

Table Mats

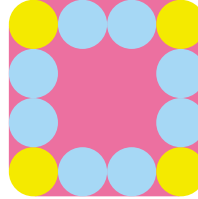
You need: different-coloured counters, a calculator (optional)

ACTIVITY

1. Hine is designing table mats bordered with coloured circles.

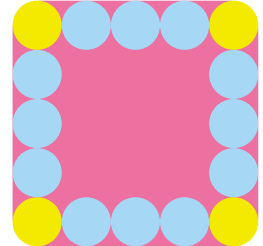


4 circles on each side



Hine's short cut calculation:
 $4 \times 2 + 4 = 12$ circles

5 circles on each side



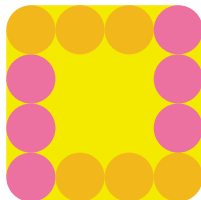
Hine's short cut calculation:
 $4 \times 3 + 4 = 16$ circles

Look carefully at Hine's designs and short cut calculations.

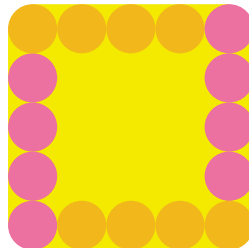
- Use her short cut to predict the total number of circles in a table mat design with 7 circles on each side.
- Make the design with counters and explain why the short cut works.
- Use Hine's short cut to predict the total number of circles in a design with 100 circles on each side.

2. Hine's friend, Larissa, is also designing table mats.

4 circles on each side



5 circles on each side



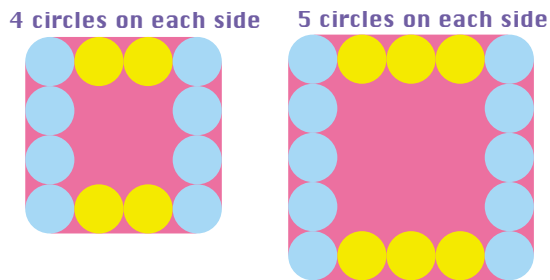
- Larissa claims that her design with 8 circles on each side will have $4 \times 7 = 28$ circles altogether. Make the design and explain how the short cut works.
- Use Larissa's short cut to predict the number of circles in a design with 200 circles on each side.



3. Complete the table below for table mat designs.

Number of circles on side	Total number of circles	
	Hine's short cut	Larissa's short cut
4	$4 \times 2 + 4 = 12$	
10		
15		
90		
63		
136		
500		

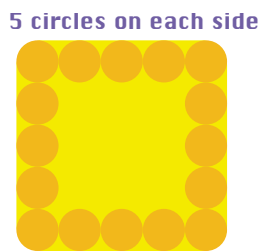
4. Hine changes her original table mat designs.



- a. Find a rule based on Hine's new designs. Explain how the rule works.
- b. Complete this table using the rule.

Number of circles on side	Total number of circles
4	
5	
8	
27	
156	

5. Larissa uses $4 \times 5 - 4$ as a short cut for calculating the number of circles in this table mat.



- a. Write Larissa's new short cut for a table mat with 6 circles on each side. Explain how the short cut or rule works.
- b. Complete this table using Larissa's rule. Show your calculations.

Number of circles on side	Total number of circles
6	
9	
14	
59	
131	

6. a. Use counters to make your own table mat design.
- b. Find a rule for the design and explain how it works.
- c. Use your rule to predict the total number of circles for a table mat with 100 circles on each side.

