

Chapter 6: Multiplication

1. Calculate each product.

a) $6 \times 2 =$ _____

g) $5 \times 7 =$ _____

b) $5 \times 5 =$ _____

h) $6 \times 6 =$ _____

c) $3 \times 6 =$ _____

i) $6 \times 4 =$ _____

d) $4 \times 4 =$ _____

j) $6 \times 8 =$ _____

e) $3 \times 7 =$ _____

k) $7 \times 9 =$ _____

f) $4 \times 7 =$ _____

l) $9 \times 8 =$ _____

2. Calculate.

a) $7 \times 10 =$ _____

g) $3 \times 100 =$ _____

b) $7 \times 60 =$ _____

h) $7 \times 100 =$ _____

c) $4 \times 90 =$ _____

i) $9 \times 500 =$ _____

d) $50 \times 8 =$ _____

j) $700 \times 7 =$ _____

e) $30 \times 9 =$ _____

k) $300 \times 8 =$ _____

f) $20 \times 8 =$ _____

l) $600 \times 2 =$ _____

Chapter 9
Lesson 1**Exploring Multiplication****GOAL**

Use your own strategies to solve everyday math problems.

1. Circle the problem that can be solved using multiplication.

- A. Matt read 22 pages on Monday, 29 pages on Tuesday, and 27 pages on Thursday. How many pages did he read altogether?
- B. Diane read on Monday, Tuesday, and Thursday. She read 31 pages each day. How many pages did she read altogether?
- C. Jade read 96 pages in total on Monday, Tuesday, and Thursday. How many pages did she read each day?
- D. Cole read 37 pages on Monday. Lang read 29 pages on Monday. How many more pages did Cole read than Lang?

At-Home Help

Multiplication involves groups of the same size.

4×28 is 4 groups of 28 objects.

28×4 is 28 groups of 4 objects. It has the same product as 4×28 .

Explain how you know this problem can be solved using multiplication.

2. Solve the problem you circled in Question 1.

3. Emily, Kate, Hailey, and Annie each have \$22. How much money do the 4 girls have altogether?

Chapter 9
Lesson 2**Multiplying 10s and 100s****GOAL**

Use patterns to multiply 10s and 100s.

1. Multiply.

a) $4 \times 1 =$ _____

b) $4 \times 2 =$ _____

c) $4 \times 5 =$ _____

$4 \times 10 =$ _____

$4 \times 20 =$ _____

$4 \times 50 =$ _____

$4 \times 100 =$ _____

$4 \times 200 =$ _____

$4 \times 500 =$ _____

2. Multiply.

a) $5 \times 10 =$ _____

e) $2 \times 200 =$ _____

i) $7 \times 300 =$ _____

b) $60 \times 3 =$ _____

f) $9 \times 30 =$ _____

j) $90 \times 4 =$ _____

c) $8 \times 100 =$ _____

g) $500 \times 5 =$ _____

k) $10 \times 6 =$ _____

d) $70 \times 4 =$ _____

h) $40 \times 6 =$ _____

l) $4 \times 800 =$ _____

3. Kate found four \$100 bills.

How much money did she find?

4. Lang is building a model of the school using blocks.

He bought 8 sets of 30 blocks.

How many blocks does he have in total?

Multiplying by 10

Name _____

Multiply 10×16 .

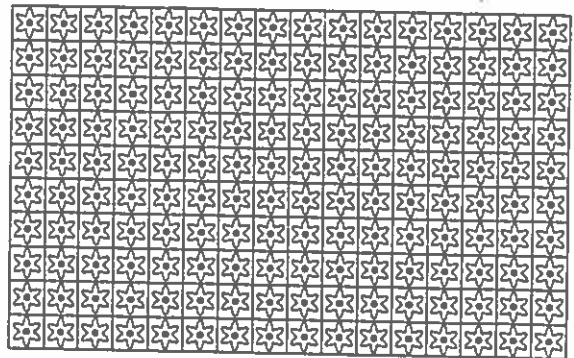
Think: $1 \times 16 = 16$, so
 $10 \times 16 = 160$



When you multiply by 10,
 think of multiplying by 1.
 Then write a 0.



$$1 \times 16 = 16$$



$$10 \times 16 = 160$$

Complete each sentence.

1. Since I know $23 \times 1 = 23$,
 I also know $23 \times 10 = 230$.

3. Since I know $98 \times 1 =$ _____,
 I also know $98 \times 10 =$ _____.

5. Since I know $60 \times 1 =$ _____,
 I also know $60 \times 10 =$ _____.

2. Since I know $45 \times 1 =$ _____,
 I also know $45 \times 10 =$ _____.

4. Since I know $1 \times 36 =$ _____,
 I also know $10 \times 36 =$ _____.

6. Since I know $1 \times 72 =$ _____,
 I also know $10 \times 72 =$ _____.

Multiply these pairs of factors.

7. $85 \times 1 =$ _____

$85 \times 10 =$ _____

8. $38 \times 1 =$ _____

$38 \times 10 =$ _____

9. $572 \times 1 =$ _____

$572 \times 10 =$ _____

10. $1 \times 443 =$ _____

$10 \times 443 =$ _____

11. $20 \times 1 =$ _____

$20 \times 10 =$ _____

12. $1 \times 76 =$ _____

$10 \times 76 =$ _____

Multiply.

13. $10 \times 35 =$ _____

14. $69 \times 10 =$ _____

15. $546 \times 10 =$ _____

16. $41 \times 10 =$ _____

17. $10 \times 768 =$ _____

18. $10 \times 80 =$ _____

9.2 Multiplying 10s and 100s Page 1

Student Book pages 312–313

GOAL

Use patterns to multiply 10s and 100s.

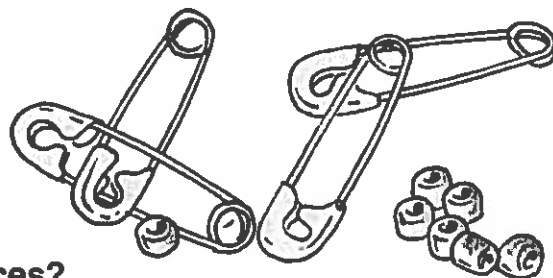
You will need

- base ten blocks

**Problem**

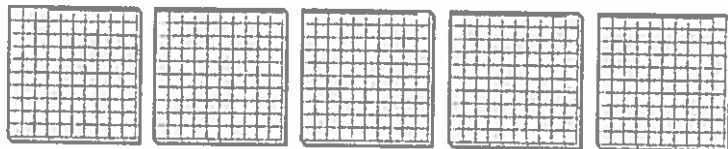
Diane is making safety pin necklaces.

She uses 100 beads and 10 safety pins to make each necklace.

**How many does she need to make 5 necklaces?****Step 1:** Use base ten blocks to model the number of beads in each necklace.

There are 100 beads in each necklace.

Use 5 hundreds blocks to show the beads.

**These blocks show 5×100 .**

Count by 100s to find out how many beads are needed for the 5 necklaces.

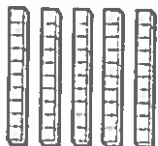
100, 200, _____, _____, _____

Diane needs _____ beads.

Step 2: Use base ten blocks to model the number of pins in each necklace.

There are 10 pins in each necklace.

Use 5 tens blocks to show the pins.

**These blocks show 5×10 .**

Count by 10s to find out how many pins are needed for the 5 necklaces.

10, 20, _____, _____, _____

Diane needs _____ pins.

9.2 Multiplying 10s and 100s Page 2

Step 3: You can use tables to organize your information and look for patterns.

Complete the tables below for up to 5 necklaces.

Number of necklaces		Number of beads
1	$1 \times 1 \text{ hundred} = 1 \text{ hundred}$	100
2	$2 \times 1 \text{ hundred} = 2 \text{ hundreds}$	200
3		
4		
5		500

Number of necklaces		Number of pins
1	$1 \times 1 \text{ ten} = 1 \text{ ten}$	10
2	$2 \times 1 \text{ ten} = 2 \text{ tens}$	20
3		
4		
5		50

Reflecting

What patterns do you see in your tables?

Name: _____

Date: _____

WORD PROBLEM

Tanvi was selling boxes of candy. Each box had 6 pieces of candy in it. The first week she sold 10 boxes. The second week she visited an apartment building where she sold 100 boxes. How many pieces of candy did she sell in all?

BASICS BOX

There are place-value patterns in multiplication that can help you multiply by 10s, 100s, or even 1,000s. This is great for saving time by using mental math.

1. Begin by finding the simple fact in the larger problem. This is 6×1 , which is 6.
2. Count the 0s in the problem. In this case, there is one. This lets us know there will be one 0 in the product.
3. Write 6 with one 0 behind it to get the product of 60. Repeat the same three steps for the second part to get a product of 600.

In Tanvi's problem, we have to multiply 6×10 for the first week, which is 60. The second week is $6 \times 100 = 600$. Add 600 and 60 to see that she sold 660 pieces of candy.

PRACTICE

Find the products.

