

Special Products

GOAL

Use special strategies to multiply by 8 and 9.

Marko's mother embroidered eight red flowers to make this Ukrainian pillowcase. She made six pillowcases as gifts for her family.



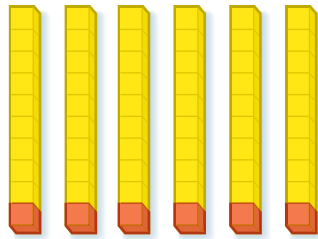
How many flowers did Marko's mother embroider?



Maya's Strategy

There are six pillowcases with eight flowers on each.
I'll calculate 6×8 .
I know that 6×8 is double 6×4 , and 6×4 is double 6×2 .
I know that $6 \times 2 = 12$.

- A.** How can you use doubling and 6×2 to get 6×8 ?
- B.** How does the diagram below show that $6 \times 9 = 60 - 6$?



- C.** How can you use $6 \times 9 = 54$ to calculate 6×8 ?
- D.** How many flowers did Marko's mother embroider?

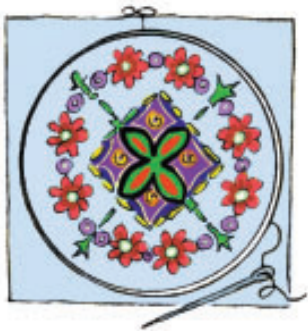
Reflecting

- E.** In Part A, you calculated 6×8 by doubling 6×2 twice. How can you calculate 8×8 by doubling?
- F.** In Part B, you explained why $6 \times 9 = 60 - 6$. Use this strategy to multiply other one-digit numbers by 9. Describe a pattern for multiplying by 9.

Checking

- a)** Calculate 8×7 by doubling.

b) Calculate 8×9 using two different strategies.
- The pillowcase design has four green leaves in the centre. How many leaves need to be embroidered on nine pillowcases?



Practising

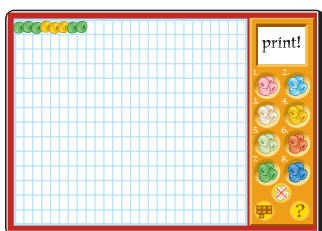
- Describe a strategy for calculating each product. Then write the product.
 - 3×9
 - 5×8

Reading Strategy

Questioning

What questions can you ask to help you understand this problem?

- Spiders have eight legs and ants have six legs.
 - How many more legs do eight spiders have than eight ants? How do you know?
 - How many more legs do nine spiders have than nine ants?



- How much greater is 9×9 than each product below? Explain what you did for one answer.

a) 9×5 b) 9×7 c) 9×6 d) 8×9

- Levi uses a website to create a bead pattern. If he decides to have three rows of eight beads in his pattern, how many beads will he need?

- Calculate.

a) 9×1 b) 5×9 c) 7×9 d) 7×8

- Use a sketch to show that each equation is true.

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

b) $6 \times 8 = \text{double } 6 \times 4$

- Use the multiplication table you started in Lesson 1.

a) Fill in the new multiplication facts you figured out or used in this lesson.

b) What do you notice about the ones digits of all the numbers in the $8 \times$ row and the $\times 8$ column?

c) What do you notice about the ones digits and the tens digits in the $9 \times$ row and the $\times 9$ column?

- Imagine that you forgot the product 9×4 . Describe two ways to figure it out.
 - Imagine that you forgot the product 5×8 . Describe two ways to figure it out.

\times	0	1	2	3	4
0					
1					4
2			4		
3			6		12
4			8	12	16