

Teacher guidance: Integrated measurement projects

Purpose. This is a synthesis objective. It introduces no new formula; students must decide which familiar measurement is required at each stage of one sustained context.

Prerequisites

Compound-shape area, Pythagoras, prism volume, metric units, rates, percentage allowances, rounding purchases upward, and money calculations.

Suggested teaching sequence

1. Annotate the diagram by purpose: sponsorship area, art area, light path and concrete cross-section.
2. Make a quantity table with columns for measurement, units, rate and cost.
3. Require students to show unrounded intermediate values.
4. Add component costs only after each line has been independently checked.
5. Finish by testing at least one assumption or limitation.

Assessment evidence

A secure response selects the correct region or boundary, maintains square/cubic units, applies the correct rate and fixed fee, and produces a traceable total. Higher-level evidence compares alternatives or explains how an assumption changes the quote.

Common errors

- Using total area for a finish that applies to one component only.
- Multiplying an area rate by a length or volume.
- Treating the visible side area as the concrete volume.
- Applying an installation fee twice, or omitting it.
- Rounding a purchase down or rounding intermediate measurements too early.
- Listing a vague “not to scale” limitation without explaining its effect.

TikZ provenance

The course profile is `\PicCompoundTriOnRectNoAngle` from `OBJECTIVES/_shared/tikz-2d-shapes.tex`, represented in the shared shapes root-file bank. LO sources call the public macro; they contain no one-off silhouette drawing.