1. $5 \times 10 =$ _____
2. $5 \times 100 =$ _____
3. $5 \times 1,000 =$ _____
4. $10 \times 3 =$ _____
5. $10 \times 30 =$ _____
6. $10 \times 300 =$ _____
7. $500 \times 4 =$ _____
8. $50 \times 4 =$ _____
9. $40 \times 50 =$ _____
10. $2 \times 20 =$ _____
11. $2 \times 200 =$ _____
12. $20 \times 20 =$ _____

JOURNAL

How can multiplication patterns help you solve a problem like 16×100 ?

Name: _____

Date: _____

Multiplication Patterns

Find the products.

1. $10 \times 8 =$ _____

6. $400 \times 40 =$ _____

11. $9 \times 20 =$ _____

2. $10 \times 80 =$ _____

7. $1 \times 400 =$ _____

12. $90 \times 20 =$ _____

3. $100 \times 8 =$ _____

8. $40 \times 40 =$ _____

13. $900 \times 20 =$ _____

4. $1,000 \times 8 =$ _____

9. $9 \times 10 =$ _____

14. $20 \times 50 =$ _____

5. $4 \times 40 =$ _____

10. $90 \times 10 =$ _____

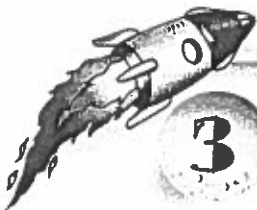
15. $200 \times 50 =$ _____

Review.

16. What strategy could be used to solve 8×6 ? Explain.

17. What property of multiplication tells us that if $3 \times 9 = 27$ then $9 \times 3 = 27$?

18. Give an example of a fact for the Half-Then-Double strategy.



3

Multiplication

Find the products mentally.

① $100 \times 7 =$ _____

② $9 \times 10 =$ _____

③ $8 \times 1000 =$ _____

④ $10 \times 5 =$ _____

⑥ $6 \times 100 =$ _____

⑧ $12 \times 100 =$ _____



Quick Tip

When you multiply a number by 10, just add 1 zero to the number. Add 2 zeros when you multiply it by 100, and 3 zeros when you multiply it by 1000.

⑤ $1000 \times 2 =$ _____

⑦ $3 \times 1000 =$ _____

⑨ $1000 \times 15 =$ _____



Examples

① $2 \times 20 = 2 \times 2 \times 10$
 $= 4 \times 10$
 $= 40$

② $300 \times 4 = 100 \times 3 \times 4$
 $= 100 \times 12$
 $= 1200$

Find the products.

⑩ $3 \times 80 =$ _____

⑫ $4 \times 600 =$ _____

⑭ $400 \times 3 =$ _____

⑯ $400 \times 7 =$ _____

⑰ $9 \times 20 =$ _____

⑱ $8 \times 70 =$ _____

⑲ $60 \times 6 =$ _____

⑳ $200 \times 8 =$ _____

㉑ $500 \times 6 =$ _____

㉒ $3000 \times 9 =$ _____

⑪ $50 \times 4 =$ _____

⑬ $2 \times 3000 =$ _____

⑮ $2000 \times 4 =$ _____

⑯ $2 \times 5000 =$ _____

⑰ $5 \times 400 =$ _____

⑱ $90 \times 5 =$ _____

㉑ $700 \times 9 =$ _____

㉓ $4000 \times 2 =$ _____

㉕ $40 \times 7 =$ _____

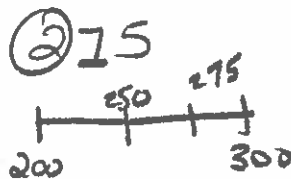
㉗ $900 \times 4 =$ _____

Solve the problems. Estimate

- ⑦ Daniel and Michelle went apple-picking. They filled 7 baskets with 275 apples each. How many apples did they pick?

$$300 \times 7 = 2100$$

About 2100 apples



- ⑧ Julian's school bus can carry 55 students each time. The bus is filled 6 times a day. How many students have been on the bus in one day?



- ⑨ The bleachers of Julian's school have 5 sections. Each section can seat 125 people. How many people can sit in the bleachers?



- ⑩ Amanda has 7 boxes of cookies for sale in a fundraising event. Each box contains 24 packages of cookies. How many packages of cookies will Amanda have to sell?



MIND BOGGLER

What number am I?

I'm a 2-digit number smaller than 50. When I'm multiplied by 7, the product is greater than 200. The sum of my digits is 5.

You are _____.



9.3 Multiplying Using Arrays Page 1

Student Book pages 314–317

GOAL

Use arrays to visualize easier ways to multiply.

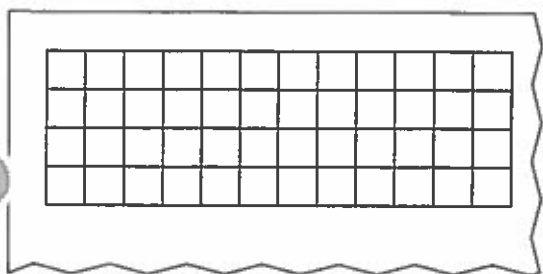
Problem

Alec has a game board that has 4 rows of 12 spaces.

 How can you calculate the number of spaces on Alec's 4-by-12 game board?

Step 1: The game board has 4 rows of 12 spaces.

Sketch it on grid paper.



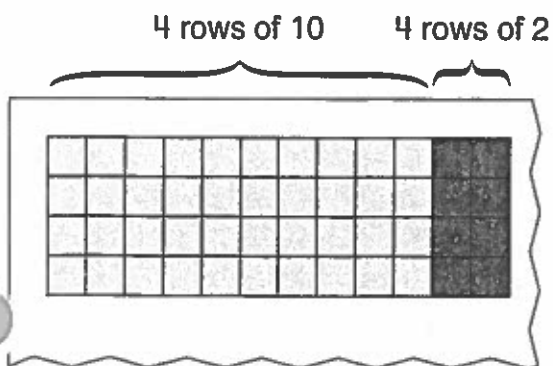
Step 2: 4×12 tells the number of spaces.

You already know $4 \times 10 =$ _____.

You also know that $4 \times 2 =$ _____.

Split the 4-by-12 array into a 4-by-10 array and a 4-by-2 array.

Colour and label both arrays as shown below.



You will need

- grid paper



- pencil
crayons



9.3 Multiplying Using Arrays Page 2

Step 3: 4 rows of 10 = 4×10

4 rows of 2 = 4×2

Use $4 \times 10 + 4 \times 2$ to calculate 4×12 .

$$4 \times 12 = 4 \times 10 + 4 \times 2$$

$$4 \times 12 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

$$4 \times 12 = \underline{\hspace{2cm}}$$

So, there are _____ spaces on Alec's game board.

Reflecting

How does splitting an array into smaller arrays help you to multiply?

What other ways can you split the 4-by-12 array to calculate 4×12 ?

9.3 Multiplying Using Arrays Page 1

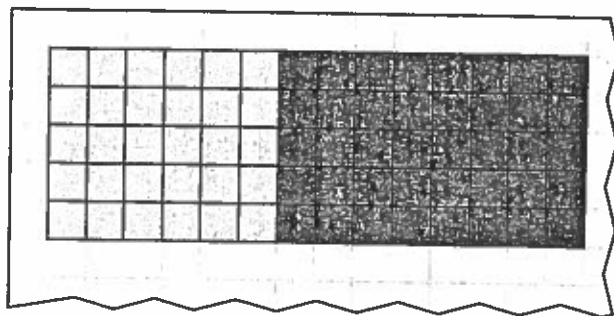
Student Book pages 314–317

GOAL

Use arrays to visualize easier ways to multiply.

Checking

1. a) Complete the number sentence to show how the 5-by-14 array is shaded.



Look at the light grey part of the array.

How many rows are there in all? _____

How many light grey squares are in each row? _____

There are $5 \times$ _____ squares in the light grey part of the array.

Look at the dark grey part of the array.

How many rows are there in all? _____

How many dark grey squares are in each row? _____

There are $5 \times$ _____ squares in the dark grey part of the array.

The 5-by-14 array combines the 2 smaller arrays.

