L Name: _____ Date: _____

6.1 Multiplication Strategies Page 1

Student Book pages ~~176–179~~ 310

GOAL

Multiply one-digit numbers using mental math strategies.

You will need

- counters
- a blank multiplication table

Owen swims 6 days a week.

How many days does Owen swim in February?

February has 4 weeks.

Owen swims _____ times a week.

The total number of days is 4 × _____.

There are different ways to solve this problem.

First way: Skip counting

Start with 2 × 6 = 12.

Skip count by 6 two times to get to 4 × 6.

+6 +6

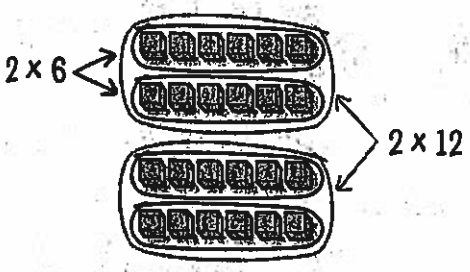
12 ___ ___

Owen swam _____ days in February.

Second way: Doubling

Start with 2 × 6.

Then double the groups.



1 group of 6 is 1 × 6 = _____.

2 groups of 6 is 2 × _____ = _____.

4 groups of 6 is _____ × _____ = _____.

Owen swam _____ days in February.

L Name: _____ Date: _____

6.1 Multiplication Strategies Page 2

Third way: Using known multiplication facts

Suppose that February had 5 weeks.

You know that $5 \times 6 = 30$.

However, February has 4 weeks.

4 is _____ less than 5, so there are _____ $\times$ 6 = _____ fewer swim days.

$4 \times 6 = 30 -$ _____

$4 \times 6 =$ _____

Owen swam _____ days in February.

Reflecting

Owen related 4×6 to 2×6.

How can you relate 4×6 to 3×6 instead?

Hint: $3 \times 6 = 18$.

Ami doubled 2×6 to get 4×6. What other multiplication facts can you calculate by doubling?

C&P Name: _____ Date: _____

6.1 Multiplication Strategies Page 1

Student Book pages ~~178-179~~ 30

Checking

You will need

- counters

- a blank multiplication table

1. a) Calculate 7 × 3 in 2 ways.

First way:

Use 1 × 3 = _____.

Skip count by 3s.

3, 6, _____, _____, _____, _____, _____

7 × 3 = _____

Second way:

Use 3 × 3 = _____.

Skip count by 3s.

9, _____, _____, _____, _____

7 × 3 = _____

b) Calculate 6 × 6 using 3 × 6.

3 × 6 = _____

Double your answer.

2 × _____ = _____

6 × 6 is the same as the double of 3 × 6.

6 × 6 = _____

Communication Tip

You can say "double" to mean the same as "multiply by 2."

2. Aaron practises piano 5 times a week.

How many times did he practise in February?

February has 4 weeks.

The number of times he practised is 4 × _____.

I know 2 × 5 = _____, so I can double _____ to calculate 4 × 5.

4 × 5 = _____

C&P Name: _____ Date: _____

9.1 Multiplication Strategies Page 2

Practising

3. Describe a strategy for calculating each product.

Then write the product.

a) 7×6

I know $5 \times 6 =$ _____, so I can skip count by 6s from _____.

_____, _____, _____

$7 \times 6 =$ _____

Another strategy I can use is _____

_____.

b) 6×5

I know $3 \times 5 =$ _____, so I can double _____ to calculate 6×5.

$6 \times 5 =$ _____

Another strategy I can use is _____

_____.

8. There are 7 days in a week.

How many days are in 8 weeks?

Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
						
Walk the dog.	Do math homework.	Play soccer.	Help with supper.	Have piano lesson.	Go to BBQ in park.	Swim in pool.

I need to calculate _____ × _____.

I know _____, so I can _____

_____.

Name: _____ Date: _____

Chapter 6 Lesson 1

Multiplication Strategies

GOAL

Multiply one-digit numbers using mental math strategies.

1. Calculate.

a) $3 \times 5 =$ _____ **c)** $8 \times 2 =$ _____

b) $4 \times 7 =$ _____ **d)** $6 \times 5 =$ _____

2. Use doubling to calculate.

a) $2 \times 4 =$ _____, so $4 \times 4 =$ _____

b) $3 \times 3 =$ _____, so $3 \times 6 =$ _____

3. Use each fact to calculate. The first one is partly done for you.

a) $5 \times 5 = 25$, so 5×6 is the same as

25 + 5 = _____

b) $2 \times 7 = 14$, so 3×7 is the same as

_____

c) $8 \times 4 = 32$, so 8×3 is the same as

_____

4. Calculate.

a) $2 \times 9 =$ _____ **b)** $5 \times 7 =$ _____ **c)** $6 \times 4 =$ _____

5. a) Four students are in Justine's reading group. Each student has three books. How many books do they have in all?

b) Describe how you calculated the answer.

_____

At-Home Help

Here are some strategies to help you multiply. For example, suppose you don't know the product of 4×5.

Skip counting up

You can use a known fact like $2 \times 5 = 10$. Skip count up by adding two groups of 5.

+5 +5

10, 15, 20

Skip counting down

You can use a known fact like $5 \times 5 = 25$. Skip count down by subtracting one group of 5.

