UNIT 3

STUDENT BOOK 1 LESSON

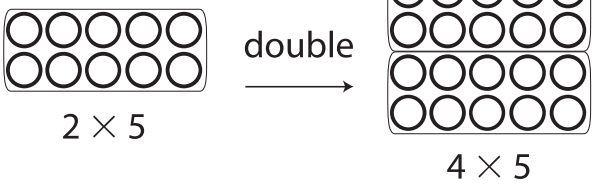
Using Doubles to Multiply

Quick Review

At Home At School

Doubling is a strategy you can use to multiply.

➤ Use doubling to multiply by 4.
To find 4×5:
First find 2×5, then double.
$2 \times 5 = 10$
$4 \times 5 = 20$



2×5 $\qquad$ 4×5

➤ Use repeated doubling to multiply by 8.
To find 8×3:
First find 2×3, then double, then double again.
$2 \times 3 = 6$
$4 \times 3 = 12$
$8 \times 3 = 24$

➤ Begin with a fact you know.
Double one of the factors, then multiply.
You know $3 \times 4 = 12$.
Double the factor 3, then multiply: $6 \times 4 = 24$ (double of 12)
Or, double the factor 4, then multiply: $3 \times 8 = 24$ (double of 12)
When you double a factor, the product doubles.

Try These

1. Use doubling to multiply.

a) $2 \times 7 = 14$
$4 \times 7 =$ _____

b) $4 \times 3 = 12$
$8 \times 3 =$ _____

c) $3 \times 5 = 15$
_____

2. Double one of the factors each time to get a product.
Then check the circle if the product is double the one in the box.

a) $4 \times 3 = \square$
_____ ○
_____ ○

b) $2 \times 5 = \square$
_____ ○
_____ ○

c) $5 \times 3 = \square$
_____ ○
_____ ○

Practice

1. Use doubling to multiply.

a) $2 \times 9 = 18$
$4 \times 9 =$ _____

b) $3 \times 3 = 9$
_____

c) $6 \times 5 =$ _____
_____

2. Find each product.

a) $2 \times 6 =$ _____
$4 \times 6 =$ _____
$8 \times 6 =$ _____

b) $2 \times 9 =$ _____
$4 \times 9 =$ _____
$8 \times 9 =$ _____

c) $2 \times 7 =$ _____
$2 \times 14 =$ _____
$2 \times 28 =$ _____

3. Use repeated doubling to multiply.

a) $8 \times 6 = \square$
_____
_____
_____
$8 \times 6 =$ _____

b) $8 \times 5 = \square$
_____
_____
_____
$8 \times 5 =$ _____

c) $9 \times 8 = \square$
_____
_____
_____
$9 \times 8 =$ _____

4. What could each missing number be?
Find as many answers as you can.

a) $\square \times \square = 18$

_____
_____
_____
_____

b) $\triangle \times \bigcirc = 36$

_____
_____
_____
_____

Stretch Your Thinking

Multiply.

1. $2 \times 2 =$ _____ $4 \times 2 =$ _____ $8 \times 2 =$ _____ $16 \times 2 =$ _____ $32 \times 2 =$ _____

2. $2 \times 5 =$ _____ $4 \times 5 =$ _____ $8 \times 5 =$ _____ $16 \times 5 =$ _____ $32 \times 5 =$ _____

UNIT 3

STUDENT BOOK 2 LESSON

Multiplying by 1, by 0, and by 10

At Home At School

Quick Review

Think: 5 groups of 1 is 5×1.

5	×	1	=	5
bowls		fish		fish in all

Also, $1 \times 5 = 5$

When 1 is a factor, the product is always the other factor.

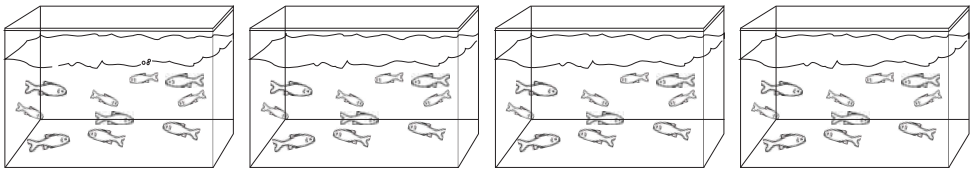
Think: 7 groups of 0 is 7×0.