Complete the number sentence below.

$$5 \times 14 = 5 \times \underline{\hspace{2cm}} + 5 \times \underline{\hspace{2cm}}$$

- b) Complete the number sentences to calculate 5×14 .

$$5 \times 14 = 5 \times \underline{\hspace{2cm}} + 5 \times \underline{\hspace{2cm}}$$

$$5 \times 14 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

$$5 \times 14 = \underline{\hspace{2cm}}$$

You will need

- grid paper



- pencil
crayons



9.3 Multiplying Using Arrays Page 2

Practising

3. Look at the different shades in the arrays below.

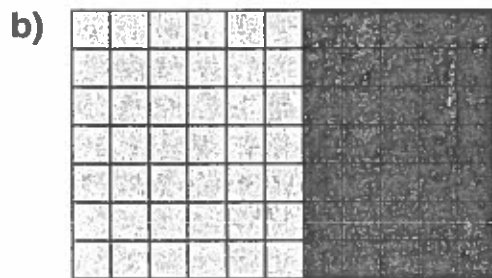
Complete the number sentences.



$$6 \times 12 = 6 \times 10 + 6 \times \underline{\hspace{2cm}}$$

$$6 \times 12 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

$$6 \times 12 = \underline{\hspace{2cm}}$$



$$7 \times 11 = \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} + \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$$

$$7 \times 11 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

$$7 \times 11 = \underline{\hspace{2cm}}$$

9. Sketch arrays on grid paper to show that each statement is true.

a) $5 \times 23 = 5 \times 20 + 5 \times 3$

b) $5 \times 23 = 5 \times 10 + 5 \times 10 + 5 \times 3$

c) $5 \times 23 = 5 \times 7 + 5 \times 7 + 5 \times 7 + 5 \times 2$

Scaffolding for Lesson 3, Questions 4 & 5

STUDENT BOOK PAGE 316

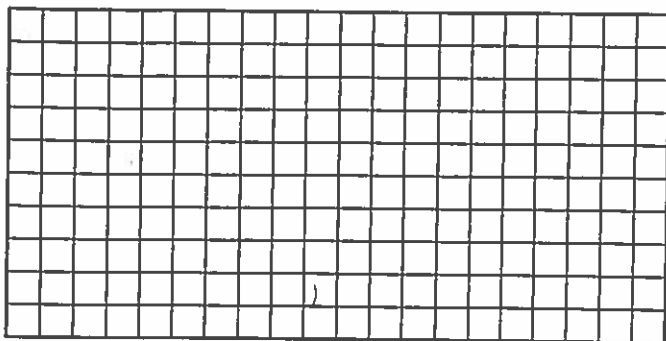
4. Jiri planted 7 rows of 18 trees. How many trees did he plant?

There are _____ rows with _____ trees in each.

So, there are _____ \times _____ trees in all.

I can model this problem with an array that has _____ rows and _____ columns.

Draw the array on this grid.



Find and colour 2 smaller arrays inside the array.

Find the products of the 2 smaller arrays and add them together.

$$7 \times 18 = 7 \times \underline{\hspace{1cm}} + 7 \times \underline{\hspace{1cm}}$$

$$7 \times 18 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}}$$

$$7 \times 18 = \underline{\hspace{1cm}}$$

Jiri planted _____ trees.

5. Complete.

a) $6 \times 21 = 6 \times 20 + 6 \times 1$

$$6 \times 21 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}}$$

$$6 \times 21 = \underline{\hspace{1cm}}$$

c) $5 \times 32 = 5 \times 30 + 5 \times \underline{\hspace{1cm}}$

$$5 \times 32 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}}$$

$$5 \times 32 = \underline{\hspace{1cm}}$$

b) $4 \times 16 = 4 \times 8 + 4 \times 8$

$$4 \times 16 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}}$$

$$4 \times 16 = \underline{\hspace{1cm}}$$

d) $5 \times 28 = 5 \times \underline{\hspace{1cm}} + 5 \times \underline{\hspace{1cm}}$

$$5 \times 28 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}}$$

$$5 \times 28 = \underline{\hspace{1cm}}$$

Chapter 9

Lesson 3

Multiplying Using Arrays

pg. 317 6-8

GOAL

Use arrays to visualize easier ways to multiply.

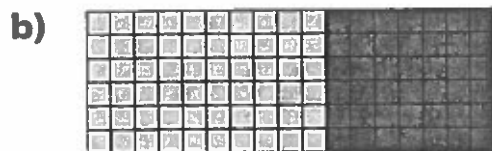
1. Fill in the blanks.



$$3 \times 14 = 3 \times 10 + 3 \times \underline{\quad}$$

$$3 \times 14 = \underline{\quad} + \underline{\quad}$$

$$3 \times 14 = \underline{\quad}$$



$$6 \times 17 = 6 \times 10 + 6 \times \underline{\quad}$$

$$6 \times 17 = \underline{\quad} + \underline{\quad}$$

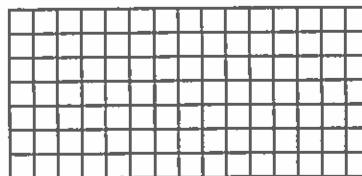
$$6 \times 17 = \underline{\quad}$$

2. Sketch arrays to help you multiply.

a) $5 \times 13 = \underline{\quad}$



b) $7 \times 15 = \underline{\quad}$

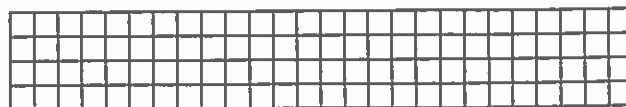


c) $2 \times 17 = \underline{\quad}$



3. Sketch an array to show that this statement is true.

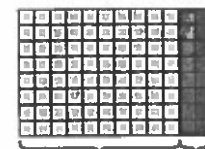
$$4 \times 26 = 4 \times 20 + 4 \times 6$$



At-Home Help

You can use an array to help you multiply. For example:

I want to calculate 8×12 .
I already know that $8 \times 10 = 80$.



$$\begin{array}{ll} 8 \text{ rows of } 10 & 8 \text{ rows of } 2 \\ 8 \times 10 = 80 & 8 \times 2 = 16 \end{array}$$

$$8 \times 12 = 8 \times 10 + 8 \times 2$$

$$8 \times 12 = 80 + 16$$

$$8 \times 12 = 96$$

9.4 Modelling Multiplication Page 1

Student Book pages 318–321

GOAL

Modelling multiplication as equal groups.

Problem

Annie is making 54 leather bags.

She sews 3 designs on each bag.



How many designs will Annie sew?

Use expanded form to calculate.

5 tens + 4 ones

_____ $\times 3$

Step 1: 5 tens $\times 3 =$ _____

Step 2: 4 ones $\times 3 =$ _____

Step 3: 15 tens = _____

Step 4: 12 ones = _____

Step 5: 15 tens = _____ (see Step 3)

+ 12 ones = _____ (see Step 4)

Total = _____

Annie sewed _____ designs.



Name: _____ Date: _____

9.4 Modelling Multiplication Page 2

Reflecting

How does grouping tens and ones help you with multiplication?

9.4 Multiplying Using Expanded Form Page 1

Student Book pages 318–321

GOAL

Multiply 2-digit numbers by 1-digit numbers using expanded form.

You will need

- base ten blocks



- a place value chart

Thousands	Hundreds	Tens	Ones

Checking

2. Sam serves 4 trays of salmon.

Each tray holds 32 pieces.

How many pieces of salmon does Sam serve?

Follow these steps to calculate 4×32 .**Step 1: Expand**

$$\begin{array}{r} 32 \text{ is } \underline{\hspace{2cm}} \text{ tens} + 2 \text{ ones} \\ \times 4 \qquad \qquad \qquad \times 4 \end{array}$$

Step 2: Multiply 4×32 is _____ groups of 32.

Model 4 groups of 32 with base ten blocks on the place value chart.

Step 3: Add

$$\begin{array}{r} 32 \text{ is } 3 \text{ tens} + 2 \text{ ones} \\ \times 4 \qquad \qquad \qquad \times 4 \\ \hline \underline{\hspace{2cm}} \text{ tens} \\ + \underline{\hspace{2cm}} \text{ ones} \end{array}$$

Sam served _____ pieces of salmon.

9.4 Multiplying Using Expanded Form Page 2

Practising

5. Alasie made a bracelet with 6 rows of 64 beads.

a) How did Alasie know she would need more than 350 beads?

Hint: She can estimate.

She can use a number close to 64 that is easy to multiply.

For example, _____ is close to 64.

Since $6 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$, she knows she needs more than 350 beads.

b) How many beads did she use altogether?

Hint: Use base ten blocks to model this problem.

$$\begin{array}{r}
 \underline{\hspace{1cm}} \text{ tens} \\
 \quad + \underline{\hspace{1cm}} \text{ ones} \\
 \hline
 \quad \times 6 \\
 \hline
 \underline{\hspace{1cm}} \text{ tens} \\
 \quad + \underline{\hspace{1cm}} \text{ ones} \\
 \hline
 \end{array}$$

Alasie used _____ beads altogether.

Solve the problems. Show your work.

- 62 Mom bought 4 boxes of chocolate for May's birthday party. There were 36 chocolates in each box. How many chocolates did Mom buy?

$$4 \times 36 = 144$$

Mom bought 144 chocolates.

$$\begin{aligned} 30 \times 4 &= \\ 6 \times 4 &= \end{aligned}$$

$$\begin{array}{r} 30 + 6 \\ \times \quad 4 \\ \hline 120 \\ + 24 \\ \hline 144 \end{array}$$

- 63 There were 24 party hats in a bag. How many party hats were there in 3 bags?

$$24 \times 3 = \underline{\quad}$$

There was party hats.

$$\begin{array}{r} 20 + 4 \\ \times \quad 3 \\ \hline \end{array}$$

- 64 Mom bought 2 bags of straws with 98 straws in each bag. How many straws did Mom buy?

$$\begin{array}{r} 90 + 8 \\ \times \quad 2 \\ \hline \end{array}$$

- 65 Ted and 4 friends each contributed \$18 to buy a birthday gift for May. What was the cost of the birthday gift?

$$\begin{array}{r} 10 + 8 \\ \times \quad 4 \\ \hline \end{array}$$

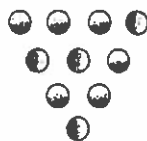
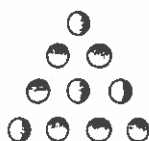
- 66 May put 42 cookies on a plate. How many cookies were there on 4 plates?

$$\begin{array}{r} 40 + 2 \\ \times \quad 4 \\ \hline \end{array}$$



Solve the problem.