$25 - 5 = 20$

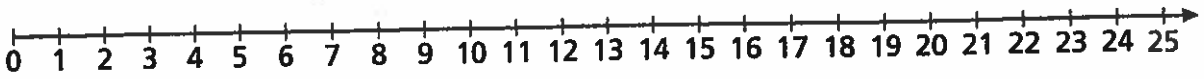
Doubling

You can double 5 to get $2 \times 5 = 10$, and then double again to get $4 \times 5 = 20$.

Name: _____ Date: _____

Chapter 9: Multiplying Multi-Digit Numbers

1. a) Skip count forward by 3s to 24. Use the number line.



b) How many 3s did you count? _____

c) $8 \times 3 =$ _____

d) $8 \times 6 =$ _____

2. Write a multiplication sentence for each.

a) $8 + 8 + 8 + 8 + 8 + 8$ _____ = _____

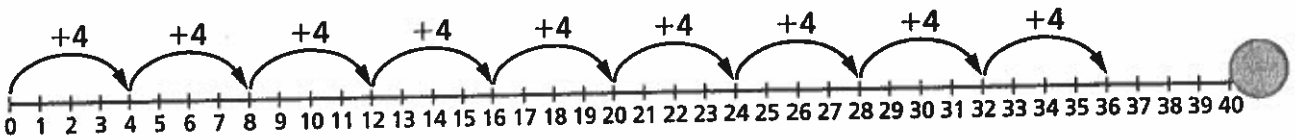
b) 4 groups of 7 _____ = _____

c) $9 + 9 + 9 + 9$ _____ = _____

d) 5 groups of 6 _____ = _____

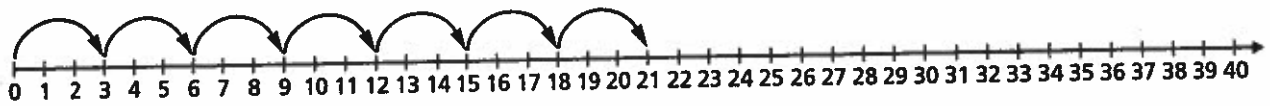
3. What multiplication does each number line show?

a)



9 × _____ = _____

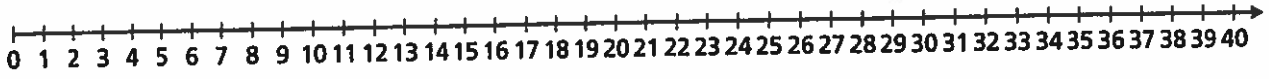
b)



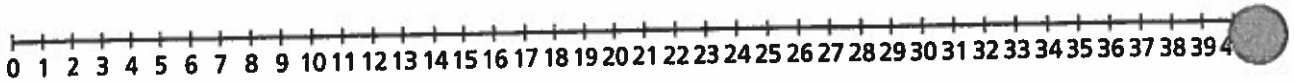
_____ × _____ = _____

4. Show each multiplication on a number line. Write the product.

a) $8 \times 5 =$ _____



b) $6 \times 6 =$ _____



64

L Name: _____ Date: _____

9.2 Multiplying 10s and 100s Page 1

Student Book pages 312–313

GOAL

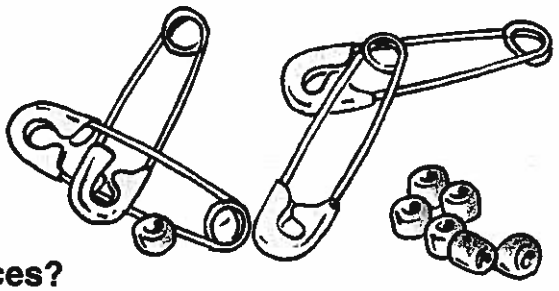
Use patterns to multiply 10s and 100s.

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.



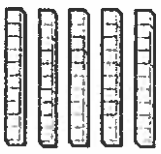
How many does she need to make 5 necklaces?

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.

L Name: _____ Date: _____

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 × 1 hundred = 1 hundred	100
2	2 × 1 hundred = 2 hundreds	200
3		
4		
5		500

Number of necklaces		Number of pins
1	1 × 1 ten = 1 ten	10
2	2 × 1 ten = 2 tens	20
3		
4		
5		50

Reflecting

What patterns do you see in your tables?

_____

_____

_____

_____

C&P Name: _____ Date: _____

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

Checking

1. How many beads and pins does Diane need for 7 bracelets?

Step 1: Each bracelet needs 100 beads.

Use base ten blocks to help fill in the chart below.

Number of bracelets		Number of beads
1	1 × 1 hundred = _____	
2	2 × 1 hundred = _____	
3	3 × 1 hundred = _____	
4		
5		
6		
7		

Step 2: Each bracelet needs 50 pins.

Use base ten blocks to help fill in the chart below.

Number of bracelets		Number of pins
1	1 × 5 tens = _____ tens	
2	2 × 5 tens = _____ tens	
3	3 × 5 tens = _____ tens	
4		
5		
6		
7		

Diane needs _____ beads and _____ pins to make 7 bracelets.

C&P Name: _____ Date: _____

9.2 Multiplying 10s and 100s Page 2

Practising

2. Multiply.

a) $7 \times 10 =$ _____ $\times$ 1 ten
$=$ _____ tens
$=$ _____

b) $3 \times 40 =$ _____ $\times$ _____ tens
$=$ _____ tens
$=$ _____

c) $50 \times 4 =$ _____ tens $\times$ _____
$=$ _____ tens
$=$ _____

d) $9 \times 200 =$ _____ $\times$ _____ tens
$=$ _____ tens
$=$ _____

4. Find the missing number.

a) $400 =$ _____ $\times 100$

b) $60 =$ _____ $\times 10$

c) $80 =$ _____ $\times 10$

d) $700 = 7 \times$ _____

Hint: Think of equal groups of tens and hundreds.

