Dimensioning Guide

A student reference for placing dimensions so a part can be built, inspected, and revised correctly.

Use this guide when...

- you are adding dimensions to a sketch, CAD drawing, or manufacturing package.
- you need to communicate feature size, feature location, and design intent.
- you want another person to build or inspect the part without guessing.

Dimensioning goals

Goal	What it means	Student check
Size	Communicate how large the part or feature is.	Are overall length, width, thickness, diameters, and radii clear?
Location	Communicate where features are placed.	Can someone locate hole centers, slots, cutouts, and edges?
Design intent	Communicate the dimensions that control function.	Are fit, alignment, clearance, and assembly-critical features defined?
Inspection	Make measurements checkable.	Could another student verify the part using calipers, ruler, or gauge?

Core rules

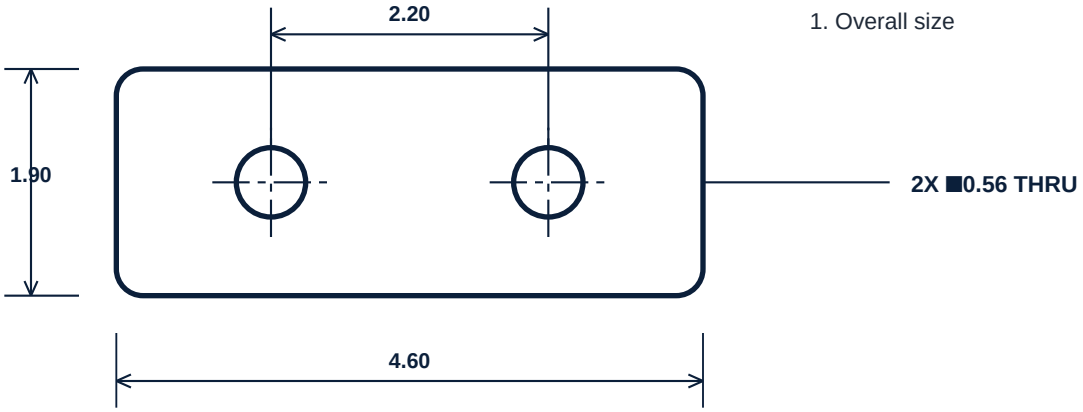
Rule	Why it matters
Dimension each required feature once.	Repeated dimensions can disagree after revisions and create confusion.
Place dimensions in the view where the feature shape is clearest.	A circle, hole, slot, or angled edge should be dimensioned where it is easiest to read.
Avoid dimensioning to hidden lines.	If an important internal feature must be dimensioned, use a section view or another clearer view.
Use extension lines instead of object edges as dimension lines.	Object lines show part geometry; dimension and extension lines communicate measurement.
Avoid crossing dimension lines when possible.	Clean placement reduces misreading and inspection errors.
Use datums, baselines, or common edges for related features.	This reduces tolerance stack-up and preserves alignment.
Include units, tolerance, or a general note when required.	A part can be made incorrectly if inch/mm or allowable variation is unclear.

Dimensioned bracket example

This example defines overall size, hole size, and hole location without duplicate dimensions.

What this drawing defines:

4. Hole callout and quantity
3. Hole-center spacing
2. Hole diameter
1. Overall size



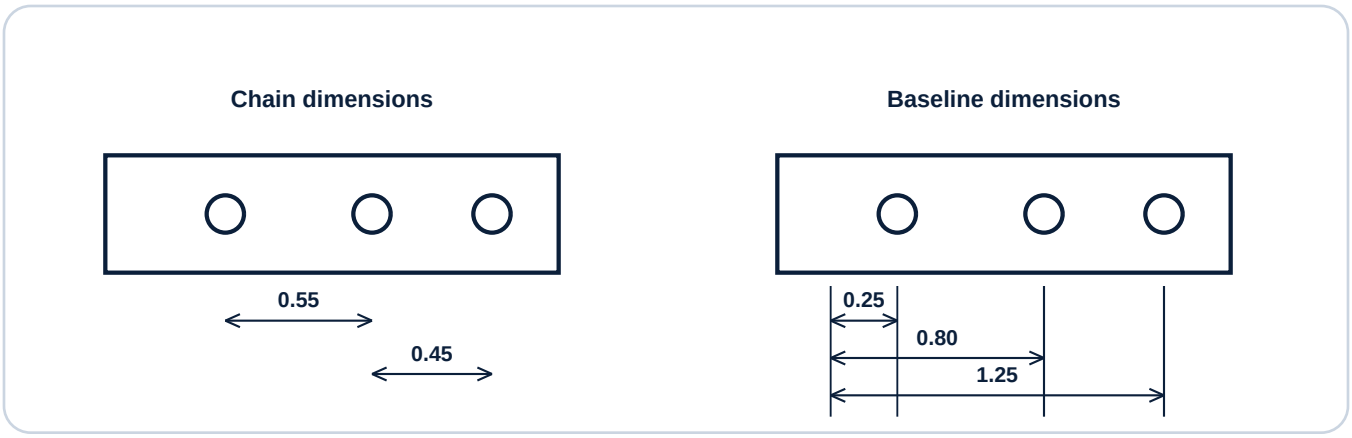
Hole and curve callouts

Use symbols so the reader knows whether a number describes a diameter, radius, or repeated feature.

Callout	Meaning	Example use
■0.25	Diameter of a circular feature.	Hole, circular cut, or cylindrical feature.
R0.25	Radius of an arc or rounded edge.	Fillet, round, or curved corner.
2X, 4X	The same feature occurs multiple times.	2X ■0.56 means two holes of the same diameter.
THRU	The hole passes completely through the part.	Useful for plates, brackets, and laser-cut parts.
Depth note	The feature stops at a specified depth.	Blind hole, pocket, or counterbore.

Baseline vs. chain dimensioning

Related features are often easier to inspect when they are dimensioned from a common reference.



- Chain dimensions are acceptable for simple features, but errors can accumulate from one feature to the next.
- Baseline dimensions locate multiple features from the same reference edge or datum.
- Use baseline or datum-style dimensioning when alignment matters, such as hole patterns on brackets or payload mounts.

Quality checklist

- Every required feature has a clear size and location.
- Dimensions are placed in the clearest view and are not attached to hidden lines.
- Repeated or duplicate dimensions are removed.
- Hole, radius, and repeated-feature callouts use correct symbols.
- Related features are dimensioned from a useful common reference when alignment matters.
- Units, tolerance, or general notes are included when needed for manufacturing or inspection.