



Plans, elevations and measures

GCSE Mathematics 1MA1 · L037 · 60 minutes

Objective: Interpret plans and elevations and connect two-dimensional views to three-dimensional objects.

Calculator conditions: Core work is non-calculator. A calculator may be used only for a labelled scale/area check.

Connect & Check
5 min

Retrieve surface area/volume by recognising faces and viewpoints before changing representation.

C1. From above, which information about a solid can a plan show? **[NC] [2 marks]**

C2. Explain the difference between a plan and a front elevation. **[NC] [2 marks]**

Share
5 min

Choose a route: Visual (draw/annotate), Method (structured calculation), or Explain (justify decisions). Compare with a partner; all routes must produce the same core evidence.

Route	Journey	Evidence
A · Visual	Build or sketch the solid and draw each view.	Three labelled views.
B · Method	Use a grid and project	Grid views with dimensions.

heights/widths systematically.

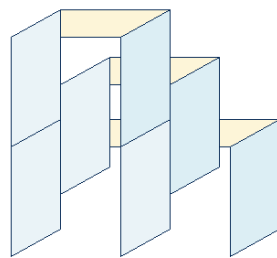
C · Explain

Describe what each viewpoint can and cannot reveal. Justified interpretation.

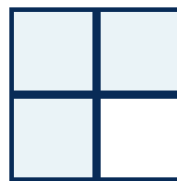
Present
12 min

Use the model to connect the same solid to plan/front/side views. Test what becomes hidden in each projection.

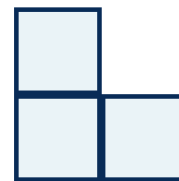
From a 3D object to plan, front and side elevations



3D object



Plan



Front elevation

Elevation = straight-on view; plan = view from above. Hidden depth can create ambiguity.

P1. For the model shown, explain why the plan does not reveal the height of the stacked column.
[NC] [2 marks]

Apply
25 min

Complete supported practice, then remove the scaffold and complete independent/exam-style work. Show a separate check where requested.

Supported practice

A1. A solid has a front elevation with column heights 2, 1 and 1. Sketch one possible arrangement of unit cubes. [NC] [3 marks]

A2. A plan occupies an L-shape of three squares. Explain what extra information is needed to determine the solid uniquely. **[NC] [2 marks]**

Independent practice - scaffold removed

A3. Draw the plan, front elevation and side elevation of a 2×2 base where one corner has a second cube stacked on top. **[NC] [6 marks]**

A4. Two solids have the same front elevation. Give one reason their plans might differ. **[NC] [2 marks]**

Exam-style practice

E1. A rectangular room measures 6 cm by 4 cm on a 1:100 plan. Find the real floor area in m^2 . **[C] [4 marks]**

E2. A solid has identical front and side elevations, each two squares wide and two squares high. Must the plan be a 2×2 square? Explain with a counterexample or convincing description. **[NC] [4 marks]**

Extension and deep challenge

X1. Sketch two different solids that have the same front elevation but different side elevations. **[NC] [4 marks]**

X2. Two solids have identical front and side elevations. Must their plans be identical? Explain using a specific arrangement of cubes. **[NC] [5 marks]**

Recall & Review

8 min

Complete the exit task without notes, compare with your baseline and record one WWW and one EBI.

R1. A solid is made from four cubes: three form an L-shape on the base and one is stacked on the corner cube. Describe or sketch its plan and front elevation. **[NC] [4 marks]**

WWW: _____

EBI: _____

Next lesson preparation: Review square numbers 1^2 to 15^2 and identify the hypotenuse in three right-angled triangles.

Recall & Review: feedback and extension integration

Lesson L037: Plans elevations and measures

Objective: Interpret plans and elevations and connect views to three-dimensional objects.

Timing for a 60-minute lesson

0-7 Connect & Check; 7-14 Share; 14-25 Present/model; 25-44 Apply route choice/practice; 44-52 independent exam-style check; 52-60 Recall & Review, WWW/EBI and next step.

Recall & Review evidence

At the end of the lesson, solve a fresh question without prompts, explain one check, correct one error and record the next practice step.

What Went Well (WWW)

I selected the correct geometric fact, theorem, formula or transformation and used a clear diagram with appropriate labels and units.

Even Better If (EBI)

I will name the fact or theorem, show the substitution or construction step and check whether the size, direction and units of the result are reasonable.

Integrated stretch and deep challenge

Stretch: A scale plan measures 6 cm by 4 cm at 1:100. Find the real floor area in m^2 .

Deep challenge: Two solids have identical front and side elevations. Must their plans be identical? Explain with an example.

My next-step response
