

Halving and Doubling to Multiply

GOAL

Multiply by halving and doubling.



Justine is putting photos of *carnaval d'hiver* on CDs for the organizers and participants. She bought 16 packs with 50 CDs in each pack.



How many CDs did Justine buy?



Justine's Solution

I bought 16 packs, or groups, of 50 CDs.
I'll multiply to figure out the number of CDs.





- A. How do you know that the equation $16 \times 50 = \blacksquare$ describes the number of CDs in 16 packs?
- B. How many CDs are in two packs?
- C. How can you use your answer for Part B to rewrite the equation $16 \times 50 = \blacksquare$ as $8 \times 100 = \blacksquare$?
- D. How many CDs did Justine buy?

half/double strategy

To calculate a product, you can divide one number by 2 to get half and double the other number. Then you can multiply.

For example:

$$8 \times 5 = (8 \div 2) \times (5 \times 2)$$

$$8 \times 5 = 4 \times 10$$

$$8 \times 5 = 40$$

Reflecting

- E. Why was it helpful to use the **half/double strategy** in Part C?
- F. In what other multiplication situations would the half/double strategy be useful?

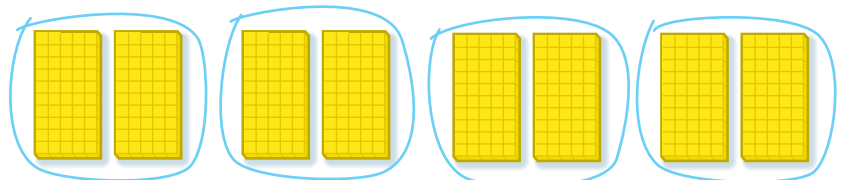
Checking

1. Explain how to use the half/double strategy to solve each problem. Then solve the problem.
 - a) How many straws are in 14 boxes of 200 straws?
 - b) What is the value of 22 \$5 bills?



Practising

2. How does this picture show that $8 \times 50 = 4 \times 100$?





3. Explain how to use the half/double strategy to solve each problem. Then solve the problem.

a) Milk in a school cafeteria costs 50¢. How much milk money is collected if 18 students buy milk?

b) There are 20 teams of 19 players in the soccer league. How many players are in the league?



4. Calculate each product using the half/double strategy.

a) 5×12

d) 50×24

b) 9×200

e) 200×18

c) 500×14

f) 18×500

5. What is the value of 40 nickels? Write an equation.



6. Rewrite each equation by making one factor 10, 100, or 1000 and keeping the product the same. Then calculate the product. Explain your reasoning for one of your equations.

a) $24 \times 5 = w$

c) $8 \times 500 = y$

b) $x = 50 \times 14$

d) $z = 500 \times 18$

7. What is the value of 40 quarters? Write an equation.



8. Calculate.

a) 18×5

c) 16×500

b) 34×50

d) 28×25

9. A box of staples holds 250 staples. How many staples does each number of boxes hold?
- a) 8 boxes b) 12 boxes



10. Calculate.
- a) 200×5 c) 38×50
 b) 16×500 d) 26×500
11. 14 students raised \$20 each in pledges for a “Save the Wetlands!” walk.
- a) How much money did the students raise?
 b) How would your answer for part a) change if each student raised \$50 in pledges?
12. Which of the following calculations become easier if you use the half/double strategy? Explain.
- A. 40×50 C. 200×60
 B. 50×75 D. 34×25
13. a) List three equations that would be easier to solve if you used the half/double strategy.
 b) List three equations that would not be easier to solve if you used the half/double strategy.
14. Suppose that a friend asked you how to multiply 48×50 using mental math. What would you say?