Show how you can move the least number of beads to change the shape of the triangle on the left-hand side to that on the right-hand side.



5

Multiplying 2-digit Numbers by 1-digit Numbers

EXAMPLE

$4 \times 23 = ?$

Long way:

$$\begin{array}{r} 23 \\ \times 4 \\ \hline 12 \\ 80 \\ \hline 92 \end{array}$$

align the numbers on the right-hand side

$4 \times 3 = 12$

$4 \times 20 = 80$

$12 + 80 = 92$

Short way:

$$\begin{array}{r} 23 \\ \times 4 \\ \hline \end{array}$$

align the numbers on the right-hand side

$$\begin{array}{r} 23 \\ \times 4 \\ \hline 2 \end{array}$$

$4 \times 3 = 12$

carry 10 ones to the tens column; keep 2 ones in the ones column

$$\begin{array}{r} 23 \\ \times 4 \\ \hline 92 \end{array}$$

$9 = 4 \times 2 + 1$

carried over from the ones column

$4 \times 23 = 92$



HINTS:

- To do vertical multiplication the short way:

Align all the numbers on the right-hand side.

Multiply the ones first.

Then multiply the tens.

Remember to carry 10 ones to 1 ten in the tens column.

Remember to add the tens carried over from the ones column after multiplying the tens digit.

Multiply the long way.

①

$$\begin{array}{r} 12 \\ \times 4 \\ \hline \square \\ \square \\ \hline \square \end{array}$$

4×2

4×10

②

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

③

$$\begin{array}{r} 32 \\ \times 4 \\ \hline \square \\ \square \\ \hline \square \end{array}$$

④

$$\begin{array}{r} 19 \\ \times 5 \\ \hline \square \\ \square \\ \hline \square \end{array}$$

⑤

$$\begin{array}{r} 31 \\ \times 6 \\ \hline \square \\ \square \\ \hline \square \end{array}$$

⑥

$$\begin{array}{r} 47 \\ \times 6 \\ \hline \square \\ \square \\ \hline \square \end{array}$$

Name: _____

Date: _____

WORD PROBLEM

Ray bought 7 packs of juice boxes for the class picnic.
There were 24 juice boxes in a pack. How many juice boxes did Ray buy?

BASICS BOX

There are many methods for multiplying numbers with more than one digit. Here are two that Ray (and you) can use:

Traditional

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

Multiply ones

$$\begin{array}{r} 24 \\ \times 7 \\ \hline 28 \end{array}$$

Regroup 2 tens

$$\begin{array}{r} 2 \\ 24 \\ \times 7 \\ \hline 8 \end{array}$$

Multiply tens

$$\begin{array}{r} 2 \\ 24 \\ \times 7 \\ \hline 8 \end{array}$$

$$2 \times 7 = 14 + 2 = 16$$

$$\begin{array}{r} 24 \\ \times 7 \\ \hline 168 \text{ juice boxes} \end{array}$$

Partial Products

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

Multiply ones

$$\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$$

Multiply tens

$$\begin{array}{r} 20 \\ \times 7 \\ \hline 140 \end{array}$$

Add both products

$$\begin{array}{r} 140 \\ + 28 \\ \hline 168 \text{ juice boxes} \end{array}$$

PRACTICE

Solve each problem using both methods. Show your work.

$$\begin{array}{r} 1. \quad 36 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 30 + 6 \\ \times 8 \\ \hline \text{---} \text{---} \text{---} \\ + \text{---} \text{---} \text{---} \\ \hline \end{array} \quad \begin{array}{l} (30 \times 8) \\ (6 \times 8) \end{array}$$

$$\begin{array}{r} 2. \quad 52 \\ \times 9 \\ \hline \end{array}$$

JOURNAL

Which multiplication method do you find easiest to work with? Why?

Name: _____

Date: _____

Multiplication Methods

Find the products. Show your work.

1.
$$\begin{array}{r} 13 \\ \times 4 \\ \hline \end{array}$$

5.
$$\begin{array}{r} 93 \\ \times 5 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 25 \\ \times 3 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 41 \\ \times 8 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 50 \\ \times 7 \\ \hline \end{array}$$

7.
$$\begin{array}{r} 33 \\ \times 3 \\ \hline \end{array}$$

4.
$$\begin{array}{r} 68 \\ \times 6 \\ \hline \end{array}$$

8.
$$\begin{array}{r} 76 \\ \times 2 \\ \hline \end{array}$$

Review.

9. $30 \times 50 = \underline{\hspace{2cm}}$

11. $40 \times 80 = \underline{\hspace{2cm}}$

10. $300 \times 50 = \underline{\hspace{2cm}}$

12. $400 \times 800 = \underline{\hspace{2cm}}$

Multiplication: One-Digit Numbers Times Two-Digit Numbers

Follow the steps for multiplying a one-digit number by a two-digit number using regrouping.

Example: Step 1: Multiply the ones.
Regroup.

$$\begin{array}{r} 2 \\ 54 \\ \times 7 \\ \hline 8 \end{array}$$

Step 2: Multiply the tens.
Add two tens.

$$\begin{array}{r} 2 \\ 54 \\ \times 7 \\ \hline 378 \end{array}$$

Directions: Multiply.

$$\begin{array}{r} 27 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 63 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 52 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 91 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 45 \\ \times 7 \\ \hline \end{array}$$

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

$$\begin{array}{r} 64 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 76 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 93 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 87 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 66 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 38 \\ \times 2 \\ \hline \end{array}$$



$$\begin{array}{r} 47 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 64 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 51 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 99 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 32 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 25 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 15 \\ \times 7 \\ \hline \end{array}$$

The chickens on the Smith farm produce 48 dozen eggs each day. How many dozen eggs do they produce in 7 days?

Name _____

Multiplication**43**

- ★ When you multiply large numbers by a 1-digit number, multiply each digit of the top number by the bottom number, starting with the ones place. Regroup if the product is 10 or above.

$$\begin{array}{r} 1 \\ 230 \\ \times 4 \\ \hline 920 \end{array}$$

Solve.

①

$$\begin{array}{r} 45 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 36 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 15 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 40 \\ \times 8 \\ \hline \end{array}$$

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

$$\begin{array}{r} 84 \\ \times 1 \\ \hline \end{array}$$

②

$$\begin{array}{r} 19 \\ \times 3 \\ \hline \end{array}$$

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

$$\begin{array}{r} 47 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 152 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 261 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 350 \\ \times 2 \\ \hline \end{array}$$

③

$$\begin{array}{r} 428 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 579 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 920 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 327 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 206 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 713 \\ \times 6 \\ \hline \end{array}$$

④

$$\begin{array}{r} 179 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 803 \\ \times 1 \\ \hline \end{array}$$

$$\begin{array}{r} 263 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 3917 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 5782 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 1429 \\ \times 5 \\ \hline \end{array}$$

⑤

At Pancho's Restaurant, 310 burritos are sold each year. Pancho's has been open for 5 years. How many burritos have been sold since Pancho's opened? $\begin{array}{r} 310 \\ \times 5 \end{array}$

⑥

Plane tickets from Miami, Florida, to Denver, Colorado, cost \$522 each. The 4 members of the Wilson family are buying tickets from Miami to Denver. How much will the tickets cost? _____

⑦

Megan bought 5 large bags of peanuts. There are 210 peanuts in each bag. How many peanuts does she have in all? _____

9.5 Estimating Products Page 1

Student Book pages 322–324

GOAL

Develop strategies for estimating.

You will need

- counters



Problem

8 soccer teams were playing in a tournament.

There were 9 players on each team.

 About how many players were playing in the tournament?

There are different strategies for estimating.

Practise using easier numbers.

There are 8 teams with 9 players.

You are trying to estimate 8×9 .

Think about easier numbers to use.

9 is close to 10.

Think about 8×10 .

You can count by 10s.

$$8 \times 10 = \underline{\hspace{2cm}}$$

Since you changed 9 to 10, there are a few less than _____ players altogether.

Try the strategy again.

What if there were 6 teams with 7 players on each team?

Think about easier numbers to use.

6 is close to 5.

Think about 5×7 .

You can count by 5s.

$$5 \times 7 = \underline{\hspace{2cm}}$$

Since you changed the 6 to 5, there are a few more than _____ players altogether.

9.5 Estimating Products Page 2

Use easier numbers to estimate the products.

$7 \times 9 = \underline{\hspace{2cm}}$

Change the fact to $7 \times 10 = \underline{\hspace{2cm}}$.

7×9 is a little less than $\underline{\hspace{2cm}}$.

$8 \times 6 = \underline{\hspace{2cm}}$

Change the fact to $\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$.

8×6 is $\underline{\hspace{2cm}}$.

$11 \times 4 = \underline{\hspace{2cm}}$

Change the fact to $\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$.

11×4 is $\underline{\hspace{2cm}}$.

$9 \times 6 = \underline{\hspace{2cm}}$

Change the fact to $\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$.