Name: _____ Date: _____

Chapter 8 Lesson 2

Multiplying 10s and 100s

GOAL

Use patterns to multiply 10s and 100s.

1. Multiply.

a) $4 \times 1 =$ _____
$4 \times 10 =$ _____
$4 \times 100 =$ _____

b) $4 \times 2 =$ _____
$4 \times 20 =$ _____
$4 \times 200 =$ _____

c) $4 \times 5 =$ _____
$4 \times 50 =$ _____
$4 \times 500 =$ _____

2. Multiply.

a) $5 \times 10 =$ _____
b) $60 \times 3 =$ _____
c) $8 \times 100 =$ _____
d) $70 \times 4 =$ _____

e) $2 \times 200 =$ _____
f) $9 \times 30 =$ _____
g) $500 \times 5 =$ _____
h) $40 \times 6 =$ _____

i) $7 \times 300 =$ _____
j) $90 \times 4 =$ _____
k) $10 \times 6 =$ _____
l) $4 \times 800 =$ _____

3. Kate found four $100 bills.
How much money did she find?

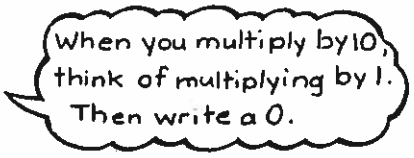
4. Lang is building a model of the school using blocks.
He bought 8 sets of 30 blocks.
How many blocks does he have in total?

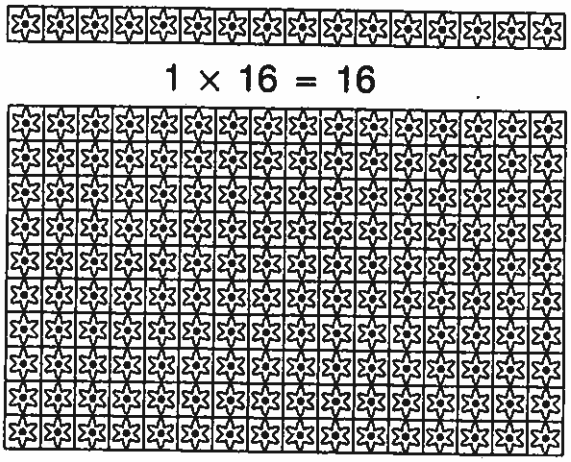
Multiplying by 10

Name _____

Multiply 10 × 16.

Think: 1 × 16 = 16, so
10 × 16 = 160





1 × 16 = 16

10 × 16 = 160

Complete each sentence.

1. Since I know 23 × 1 = 23,
   I also know 23 × 10 = 230.

2. Since I know 45 × 1 = _____,
   I also know 45 × 10 = _____.

3. Since I know 98 × 1 = _____,
   I also know 98 × 10 = _____.

4. Since I know 1 × 36 = _____,
   I also know 10 × 36 = _____.

5. Since I know 60 × 1 = _____,
   I also know 60 × 10 = _____.

6. Since I know 1 × 72 = _____,
   I also know 10 × 72 = _____.

Multiply these pairs of factors.

7. 85 × 1 = _____
   85 × 10 = _____

8. 38 × 1 = _____
   38 × 10 = _____

9. 572 × 1 = _____
   572 × 10 = _____

10. 1 × 443 = _____
    10 × 443 = _____

11. 20 × 1 = _____
    20 × 10 = _____

12. 1 × 76 = _____
    10 × 76 = _____

Multiply.

13. 10 × 35 = _____

14. 69 × 10 = _____

15. 546 × 10 = _____

16. 41 × 10 = _____

17. 10 × 768 = _____

18. 10 × 80 = _____

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 x 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 x 10 for the first week, which is 60. The second week is 6 x 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 x 100?

Name: _____ Date: _____

Multiplication Patterns

Find the products.

1. $10 \times 8 =$ _____
2. $10 \times 80 =$ _____
3. $100 \times 8 =$ _____
4. $1{,}000 \times 8 =$ _____
5. $4 \times 40 =$ _____
6. $400 \times 40 =$ _____
7. $1 \times 400 =$ _____
8. $40 \times 40 =$ _____
9. $9 \times 10 =$ _____
10. $90 \times 10 =$ _____
11. $9 \times 20 =$ _____
12. $90 \times 20 =$ _____
13. $900 \times 20 =$ _____
14. $20 \times 50 =$ _____
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.

L Name: _____ Date: _____

9.3 Multiplying Using Arrays Page 1

Student Book pages 314–317

GOAL

Use arrays to visualize easier ways to multiply.

You will need

- grid paper
- pencil crayons

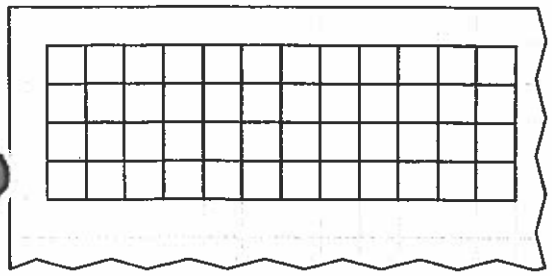
Problem

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.



