Developing Proficiency

Grade 7

Name:
Date:

Expectation – Patterning and Algebra, 7m61:
Make predictions about linear growing patterns, through investigation with concrete materials.

Knowledge and Understanding
(Facts and Procedures)

Helena created a table to look for a pattern in the given figures. The figure number in the last row is 500.

Complete Helena's table.

Figure number	Number of sides
1	3
2	5
3	7
4	
5	
500	

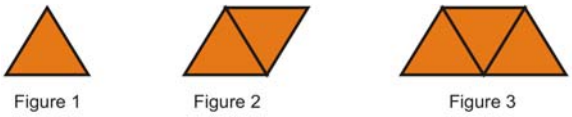
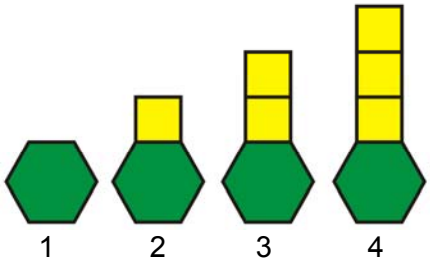


Figure 1 Figure 2 Figure 3

Knowledge and Understanding
(Conceptual Understanding)

The picture shows 4 stages in the construction of a walkway. The walkway starts with a hexagon and continues with squares.

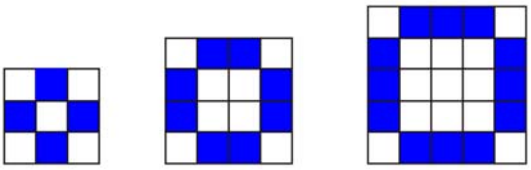


Ryan created a table:

Stage	Perimeter	Ryan's pattern
1	6	6
2	8	6 – 1 + 3
3	10	6 – 1 + 2 + 3
4	12	6 – 1 + 2 + 2 + 3

Explain Ryan's pattern. How could you use this pattern to determine the perimeter at any stage?

Problem Solving
(Reasoning and Proving, Connecting)



3 × 3 design
4 dark tiles

4 × 4 design
8 dark tiles

5 × 5 design
12 dark tiles

A tiling company specializes in multi-colour tile patterns. A small hotel is interested in the pattern above for its square-shaped reception area. How many dark-coloured tiles will there be if the reception area needs 18 tiles on each side?

Show your work.

Problem Solving
(Reasoning and Proving, Reflecting)

The picture shows rows of houses constructed using toothpicks.

Note: The walls connecting adjacent houses are constructed using one toothpick.

Chandra has 50 toothpicks. What is the greatest number of houses in 1 row that she can construct? Will any toothpicks be left over?

Explain your steps.