9×6 is $\underline{\hspace{2cm}}$.

Reflecting

Was there another way you could have changed 9×6 ? Explain.

9.5 Estimating Products Page 1

Student Book pages 322–324

GOAL

Choose when and how to estimate.

Checking

1. Natasha's school has 2 Grade 5 teams.

Each team has 31 players.

Estimate to answer the following question:

Are there more than 50 Grade 5 players?

I can use a number close to 31, such as 30.

 $30 + 30$ is the same as $30 \times$ _____.I can multiply _____ \times _____ to get an estimate.

2. How would you estimate each product?

a) 9×48

(Circle) the number closest to 48. 40 50

I would estimate by multiplying $9 \times$ _____.Explain another way you would estimate 9×48 .

b) 4×355

(Circle) the number closest to 355. 350 360

I would estimate by multiplying _____ \times _____.Explain another way you would estimate 4×355 .

9.5 Estimating Products Page 2**Practising**

6. Decide whether you can estimate to answer or if you need to calculate the exact answer. Then answer.

a) 1 CD can hold 72 minutes of music.

Are 7 CDs enough to burn 500 minutes of music?

I will have to burn my CDs all over again if my estimate is off,
so I will _____.

$$7 \times 70 = \underline{\hspace{2cm}}$$

$$7 \times 2 = \underline{\hspace{2cm}}$$

$$7 \times 72 = \underline{\hspace{2cm}} \text{ minutes}$$

7 CDs _____ enough.

b) There are 3 plates with 76 dumplings on each plate.

Are there at least 200 dumplings?

I don't need to know the _____ number, so I will _____.

76 is close to _____, so $3 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$.

There are _____ 200 dumplings.

c) Jonah has \$287 in his bank account.

His brother saved 3 times as much money.

Did his brother save at least \$900?

I will _____ because _____ $\times 3 = \underline{\hspace{2cm}}$.

Jonah's brother _____ save at least \$900 because _____

Estimating Products

GOAL

Choose when and how to estimate.

1. Estimate each product. Show your work.

a) 5×44 _____ d) 7×31 _____

b) 8×62 _____ e) 3×82 _____

c) 9×28 _____ f) 4×73 _____

2. Decide whether you can estimate to answer. Then answer.

a) Lang, Ken, and Joshua each have \$42. Do they have enough money to buy a second-hand bike for \$150?

b) Each bookcase contains 64 books. There are 4 bookcases. Are there more than 200 books?

c) 5 cartons hold 54 juice boxes each. Are there enough juice boxes for 250 students?

Estimating Products

Name _____

Estimate the product of 51 and 62.

Round each number
to the nearest 10.

Multiply.

$$\begin{array}{r} 62 \rightarrow 60 \\ \times 51 \rightarrow 50 \\ \hline \end{array}$$

$$\begin{array}{r} 60 \\ \times 50 \\ \hline 3000 \end{array}$$

Remember:
if $5 \times 6 = 30$
and $5 \times 60 = 300$
then $50 \times 60 = 3000$.



The estimated product is 3000.

Estimate by rounding to the nearest 10.

1. $\begin{array}{r} 78 \rightarrow \underline{\quad} \\ \times 57 \rightarrow \underline{\quad} \\ \hline \end{array}$

2. $\begin{array}{r} 42 \rightarrow \underline{\quad} \\ \times 28 \rightarrow \underline{\quad} \\ \hline \end{array}$

3. $\begin{array}{r} 17 \rightarrow \underline{\quad} \\ \times 47 \rightarrow \underline{\quad} \\ \hline \end{array}$

4. $\begin{array}{r} 24 \rightarrow \underline{\quad} \\ \times 68 \rightarrow \underline{\quad} \\ \hline \end{array}$

5. $\begin{array}{r} 33 \rightarrow \underline{\quad} \\ \times 52 \rightarrow \underline{\quad} \\ \hline \end{array}$

6. $\begin{array}{r} 18 \rightarrow \underline{\quad} \\ \times 74 \rightarrow \underline{\quad} \\ \hline \end{array}$

7. $\begin{array}{r} 77 \\ \times 64 \\ \hline \end{array}$

8. $\begin{array}{r} 63 \\ \times 32 \\ \hline \end{array}$

9. $\begin{array}{r} 51 \\ \times 37 \\ \hline \end{array}$

10. $\begin{array}{r} 59 \\ \times 68 \\ \hline \end{array}$

11. $\begin{array}{r} 42 \\ \times 39 \\ \hline \end{array}$

12. $\begin{array}{r} 53 \\ \times 47 \\ \hline \end{array}$

13. $\begin{array}{r} 59 \\ \times 48 \\ \hline \end{array}$

14. $\begin{array}{r} 67 \\ \times 17 \\ \hline \end{array}$

15. $\begin{array}{r} 31 \\ \times 84 \\ \hline \end{array}$

9.6 Communicating about Solving Problems Page 1

Student Book pages 328–329

GOAL

Explain your thinking when solving a problem.

Checking

1. For every year a bear lives, it ages about 4 human years.

Carolyn calculated the age of a 19-year-old bear in human years.

1. I made sure I understood the problem.

A bear this old...	...is like a human this old
1	4
2	8
3	12

2. I made a plan. I calculated 19×4 .
3. I carried out the plan. $19 \times 4 = 76$.
4. I looked back to check. 76 looks right because $20 \times 4 = 80$, so 19×4 must be less.

- a) What did Carolyn explain well?

Be specific about each step she did.

Hint: Look at Desmond's comments in the Student Book.

- b) What questions would you ask Carolyn to improve her communication?

For example: How did you know $19 \times 4 = 76$?

9.6 Communicating about Solving Problems Page 2**Practising**

2. For every year a dog lives, it ages about 7 human years.

How old is a 13-year-old dog in human years?

Step 1: Understand the Problem

I know a 1-year-old dog is _____ in human years.

I have to find out how old a _____-year-old dog is in human years.

I can make a table to show what I know.

A dog this old...is like a human this old
1	7
2	14
3	21

Step 2: Make a Plan

I plan to _____

Step 3: Carry Out the Plan

This is how I calculated the answer.

I found out _____

Step 4: Look Back

I know my answer is reasonable because _____

9.6 Communicating about Solving Problems Page 1

Student Book pages 328–329

GOAL

Explain your thinking when solving a problem.

Problem

Horses age more quickly than humans.

For every year a horse lives, it ages 3 human years.

Ken wondered how old his 8-year-old horse would be in human years.

**How can Ken explain how he solved the problem?****Understand the Problem**

What do you know?

A horse this old...	...is like a human this old
1	3
2	6
3	9
4	
5	
6	

Make a Plan

Multiply to find the answer.

How do you know that you can multiply?

9.6 Communicating about Solving Problems Page 2

Carry Out the Plan

What is the age of the horse?

Look Back to Check

Is your answer reasonable?

Reflecting

How could Ken have explained his plan more clearly?

Look at the Communication Checklist.

Do you think you have given a good explanation to how you solved the horse problem?

Why or why not?

Communication Checklist

- ✓ Did you show the right amount of detail?
- ✓ Did you explain your thinking?

9.6 Communicating about Solving Problems Page 1

Student Book pages 328–329

GOAL

Explain your thinking when solving a problem.

Checking

1. For every year a bear lives, it ages about 4 human years.

Carolyn calculated the age of a 19-year-old bear in human years.

1. I made sure I understood the problem.

A bear this old...	...is like a human this old
1	4
2	8
3	12

2. I made a plan. I calculated 19×4 .

3. I carried out the plan. $19 \times 4 = 76$.

4. I looked back to check. 76 looks right because $20 \times 4 = 80$, so 19×4 must be less.

- a) What did Carolyn explain well?

Be specific about each step she did.

Hint: Look at Desmond's comments in the Student Book.

- b) What questions would you ask Carolyn to improve her communication?

For example: How did you know $19 \times 4 = 76$?

9.6 Communicating about Solving Problems Page 2**Practising**

2. For every year a dog lives, it ages about 7 human years.

How old is a 13-year-old dog in human years?

Step 1: Understand the Problem

I know a 1-year-old dog is _____ in human years.

I have to find out how old a _____-year-old dog is in human years.

I can make a table to show what I know.

A dog this old...is like a human this old
1	7
2	14
3	21

Step 2: Make a Plan

I plan to _____

Step 3: Carry Out the Plan

This is how I calculated the answer.

I found out _____

Step 4: Look Back

I know my answer is reasonable because _____

Communicating about Solving Problems

GOAL

Explain your thinking when solving a problem.

1. Emily earns \$28 each week for doing yard work. How much money can she earn in 5 weeks?

At-Home Help

Follow these steps to help you communicate about solving problems:

Step 1 Make sure you understand the problem.

Step 2 Make a plan.

Step 3 Carry out the plan.

Step 4 Look back to check.

Communication Checklist

- ✓ Did you show the right amount of detail?
- ✓ Did you explain your thinking?

2. Jade, Cole, Michael, and Hailey each brought 46 brownies to the school bake sale. How many brownies did they bring in total?

3. Ken earned 72 points on the first day of the summer fair. If he earns the same number of points each day for 3 days will he win the prize for 290 points? Explain your solution.