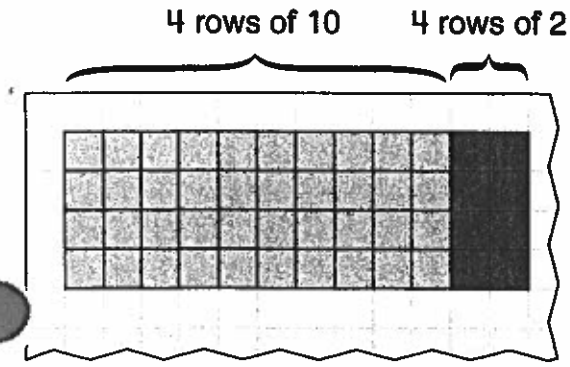
Step 2: 4×12 tells the number of spaces.

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.



L Name: _____ Date: _____

9.3 Multiplying Using Arrays Page 2

Step 3: 4 rows of 10 = 4 × 10

4 rows of 2 = 4 × 2

Use 4 × 10 + 4 × 2 to calculate 4 × 12.

4 × 12 = 4 × 10 + 4 × 2

4 × 12 = _____ + _____

4 × 12 = _____

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?

_____

_____

_____

_____

Name: _____ Date: _____

Chapter 9 Lesson 3

Multiplying Using Arrays

GOAL

Use arrays to visualize easier ways to multiply.

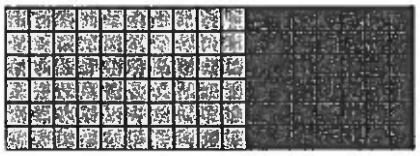
1. Fill in the blanks.

a) 

$3 \times 14 = 3 \times 10 + 3 \times$ ____

$3 \times 14 =$ _____ + _____

$3 \times 14 =$ _____

b) 

$6 \times 17 = 6 \times 10 + 6 \times$ ____

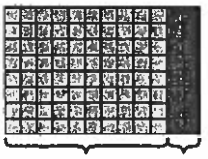
$6 \times 17 =$ _____ + _____

$6 \times 17 =$ _____

At-Home Help

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

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

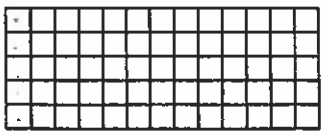


8 rows of 10 | 8 rows of 2
$8 \times 10 = 80$ | $8 \times 2 = 16$

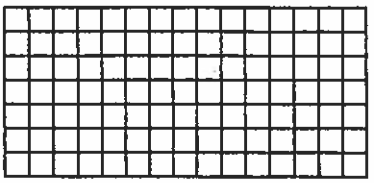
$8 \times 12 = \underline{8 \times 10} + \underline{8 \times 2}$
$8 \times 12 = 80 + 16$
$8 \times 12 = 96$

2. Sketch arrays to help you multiply.

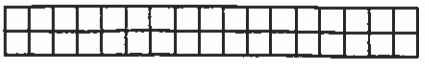
a) $5 \times 13 =$ _____



b) $7 \times 15 =$ _____

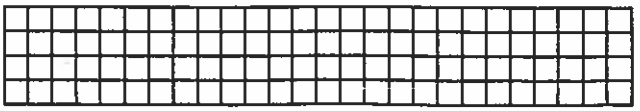


c) $2 \times 17 =$ _____



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

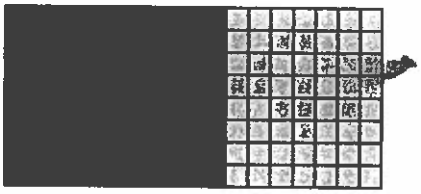
$4 \times 26 = 4 \times 20 + 4 \times 6$



Multiplying with Arrays

Goal **Use easier numbers to simplify multiplication.**

1. A kitchen floor has 8 rows and 17 columns of tiles. These arrays show 8×17 by showing $8 \times 10 + 8 \times 7$.



$8 \times 17 =$ _____ + _____

$8 \times 17 =$ ____ + ____

$8 \times 17 =$ ____

At-Home Help

Using easier numbers to multiply is useful when one factor is greater than 10.

$3 \times 18 = 3 \times 10 + 3 \times 8$
$3 \times 18 = 30 + 24$
$3 \times 18 = 54$

Or using other easier facts:

$3 \times 18 = 3 \times 9 + 3 \times 9$
$3 \times 18 = 27 + 27$
$3 \times 18 = 54$

2. Complete.

a) $2 \times 56 = 2 \times 50 + 2 \times 6$

$2 \times 56 =$ ____ + ____

$2 \times 56 =$ ____

b) $5 \times 14 = 5 \times 7 + 5 \times$ ____

$5 \times 14 =$ ____ + ____

$5 \times 14 =$ ____

c) $4 \times 29 = 4 \times$ ____ + $4 \times$ ____

$4 \times 29 =$ ____ + ____

$4 \times 29 =$ ____

d) $6 \times 22=$ ____ $\times$ ____ + ____ $\times$ ____

$6 \times 22 =$ ____ + ____

$6 \times 22 =$ ____

3. Find each product.

a) 9×18

b) 7×12

c) 4×19

d) 8×33

L Name: _____ Date: _____

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

_____ × 3

Thousands	Hundreds	Tens	Ones

Step 1: 5 tens × 3 = _____

Step 2: 4 ones × 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.

L Name: _____ Date: _____

9.4 Modelling Multiplication Page 2

Reflecting

How does grouping tens and ones help you with multiplication?

