

MODULE 4

Multiplying Real Life Numbers

Karen bought 8 T-shirts at \$9.95 each. How much money did she spend in all?

Module 4: Multiplying Real Life Numbers

In this module, you will be learning several skills for success. Skills for success are skills needed in everyday life to be successful at work, when learning and for life.

(Retrieved from: <https://www.canada.ca/en/services/jobs/training/initiatives/skills-success.html>)

In this module you will practice the following skills for success:

a) **Numeracy:** Numeracy skills are critical to your success in today's society.

Numeracy skills are necessary at work, in everyday life and in learning environments. You require these skills to understand numbers, perform calculations, manage budgets, interpret data and make estimations.

b) **Problem Solving:** Problem solving skills help you to make decisions, solve problems and make changes. Improving your problem solving skills will help you make better decisions by teaching you to identify a problem, gather the correct information and solve the problem.

c) **Reading:** Reading is important at work and in daily life activities to keep you informed, safe and successful. Reading is also important in order to learn new skills. This module will help you practice locating information through words, symbols and pictures.

d) **Writing:** The ability to communicate with other people to share information using words, symbols or images is important for success at work, in a learning environment and everyday life. Improving your writing skills will ensure you are communicating clearly and effectively in various situations.

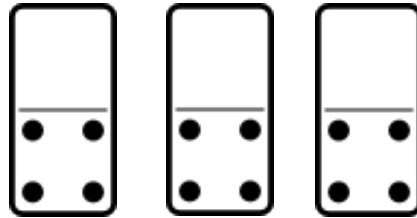
PART 1

The Meaning of Multiplication

Each domino has 4 dots.

How many dots do 3 dominos have?

To find out, you can add.



$$4 + 4 + 4 = 12$$

You can also multiply. A multiplication fact can be written in two ways.

$$3 \times 4 = 12$$

▲ ▲ ►

OR

3	◀
<u>X4</u>	◀
12	◀

factors

product

factors product

It is read “three times four equals twelve” or “three times four is twelve”.
There are 12 dots.

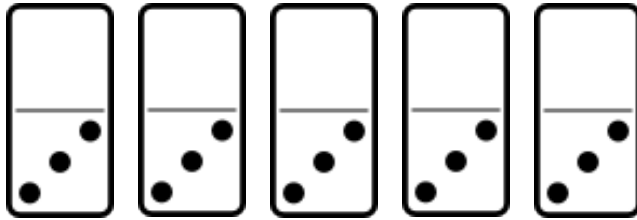
You can think of multiplication as repeated addition.

It doesn't matter what order the numbers are in. The answer will be the same.

$$3 \times 4 = 12$$

$$4 \times 3 = 12$$

Example: Find the sum and the product.



$$3 + 3 + 3 + 3 + 3 = 15$$

$$5 \times 3 = 15$$

To find the product of a multiplication fact mentally, you can skip count. For example, to find 4×2 , count by twos: 2, 4, 6, 8.

$$4 \times 2 = 8$$

Part 1: The Meaning of Multiplication

Practice Your Skills

Exercise 1A

Which numbers are the factors? Which number is the product?

	factors	product
1. $2 \times 3 = 6$		
2. $6 \times 3 = 18$		
3. $8 \times 2 = 16$		
4. $2 \times 9 = 18$		

Exercise 1B

Write the number sentence.

5. Six times four equals twenty-four. _____

6. Nine times three equals twenty-seven. _____

7. Three times six equals eighteen. _____

8. Two times seven equals fourteen. _____

Exercise 1C**Write the multiplication fact.**

9. $4 + 4 + 4 + 4$ _____

10. $2 + 2 + 2 + 2 + 2 + 2$ _____

11. $5 + 5 + 5 + 5 + 5$ _____

12. $7 + 7$ _____

Exercise 1D**Find the product mentally.**

13. 2×2 _____

14. 2×5 _____







15. 6×2 _____

16. 8×4 _____

PART 2

Multiplication Facts

Rick set up the chairs for the wedding in the garden. In one section, he made 6 rows with 6 chairs in each row. How many chairs are in this section?

	6
	6
	6
	6
	6
	<u>+6</u>
	36

$$6 \times 6 = 36$$

There are 36 chairs in this section.

Basic Number Facts

Here are the basic multiplication facts. Some people call them the “times tables”.

$0 \times 1 = 0$ $0 \times 2 = 0$ $0 \times 3 = 0$ $0 \times 4 = 0$ $0 \times 5 = 0$ $0 \times 6 = 0$ $0 \times 7 = 0$ $0 \times 8 = 0$ $0 \times 9 = 0$ $0 \times 10 = 0$	$1 \times 1 = 1$ $1 \times 2 = 2$ $1 \times 3 = 3$ $1 \times 4 = 4$ $1 \times 5 = 5$ $1 \times 6 = 6$ $1 \times 7 = 7$ $1 \times 8 = 8$ $1 \times 9 = 9$ $1 \times 10 = 10$	$2 \times 1 = 2$ $2 \times 2 = 4$ $2 \times 3 = 6$ $2 \times 4 = 8$ $2 \times 5 = 10$ $2 \times 6 = 12$ $2 \times 7 = 14$ $2 \times 8 = 16$ $2 \times 9 = 18$ $2 \times 10 = 20$	$3 \times 1 = 3$ $3 \times 2 = 6$ $3 \times 3 = 9$ $3 \times 4 = 12$ $3 \times 5 = 15$ $3 \times 6 = 18$ $3 \times 7 = 21$ $3 \times 8 = 24$ $3 \times 9 = 27$ $3 \times 10 = 30$
$4 \times 1 = 4$ $4 \times 2 = 8$ $4 \times 3 = 12$ $4 \times 4 = 16$ $4 \times 5 = 20$ $4 \times 6 = 24$ $4 \times 7 = 28$ $4 \times 8 = 32$ $4 \times 9 = 36$ $4 \times 10 = 40$	$5 \times 1 = 5$ $5 \times 2 = 10$ $5 \times 3 = 15$ $5 \times 4 = 20$ $5 \times 5 = 25$ $5 \times 6 = 30$ $5 \times 7 = 35$ $5 \times 8 = 40$ $5 \times 9 = 45$ $5 \times 10 = 50$	$6 \times 1 = 6$ $6 \times 2 = 12$ $6 \times 3 = 18$ $6 \times 4 = 24$ $6 \times 5 = 30$ $6 \times 6 = 36$ $6 \times 7 = 42$ $6 \times 8 = 48$ $6 \times 9 = 54$ $6 \times 10 = 60$	$7 \times 1 = 7$ $7 \times 2 = 14$ $7 \times 3 = 21$ $7 \times 4 = 28$ $7 \times 5 = 35$ $7 \times 6 = 42$ $7 \times 7 = 49$ $7 \times 8 = 56$ $7 \times 9 = 63$ $7 \times 10 = 70$
$8 \times 1 = 8$ $8 \times 2 = 16$ $8 \times 3 = 24$ $8 \times 4 = 32$ $8 \times 5 = 40$ $8 \times 6 = 48$ $8 \times 7 = 56$ $8 \times 8 = 64$ $8 \times 9 = 72$ $8 \times 10 = 80$	$9 \times 1 = 9$ $9 \times 2 = 18$ $9 \times 3 = 27$ $9 \times 4 = 36$ $9 \times 5 = 45$ $9 \times 6 = 54$ $9 \times 7 = 63$ $9 \times 8 = 72$ $9 \times 9 = 81$ $9 \times 10 = 90$	$10 \times 1 = 10$ $10 \times 2 = 20$ $10 \times 3 = 30$ $10 \times 4 = 40$ $10 \times 5 = 50$ $10 \times 6 = 60$ $10 \times 7 = 70$ $10 \times 8 = 80$ $10 \times 9 = 90$ $10 \times 10 = 100$	

The following table shows all of the multiplication facts. It is sometimes called a “hundreds chart”.

Times x	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

Here is how to use the table:

Suppose you need to find out what 6 times 3 is.

1. Find the first number (6) on the top row. Put a finger on it.
2. Find the second number (3) on the side row. Put a finger on it.
3. Move the finger on 6 down that column.
4. Move the finger on 3 across that column.
5. The finger will meet at 18. That is the answer.

$$6 \times 3 = 18$$

Exercise 2A

Find the sum and the product.

1. $\diamond \diamond \diamond \diamond \diamond \diamond$ $6 + 6 + 6 + 6 = \underline{\hspace{2cm}}$
 $\diamond \diamond \diamond \diamond \diamond \diamond$
 $\diamond \diamond \diamond \diamond \diamond \diamond$ $4 \times 6 = \underline{\hspace{2cm}}$
 $\diamond \diamond \diamond \diamond \diamond \diamond$

2. $* * * * *$ $8 + 8 + 8 = \underline{\hspace{2cm}}$
 $* * * * *$
 $* * * * *$ $3 \times 8 = \underline{\hspace{2cm}}$

Exercise 2B

Multiply.

3. $\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$	4. $\begin{array}{r} 2 \\ \times 3 \\ \hline \end{array}$	5. $\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array}$	6. $\begin{array}{r} 3 \\ \times 9 \\ \hline \end{array}$	7. $\begin{array}{r} 8 \\ \times 7 \\ \hline \end{array}$
8. $\begin{array}{r} 3 \\ \times 5 \\ \hline \end{array}$	9. $\begin{array}{r} 4 \\ \times 4 \\ \hline \end{array}$	10. $\begin{array}{r} 8 \\ \times 9 \\ \hline \end{array}$	11. $\begin{array}{r} 5 \\ \times 6 \\ \hline \end{array}$	12. $\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$
13. $\begin{array}{r} 5 \\ \times 2 \\ \hline \end{array}$	14. $\begin{array}{r} 7 \\ \times 4 \\ \hline \end{array}$	15. $\begin{array}{r} 9 \\ \times 5 \\ \hline \end{array}$	16. $\begin{array}{r} 7 \\ \times 6 \\ \hline \end{array}$	17. $\begin{array}{r} 4 \\ \times 8 \\ \hline \end{array}$

Exercise 2C

You know that $6 \times 6 = 36$.