7	×	0	=	0
bowls		fish		fish in all

Also, $0 \times 7 = 0$

When 0 is a factor, the product is always 0.

Think: 4 groups of 10 is 4×10.



4	×	10	=	40
tanks		fish		fish in all

Also, $10 \times 4 = 40$

When 10 is a factor, the product is always the other factor with a zero added.

Try These

Multiply.

1. **a)** $6 \times 1 =$ _____ **b)** $7 \times 1 =$ _____ **c)** $4 \times 1 =$ _____

2. **a)** $6 \times 0 =$ _____ **b)** $3 \times 0 =$ _____ **c)** $2 \times 0 =$ _____

3. **a)** $7 \times 10 =$ _____ **b)** $8 \times 10 =$ _____ **c)** $4 \times 10 =$ _____

Practice

1. Find each product.

a) $1 \times 4 =$ _____ **b)** $0 \times 0 =$ _____ **c)** $0 \times 7 =$ _____

d) $5 \times 10 =$ _____ **e)** $6 \times 0 =$ _____ **f)** $10 \times 6 =$ _____

g) $0 \times 4 =$ _____ **h)** $7 \times 10 =$ _____ **i)** $1 \times 1 =$ _____

2. Find each missing number.

a) $4 \times$ ____ $= 0$ **b)** ____ $\times 6 = 6$ **c)** $7 \times$ ____ $= 70$

d) ____ $\times 1 = 1$ **e)** ____ $\times 5 = 50$ **f)** ____ $\times 4 = 4$

g) $1 \times$ ____ $= 10$ **h)** ____ $\times 1 = 3$ **i)** $2 \times$ ____ $= 2$

3. Write + or ×.

a) 5 ____ $1 = 5$ **b)** 1 ____ $1 = 1$ **c)** 6 ____ $10 = 60$

d) 10 ___ $3 = 30$ **e)** 4 ____ $1 = 5$ **f)** 0 ____ $2 = 0$

g) 1 ____ $4 = 4$ **h)** 1 ____ $1 = 2$ **i)** 7 ____ $0 = 7$

4. Rico has 1 nickel, 5 dimes, and 7 pennies.
How much money does Rico have?
Show your work.

_____

_____

Stretch Your Thinking

Which is greater, the product of your age times 0 or the product of your age times 1? Explain.

_____

_____

_____

UNIT 3

STUDENT BOOK 3 LESSON

Using Skip Counting to Multiply

Quick Review

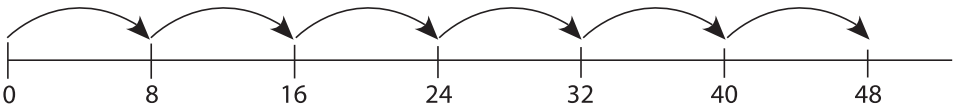
At Home At School

You can use skip counting patterns to multiply mentally.

➤ To find 6×8, skip count by 8 six times.

8, 16, 24, 32, 40, 48

These numbers are multiples of 8.



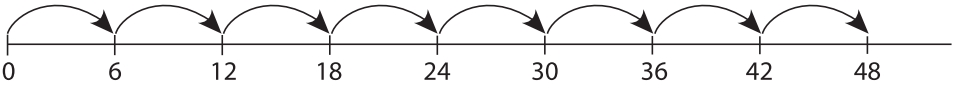
6 steps of 8 is 48.

$6 \times 8 = 48$

➤ Another way to find 6×8 is to skip count by 6 eight times.

6, 12, 18, 24, 30, 36, 42, 48

These numbers are multiples of 6.



8 steps of 6 is 48.