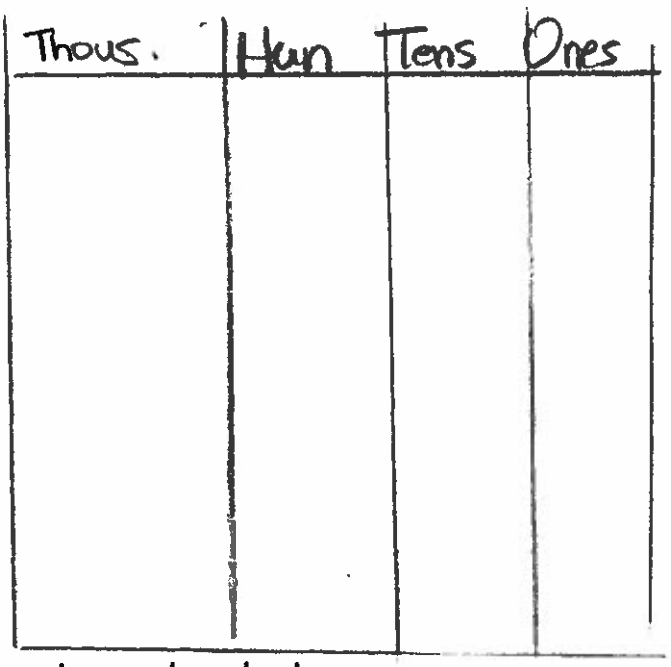
_____

_____

_____

_____

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.

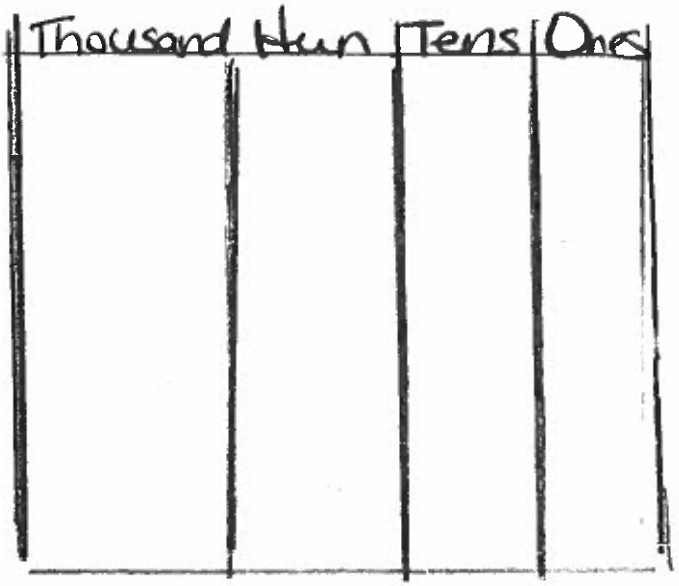
Step 1: *Expand*

32 is ____ tens + 2 ones
× 4 _____ × 4

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*

32 is 3 tens + 2 ones
× 4 _____ × 4
____ tens
+ ____ ones
_____

Sam served _____ pieces of salmon.

Chapter 9

Lesson 4

Name: _____ Date: _____

Multiplying Using Expanded Form

GOAL

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

1. Multiply.

a) $5 \times 22 =$ ☐

$$\begin{array}{r} 20 + 2 \\ \times\ 5 \\ \hline \end{array}$$

b) $3 \times 64 =$ ☐

$$\begin{array}{r} 60 + 4 \\ \times\ 3 \\ \hline \end{array}$$

2. Multiply using expanded form.

a) 2×19 **c)** 5×33 **e)** 4×26

b) 3×51 **d)** 6×82 **f)** 2×48

3. Michael's school has 7 classrooms. There are 23 students in each class. How many students are at the school?

At-Home Help

You can use expanded form to multiply 2-digit numbers by 1-digit numbers. For example:

I want to know 4×36.

36 is the same as 30 + 6, or 3 tens + 6 ones.
I will multiply each part separately by 4.

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

$4 \times 36 = 144$

Multiplying in Expanded Form

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

1. Complete.

a) 46×9

4 tens + 6 ones
× 9

36 tens + 54 ones
41 tens + 4 ones

_____

b) 89×5

8 tens + 9 ones
× 5

40 tens + _____

_____

_____

c) 78×9

70 + 8
× 9

630
+ 72

_____

d) 36×8

30 + 6
× 8

_____

+ _____

_____

At-Home Help

The **expanded form** of 28 is 2 tens + 8 ones or 20 + 8.

2. Stanley can display 37 models on 1 shelf. How many models can he display on 4 shelves?

3. Circle the letter that is a reasonable estimate for 96×5.

A. more than 450 **B.** less than 450 **C.** less than 45 **D.** less than 30

Explain how you know.

L Name: _____ Date: _____

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.

$8 \times 10 =$ _____

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.

$5 \times 7 =$ _____

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

L Name: _____ Date: _____

9.5 Estimating Products Page 2

Use easier numbers to estimate the products.

$7 \times 9 =$ _____

Change the fact to $7 \times 10 =$ _____.

7×9 is a little less than _____.

$8 \times 6 =$ _____

Change the fact to _____ × _____ = _____.

8×6 is _____.

$11 \times 4 =$ _____

Change the fact to _____ × _____ = _____.

11×4 is _____.

$9 \times 6 =$ _____

Change the fact to _____ × _____ = _____.

9×6 is _____.

Reflecting

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

_____

_____

_____

_____

Name: _____ Date: _____

Chapter 9 Lesson 5

Estimating Products

GOAL

Choose when and how to estimate.

1. Estimate each product. Show your work.

a) 5×44 _____

b) 8×62 _____

c) 9×28 _____

d) 7×31 _____

e) 3×82 _____

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?

