Which shapes tessellate?

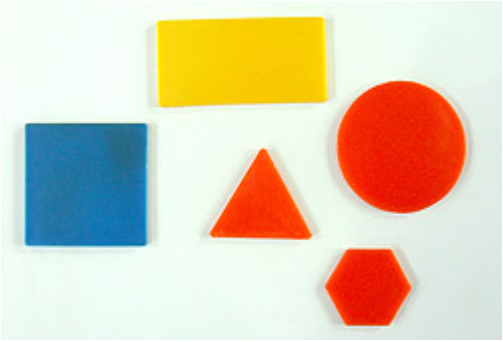
Annotation

Kiri understands angles at a point and knows that this is critical for tessellation. She knows the significance of working out interior angles and she knows, or can derive, the interior angles of these shapes. She understands the properties of shapes, can generalize as she applies this knowledge, and can justify and reason using geometric language in a clear and precise way.

Problem: Which shapes tessellate?

The teacher shows the student these shapes and poses this problem:

Which of the shapes will tessellate and why?



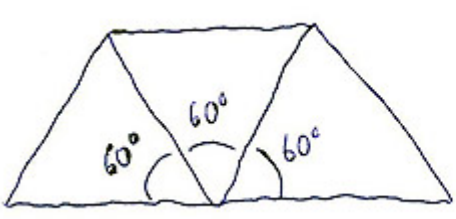
Student response

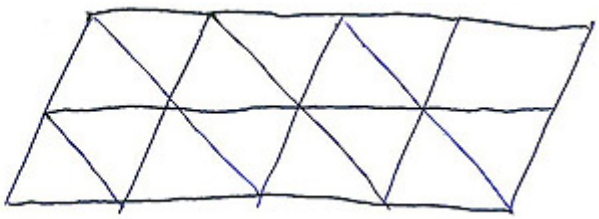
She identifies correctly squares, rectangles, equilateral triangles and regular hexagons.

Teacher: Tell me how you worked out which shapes tessellate.

Squares and rectangles tessellate because you can fit lots together without leaving gaps or overlapping. They tessellate because each corner is 90°. The four corners where they join add up to 360°, which means they fit exactly together.
Equilateral triangles tessellate. Equilateral triangles have sides the same length and all three interior angles are 60°. Joining three equilateral triangles together means three angles of 60° come together to add up to 180°, six together adds up to 360°.

Kiri:





Regular hexagons tessellate. They have interior angles that each equal 120° and, at a point, three hexagons together add up to 360°. Another way to look at regular hexagons is to see them as six equilateral triangles.
Circles do not tessellate because they do not have corners and no matter how they are joined there will always be gaps.