Estimate and tell whether the product is greater or less than 36.

18. 5×4 _____ 19. 8×7 _____ 20. 6×7 _____

21. 7×5 _____ 22. 4×8 _____ 23. 9×6 _____

PART 3

Properties of Multiplication

Brittany planted 5 plants in 1 window box. How many plants are in the window box?

$$1 + 1 + 1 + 1 + 1 = 5 \qquad 5 \times 1 = 5$$


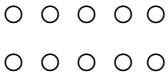
The product of one and any number is that number.

Example: Jason bought 3 packets of daisy seeds. When he opened each packet, it was empty. How many seeds did Jason have?

$$0 + 0 + 0 = 0 \qquad 3 \times 0 = 0$$

The product of zero and any number is zero.

Example: Multiply 2×5 and 5×2

		You can multiply two numbers in any order. The product is always the same.
$2 \times 5 = 10$	$5 \times 2 = 10$	

Example: Multiply $1 \times 3 \times 7$.

$$\begin{array}{rcl} (1 \times 3) \times 7 & & 1 \times (3 \times 7) \\ 3 \times 7 = 21 & & 1 \times 21 = 21 \end{array}$$

You can use parentheses to show which numbers to multiply first.

You can change the grouping of the factors. The product is always the same.

Word clues for multiplying

Word clues are often the same for adding and multiplying. Multiplying is really just a quick way of adding the same number many times.

These word clues can mean to add or multiply:

- total
- in all
- altogether
- product
- double

To find the total of different numbers you would add.

To find the total of the same number many times you would multiply.

Look at this word problem:

Jenny makes \$12 dollars per hour.

She works for six hours.

How much money did she make altogether?

The word clue is “altogether”.

You could add to get the number:

$$\begin{array}{r} \$12 \\ 12 \\ 12 \\ 12 \\ 12 \\ 12 \\ \hline +12 \\ \hline \$72 \end{array}$$

Multiplying is much quicker:

$$\begin{array}{r} \$12 \\ \times 6 \\ \hline \$72 \end{array}$$

Exercise 3A
Multiply.

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

2. $\begin{array}{r} 7 \\ \times 1 \\ \hline \end{array}$

3. $\begin{array}{r} 6 \\ \times 3 \\ \hline \end{array}$

4. $\begin{array}{r} 5 \\ \times 0 \\ \hline \end{array}$

5. $\begin{array}{r} 1 \\ \times 9 \\ \hline \end{array}$

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

7. $\begin{array}{r} 0 \\ \times 2 \\ \hline \end{array}$

8. $\begin{array}{r} 3 \\ \times 5 \\ \hline \end{array}$

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

10. $\begin{array}{r} 6 \\ \times 2 \\ \hline \end{array}$

11. $\begin{array}{r} 3 \\ \times 0 \\ \hline \end{array}$

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

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

14. $\begin{array}{r} 4 \\ \times 0 \\ \hline \end{array}$

15. $\begin{array}{r} 1 \\ \times 9 \\ \hline \end{array}$

Exercise 3B
Multiply.

16. $(4 \times 2) \times 3$ _____

17. $1 \times (6 \times 3)$ _____

18. $4 \times (1 \times 6)$ _____

19. $(3 \times 2) \times 2$ _____

20. $6 \times 7 \times 0$ _____

21. $5 \times 1 \times 6$ _____

RealLife Math

Exercise 3C

Solve.

22. Robin baked 4 quiches for lunch. She cut each quiche into 6 pieces. How many pieces of quiche are there?

23. There are 8 packages of paper plates. Each package has 9 plates. How many plates are there in all?

24. The adult learning centre had registration for 5 days in the fall. Each day, 11 learners signed up. How many learners signed up altogether?

25. John decided to improve his diet and eat healthy food. When he did this, he lost 1 kilogram each week for 8 weeks. What is the total number of kilograms that he lost?

PART 4

Multiplying by 10s, 100s, and 1,000s

Knowing your multiplication facts can help you multiply by tens, hundreds and thousands.

Look at these. What pattern do you see?

$$\begin{array}{r} 1 \text{ ten} \\ \times 3 \\ \hline 3 \text{ tens} \end{array}$$

$$\begin{array}{r} 1 \text{ hundred} \\ \times 3 \\ \hline 3 \text{ hundreds} \end{array}$$

$$\begin{array}{r} 1 \text{ thousand} \\ \times 3 \\ \hline 3 \text{ thousands} \end{array}$$

$$\begin{array}{r} 10 \\ \times 3 \\ \hline 30 \end{array}$$

$$\begin{array}{r} 100 \\ \times 3 \\ \hline 300 \end{array}$$

$$\begin{array}{r} 1,000 \\ \times 3 \\ \hline 3,000 \end{array}$$

You can multiply by powers of 10 mentally by counting the number of zeros in the factors.

