NAME_____

Module 11   Transformation of Shapes
**Lesson 5   Tessellations**

Lesson Objectives

- Analyze geometric patterns (e.g., tessellations, sequences of shapes) and develop descriptions of the patterns.
- Use tessellations and fractals to create geometric patterns.

Subtopic 1   Geometric Patterns

Geometric Patterns

- **Identify** the pattern.
- Write a **rule** or describe the pattern.
- Use the rule to find the **missing term**.

1 How many squares are in the 7th term of the sequence?
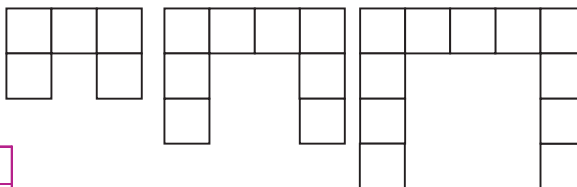
Term	Number of Squares
1	5
2	8
3	11
4	14
5	17
6	20
7	23

There are 23 squares in the 7th term.

2 What is the 31st term in this sequence?

○ □ △ ○ □ △ ○ □ △ ...

Multiple of 3: triangle
30th term is a triangle.
31st term is a circle.

3 The diagram shows the first five stages as a pentagonal figure is rolled along a flat surface. Draw the figure in the 38th stage.

36   37   38
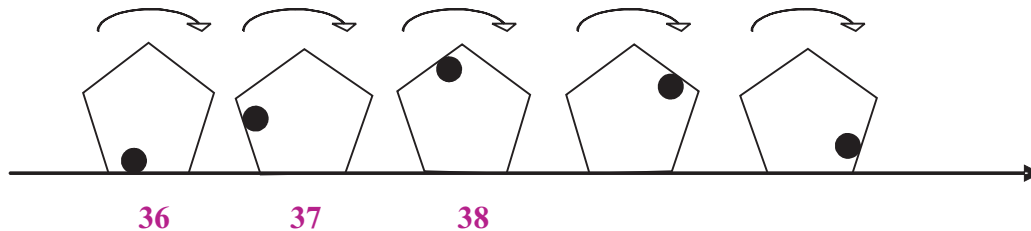
The 38th figure looks like **.**

Subtopic 2   **Tessellations**

A tessellation is a **repeating pattern** of plane figures that completely covers a plane with no **gaps** or overlaps.

A **regular** tessellation has a repeating pattern of congruent regular polygons.

Semi-regular tessellations are tessellations of more than one type of regular polygon where the arrangement of each vertex is the same.

Create a tessellation:

- Locate **midpoint** of one side.
- Rotate **180°** about that point.
- Translate quadrilateral pairs.

Create a tessellation:

- Begin with polygon that tessellates.
- Connect midpoint to endpoint with **new edge.**
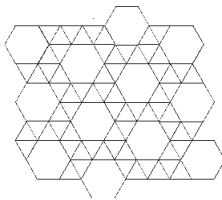- Rotate new edge 180°.
- **Rotate** and translate.

Module 11   Transformation of Shapes
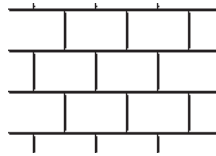**Lesson 5   Tessellations**

Create a tessellation:

- Begin with a polygon that tessellates.

- Draw new edge for one side.

- Copy edge to **opposite** side.

- Repeat for other pair of sides.
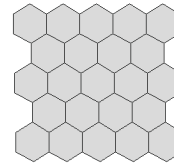
- **Translate** to tessellate.

4   Tell whether each tessellation is regular, semi-regular, or neither.
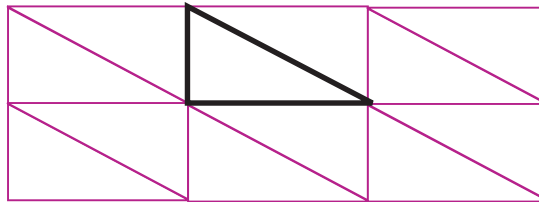
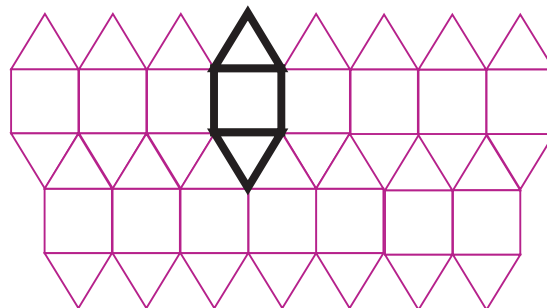**Semi-Regular**   **Neither**   **Regular**

5   Use the triangle to make a tessellation.

Possible answer:

6   Use the set of regular polygons to make a semi-regular tessellation.

Possible answer:

7   Use the quadrilateral to create a tessellation.

Possible answer: