?

_____

16. For Problems 16a–16e, select True or False for each equation.

16a. $25 \times 18 = (20 \times 10) + (20 \times 8) + (5 \times 10) + (5 \times 8)$ ○ True ○ False

16b. $25 \times 18 = (25 \times 20) + (25 \times 5) + (25 \times 10) + (25 \times 8)$ ○ True ○ False

16c. $25 \times 18 = (20 \times 18) + (5 \times 10) + (5 \times 8)$ ○ True ○ False

16d. $25 \times 18 = (25 \times 10) + (25 \times 8)$ ○ True ○ False

16e. $25 \times 18 = (25 \times 20) + (25 \times 5)$ ○ True ○ False

17. Terrell runs 15 sprints. Each sprint is 165 meters. How many meters does Terrell run? Show your work.

18. There are 3 new seats in each row in a school auditorium. There are 15 rows in the auditorium. Each new seat cost $74. What is the cost for the new seats? Explain how you found your answer.

19. Ray and Ella helped move their school library to a new building. Ray packed 27 boxes with 25 books in each box. Ella packed 23 boxes with 30 books in each box. How many more books did Ella pack? Show your work.

20. Julius and Walt are finding the product of 25 and 16.

Julius	Walt
25 × 16 150 + 250 500	25 × 16 200 50 120 + 300 670

Part A

Julius' answer is incorrect. What did Julius do wrong?

Part B

What did Walt do wrong?

Part C

What is the correct product?

21. A clothing store sells 26 shirts and 22 pairs of jeans. Each item of clothing costs $32.

Part A

What is a reasonable estimate for the total cost of the clothing? Show or explain how you found your answer.

Part B

What is the exact answer for the total cost of the clothing? Show or explain how you found your answer.