Example: Multiply. Count the zeros in the factors.

$$\begin{array}{r} 6 \\ \times 3 \\ \hline 18 \end{array}$$

$$\begin{array}{r} 60 \\ \times 3 \\ \hline 180 \end{array}$$

$$\begin{array}{r} 600 \\ \times 3 \\ \hline 1,800 \end{array}$$

$$\begin{array}{r} 6,000 \\ \times 3 \\ \hline 18,000 \end{array}$$

Using patterns of zeros to find the number of zeros in the product does not apply when the original multiplication fact ends in a zero.

Example: Multiplying the following.

$$\begin{array}{r} 4 \\ \times 5 \\ \hline 20 \end{array}$$

$$\begin{array}{r} 40 \\ \times 5 \\ \hline 200 \end{array}$$

$$\begin{array}{r} 400 \\ \times 5 \\ \hline 2,000 \end{array}$$

$$\begin{array}{r} 4,000 \\ \times \quad 5 \\ \hline 20,000 \end{array}$$

Remember: The zeros in the factors are put on after any zeros in the multiplication fact product.

Exercise 4A**Multiply. Count the zeros in the product.**

$$\begin{array}{r} 1. \quad 1 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 10 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \quad 100 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 500 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 5. \quad 1,000 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 3 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 30 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad 50 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad 300 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 3,000 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 11. \quad 1 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 12. \quad 10 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 13. \quad 100 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 14. \quad 1,000 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 15. \quad 5,000 \\ \times 6 \\ \hline \end{array}$$

Exercise 4B**Complete the charts.**

X		1	10	100	1,000
16.	2				
17.	3				
18.	5				
19.	7				
20.	8				
X		4	40	400	4,000
21.	3				
22.	5				
23.	7				
24.	8				
25.	9				

Exercise 4C
Multiply.

$$\begin{array}{r} 26. \quad 10 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 27. \quad 100 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 28. \quad 1,000 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 29. \quad 100 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 30. \quad 2,000 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 31. \quad 30 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 32. \quad 600 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 33. \quad 1,000 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 34. \quad 5,000 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 35. \quad 100 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 36. \quad 400 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 37. \quad 8,000 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 38. \quad 100 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 39. \quad 9,000 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 40. \quad 10 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 41. \quad 3,000 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 42. \quad 200 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 43. \quad 6,000 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 44. \quad 40 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 45. \quad 500 \\ \times 3 \\ \hline \end{array}$$

RealLife Math

Exercise 4D

Solve.

46. There are 500 pieces in one puzzle box. How many pieces are there in 5 boxes?

47. Six thousand people went to the county fair each night. The fair lasted 8 nights. How many people went to the fair?

48. The purchasing manager ordered 400 boxes of pens. There are 8 pens in each box. How many pens were ordered?

49. There are 30 National Hockey League (NHL) teams. Each team has 20 players. How many players are there in the National Hockey League altogether?

PART 5

Estimating Products

Adrienne bought 16 cans of tennis balls. There are 3 tennis balls in each can. About how many tennis balls did Adrienne buy?

You do not always need an exact answer. You can estimate to find out about how many tennis balls she bought.

Estimate the product of 3×16 .

Step 1			Step 2
16 <u>X 3</u>	→ →	20 <u>X 3</u>	20 <u>X 3</u> 60

Step 1: Round any factor greater than 10 to its greatest place value.
You do not need to round a one-digit factor.

Step 2: Multiply.

3×16 is about 60

Adrienne bought about 60 tennis balls.

Example: Estimate the product: 5×24

Step 1			Step 2
24 <u>X 5</u>	→ →	20 <u>X 5</u>	20 <u>X 5</u> 100

If you round the factor down, the exact product is greater than the estimated product.

24×5 is about 100.

The exact product is greater than 100.

Example: Estimate the product: 7×178

Step 1			Step 2	The number of zeros in the factor tells how many zeros are in the product.
178	→	200	200	
<u>X 7</u>	→	<u>X 7</u>	<u>X 7</u> 1,400	

If you round the factor up, the exact product is less than the estimated product.

178×7 is about 1,400.

The exact product is less than 1,400.

Example: Estimate the product: $3 \times 6,389$

Step 1			Step 2
6,389	→	6,000	6,000
<u>X 3</u>	→	<u>X 3</u>	<u>X 3</u> 18,000

$3 \times 6,389$ is about 18,000

Example: Estimate the product: $6 \times 4,509$. Then tell whether the exact product will be greater than or less than the estimated product.

Step 1			Step 2
4,509	→	5,000	5,000
<u>X 6</u>	→	<u>X 6</u>	<u>X 6</u> 30,000

$6 \times 4,509$ is about 30,000. The exact product is less than 30,000.

