

4.2.2 Solid Views

Name: _____ Class: _____ Date: _____

KEY WORDS elevation

<!-- Session 2 native-skill companion -->

Objective

Practise solid views within the labelled native lessons. Public original tasks; locally authored answer guidance.

1 Key knowledge and worked examples

■ Solid properties, plans and elevations · Foundation

A face is a flat boundary polygon; curved surfaces must be named separately. Edges join faces and vertices are corners. A prism has two congruent parallel end faces and a constant cross-section. A pyramid joins one polygon base to an apex. Plan is the view from above; front and side elevations are direct views without perspective. Give the viewing direction and align corresponding widths, depths and heights.

$$A_{\text{plan}} = wd, \quad A_{\text{front}} = wh$$

A cube or cuboid has 6 faces, 12 edges and 8 vertices. A triangular prism has 5 faces, 9 edges and 6 vertices; a square pyramid has 5 faces, 8 edges and 5 vertices. A cylinder has two circular flat faces and one curved surface, with no vertices. A cone has one flat circular face, one curved surface and one apex; a sphere has only a curved surface. For a cuboid of width 4, depth 3 and height 2 units, the plan is 4 by 3, front elevation 4 by 2 and side elevation 3 by 2. A stack with front-row column heights 1 and 3, and back-row heights 2 and 1, occupies four cells. The front elevation has column maxima 2 and 3; the side elevation has depth-row maxima 3 and 2. These views do not determine every hidden cube uniquely.

Do not draw perspective diagonals in an orthographic elevation. A plan alone cannot give height. Different hidden arrangements can share the same plan and elevations; do not claim a unique reconstruction without enough information.

AQA G12/G13 covers the named solids and construction/interpretation of views. Label dimensions and directions, preserve alignment between views and explain any hidden-space ambiguity.

Cuboid width 4, depth 3, height 2



Plan: 4×3



Front: 4×2



Side: 3×2

Original native-lesson illustration; labels belong to its worked example.

2 Practice

2.1 (Foundation) How many edges does a triangular prism have?

2.2 (Foundation) Find the plan area of a cuboid width 4, depth 3, height 2.

2.3 (Foundation) Find the front-elevation area for that cuboid.

3 Exam-style questions

3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: A plan view always determines the height of a solid.

Solutions

2.1 Three edges on each triangular end plus three joining edges: $3+3+3$.

2.2 Plan uses width and depth: $4 \times 3 = 12$ square units.

2.3 Front uses width and height: $4 \times 2 = 8$ square units.

3.1 False. Cuboids 4 by 3 by 2 and 4 by 3 by 7 have the same 4 by 3 plan view but different heights. An elevation or height label is needed.

Local review guidance: show the chosen method; give the checked result; explain the condition or failed shortcut. This is authored classroom guidance.