LESSON MAKER PRO

Measure for the Sketch

Choose measurement tools that match a scale drawing.

HIGH SCHOOL · MM.D3D.A.10.a

MM.D3D.A.10.a "Determine the level of precision and the appropriate tools for taking the measurements in constructing a two-dimensional visual representation of a three-dimensional object or structure."

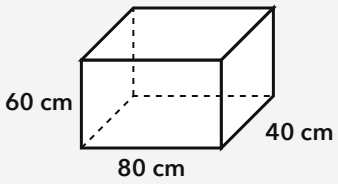
NAME _____ DATE _____

MATCH THE PRECISION

At a scale of 1:n, multiply the target drawing precision by n to find the largest acceptable measurement interval on the real object. Choose a measuring tool with marks no farther apart than that interval. Use a drawing ruler with marks no farther apart than the target drawing precision.

WORKED EXAMPLE

Draw the prism's front face (l by h) at 1:20. The drawing needs 1 mm precision. Choose a tape marked every 1 cm or 5 cm, and a drawing ruler marked every 1 mm or 5 mm.



1. Front-face drawing: 80 ÷ 20 = 4 cm wide; 60 ÷ 20 = 3 cm high.
2. Real-object interval: 1 mm × 20 = 20 mm = 2 cm.
3. Choose the 1 cm tape and 1 mm drawing ruler.

Answer: 4 cm by 3 cm; 1 cm-marked tape; 1 mm-marked ruler

PRACTICE 4 problems

1 At 1:10, a drawing needs 1 mm precision. What is the largest acceptable measurement interval on the real object?

ANSWER _____

2 At 1:25, a drawing needs 2 mm precision. Which tape works: marks every 1 cm or every 10 cm?

ANSWER _____

3 At 1:5, a drawing needs 1 mm precision. Does a tape marked every 1 cm work? Give the largest acceptable interval.

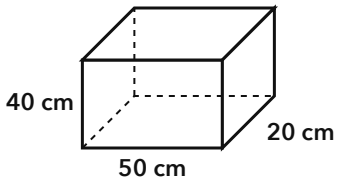
ANSWER _____

4 At 1:40, a drawing needs 1 mm precision. Choose a tape marked every 2 cm or every 5 cm. Why?

ANSWER _____

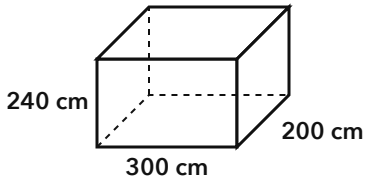
APPLY IT Show your work

1 You are sketching a gaming PC case. Draw its side face (l by h) at 1:5. Find the drawing size. For 1 mm drawing precision, choose a tape marked every 5 mm or 1 cm.



ANSWER _____

2 A pop-up merch booth needs a front-view plan (l by h) at 1:40. Find the plan size. For 1 mm drawing precision, choose a tape marked every 1 cm or 5 cm.



ANSWER _____

CHALLENGE One step up

For the booth above, change the plan scale to 1:100 but keep the 1 mm precision target. Would a tape marked every 5 cm now work? Show why.

WORK SPACE AND ANSWER

ANSWER KEY

Measure for the Sketch

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	At 1:10, a drawing needs 1 mm precision. What is the largest acceptable measurement interval on the real object?	**1 cm**
2	At 1:25, a drawing needs 2 mm precision. Which tape works: marks every 1 cm or every 10 cm?	**Tape marked every 1 cm**
3	At 1:5, a drawing needs 1 mm precision. Does a tape marked every 1 cm work? Give the largest acceptable interval.	**No. The largest acceptable interval is 5 mm.**
4	At 1:40, a drawing needs 1 mm precision. Choose a tape marked every 2 cm or every 5 cm. Why?	**Every 2 cm. The largest acceptable interval is 4 cm.**

PART 2 · APPLY IT

1. **10 cm by 8 cm; tape marked every 5 mm** Divide l and h by 5. The largest acceptable real-object interval is 1 mm × 5 = 5 mm.
2. **7.5 cm by 6 cm; tape marked every 1 cm** Divide l and h by 40. The largest acceptable real-object interval is 4 cm, so the 5 cm-marked tape does not qualify.

CHALLENGE

Yes. At 1:100, the largest acceptable real-object interval is 1 mm × 100 = 10 cm. The tape's 5 cm marks are close enough.

Accept equivalent units. A tool qualifies when the spacing between its marks is no greater than the calculated interval.