Exercise 5A**Round the number to its greatest place.**

1. 38 _____

2. 53 _____

3. 429 _____

4. 781 _____

5. 3,209 _____

6. 4,983 _____

7. 7,007 _____

8. 8,750 _____

Exercise 5B**Estimate the product.**

9.
$$\begin{array}{r} 48 \\ \times 2 \\ \hline \end{array}$$

10.
$$\begin{array}{r} 13 \\ \times 8 \\ \hline \end{array}$$

11.
$$\begin{array}{r} 56 \\ \times 3 \\ \hline \end{array}$$

12.
$$\begin{array}{r} 81 \\ \times 4 \\ \hline \end{array}$$

13.
$$\begin{array}{r} 31 \\ \times 7 \\ \hline \end{array}$$

14.
$$\begin{array}{r} 247 \\ \times 3 \\ \hline \end{array}$$

15.
$$\begin{array}{r} 541 \\ \times 5 \\ \hline \end{array}$$

16.
$$\begin{array}{r} 607 \\ \times 6 \\ \hline \end{array}$$

17.
$$\begin{array}{r} 894 \\ \times 4 \\ \hline \end{array}$$

18.
$$\begin{array}{r} 465 \\ \times 7 \\ \hline \end{array}$$

19.
$$\begin{array}{r} 1,483 \\ \times 7 \\ \hline \end{array}$$

20.
$$\begin{array}{r} 3,849 \\ \times 6 \\ \hline \end{array}$$

21.
$$\begin{array}{r} 5,384 \\ \times 3 \\ \hline \end{array}$$

22.
$$\begin{array}{r} 6,812 \\ \times 5 \\ \hline \end{array}$$

23.
$$\begin{array}{r} 4,753 \\ \times 7 \\ \hline \end{array}$$

24.
$$\begin{array}{r} 187 \\ \times 5 \\ \hline \end{array}$$

25.
$$\begin{array}{r} 2,940 \\ \times 6 \\ \hline \end{array}$$

26.
$$\begin{array}{r} 8,152 \\ \times 3 \\ \hline \end{array}$$

27.
$$\begin{array}{r} 407 \\ \times 9 \\ \hline \end{array}$$

28.
$$\begin{array}{r} 3,817 \\ \times 5 \\ \hline \end{array}$$

Writing in Math

The word “about” can be used in many contexts. For example, the temperature is about 25 degrees. Write three sentences using the word about in three different ways.

29. _____

30. _____

31. _____

PART 6

Problem Solving Strategy: Using Patterns

Lana’s department is going to a training seminar. There will be 2 instructors for every 6 employees. There will be 18 instructors in all. How many employees are going to the training seminar?

You can make a table to continue the pattern and find the answer.

Instructors	2	4	6	8	10	12	14	16	18
Employees	6	12	18	24	30	36	42	48	54

There will be 54 employees at the seminar.

The table shows that the pattern Lana used is to increase the number of employees by 6 for every 2 instructors.

Example: The display manager is making a drawing of a cat food display. It will be 15 rows high. One can will be on the top row, 3 cans on the next row, 6 cans on the row below it, and so on. How many cans will she use to make the bottom row?

Cat Food Display															
Row	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Cans	1	3	6	9	12	15	18	21	24	27	30	33	36	39	42

She will use 42 cans to make the 15th row.

RealLife Math

Exercise 6A

Solve. Look for a pattern. Make a table if necessary.

1. Diana swims 4 laps the first day, 8 laps on the second day, 12 laps on the third day, and so on. If the pattern continues, how many laps does she swim on the seventh day?

2. There are 3 tennis balls in each can, 18 balls in 6 cans, and 21 balls in 7 cans. How many tennis balls are in 9 cans?

3. Raymond took 6 hours of tennis lessons in April, 12 hours in May, 18 hours in June, and 24 hours in July. If the pattern continues, how many hours of lessons will he have in August?

4. Leslie is knitting an afghan. The first row is blue, the second row is white, the third row is green, the fourth row is yellow, the fifth row is blue and so on. If the pattern continues, what colour is the sixteenth row?

5. Fred practices the piano 20 minutes the first day, 40 minutes the second day, 20 minutes the third day, 50 minutes the fourth day, 20 minutes the fifth day, 60 minutes the sixth day, and 20 minutes the seventh day. If this pattern continues, how long will he practice on the twelfth day?

Part 7

Multiplying 2 Digit Numbers

When you multiply 2 digit numbers, the product of the ones can be greater than 9. When this happens, you have to regroup 10 ones as 1 ten.

Example: Multiply 38×2 .

Step 1: Multiply the 8 ones by 2.
Regroup 16 ones as 1 ten 6 ones

$$\begin{array}{r} 3^18 \\ \times 2 \\ \hline 76 \end{array}$$

Step 2: Multiply the 3 tens by 2.
Add the 1 ten.

$$\begin{array}{r} 3^18 \\ \times 2 \\ \hline 76 \end{array}$$

So, $38 \times 2 = 76$

Sometimes when you multiply a 2 digit number by a 1 digit number, you need to regroup 10 tens as 1 hundred.

Example: Multiply 54 by 3.

Step 1: Multiply 4 ones by 3.
Regroup 12 ones as 1 ten 2 ones.

$\begin{array}{r} 54 \\ \times 3 \\ \hline 2 \end{array}$	$4 \times 3 = 12$
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Step 2: Multiply 5 tens by 3.
Add the 1 ten.

$\begin{array}{r} 54 \\ \times 3 \\ \hline 162 \end{array}$	$\begin{array}{l} 5 \times 3 = 15 \text{ tens} \\ 15 \text{ tens} + 1 \text{ ten} = 16 \text{ tens} \end{array}$
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So, $54 \times 3 = 162$

When you multiply a 2 digit number by a 2 digit number, make sure each digit is aligned in the proper place.

