Isometric Stacked Blocks: A Grid-Based Drawing Guide

Original tasks 1, 2 / complete keys

Task 1

On a ground grid with a hypothetical unit of 15 mm, draw one block. State your convention and list the three visible faces.

Answer: A single block with a top rhombus, a left side parallelogram, and a right side parallelogram, all using 15 mm edges. Convention stated, for example: vertical edges vertical; ground axes at 30 degrees above horizontal; hidden edges omitted.

Reason: A block has three visible faces in isometric view. The top face uses the two ground axes; the side faces use vertical edges plus one ground axis each. Using one unit for all edges keeps the form consistent.

Check: Verify every edge is vertical or parallel to a ground axis; verify the top face is a rhombus with 15 mm edges; verify side faces have vertical edges of 15 mm.

Task 2

Draw two blocks stacked vertically and aligned, using a hypothetical unit of 10 mm. Identify the shared vertical edges and state whether you draw hidden edges.

Answer: Two aligned blocks whose four vertical edges are collinear continuations of the lower block's vertical edges, with the upper block's bottom face coinciding with the lower block's top face. The upper block starts at the lower block's top-front corner. Hidden edges may be dashed or omitted, with the convention stated; if drawn, they meet at each block's hidden back-bottom corner.

Reason: An aligned stack places the upper block directly above the lower block, so their vertical edges coincide. Starting at the top-front corner ensures alignment without counting offsets.

Check: Confirm the upper block's front-bottom corner sits on the lower block's top-front corner; confirm shared vertical edges coincide; confirm each top face is a rhombus with 10 mm edges; if hidden edges are drawn, confirm they meet at hidden back-bottom corners.

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Original tasks 3, 4 / complete keys

Task 3

Draw two blocks where the upper block sits on the lower block's top face, offset one grid step along the right ground axis from the lower block, using a hypothetical unit of 12 mm. Count the steps before drawing.

Answer: The lower block is drawn first. The offset block sits on the lower block's top face, with its front-bottom corner one 12 mm ground step along the right ground axis from the lower block's top-front corner. Its base is at the lower block's top plane, not at ground level. The offset matches the counted step.

Reason: An offset stack requires counting grid steps along a ground axis. Marking the new corner before drawing prevents accidental misalignment and makes the offset checkable.

Check: Measure the offset along the right ground axis between the two blocks' front-bottom corners and confirm it equals one 12 mm step; confirm both blocks use 12 mm edges; confirm top faces are rhombi; confirm the offset block's base is at the lower block's top plane, not at ground level.

Task 4

Draw a scene with three blocks: two aligned vertically and a third placed one grid step along the left ground axis away from the viewer from the bottom block, using a hypothetical unit of 8 mm. Count visible top faces and explain your count.

Answer: Two aligned blocks share vertical edges; the third block is offset one 8 mm step along the left ground axis away from the viewer from the bottom block, so it is not under the upper aligned block. Visible top faces: the top of the upper aligned block and the top of the offset block, so two visible top faces, because the bottom aligned block is covered from above.

Reason: A block covered from above has a hidden top face. Counting visible top faces checks depth cues and confirms which blocks are covered. The offset is checked by counting one grid step along the left ground axis.

Check: Confirm the aligned pair shares vertical edges; confirm the offset equals one 8 mm step along the left ground axis; count visible top faces and compare with uncovered blocks; confirm all edges follow the three allowed directions; if hidden edges are drawn, confirm they meet at hidden back-bottom corners.

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Source rubric / reflection

- [ ] Axis directions: all edges are vertical or parallel to one of the two ground axes at 30 degrees above horizontal.
- [ ] Face shapes: every visible top face is a rhombus and every visible side face is a parallelogram with vertical edges.
- [ ] Stacking: aligned stacks share vertical edges; offset stacks match counted grid steps.
- [ ] Depth cues: hidden edges are treated according to a stated convention and meet at hidden back-bottom corners.
- [ ] Units: one consistent unit length is used and labelled as a hypothetical example.
- [ ] Clarity: any labels or annotations are legible.

Reflection: What did you check, what did you change, and what will you try next?