Multiplying with an Algorithm

Goal **Multiply using a procedure.**

1. Estimate each product.

a) 139×9

b) 358×8

c) 729×2

d) 298×5

e) 498×6

At-Home Help

One multiplication **algorithm**, or **procedure** to multiply, is this:

$$\begin{array}{r} {\scriptstyle 3\,2} \\ 174 \\ \times\ 5 \\ \hline 870 \end{array}$$

Because
4 ones $\times$ 5 = 20,
or 2 tens **0 ones.**
7 tens $\times$ 5 + 2 tens more =
350 + 20 = 370, or
3 hundreds **7 tens.**
1 hundred $\times$ 5 + 3 hundreds
more = 500 + 300 = 800,
or **8 hundreds.**

2. You should have 3 estimates that are 1500 or less. Calculate their products.

3. Estimate and then calculate.

a) $\begin{array}{r} 396 \\ \times\ 7 \\ \hline \end{array}$

b) $\begin{array}{r} 629 \\ \times\ 5 \\ \hline \end{array}$

Name: _____ Date: _____

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?

_____

_____

Name: _____ Date: _____

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?

Chapter 9 Lesson 6

Name: _____ Date: _____

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?

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

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?

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.

Communicate About Solving Problems

Goal **Explain your thinking when solving a problem.**

1. Name the steps that Chantal used to solve this problem.
Chantal's baby brother is 17 weeks old.
How many days old is he?

Step 1 _____

My brother is 17 weeks old.
I know there are 7 days in 1 week.

Step 2 _____

I will multiply 17 and 7.

Step 3 _____

$$\begin{array}{r} 10 + 7 \\ \times\ 7 \\ \hline 70 \\ +\ 49 \\ \hline 119 \end{array}$$

My brother is 119 days old.

Step 4 _____

If my brother were 20 weeks old, he would be 140 days old.
So 119 days is reasonable for 17 weeks old.

At-Home Help

Problem solving involves
- understanding the problem
- making a plan to solve the problem
- carrying out the plan
- looking back to check

2. Show the steps as you solve each problem.

a) At a party there are 36 tables. Each table will have 5 balloons. How many balloons will there be in all?

b) It rained for 3 days. How many hours did it rain?

L Name: _____ Date: _____

9.7 Multiplying 2-Digit Numbers Page 1

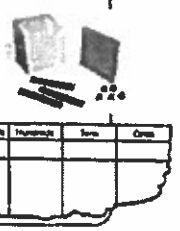
Student Book pages 330–332

GOAL

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

You will need

- base ten blocks
- a place value chart



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 × 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.

Hundreds	Tens	Ones
		

$$\begin{array}{r} 14 \\ \times\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 10 + 4 \\ \times\ 4 \\ \hline \end{array}$$

L Name: _____ Date: _____

9.7 Multiplying 2-Digit Numbers Page 2

Step 3: Multiply to show the number of tens first.

```
  14        10 + 4
× 4       ×    4
          ------
          40      (number of tens)
        + ____
          ____
```

