

# Using Expressions to Create Tables

## GOAL

Create and use a mathematical expression to make a table of values.

### expression

A phrase that uses operations with numbers, variables, or both

For example,  $t + 10$  is an expression that means "Add 10 to the number that  $t$  stands for."

Robin's hiking club charges an annual fee of \$10. The club also charges \$2 for each hike.

Robin wants to make a table of values to show new members the cost of hiking with the club.



**How can you show the cost of hiking with Robin's club?**



## Robin's Rules

To figure out the total cost for going on any number of hikes, I wrote a rule in two ways. One way uses words. The other way uses an **expression**.

### Communication Tip

Sometimes the symbol  $\times$  for multiplication can be mistaken for the variable  $x$  in an expression. To avoid this problem, you can write  $2 \times h$  as  $2h$ . Write the number first and the variable second.

- Words: Multiply the number of hikes by \$2 and add \$10 to the product.
- Expression:  $2 \times h + 10$  or  $2h + 10$ , where the variable,  $h$ , represents the number of hikes

Number of hikes (h)	Total cost (\$)
0	10
1	
2	



- A.** Jason says that  $2h + 10$  can also be written as  $10 + 2h$ . Is Jason correct? Explain.
- B.** Could Robin have chosen a different letter to represent the number of hikes? Explain your thinking.
- C.** What is the total cost for 0 to 10 hikes with Robin's club? Record your answers in a table.

## Reflecting

- D.** When you are writing a rule as an expression, how can you decide which part of the rule the variable should stand for? Compare Robin's two ways of writing the rule to explain.
- E.** Why was it helpful for Robin to write the rule in words before she wrote it as an expression with a variable?

## Checking

- 1.** A rock-climbing club charges an annual fee of \$100. They also charge \$5 for each hour of climbing.
  - a)** Use words to write a rule that you could use to calculate the total cost for any number of hours of climbing, including the annual fee.
  - b)** Write an expression that has the same meaning as your rule in part a). Remember to include a variable in your expression.
  - c)** Use your expression to make a table of values that shows the total cost for 15 h to 20 h of climbing, including the annual fee. Explain what you did.

## Practising

- 2. a)** Write an expression that means "Add 5 to a number." Use your expression to create a table. Use 1 to 4 as values of the variable in the first column.
- b)** Repeat part a) for the rule "Multiply a number by 3 and add 4 to the product."

$n$	$7n$
1	
2	
3	
4	

3. a) Use words to write a rule that has the same meaning as the expression  $7n$ . Use your rule to complete a table of values, with 1 to 4 as values for  $n$ .
- b) Repeat part a) for the expression  $3n - 2$ .
- c) Repeat part a) for the expression  $50 - 5n$ .

4. Copy and complete each table.

a)

$m$	$4m$
2	
	16
	24
8	

b)

$m$	$6m - 3$
5	
10	
15	
20	

5. Correct the error in each table.

a)

$p$	$p - 11$
20	9
40	29
60	39
80	69

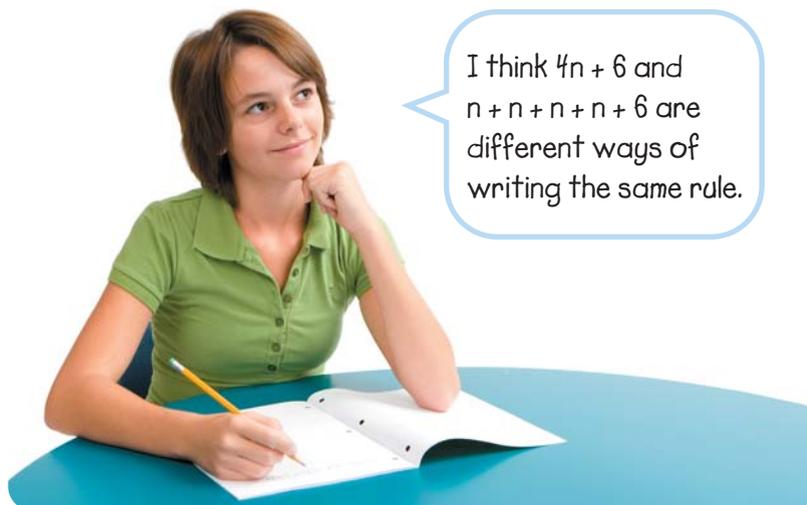
b)

$p$	$100 - 5p$
5	75
6	70
7	65
8	55

Number of games	Total cost (\$)
1	10
2	22
3	
4	
5	

6. Asha and her friends are going bowling. The cost of each game is \$12 for the group. They have a coupon for \$2 off the cost of the first game.
- a) Why do the numbers 10 and 22 make sense in the second column of the table at the left?
- b) Use words to write a rule that you can use to calculate the total cost for any number of games.
- c) Write an expression that has the same meaning as your rule in part b). Remember to include a variable in your expression.
- d) Copy the table. Use your expression to figure out the missing numbers.
- e) How many games can Asha and her friends play for \$82? Show your work.

7. Is Léa's statement below right? Explain your thinking.



$a$	$20 - a$
1	
2	
3	
4	

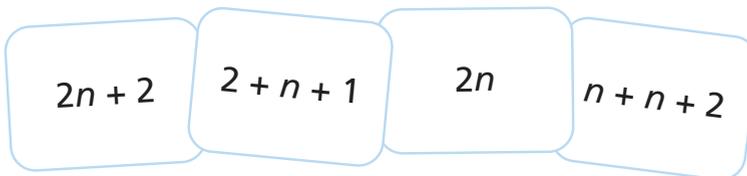
8. a) Predict whether the expression in the second column of Ivory's table at the left will create an increasing or decreasing pattern. Explain your prediction.  
 b) Complete the table to check your prediction.
9. a) Write an expression with a variable. Use two different operations in your expression.  
 b) Copy the table below. Use your expression to figure out the missing numbers.

$n$	0	1	2	3	4	5
Your expression						

Table of Values

$n$	?
1	4
2	6
3	8
4	10

10. Which expressions can be used to create the numbers in the second column of the table at the left?



11. Why is creating a table of values from an expression easier than figuring out an expression from a table of values?