$6 \times 8 = 48$

Try These

1. Skip count to find the missing numbers.

a) 4, 8, 12, _____, _____, _____, _____

b) 9, 18, 27, _____, _____, _____, _____

c) 7, 14, 21, _____, _____, _____, _____

2. Skip count to find each product.

a) $5 \times 4 =$ _____ **b)** $3 \times 8 =$ _____ **c)** $4 \times 3 =$ _____ **d)** $9 \times 2 =$ _____

e) $7 \times 5 =$ _____ **f)** $3 \times 7 =$ _____ **g)** $6 \times 8 =$ _____ **h)** $8 \times 8 =$ _____

Practice

1. **a)** Use the hundred chart. Colour all the numbers in which the ones digit and the tens digit add up to 9.

b) What multiples have you coloured?

_____

_____

_____

Hundred Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

2. Play this game with 2 or 3 friends.

You will need:
2 sets of cards numbered 2 to 10
3 counters for each player
a small container

- ➤ Take 3 counters each.
- ➤ Shuffle the cards and put them in a pile face down.
- ➤ Turn over the top card. This is the number you will start with.
- ➤ Go around the group. Say one number each, counting on by the number on the card.
  The player who says 100 or a number over 100 puts a counter in the container.
  The next player turns over a new card and starts the counting.
- ➤ The first person to get rid of all 3 counters wins.

Stretch Your Thinking

1. **a)** In the game above, which start numbers will result in a player saying 100?

_____

b) Which start numbers will result in a player going over 100?

_____

UNIT 3

STUDENT BOOK 4 LESSON

Other Strategies for Multiplying

Quick Review

At Home At School

You can multiply by adding groups to the facts you know.

➤ Use facts with 2 to multiply by 3.
To find 3×9:

$2 \times 9 = 18$
$1 \times 9 = 9$ → $18 + 9 = 27$

So, $3 \times 9 = 27$

➤ Use facts with 5 to multiply by 6.
To find 6×8:

$5 \times 8 = 40$
$1 \times 8 = 8$ → $40 + 8 = 48$

So, $6 \times 8 = 48$

➤ Use facts with 5 and 2 to multiply by 7.
To find 7×6:

$5 \times 6 = 30$
$2 \times 6 = 12$ → $30 + 12 = 42$

So, $7 \times 6 = 42$

➤ Use facts with 10 to multiply by 9.
To find 9×8:

$10 \times 8 = 80$
$1 \times 8 = 8$ → $80 - 8 = 72$

So, $9 \times 8 = 72$

➤ To multiply by an even factor, use a half, and then double.
To find 8×7:
Half of 8 is 4.

$4 \times 7 = 28$
$28 \times 2 = 56$

So, $8 \times 7 = 56$

Try These

1. **a)** $3 \times 7 =$ ____ **b)** $3 \times 5 =$ ____ **c)** $3 \times 8 =$ ____

2. **a)** $6 \times 9 =$ ____ **b)** $6 \times 5 =$ ____ **c)** $6 \times 7 =$ ____

3. **a)** $7 \times 7 =$ ____ **b)** $7 \times 9 =$ ____ **c)** $7 \times 8 =$ ____

4. **a)** $9 \times 9 =$ ____ **b)** $9 \times 7 =$ ____ **c)** $9 \times 4 =$ ____

5. **a)** $6 \times 3 =$ ____ **b)** $8 \times 6 =$ ____ **c)** $4 \times 9 =$ ____

Practice

1. Name two facts that help you find each product.

a) 4×9 _____

b) 7×6 _____

c) 6×8 _____

d) 9×6 _____

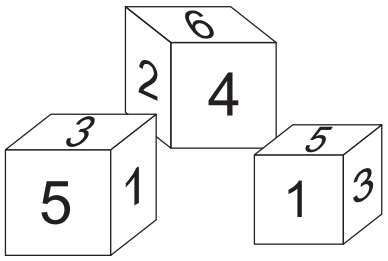
e) 4×8 _____

f) 8×7 _____

2. Show how you could use the product of 4×6 to find the product of 8×6.

_____

3. Play this game with a partner.



You will need:
3 number cubes labelled 1 to 6
2 calculators

- Take turns to roll all 3 number cubes.
  Put the one with the greatest number aside.
  If you roll more than one greatest number, put only one aside.
  Roll the other 2 number cubes.
  Put the one with the greater number aside.
  Roll the last number cube.
- Add the numbers on your first 2 cubes.
  Multiply the total by the number on your third cube.
  The product is your score.
- Keep playing until one player reaches a total of 200.