Thousands	Hundreds	Tens	Ones

9.7 Multiplying 2-Digit Numbers Page 1

Student Book pages 330–332

GOAL

Multiply 2-digit numbers by 1-digit numbers using expanded form.

Problem

Diane lives near a beach.

She collected 14 shells in 1 week.

She wants to collect the same number of shells each week.



How many shells will Diane have in 4 weeks?

There are 4 groups of 14 shells after 4 weeks.

When there are equal groups, you can multiply.

Step 1: Estimate first.

4×14 is about $4 \times 10 =$ _____.

I predict that Diane will have more than _____ shells.

Step 2: Make 4 groups of 14 with base ten blocks.

Record them using the expanded form.

You will need

- base ten blocks



- a place value chart

Thousands	Hundreds	Tens	Ones

Hundreds	Tens	Ones

$$\begin{array}{r} 14 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 10 + 4 \\ \times 4 \\ \hline \end{array}$$

9.7 Multiplying 2-Digit Numbers Page 2**Step 3:** Multiply to show the number of tens first.

$$\begin{array}{r} 14 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 10 + 4 \\ \times \quad 4 \\ \hline \end{array}$$

40 (number of tens)

$$\begin{array}{r} + \quad \quad \\ \hline \end{array}$$

Step 4: Complete the multiplication.

$$\begin{array}{r} 14 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 10 + 4 \\ \times \quad 4 \\ \hline \end{array}$$

40 (number of tens)

+ _____ (number of ones)

_____ (total)

Diane will have _____ shells in 4 weeks.

Reflecting

Suppose that you multiplied the ones first. Would the product be the same? Explain.

9.7 Multiplying 3-Digit Numbers Page 1

Student Book pages 330–332

GOAL

Multiply 3-digit numbers by 1-digit numbers using expanded form.

You will need

- base ten blocks

**Checking**

1. Model with base ten blocks. Multiply.

a) $300 + 20 + 7$ is the same as 327
 $\times \quad \quad 5$ $\times 5$

Make 5 groups of _____ with base ten blocks.

Do not regroup.

Fill in the rest of the question.

$$\begin{array}{r}
 300 + 20 + 7 \\
 \times \quad \quad 5 \\
 \hline
 1500 \quad (\text{number of hundreds}) \\
 100 \quad (\text{number of tens}) \\
 + \quad \quad (\text{number of ones}) \\
 \hline
 \quad \quad (\text{total altogether})
 \end{array}$$

b) Model 5 groups of 327 with base ten blocks.

Remember, do not regroup.

$$\begin{array}{r}
 327 \\
 \times \quad \quad 5 \\
 \hline
 35 \quad (\text{number of ones}) \\
 \quad \quad (\text{number of tens}) \\
 + \quad \quad (\text{number of hundreds}) \\
 \hline
 \quad \quad (\text{total altogether})
 \end{array}$$

9.7 Multiplying 3-Digit Numbers Page 2**Practising**

7. Estimate, then calculate.

a) 3×986

986 is close to 1 so I can estimate by multiplying $3 \times$ = .

$$\begin{array}{r}
 986 \\
 \times \quad 3 \\
 \hline
 \text{ (number of hundreds)} \\
 \text{ (number of tens)} \\
 + \text{ (number of ones)} \\
 \hline
 \text{ (total altogether)}
 \end{array}$$

b) 5×181

181 is close to 2 so I can estimate by multiplying $5 \times$ = .

$$\begin{array}{r}
 181 \\
 \times 5 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 + \\
 \hline
 \end{array}$$

c) 7×332

332 is close to so I can estimate by multiplying $7 \times$ = .

$$\begin{array}{r}
 332 \\
 \times 7 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 + \\
 \hline
 \end{array}$$

Name: _____

Date: _____

Scaffolding for Lesson 7, Question 5

STUDENT BOOK PAGE 332

5. Calculate. Follow Diane's Solution from Student Book page 330.

a)
$$\begin{array}{r} 361 \\ \times 7 \\ \hline \end{array}$$

 $______$ $______$

$$\begin{array}{r} + ______ \\ \hline \end{array}$$

$$\begin{array}{r} 300 + 60 + 1 \\ \times 7 \\ \hline \end{array}$$

 $______$ $______$

$$\begin{array}{r} + ______ \\ \hline \end{array}$$

b)
$$\begin{array}{r} 421 \\ \times 4 \\ \hline \end{array}$$

 $+ ______$

$$\begin{array}{r} 400 + 20 + 1 \\ \times 4 \\ \hline \end{array}$$

 $+ ______$

c)
$$\begin{array}{r} 618 \\ \times 3 \\ \hline \end{array}$$

 $+ ______$

$$\begin{array}{r} 600 + 10 + 8 \\ \times 3 \\ \hline \end{array}$$

 $+ ______$

d)
$$\begin{array}{r} 333 \\ \times 6 \\ \hline \end{array}$$

 $+ ______$

$$\begin{array}{r} 300 + 30 + 3 \\ \times 6 \\ \hline \end{array}$$

 $+ ______$

Chapter 9
Lesson 7

Multiplying 3-Digit Numbers

GOAL

Multiply 3-digit numbers by 1-digit numbers using expanded form.

1. Multiply.

a) $3 \times 242 =$ 

$$\begin{array}{r} 200 + 40 + 2 \\ \times 3 \\ \hline \end{array}$$

b) $2 \times 567 =$ 

$$\begin{array}{r} 500 + 60 + 7 \\ \times 2 \\ \hline \end{array}$$

2. Multiply.

a) 2×122

c) 3×254

e) 4×197

b) 5×316

d) 6×624

f) 2×472

At-Home Help

You can use expanded form to multiply 3-digit numbers by 1-digit numbers. For example:

I want to know 4×321 .

I know that 321 is the same as $300 + 20 + 1$.

I will multiply each part separately by 4.

$$\begin{array}{r} 300 + 20 + 1 \\ \times 4 \\ \hline 1200 \\ 80 \\ + 4 \\ \hline 1284 \\ 4 \times 321 = 1284 \end{array}$$

3. Estimate to check your answer for each part of Question 2.

a)

c)

e)

b)

d)

f)

9.8 Multiplying Another Way Page 1

Student Book pages 334–337

GOAL

Multiply, regrouping as you go.

You will need

- base ten blocks



Problem

Michael has 56 hockey cards. Pedro has twice as many.



How many cards does Pedro have?

Twice as many means 2 times as many.

Multiply 56 cards by 2.

Step 1: Estimate 2×56 first.

I know that $2 \times 50 =$ _____.

So Pedro has more than _____ cards.

Step 2: Multiply by making 2 groups of 56.

Use base 10 blocks.

Hundreds	Tens	Ones

$$2 \times 56 = \underline{\quad}$$

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

Step 3: There are 2×6 ones.

$$2 \times 6 = 12$$

Regroup 12 ones as 1 ten, 2 ones.

Hundreds	Tens	Ones

$$2 \times 56 = \underline{\quad}$$


$$\begin{array}{r} 1 \\ 56 \\ \times 2 \\ \hline 2 \end{array}$$

9.8 Multiplying Another Way Page 2

Step 4: There are 2×5 tens + 1 ten.

There are 11 tens.

Regroup 11 tens as 1 hundred, 1 ten.

Hundreds	Tens	Ones
		<div>□</div> <div>□</div>

$$2 \times 56 = \underline{\quad}$$

$$\begin{array}{r} 11 \\ 56 \\ \times 2 \\ \hline 12 \end{array}$$

Step 5: Add.

$$100 + 10 + 2 = \underline{\quad}$$

$$2 \times 56 = \underline{\quad}$$

So, Pedro has _____ cards.

Reflecting

How did using the place value chart help you to multiply 2-digit numbers?

9.8 Multiplying Another Way Page 1

Student Book pages 334–337

GOAL

Multiply, regrouping as you go.

Checking

1. Follow these steps to calculate.

a) 7×62 **Step 1:** Multiply by making 7 groups of 62 using base ten blocks.

Sketch the groups on a place value chart.

How many ones? _____

Regroup the ones as _____ tens _____ ones.

How many tens? _____

Regroup the tens as _____ hundreds _____ tens.

How many hundreds? _____

Step 2: Count all the blocks together.

There are _____ hundreds _____ tens _____ ones.

 $7 \times 62 =$ _____**b)** 7×145 **Step 1:** Multiply by making 7 groups of 145 using base ten blocks.

Sketch the groups on a place value chart.

How many ones? _____

Regroup the ones as _____ tens _____ ones.

How many tens? _____

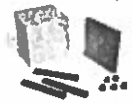
Regroup the tens as _____ hundreds _____ tens.

How many hundreds? _____

Regroup the hundreds as _____ thousand _____ hundreds.

You will need

- base ten blocks



- a place value chart

Thousands	Hundreds	Tens	Ones

9.8 Multiplying Another Way Page 2

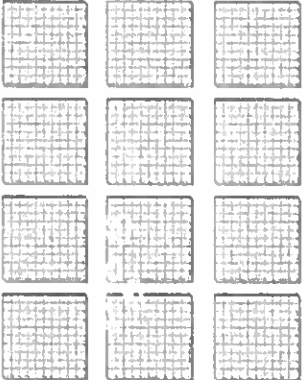


Step 2: Count all the blocks together.