Example: Multiply 68 by 35.

	TH	H	T	O	
			6	8	
			<u>3</u>	<u>5</u>	
Multiply 68 by 5 ones. →		3	4	0	
Multiply 68 by 3 tens. →	<u>2</u>	<u>0</u>	<u>4</u>	<u>0</u>	← Add a zero.
Add. →	2	3	8	0	

Example: Frank rides his exercise bicycle 27 kilometres each day for 25 days. How many kilometres does he ride?

To find out, multiply 27 by 25.

Step 1	Step 2	Step 3
$\begin{array}{r} 27 \\ \times 25 \\ \hline 135 \end{array}$	$\begin{array}{r} 27 \\ \times 25 \\ \hline 135 \\ 540 \end{array}$	$\begin{array}{r} 27 \\ \times 25 \\ \hline 135 \\ 540 \\ \hline 675 \end{array}$

Step 1: Multiply 27 by 5 ones.

Step 2: Multiply 27 by 2 tens.

Step 3: Add.

Frank rides 675 kilometres.

Exercise 7A

$$\begin{array}{r} 1. \quad 12 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 18 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \quad 42 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 63 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 5. \quad 48 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 23 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 33 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad 78 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad 67 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 22 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 11. \quad 13 \\ \times 90 \\ \hline \end{array}$$

$$\begin{array}{r} 12. \quad 25 \\ \times 63 \\ \hline \end{array}$$

$$\begin{array}{r} 13. \quad 18 \\ \times 27 \\ \hline \end{array}$$

$$\begin{array}{r} 14. \quad 43 \\ \times 42 \\ \hline \end{array}$$

$$\begin{array}{r} 15. \quad 37 \\ \times 53 \\ \hline \end{array}$$

$$\begin{array}{r} 16. \quad 55 \\ \times 27 \\ \hline \end{array}$$

$$\begin{array}{r} 17. \quad 34 \\ \times 49 \\ \hline \end{array}$$

$$\begin{array}{r} 18. \quad 62 \\ \times 35 \\ \hline \end{array}$$

$$\begin{array}{r} 19. \quad 49 \\ \times 53 \\ \hline \end{array}$$

$$\begin{array}{r} 20. \quad 45 \\ \times 45 \\ \hline \end{array}$$

$$\begin{array}{r} 21. \quad 26 \\ \times 41 \\ \hline \end{array}$$

$$\begin{array}{r} 22. \quad 87 \\ \times 53 \\ \hline \end{array}$$

$$\begin{array}{r} 23. \quad 45 \\ \times 63 \\ \hline \end{array}$$

$$\begin{array}{r} 24. \quad 82 \\ \times 37 \\ \hline \end{array}$$

$$\begin{array}{r} 25. \quad 97 \\ \times 56 \\ \hline \end{array}$$

PART 8

Multiplying 3 Digit Numbers

Mr. Webber stacks books on 4 shelves in the library. He puts 168 books on each shelf. How many books are there in all?

To find out, multiply 4×168 . You will need to regroup 10 ones as 1 ten and 10 tens as 1 hundred.

Step 1	Step 2	Step 3
$\begin{array}{r} 16^3 8 \\ \times \quad 4 \\ \hline 2 \end{array}$	$\begin{array}{r} 1^2 6^3 8 \\ \times \quad 4 \\ \hline 7 \quad 2 \end{array}$	$\begin{array}{r} 1^2 6^3 8 \\ \times \quad 4 \\ \hline 6 \quad 7 \quad 2 \end{array}$

Step 1: Multiply 8 ones by 4. Regroup 32 ones as 3 tens 2 ones.

Step 2: Multiply 6 tens by 4 and add the 3 tens.
Regroup 27 tens as 2 hundreds 7 tens.

Step 3: Multiply 1 hundred by 4 and add the 2 hundreds.

Example: Multiply: 302×7

Step 1	Step 2	Step 3
$\begin{array}{r} 30^1 2 \\ \times \quad 7 \\ \hline 4 \end{array}$	$\begin{array}{r} 30^1 2 \\ \times \quad 7 \\ \hline 14 \end{array}$	$\begin{array}{r} 30^1 2 \\ \times \quad 7 \\ \hline 2,114 \end{array}$

Step 1: Multiply 2 ones by 7. Regroup 14 ones as 1 ten 4 ones.

Step 2: Multiply 0 ones by 7 and add 1 ten. Remember, the product of any number and zero is zero.

Step 3: Multiply 3 hundreds by 7.

When you multiply a 3 digit number by a 2-digit number, make sure each digit is aligned in the proper place.

Example: Multiply 345 by 27.

Multiply 346 by 7 ones. Multiply 346 by 2 tens.	X	TH	H	T	O	Add.
			3	4	6	
				<u>2</u>	<u>7</u>	
		2	4	2	2	
		<u>6</u>	<u>9</u>	<u>2</u>	<u>0</u>	
		9	3	4	2	

Example: Multiply 821 x 39.