Step 4: Complete the multiplication.

```
  14        10 + 4
× 4       ×    4
          ------
          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.

C&P Name: _____ Date: _____

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

× 5 × 5

Make 5 groups of _____ with base ten blocks.

Do not regroup.

Fill in the rest of the question.

300 + 20 + 7

× 5

1500 (number of hundreds)

100 (number of tens)

+ _____ (number of ones)

(total altogether)

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

Remember, do not regroup.

327

× 5

35 (number of ones)

(number of tens)

+ _____ (number of hundreds)

(total altogether)

C&P Name: _____ Date: _____

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 × _____ = _____.

986
× 3

(number of hundreds)
(number of tens)
+ (number of ones)
(total altogether)

b) 5 × 181

181 is close to 2 so I can estimate by multiplying 5 × _____ = _____.

181
× 5

+

c) 7 × 332

332 is close to so I can estimate by multiplying 7 × _____ = _____.

332
× 7

+

Name: _____ Date: _____

Chapter 9 Lesson 7

Multiplying 3-Digit Numbers

GOAL

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

1. Multiply.

a) $3 \times 242 = \blacksquare$

$200 + 40 + 2$

$\times 3$

b) $2 \times 567 = \blacksquare$

$500 + 60 + 7$

$\times 2$

2. Multiply.

a) 2×122 **c)** 3×254 **e)** 4×197

b) 5×316 **d)** 6×624 **f)** 2×472

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

a) **c)** **e)**

b) **d)** **f)**

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.

$300 + 20 + 1$

$\times 4$

1200

80

$+ 4$

1284

$4 \times 321 = 1284$

Multiplying 3 Digits by 1 Digit

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

1. Complete.

372 × 3 is about

_____

300 + 70 + 2
× 3
_____

At-Home Help

Estimating helps you to check that your answers are reasonable.

298 × 5 is about 300 × 5, or 1500.

200 + 90 + 8
× 5
_____
1000
450
+ 40
_____
1490

2. A bottle of vitamins contains 120 tablets.
How many tablets are in 8 bottles?
Circle the most reasonable estimate.

A. more than 800 **B.** less than 800 **C.** more than 1600 **D.** more than 80

Explain how you know.

3. Connor's family's cable bill is $126 every 2 months.

a) Estimate how much they pay in 1 year.

b) Calculate how much they pay in 1 year.

4. Jasmine often visits her grandmother on weekends.
It is 247 km there and back.

a) Create a 1-digit by 3-digit multiplication problem about Jasmine's visits.

b) Estimate the answer.

c) Calculate the answer.

L Name: _____ Date: _____

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.

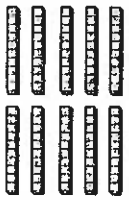
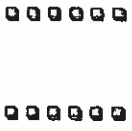
Step 1: Estimate 2×56 first.

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
		

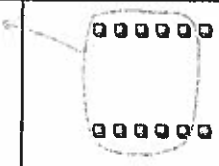
$2 \times 56 =$ __

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

Step 3: There are 2×6 ones.

$2 \times 6 = 12$

Regroup 12 ones as 1 ten, 2 ones.

Hundreds	Tens	Ones
		

$2 \times 56 =$ __

$$\begin{array}{r} {\scriptstyle 1} \\ 5\ 6 \\ \times\quad 2 \\ \hline 2 \end{array}$$

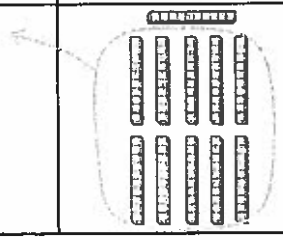
L Name: _____ Date: _____

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
		

2 × 56 = __

1	1	
	5	6
×		2
	1	2

Step 5: Add.

100 + 10 + 2 = _____

2 × 56 = _____

So, Pedro has _____ cards.

Reflecting

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

_____

_____

_____

_____

b)

	2	6	0	
	x		5	

c)

	2	9	3	
	x		6	

d)

	4	2	9	
	x		4	

Name: _____ Date: _____

Chapter 9 Lesson 8

Multiplying Another Way

GOAL

Multiply, regrouping as you go.

1. Multiply by regrouping.

a) $\overset{+1}{4}3 \times 5$

b) 152×4

c) 461×6

d) 243×5

e) 548×2

f) 617×7

g) 492×3

h) 129×5

i) 257×2

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.

$$\begin{array}{r} {\scriptstyle 2\,1} \\ 384 \\ \times\ 3 \\ \hline 1152 \end{array}$$

$3 \times 384 = 1152$

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

Thousands	Hundreds	Tens	Ones

b) Calculate the product.

$253 \times 3 =$

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.

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

Solve.

1)	$\begin{array}{r} {\scriptstyle +1\ \ } \\ 45 \\ \times\ 3 \\ \hline \end{array}$	$\begin{array}{r} 36 \\ \times\ 5 \\ \hline \end{array}$	$\begin{array}{r} 15 \\ \times\ 7 \\ \hline \end{array}$	$\begin{array}{r} 40 \\ \times\ 8 \\ \hline \end{array}$	$\begin{array}{r} 73 \\ \times\ 2 \\ \hline \end{array}$	$\begin{array}{r} 84 \\ \times\ 1 \\ \hline \end{array}$
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?

$$\begin{array}{r} 310 \\ \times\ 5 \\ \hline \end{array}$$

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? _____

L Name: _____ Date: _____

9.9 Choosing a Method for Multiplying Page 1

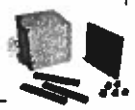
Student Book pages 338–340

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.

_____

_____

_____

L Name: _____ Date: _____

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?

_____

_____

_____

_____

Name: _____ Date: _____

Chapter 9 Lesson 9

Choosing a Method for Multiplying

GOAL

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

1. Jade can string 76 beads every hour. Which question could you answer by estimating?

A. How many beads can Jade string in 10 hours?

B. How many beads can Jade string in 12 hours?

C. Would Jade use more than 200 beads in 3 hours?

D. 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

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

a) A skateboard costs $325.
Can you buy 2 skateboards for $600? _____

b) Joshua earned 279 points at the school fair.
Diane earned 3 times as many points.
How many points did Diane earn? _____

c) Aneela can type 42 words in a minute.
How many words can she type in 5 minutes? _____

3. 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. _____

_____

_____

Choosing a Method to Multiply

Goal **Choose and justify a multiplication method.**

Use these facts in the questions below.

- The average Canadian consumes 25 kg of fresh fruit in juices in 1 year.
- The average Canadian child watches 884 hours of TV in 1 year.
- A small roast beef submarine sandwich has 954 kilojoules of energy.

At-Home Help

Look at the question to decide if an estimate will do.
Look at the numbers in a problem to decide if you can solve it mentally or if you need to use pencil and paper.

1. You want to find out how many kilograms of fresh fruit in juices a family of 6 consumes in 1 year. Would you use pencil and paper or mental math? Explain your choice. Solve the problem.

2. You want to find out about how many hours of TV a child would watch in 9 years. Would you estimate or do an exact calculation? Explain your choice. Solve the problem.

3. You want to find out how many kilojoules of energy a person would get from eating 1 small roast beef submarine sandwich each day for a week. Would you use pencil and paper or mental math? Why? Solve the problem.

C&P Name: _____ Date: _____

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?

_____

_____

L Name: _____ Date: _____

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.

7 x 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.

Name: _____ Date: _____

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) _____ × 26

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

Diane made _____ cookies.

b) 3 × _____

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

Ken earns $_____ in 3 weeks.

c) _____ × _____

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

Jade used _____ beads.

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).

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

_____

5 Multiplying 2-digit Numbers by 1-digit Numbers

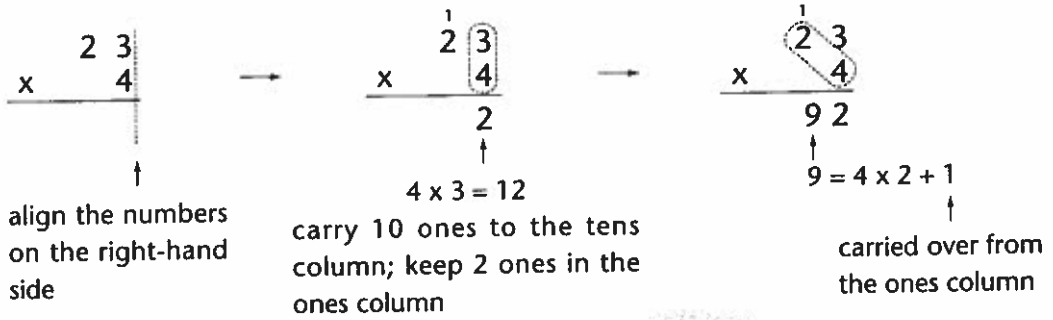
EXAMPLE

4 x 23 = ?

Long way:

```
  23   ← align the numbers on the right-hand side
x  4
----
  12   ← 4 x 3  = 12
  80   ← 4 x 20 = 80
----
  92   ← 12 + 80 = 92
```

Short way:



4 x 23 = 92

- To do vertical multiplication the short way:

  Align all the numbers on the right-hand side.

  Multiply the ones first.

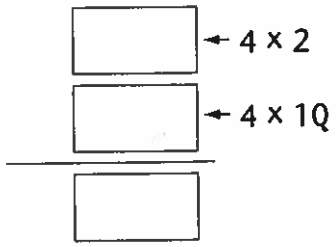
  Then multiply the tens.

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

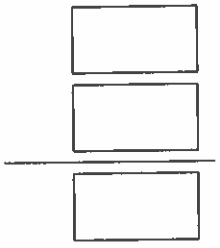
  Remember to add the tens carried over from the ones column after multiplying the tens digit.

Multiply the long way.

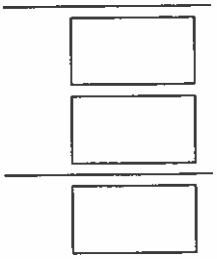
① 12 x 4



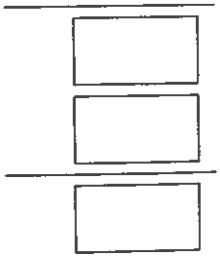
② 24 x 3



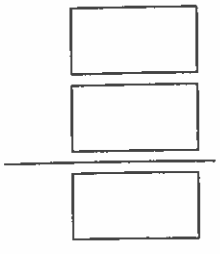
③ 32 x 4



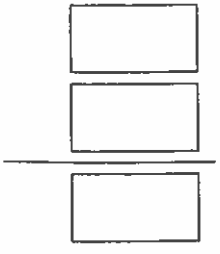
④ 19 x 5



⑤ 31 x 6



⑥ 47 x 6



Name: _____ Date: _____

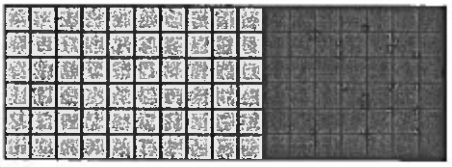
Chapter 9 Test Yourself

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.** $8 \times 5 \times 3$

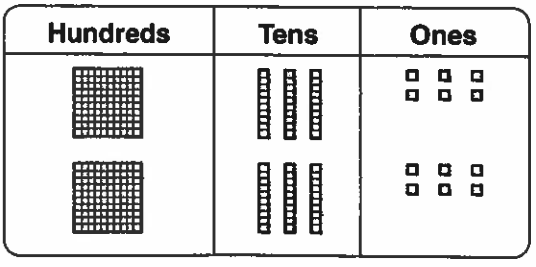
4. Matt made 6 models. Each model used 29 small sticks. About how many small sticks did Matt use?

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

Test Yourself

Circle the correct answer.

1. What are these base ten blocks modelling?

A. $140 \div 5$ **B.** 5×29 **C.** 29×4 **D.** $30 + 30 + 30 + 30 + 30$

2. Which multiplication equation is modelled by this array?

E. $4 \times 22 = 4 \times 20 + 4 \times 2$

F. $23 \times 4 = 20 \times 4 + 3 \times 4$

G. $4 \times 20 = 4 \times 10 + 4 \times 10$

H. $4 \times 20 = 2 \times 20 + 2 \times 20$

3. The array in Question 2 could be broken into other arrays. Which of these is possible?

A. $4 \times 9 + 4 \times 14$

B. $4 \times 11 + 4 \times 11$

C. $2 \times 23 + 2 \times 23$

D. $25 \times 4 + 3 \times 4$

4. Miki used expanded form. What problem was she solving?

$$\begin{array}{r} 100 + 20 + 9 \\ \times\ 7 \\ \hline 700 \\ 140 \\ +\ 63 \\ \hline 903 \end{array}$$

E. How many eggs are in 129 dozen?

F. How many weeks are in 129 days?

G. How many hours are in 7 days?

H. How many days are in 129 weeks?

5. Which estimate is the most reasonable for the product of 389×4?

A. 1200 **B.** 1600 **C.** 2000 **D.** 700

6. What is the product of 638×6?

E. 3828 **F.** 3688 **G.** 3728 **H.** 3888

7. The average Canadian eats 183 kg of vegetables in 1 year. How much does a family of 4 eat in 2 years?

A. 366 kg **B.** 732 kg **C.** 1464 kg **D.** 1098 kg