There are _____ thousands _____ hundreds _____ tens _____ ones.

$$7 \times 145 = \underline{\hspace{2cm}}$$

Practising

5. Write the multiplication equation for this model.

Thousands	Hundreds	Tens	Ones
			

Circle the groups.

How many are there? _____

How much do the blocks in 1 group equal? _____

Use your answers to write the multiplication equation.

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

Count the blocks.

Regroup if you need to.

There are _____ thousands _____ hundreds _____ tens _____ ones.

The product is _____.

Scaffolding for Lesson 8, Question 7

STUDENT BOOK PAGE 337

7. Multiply. Follow Michael's Calculations from Student Book page 334–335.

a)

	3	0	5	
	x		4	

- Step 1 Estimate 4×305 is about $4 \times$ ____.
- Step 2 Multiply by making ____ groups of ____.

Sketch the groups on a place value chart.

Thousands	Hundreds	Tens	Ones

- Step 3 Multiply the ones. Regroup if you need to.
- Step 4 Multiply the tens. Regroup if you need to.
- Step 5 Multiply the hundreds. Regroup if you need to.

b)

	2	6	0	
	x		5	

c)

	2	9	3	
	x		6	

d)

	4	2	9	
	x		4	

Chapter 9 Lesson 8

Multiplying Another Way

GOAL

Multiply, regrouping as you go.

1. Multiply by regrouping.

a)
$$\begin{array}{r} 43 \\ \times 5 \\ \hline \end{array}$$

d)
$$\begin{array}{r} 243 \\ \times 5 \\ \hline \end{array}$$

g)
$$\begin{array}{r} 492 \\ \times 3 \\ \hline \end{array}$$

b)
$$\begin{array}{r} 152 \\ \times 4 \\ \hline \end{array}$$

e)
$$\begin{array}{r} 548 \\ \times 2 \\ \hline \end{array}$$

h)
$$\begin{array}{r} 129 \\ \times 5 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 461 \\ \times 6 \\ \hline \end{array}$$

f)
$$\begin{array}{r} 617 \\ \times 7 \\ \hline \end{array}$$

i)
$$\begin{array}{r} 257 \\ \times 2 \\ \hline \end{array}$$










At-Home Help

You can multiply by regrouping. For example:

I want to know 3×384 .
As I multiply, I will regroup ones, tens, and hundreds.

$$\begin{array}{r} 21 \\ 384 \\ \times 3 \\ \hline 1152 \\ 3 \times 384 = 1152 \end{array}$$

2. a) What multiplication equation does this model show? _____

Thousands	Hundreds	Tens	Ones
			
			
			

b) Calculate the product.

Scaffolding for Lesson 8, Question 7

STUDENT BOOK PAGE 337


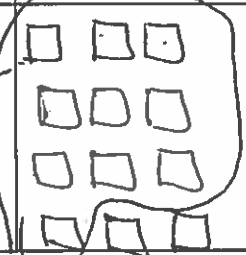

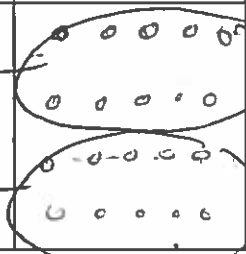
7. Multiply. Follow Michael's Calculations from Student Book page 334–335.

a)

	3	0	5	
	x		4	

- Step 1 Estimate 4×305 is about $4 \times 300 = 1200$
- Step 2 Multiply by making 4 groups of 300

Sketch the groups on a place value chart.

Thousands	Hundreds	Tens	Ones
			

$$\begin{array}{r}
 305 \\
 \times 4 \\
 \hline
 1220
 \end{array}$$

Handwritten checkmarks are under each row of the multiplication.

- Step 3 Multiply the ones. Regroup if you need to.
- Step 4 Multiply the tens. Regroup if you need to.
- Step 5 Multiply the hundreds. Regroup if you need to.

b)

	+3			
	2	6	0	
	x		5	
1	3	0	0	

c)

	+5	+1		
	2	9	3	
	x		6	
1	7	5	8	

Handwritten checkmark under the result row.

d)

	+1	+3		
	4	2	9	
	x		4	
1	7	1	6	

Chapter 9

Lesson 8

Multiplying Another Way

GOAL

Multiply, regrouping as you go.

1. Multiply by regrouping.

a)
$$\begin{array}{r} 43 \\ \times 5 \\ \hline \end{array}$$

d)
$$\begin{array}{r} 243 \\ \times 5 \\ \hline \end{array}$$

g)
$$\begin{array}{r} 492 \\ \times 3 \\ \hline \end{array}$$

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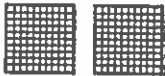








At-Home Help

You can multiply by regrouping. For example:

I want to know 3×384 .
As I multiply, I will regroup ones, tens, and hundreds.

$$\begin{array}{r} 21 \\ 384 \\ \times 3 \\ \hline 1152 \\ 3 \times 384 = 1152 \end{array}$$

2. a) What multiplication equation does this model show? _____

Thousands	Hundreds	Tens	Ones
			
			
			

- b) Calculate the product.

9.9 Choosing a Method for Multiplying Page 1

Student Book pages 338–340

GOAL

Choose whether to estimate or calculate, and explain your multiplication method.

You will need

- base ten blocks



Problem

Sometimes you can find an answer using estimation.

Sometimes you can solve a problem using mental math.

Sometimes you need materials to solve a problem.



How can you solve each problem?

1. You and your friend are buying 2 bottles of water.

1 bottle of water costs \$1.25.

You want to make sure you have enough money to buy 2 bottles.

Would you estimate or calculate the cost of 2 bottles?

Explain or show what you would do.

2. There are 45 pencils in a box.

You want to know if there are more than 150 pencils in 3 boxes.

Would you estimate or calculate the number of pencils?

Explain or show what you would do.

9.9 Choosing a Method for Multiplying Page 2

3. 5 schools are getting together for a checkers tournament.

Each school is bringing 100 students.

How many students will be at the tournament altogether?

Would you estimate or calculate the number of students?

Explain or show what you would do.

4. The grocery store sells eggs in cartons of 12.

If you buy 3 cartons of eggs, will you have more or less than 30 eggs?

Would you estimate or calculate the number of eggs?

Explain or show what you would do.

Reflecting

How did you decide when to use mental math?

How did you decide when to estimate?

9.9 Choosing a Method for Multiplying Page 1

Student Book pages 338–340

GOAL

Choose whether to estimate or calculate, and explain your multiplication method.

You will need

- base ten blocks



- a place value chart

Thousands	Hundreds	Tens	Ones

Checking

1. In 2004:

- 33 babies were born in Saskatchewan every 24 hours
- 44 babies were born in Alberta every 10 hours

Would you estimate or calculate to find the following answers? Why?

a) How many Saskatchewan babies were born in 5 days?

I need to find out the exact answer so I would _____.

b) Were more than 1000 babies born in Alberta each month?

I would _____ because _____.

2. How would you calculate in each situation?

Hint: Choose mental math, expanded form, or base ten blocks.

a) the number of Saskatchewan babies born in 6 days

1 day = 33 babies, so 6 days = _____ \times _____

I would _____.

b) the number of Alberta babies born in 90 hours

10 hours = 44 babies, so 90 hours = _____ \times _____

I would _____.

9.9 Choosing a Method for Multiplying Page 2**Practising**

3. Would you answer each question using mental math or base ten blocks?

a) There are 250 sheets in 1 pack of paper.

Are there more than 500 sheets in 3 packs?

1 pack = 250

3 packs = _____ \times 250

I would _____ because _____

b) How many days are there in 2 years?

1 year = 365 days

2 years = _____ \times 365

I would _____ because _____

c) Aaron has 3 times as much money as Raven. Raven has \$127.

Raven = \$127

Aaron = _____ \times 127

I would _____ because _____

6. Alana earns \$9 an hour babysitting. Which could you answer by estimating?

A: the amount Alana earns in 10 hours

B: the amount Alana earns in 15 hours

C: the number of hours needed to earn \$90

D: about how long it would take Alana to earn \$250

I could estimate letter _____ because _____

Chapter 9 Lesson 9

Choosing a Method for Multiplying

GOAL

Choose whether to estimate or calculate, and explain your multiplication method.

- Jade can string 76 beads every hour. Which question could you answer by estimating?
 - How many beads can Jade string in 10 hours?
 - How many beads can Jade string in 12 hours?
 - Would Jade use more than 200 beads in 3 hours?
 - How many hours would it take for Jade to use 380 beads?

At-Home Help

Here are 3 methods you can use to solve multiplication problems:

- estimate
- calculate using mental math
- calculate using materials

- How would you answer each question: by estimating, using mental math, or using base ten blocks?

- A skateboard costs \$325.

Can you buy 2 skateboards for \$600?

estimating

- Joshua earned 279 points at the school fair.

Diane earned 3 times as many points.

How many points did Diane earn?

base 10 blocks

- Aneela can type 42 words in a minute.

How many words can she type in 5 minutes?

mental math

- Matt and Hailey want to solve this problem:

A box of crayons holds 54 crayons. About how many crayons are in 9 boxes?