Multiply 821 by 9 ones. Multiply 821 by 3 tens.	X	TT	TH	H	T	O	Add.
				8	2	1	
					<u>3</u>	<u>9</u>	
			7	3	8	9	
		<u>2</u>	<u>4</u>	<u>6</u>	<u>3</u>	<u>0</u>	
		3	2	0	1	9	

Example: Hannah's Hair Salon services 654 customers per week. How many customers does it see in 14 weeks?

$$\begin{array}{r} 654 \\ \times 14 \\ \hline 2,616 \end{array}$$

$$\begin{array}{r} 654 \\ \times 14 \\ \hline 2,616 \\ 6,540 \end{array}$$

$$\begin{array}{r} 654 \\ \times 14 \\ \hline 2,616 \\ \underline{6,540} \\ 9,156 \end{array}$$

There are 9,156 customers in 14 weeks.

Exercise 8A
Multiply.

1.
$$\begin{array}{r} 135 \\ \times 6 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 249 \\ \times 3 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 617 \\ \times 4 \\ \hline \end{array}$$

4.
$$\begin{array}{r} 112 \\ \times 9 \\ \hline \end{array}$$

5.
$$\begin{array}{r} 363 \\ \times 5 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 307 \\ \times 4 \\ \hline \end{array}$$

7.
$$\begin{array}{r} 210 \\ \times 6 \\ \hline \end{array}$$

8.
$$\begin{array}{r} 319 \\ \times 8 \\ \hline \end{array}$$

9.
$$\begin{array}{r} 404 \\ \times 9 \\ \hline \end{array}$$

10.
$$\begin{array}{r} 684 \\ \times 2 \\ \hline \end{array}$$

11.
$$\begin{array}{r} 473 \\ \times 22 \\ \hline \end{array}$$

12.
$$\begin{array}{r} 894 \\ \times 38 \\ \hline \end{array}$$

13.
$$\begin{array}{r} 149 \\ \times 13 \\ \hline \end{array}$$

14.
$$\begin{array}{r} 426 \\ \times 26 \\ \hline \end{array}$$

15.
$$\begin{array}{r} 812 \\ \times 16 \\ \hline \end{array}$$

16.
$$\begin{array}{r} 819 \\ \times 42 \\ \hline \end{array}$$

17.
$$\begin{array}{r} 625 \\ \times 19 \\ \hline \end{array}$$

18.
$$\begin{array}{r} 527 \\ \times 33 \\ \hline \end{array}$$

19.
$$\begin{array}{r} 227 \\ \times 46 \\ \hline \end{array}$$

20.
$$\begin{array}{r} 385 \\ \times 24 \\ \hline \end{array}$$

21.
$$\begin{array}{r} 305 \\ \times 25 \\ \hline \end{array}$$

22.
$$\begin{array}{r} 618 \\ \times 22 \\ \hline \end{array}$$

23.
$$\begin{array}{r} 189 \\ \times 16 \\ \hline \end{array}$$

24.
$$\begin{array}{r} 463 \\ \times 25 \\ \hline \end{array}$$

25.
$$\begin{array}{r} 263 \\ \times 49 \\ \hline \end{array}$$

Critical Thinking

26. What is the largest product you can get by multiplying a 3 digit number by a 2 digit number?

27. What is the smallest product?

PART 9

Multiplying Money

Multiplying money amounts is the same as multiplying whole numbers. Since the product must be in dollars and cents, write the decimal point and the dollar sign in the product.

Example: Multiply \$3.80 by 7.

$$\begin{array}{r} \$3.80 \\ \times 7 \\ \hline \$26.60 \end{array}$$

There are always 2-digits to the right of the decimal point.

Example: Multiply \$6.74 by 19.

$$\begin{array}{r} 674 \\ \times 19 \\ \hline 6,066 \\ 6,740 \\ \hline 12,806 \end{array}$$
$$\begin{array}{r} \$6.74 \\ \times 19 \\ \hline 60\ 66 \\ 67\ 40 \\ \hline \$128.06 \end{array}$$

Write the dollar sign and decimal point in the product.

Example: Mrs. Greco plans to invite 27 guests to her daughter's birthday party. The cost per person is \$3.75. What is the total cost of the party?

To find out, multiply \$3.75 by 27.

$$\begin{array}{r} \$3.75 \\ \times 27 \\ \hline 2625 \\ 7500 \\ \hline \$101.25 \end{array}$$

Add zeros

The total cost of the party is \$101.25

Exercise 9A
Multiply.

