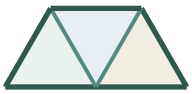
Pattern Block Grid Paper

Answer | Task 1 of 4 — complete key | A4

Original prompt

Task 1: Fill one trapezoid outline using three triangles, arranged as one triangle sitting on two.

Three triangles tile one trapezoid



Perimeter: long base 2s • short base s • slants s | s = one 12 mm grid step

Answer

Place two upright triangles on the two halves of the trapezoid's long base and an inverted triangle between them above the base. The inverted triangle's top edge is the short base; its two slanted edges meet the upper slanted edges of the lower triangles.

Reasoning

The stated isosceles trapezoid has long base 2s, short base s, and height $\sqrt{3}s/2$. Its interior is exactly the union of two lower upright unit triangles and one upper inverted unit triangle.

Check

Check the three unit triangles cover the full trapezoid: long base 2s, short base s, height $\sqrt{3}s/2$; all internal edges coincide and there is no gap or overlap.

Pattern Block Grid Paper

Answer | Task 2 of 4 — complete key | A4

Original prompt

Task 2: Fill one rhombus outline using two triangles.

The short diagonal is the single interior seam



Short diagonal joins the obtuse vertices; s = one 12 mm grid step.

Answer

Split the 60/120 rhombus along its short diagonal between the obtuse vertices. This diagonal equals one side length, so the two resulting pieces are equilateral triangles. Each triangle shares two outer edges with the rhombus; the diagonal is their internal seam.

Reasoning

The rhombus sides are s and the short diagonal is s. Each half therefore has three side lengths s and is equilateral; the two halves cover the rhombus.

Check

Check two triangles, two rhombus boundary edges per triangle, and one shared internal diagonal; no gap or overlap remains.

Pattern Block Grid Paper

Original prompt

Task 3: Build a strip of three rhombus outlines by joining neighboring pieces along one full edge. Cap the left and right ends with one equilateral triangle each, each triangle sharing one exposed slanted edge with its end rhombus.

Three-rhombus strip with one triangle cap at each end



Four full joins; other edges stay exposed. Each join s = one 12 mm grid step.

Answer

Place three congruent rhombi in a strip, with each neighboring pair sharing one complete side. Attach one equilateral triangle across one exposed slanted edge at the left end and one across a corresponding exposed slanted edge at the right end. The remaining unshared edges form the union's exposed outside perimeter.

Reasoning

Each rhombus side and triangle side has length s, so the four stated joins are full matching edges. This is a partial strip motif: its polygon union still has an exposed outside boundary, and the remaining boundary edges are not missing pieces.

Check

Count only Task 3's pieces: three rhombi and two triangles. Trace the two rhombus joins and the two end-cap joins; each is one full edge of length s, with no gap or overlap. The other edges remain exposed on the outside boundary.

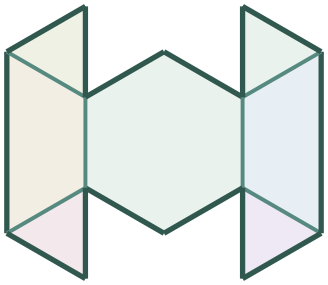
Pattern Block Grid Paper

Answer | Task 4 of 4 — complete key | A4

Original prompt

Task 4: Design a motif using one hexagon, two trapezoids, and four triangles, all edge-matched.

One complete edge-matched motif



Six full joins; both long bases stay exposed. s = one 12 mm grid step.

Answer

Center one regular hexagon. Attach one trapezoid by its short base to each of two opposite hexagon edges. Attach one equilateral triangle to each of the two slanted sides of each trapezoid. Keep both long trapezoid bases exposed on the outside perimeter.

Reasoning

The two trapezoids share one full short base each with the hexagon. Four triangles then share the four slanted trapezoid sides. Every join has length s; exposed long bases are perimeter edges, not missing pieces.

Check

Count 1 hexagon, 2 trapezoids, and 4 triangles. Verify the two hexagon joins and four slanted-side joins are full length, the two long bases lie on the outside perimeter, and all pieces are separate with no gaps inside or overlaps.