Stretch Your Thinking

Show how you could use a half, than double to find the product 6×9.

_____

UNIT 3

STUDENT BOOK 5 LESSON

Using Patterns in a Multiplication Chart

Quick Review

At Home At School

You can use patterns to remember multiplication facts.

➤ In a multiplication chart, there are matching numbers on each side of the diagonal from 1 to 81.

If you know... then you know:

$5 \times 7 = 35$ $7 \times 5 = 35$

$9 \times 8 = 72$ $8 \times 9 = 72$

×	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36	42	48	54
7	7	14	21	28	35	42	49	56	63
8	8	16	24	32	40	48	56	64	72
9	9	18	27	36	45	54	63	72	81

➤ There are patterns in the multiplication facts with 9.

- The digits in the product always add to 9.

  $5 \times 9 = 45$ ← $4 + 5 = 9$ $8 \times 9 = 72$ ← $7 + 2 = 9$

- The number multiplied by 9 is always 1 more than the tens digit in the product.

  6 $\times 9 =$ **5**4 ← 6 is 1 more than 5. **4** $\times 9 =$ **3**6 ← 4 is 1 more than 3.

Try These

1. Complete.

a) $8 \times 9 =$ ___ $\times 8$ **b)** $3 \times 7 = 7 \times$ ___ **c)** $6 \times 4 =$ ___ $\times 6$

2. Multiply.

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

d) $9 \times 8 =$ _____ **e)** $7 \times 9 =$ _____ **f)** $4 \times 9 =$ _____

g) $8 \times 9 =$ _____ **h)** $9 \times 7 =$ _____ **i)** $9 \times 4 =$ _____

Practice

1. Play this game with a partner.

You will need:
25 counters
2 calculators
paper and pencils

- ➤ Decide on a number from 2 to 9. This number will be the game factor.
- ➤ Player A: Place a counter on any number on the board and multiply by the game factor. Record the product as your score.
- ➤ Player B: Place a counter on a number adjacent to Player A's number. Multiply by the game factor and record your score.
- ➤ Continue playing. On each turn, place a counter next to the last one played. If an adjacent square is not empty, place the counter in any empty square.
- ➤ When the board is filled, the winner is the player with the highest total score.

When something is *adjacent* to something else, it is next to it.

1	7	8	4	2
5	8	3	6	4
0	3	4	7	1
2	7	2	9	5
9	1	6	3	0

Stretch Your Thinking

Suppose you are Player A. Where will you place the first counter? Explain.

UNIT 3

STUDENT BOOK 7 LESSON

Using Arrays to Divide

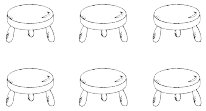
Quick Review

At Home At School

There are 6 stools.
They will be put into equal rows.
How many stools could be in each row?

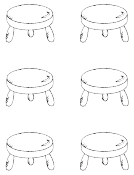
You can make an array to show each way.

2 rows of 3



2 rows of
3 stools
$6 \div 2 = 3$

3 rows of 2

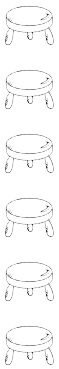


3 rows of
2 stools
$6 \div 3 = 2$

1 row of 6

1 row of
6 stools
$6 \div 1 = 6$

6 rows of 1

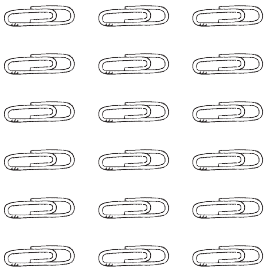


6 rows of
1 stool
$6 \div 6 = 1$

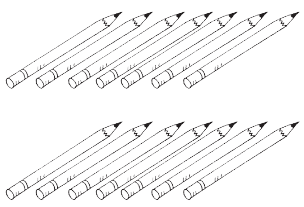
Try These

1. Use the array to complete the sentence.

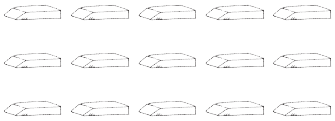
a) $18 \div 6 =$ _____



b) $14 \div 2 =$ _____



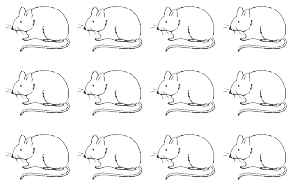
c) $15 \div 3 =$ _____



Practice

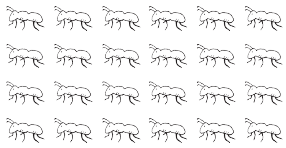
1. Write a division sentence for each array.

a)



_____

b)



_____

c)

_____

2. Draw an array for each division sentence.

a) 15 ÷ 5 = _____	**b)** 12 ÷ 2 = _____	**c)** 24 ÷ 6 = _____

3. Use counters. Make an array to find each answer.

a) 20 ÷ 4 = _____ **b)** 16 ÷ 2 = _____ **c)** 6 ÷ 1 = _____

d) 18 ÷ 9 = _____ **e)** 30 ÷ 5 = _____ **f)** 28 ÷ 7 = _____

Stretch Your Thinking

There are 24 members in the Boy Scout troop.
They will march in the parade in equal rows.
How many Boy Scouts could be in each row?
Find as many answers as you can.

_____

UNIT 3

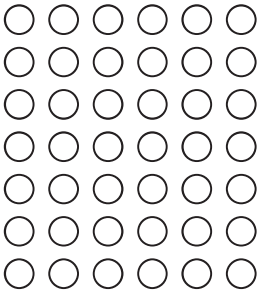
STUDENT BOOK 8 LESSON

Relating Multiplication and Division

Quick Review

At Home At School

There are 42 students who want to play hockey.
There are 6 players on a team.
How many teams can there be?



To find out, divide: 42 ÷ 6
Here are two ways to find 42 ÷ 6:

- Make an array of 42 counters with 6 counters in each row.
  There are 7 rows.
  So: 42 ÷ 6 = 7
  There can be 7 teams.
- You can think about multiplication to divide.
  Every division fact has a related multiplication fact.

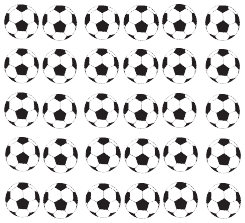
Think:

6 times which number is 42?
You know 6 × 7= 42.
So, 42 ÷ 6 = 7

Try These

1. Write a multiplication fact and a division fact for each array.

a)



_____

b)

_____

2. Use a related multiplication fact to help you divide. Write the related fact.

a) 20 ÷ 4 = _____

_____

b) 30 ÷ 5 = _____

_____

c) 14 ÷ 7 = _____

_____

Practice

1. Divide. Draw a picture to show your work.

24 ÷ 3 = _____	30 ÷ 5 = _____
18 ÷ 2 = _____	5 ÷ 5 = _____

2. Use a related multiplication fact to divide.

a) 18 ÷ 6 = _____ **b)** 45 ÷ 5 = _____ **c)** 56 ÷ 7 = _____ **d)** 35 ÷ 5 = _____

e) 24 ÷ 4 = _____ **f)** 27 ÷ 3 = _____ **g)** 12 ÷ 2 = _____ **h)** 9 ÷ 1 = _____

3. Write a division fact to solve each question.

a) 24 children
6 children on a team
How many teams?

_____

b) 18 cookies
9 cookies on a plate
How many plates?

_____

c) 42 cans
7 cans in each row
How many rows?

_____

Stretch Your Thinking

Find all the ways of dividing 36 students into equal teams.
Write a division fact to show each way.

_____

_____

_____

_____

UNIT 3

STUDENT BOOK 9 LESSON

Dividing by Numbers from 1 to 9

Quick Review

At Home At School

Here's how to divide by 8 and 9.

48 ÷ 8

8 × □ = 48

8 × 6 = 48

So, 48 ÷ 8 = 6

Also, 48 ÷ 6 = 8

Think multiplication.

Related Facts

48 ÷ 8 = 6

48 ÷ 6 = 8

6 × 8 = 48

8 × 6 = 48

63 ÷ 9

9 × □ = 63

9 × 7 = 63

So, 63 ÷ 9 = 7

Also, 63 ÷ 7 = 9

Think multiplication.