1. $\begin{array}{r} \$0.63 \\ \times 7 \\ \hline \end{array}$ 2. $\begin{array}{r} \$0.83 \\ \times 9 \\ \hline \end{array}$ 3. $\begin{array}{r} \$0.56 \\ \times 8 \\ \hline \end{array}$ 4. $\begin{array}{r} \$1.15 \\ \times 7 \\ \hline \end{array}$ 5. $\begin{array}{r} \$3.89 \\ \times 7 \\ \hline \end{array}$

6. $\begin{array}{r} \$5.26 \\ \times 7 \\ \hline \end{array}$ 7. $\begin{array}{r} \$13.85 \\ \times 4 \\ \hline \end{array}$ 8. $\begin{array}{r} \$22.63 \\ \times 3 \\ \hline \end{array}$ 9. $\begin{array}{r} 18.95 \\ \times 8 \\ \hline \end{array}$ 10. $\begin{array}{r} \$22.05 \\ \times 9 \\ \hline \end{array}$

11. $\begin{array}{r} \$87.89 \\ \times 4 \\ \hline \end{array}$ 12. $\begin{array}{r} \$20.10 \\ \times 5 \\ \hline \end{array}$ 13. $\begin{array}{r} \$0.89 \\ \times 25 \\ \hline \end{array}$ 14. $\begin{array}{r} \$0.62 \\ \times 39 \\ \hline \end{array}$ 15. $\begin{array}{r} \$3.78 \\ \times 42 \\ \hline \end{array}$

16. $\begin{array}{r} \$4.29 \\ \times 37 \\ \hline \end{array}$ 17. $\begin{array}{r} \$5.16 \\ \times 41 \\ \hline \end{array}$ 18. $\begin{array}{r} \$8.49 \\ \times 37 \\ \hline \end{array}$ 19. $\begin{array}{r} \$7.13 \\ \times 25 \\ \hline \end{array}$ 20. $\begin{array}{r} \$8.93 \\ \times 47 \\ \hline \end{array}$

RealLife Math

Exercise 9B

Solve.

21. Dean orders 14 roses from the florist. Each rose is \$3.25. How much money does Dean spend?

22. Vicky bowled 6 games on Saturday. Each game is \$6.90. How much did Vicky spend?

RealLife Math

Module #4 TaskBased Activity: Catalogue Orders

Ordering by mail or online has become a popular way for busy people to shop. You can order food, office supplies, clothes, and movies through mail-order catalogues or online.

To order from a catalogue, you may need to complete a form and calculate the total cost of your order. Sometimes you may need to add sales tax and a shipping and handling charge.

Jana is the office manager for a print shop. She orders office supplies through a catalogue. Calculate the total cost of her order before tax.

Row No.	Item No.	Description	Price	How many?	Total Price (How many x Price)
1.	33-B	Pens	\$3.98	4	
2.	66-7	Notebooks	\$8.27	7	
3.	89-5	USB Drives	\$2.98	12	
4.	44-A	Printer cartridges	\$27.85	2	
5.	34-Z	Copy paper (case)	\$29.99	3	
6.	89-B	Sticky Notes	\$10.99	24	
			Subtotal		
			Shipping & Handling		+\$5.50
			Sub-Total		
			Tax		
			Total		

Module 4: Multiplying Whole Numbers

Review

Write the number sentence.

1. Five times six equals thirty. _____

2. Nine times eight equals seventy-two. _____

3. Seven times five equals thirty-five. _____

Multiply.

4.
$$\begin{array}{r} 5 \\ \times 0 \\ \hline \end{array}$$

5.
$$\begin{array}{r} 1 \\ \times 8 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 10 \\ \times 9 \\ \hline \end{array}$$

7.
$$\begin{array}{r} 6 \\ \times 1 \\ \hline \end{array}$$

8.
$$\begin{array}{r} 500 \\ \times 2 \\ \hline \end{array}$$

9.
$$\begin{array}{r} 2,000 \\ \times 7 \\ \hline \end{array}$$

10.
$$\begin{array}{r} 10 \\ \times 2 \\ \hline \end{array}$$

11.
$$\begin{array}{r} 16 \\ \times 3 \\ \hline \end{array}$$

12.
$$\begin{array}{r} 18 \\ \times 9 \\ \hline \end{array}$$

13.
$$\begin{array}{r} 22 \\ \times 3 \\ \hline \end{array}$$

14.
$$\begin{array}{r} 35 \\ \times 22 \\ \hline \end{array}$$

15.
$$\begin{array}{r} 26 \\ \times 24 \\ \hline \end{array}$$

16.
$$\begin{array}{r} 123 \\ \times 4 \\ \hline \end{array}$$

17.
$$\begin{array}{r} 189 \\ \times 6 \\ \hline \end{array}$$

18.
$$\begin{array}{r} 143 \\ \times 9 \\ \hline \end{array}$$

19.
$$\begin{array}{r} \$1.89 \\ \times 5 \\ \hline \end{array}$$

20.
$$\begin{array}{r} \$2.17 \\ \times 9 \\ \hline \end{array}$$

21.
$$\begin{array}{r} 143 \\ \times 27 \\ \hline \end{array}$$

22.
$$\begin{array}{r} 389 \\ \times 28 \\ \hline \end{array}$$

23.
$$\begin{array}{r} 561 \\ \times 32 \\ \hline \end{array}$$

Estimate the product.

24.
$$\begin{array}{r} 37 \\ \times 3 \\ \hline \end{array}$$

25.
$$\begin{array}{r} 409 \\ \times 7 \\ \hline \end{array}$$

26.
$$\begin{array}{r} 8,487 \\ \times 4 \\ \hline \end{array}$$

27.
$$\begin{array}{r} 6,734 \\ \times 5 \\ \hline \end{array}$$