Matt says, "I will use mental math to solve the problem.

$9 \times 50 = 450$, and $9 \times 4 = 36$. The answer is $450 + 36 = 486$."

Hailey says, "I will estimate to solve the problem. 9 is close to 10.

$10 \times 54 = 540$, so the answer is about 540."

Can both answers be correct? Explain your answer. Yes. I think both answers can be right because one is an approximate or estimate the other is an exact calculation.

Solve the problems. Show your work.

- 47 A bag of potato chips weighs 225 g. What is the total weight of 4 bags of potato chips?

The total weight of 4 bags of potato chips is

900.

$$\begin{array}{r} +1+2 \\ 225 \\ \times \quad 4 \\ \hline 900 \end{array}$$

- 48 A box of sugar contains 125 packets. How many packets are there in 6 boxes?

750 in each.

$$\begin{array}{r} +1+3 \\ 125 \\ \times \quad 6 \\ \hline 750 \end{array}$$

- 49 The capacity of one can of pop is 355 mL. How many mL of pop are there in 6 cans?

2130 mL

$$\begin{array}{r} +2+3 \\ 355 \\ \times \quad 6 \\ \hline 2130 \end{array}$$

- 50 Ted drinks 1 box of juice each day. If the capacity of a box of juice is 250 mL, how many mL of juice does Ted drink in one week?

1750 in one week

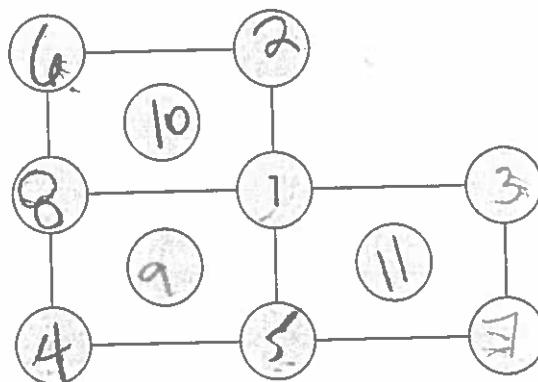
$$\begin{array}{r} +3 \\ 250 \\ \times \quad 7 \\ \hline 1750 \end{array}$$



Solve the problem.



Write 2 to 11 in the circles so that the sum of the numbers at the centre and the 4 corners of each rectangle is 27.



9.10 Creating Multiplication Problems

Student Book page 341

GOAL

Create and solve multiplication problems.



How can you create a story about multiplication?

Step 1: Understand the Problem

What do you have to do?

Step 2: Make a Plan

What is your story going to be about?

What kinds of multiplication problems will be in the story?

What strategies will you use to find the answer to these multiplication problems?

Step 3: Carry Out the Plan

Write the pages of your story. Show how you solved the multiplication problems.

Step 4: Look Back

How do you know you made multiplication problems in your book?

9.10 Creating Multiplication Problems

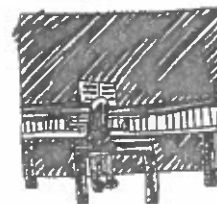
Student Book page 341

GOAL

Create and solve multiplication problems.

You will need

- pencil
- crayons



$$7 \times 15$$

Kelly practised piano 15 minutes
a day every day of the week.

That makes 105 minutes.



How can you create a story about multiplication?

Hint: First think of equal groups of things for a story.

Write the multiplication fact that goes with your story.

Write your story.

End your story with the answer to the multiplication problem.

9.10 Creating Multiplication Problems

Student Book page 341

GOAL

Create and solve multiplication problems.



How can you create a story about multiplication?

Step 1: Understand the Problem

What do you have to do?

Step 2: Make a Plan

What is your story going to be about?

What kinds of multiplication problems will be in the story?

What strategies will you use to find the answer to these multiplication problems?

Step 3: Carry Out the Plan

Write the pages of your story. Show how you solved the multiplication problems.

Step 4: Look Back

How do you know you made multiplication problems in your book?

9.10 Creating Multiplication Problems

Student Book page 341

GOAL

Create and solve multiplication problems.

You will need

- pencil
- crayons



Problem

Alec wrote a page for a book about multiplication.

He included a picture and a multiplication story.

He also wrote a multiplication fact.

His story told the answer to the problem.



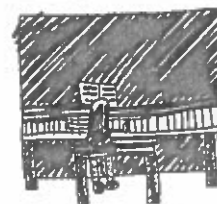
How can you create a story about multiplication?

Hint: First think of equal groups of things for a story.

Write the multiplication fact that goes with your story.

Write your story.

End your story with the answer to the multiplication problem.



$$7 \times 15$$

Kelly practised piano 15 minutes

a day every day of the week.

That makes 105 minutes.

Chapter 9
Lesson 10**Creating Multiplication Problems****GOAL**

Create and solve multiplication problems.

1. Fill in the blanks to write your own multiplication problems.

a) _____ \times 26

Diane made 26 cookies every day. How many cookies did she make in _____ days?

Diane made _____ cookies.

b) $3 \times$ _____

Ken earns \$_____ every week.
How much does he earn in 3 weeks?

Ken earns \$_____ in 3 weeks.

c) _____ \times _____

Jade made _____ necklaces with _____ beads in each necklace. How many beads did Jade use?

Jade used _____ beads.

2. Write a multiplication problem that uses the numbers 4 and 213. Solve your problem.
- _____

At-Home Help

Follow these steps to create your own multiplication problem.

Step 1 Think of 2 numbers to multiply (e.g., 125×4).

Step 2 Write a problem using your 2 numbers (e.g., There are 125 raisins in a bag. How many raisins are in 4 bags?).

Step 3 Solve your problem (e.g., 500 raisins are in 4 bags).

Chapter 9

Test Yourself

Circle the correct answer.

1. What is the product? $5 \times 300 =$ 

A. 1100

B. 1200

C. 1500

D. 1800

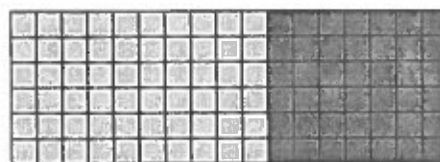
2. Which number sentence does this array show?

A. $6 \times 10 = 60$

B. $6 \times 17 = 6 \times 10 + 6 \times 7$

C. $7 \times 12 = 7 \times 10 + 7 \times 2$

D. $10 \times 60 = 600$



3. What is the expanded form of 853?

A. $800 + 50 + 3$

B. $85 + 30$

C. $8 + 5 + 3$

D. $8 \times 5 \times 3$

4. Matt made 6 models. Each model used 29 small sticks. About how many small sticks did Matt use?

A. 220

B. 180

C. 120

D. 300

5. Jade used 521 beads for each of 4 necklaces. How many beads did she use?

A. 2840

B. 2804

C. 2484

D. 2084







6. Which multiplication equation does this model show?

A. 3×236

B. 3×136

C. 136×2

D. 1×266

Hundreds	Tens	Ones
		
		

Chapter 9 Test Page 1

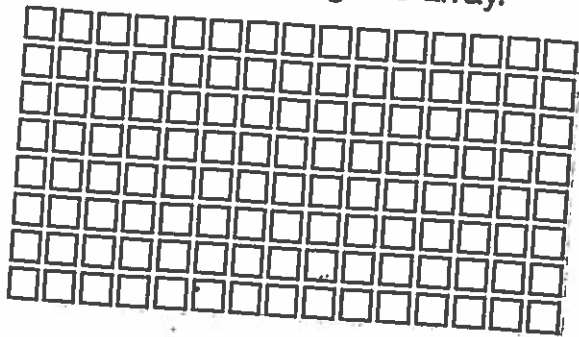
1. What is the missing number?

a) $400 = \underline{\quad} \times 100$

b) $\underline{\quad} \times 70 = 490$

c) $\underline{\quad} \times 500 = 1500$

2. Mika multiplied using this array.



a) What multiplication does the array show? _____

b) Split the array to show 2 smaller arrays. What is the multiplication sentence? _____

c) Write the product. Calculate and show your work. _____

3. Patti's hip hop class has 34 dancers. Each dancer sold 5 raffle tickets.

How many raffle tickets did the dance class sell altogether? Show your work! _____

4. Would you estimate or calculate? Why?

If you would estimate, explain how.

a) One shelf holds 400 CDs. How many CDs are on 3 shelves? _____

b) Jody is reading a book that has 108 pages. Dar is reading a book that has about 4 times as many pages. About how many pages does Dar's book have? _____

Name: _____

Date: _____

Chapter 9 Test Page 2

5. Multiply. Explain your choice of method. (Show process/work)

a) 6×50

b) 7×412

c) 8×499

d) 3×668

19

6. Derek brushes his teeth 3 times a day. Use regrouping (old school) strategy. How many times does he brush his teeth in 1 year?

7. Calculate. Use the expanded multiplication strategy

a) 4×73

b) 5×29

c) 7×361

d) 8×333

8. A car is travelling 88 km in 1 hour. How far does the car travel in 8 hours? Show your work.

9. Ali is fencing off a square field for her goats. Each side of the field is 125 m long. What is the length of the fence? Use base ten blocks to solve.

Thousands	Hundreds	Tens	Ones

4