Related Facts

63 ÷ 9 = 7

63 ÷ 7 = 9

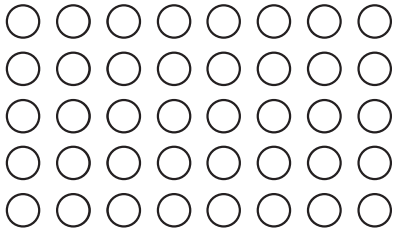
7 × 9 = 63

9 × 7 = 63

Try These

1. Write two multiplication facts and two division facts for each array.

a)



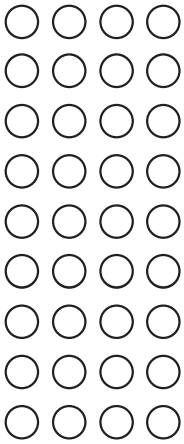
_____

_____

_____

_____

b)



_____

_____

_____

_____

2. Divide.

a) 27 ÷ 9 = _____ **b)** 16 ÷ 8 = _____

c) 45 ÷ 9 = _____ **d)** 64 ÷ 8 = _____

e) 36 ÷ 9 = _____ **f)** 32 ÷ 8 = _____

Practice

1. Find the product. Then write a related multiplication fact and two related division facts.

a) $3 \times 9 =$ _____

_____

_____

_____

b) $8 \times 5 =$ _____

_____

_____

_____

c) $9 \times 7 =$ _____

_____

_____

_____

2. Divide.

a) $49 \div 7 =$ _____ **b)** $81 \div 9 =$ _____ **c)** $45 \div 5 =$ _____

d) $27 \div 3 =$ _____ **e)** $56 \div 8 =$ _____ **f)** $36 \div 6 =$ _____

3. Write a division sentence to show each answer.

a) There are 28 days in February. How many weeks is that?

_____

b) There are 3 tennis balls in a carton.
How many cartons are needed for 27 balls?

_____

c) There are 54 students in the band. They march in 6 equal rows.
How many students are in each row?

_____

d) There are 9 kiwi fruit in a small basket.
A box contains 72 kiwi fruit in a single layer.
How many small baskets of kiwi fruit can be filled?

_____

Stretch Your Thinking

Complete this division sentence in as many ways as you can. $\square \div \square = 8$

_____

_____

UNIT 3

STUDENT BOOK 10 LESSON

Pose and Solve Problems

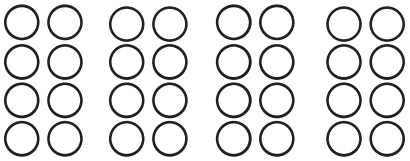
Quick Review

At Home At School

Thirty-two students signed up for swimming lessons.
The classes are taught in groups of 8.
How many classes will there be?

Here are 2 ways to find out.

➤ Use a model.
Use 32 counters.
Put them into groups of 8.
So, there will be 4 classes.



➤ Guess, then test.
Suppose you guess 5 classes.
Test: $5 \times 8 = 40$; that is too many students.
Guess again: $4 \times 8 = 32$; that is the correct number.
So, there will be 4 classes.

Try These

Use counters or guess, then test. Show your work.

1. Twenty-three students go on a camping trip.
Each tent holds 4 students.
How many tents will be needed?

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2. Ramzi has 4 cages of gerbils.
There are 5 gerbils in each cage.
How many gerbils does Ramzi have?

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Practice

1. Suri picked 72 apples. Each basket holds 9 apples.
How many baskets did she need?

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2. Enrico saw 16 bicycles and tricycles in the playground.
He counted a total of 36 wheels.
How many bicycles were there? How many tricycles?

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3. Use the data in the table.
Write a story problem you can solve using multiplication or division.
Solve your problem.

Product	Number in a Box
Tennis balls	3
Baseballs	6
Hockey pucks	4

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Stretch Your Thinking

Chase had 81 chickens. He sold an equal number of chickens to each of 3 customers and had 54 chickens left. How many chickens did Chase sell to each customer?

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