

Bailey Bridges

You need: sticks

ACTIVITY

Bailey bridges were once common in New Zealand. They were quick and cheap to build. They are now built as temporary bridges.



1. Sali uses sticks to show how to build a Bailey bridge.



He joins the sticks to make a bridge with 9 triangles.



- a. Sali uses $9 \times 2 + 1$ as a short cut for the number of sticks in his bridge.
Build a bridge with sticks for the short cut $5 \times 2 + 1$.
- b. Explain how Sali's short cut works.
- c. Complete the table below.



Number of triangles	Number of sticks
9	$9 \times 2 + 1 = 19$
	$5 \times 2 + 1 = 11$
90	
1 563	201



2. Sali's friend, Rory, shows a different way to build a Bailey bridge.



- Build a bridge with 5 triangles using Rory's method.
- Write a short cut for the number of sticks in Rory's arrangement.
- Explain how the short cut works.
- Use the short cut to predict the number of sticks in a bridge with 50 triangles.

3. Sali changes Rory's arrangement of sticks.



- Write a short cut for a bridge with 12 triangles based on Sali's new arrangement.
- Complete the table below.

Number of triangles	Number of sticks	
	Rory's rule	Sali's new rule
7		
12		
25		
100		
351		

- Explain how the two short cuts are different.

4. Sali thinks he can see another way to show how to build Bailey bridges.



He uses 6 additional sticks of a different colour for a bridge with 7 triangles.

- Explain why $7 \times 3 - 6$ is the short cut for this arrangement.
- Write the short cut for a bridge with 10 triangles.
- Complete the table below using this new short cut.

Number of triangles	Number of sticks
7	$7 \times 3 - 6 = 15$
10	
27	
63	
187	