

Sketching and communicating a design

Lesson at a glance

Open by comparing two board drawings of the same desk book-stand (one bare outline, one with part, material and size labels) and ask which a partner could build without questions. Model a brisk annotated sketch (card base 15 cm, card back 12 cm, tape join), then wipe it so pupils invent their own stand on the Investigation Journal Design Brief page. Partners swap pages in silence, describe the design and a build order from the drawing alone, then class-talk what labels made the plan clear.

Learning objectives

- Produce a labelled, measured design sketch that names parts, materials and sizes
- Read a partner's sketch and describe the design, including a build order, from the drawing alone

Before the bell: prep

Before the bell, sketch Drawing A (outline only) and Drawing B (three labels: e.g. card base 15 cm, card back 12 cm, tape join) on the board or IWB. Have Design Brief pages and rulers ready. Plan space to wipe or cover the finished demo before pupils sketch.

Materials

Item	Qty	Per	Source	Low-cost substitute
30 cm ruler	1	pupil	classroom	a strip of card marked in centimetres
Investigation Journal Design Brief page	1	pupil	provided printable	plain A4 paper with space for a large sketch and margin labels

Safety watch-point

Ruler edges and pencil points only: ordinary classroom care. No build materials or tools are out in this lesson.

**Teaching moves**

- **Getting Started:** Show Drawing A and Drawing B side by side. Hands up for which a partner could build without asking. Capture two or three missing ideas (part names, materials, sizes) on the board. Link briefly to flat-pack diagrams or LEGO booklets: labels carry the plan when the designer is not there.
- **What makes a design sketch clear?:** Invite the class to name what Drawing B adds in their own words first, then lock in the three terms: annotated sketch, label, sharing a plan clearly. Push the pattern part + material + size. Ask: if a label only said 'wood', what would a builder still not know?
- **Model a clear annotated sketch:** Think aloud a simple stand (base, sloping back, front lip) with a ruler so sizes look deliberate. Add three labels out loud, then clear or cover the finished sketch before pages go out. Say firmly: the demo showed the labelling pattern. Your stand must be a different shape and sizes.
- **Sketch your design:** Hand out Design Brief pages and rulers only: no junk box. State constraints once: base about A5, freestanding on a desk, materials named as everyday junk-modelling items on the page. Circulate coaching thin labels ('wood') into full ones (which piece, how long in cm).
- **Swap sketches: can your partner understand?:** Pair pupils, exchange pages, time one full silent minute yourself. Partner A speaks about two minutes from the board prompts; switch. Offer stems: I can see the... is made of...; I would build it by first... Stop anyone inventing unwritten details. Ask where the page says that. Sketcher must not talk the partner through.
- **What makes a sketch clear enough to build?:** Whole-class talk: one label that helped, one that left people stuck. Draw out joins, centimetre sizes, and that neatness only helps when labels are complete. Give one minute to fix a single label on their own page. Celebrate pairs where the reader gave a full build order with no help.

What it should show

A successful sketch names every main part, gives each a material, and shows at least two sizes in cm so a partner can state a build order with no help from the sketcher. Surprising stuck moments usually mean missing join labels (tape, slot, band) or sizes written as 'big/small' instead of centimetres: send them back to add one label.

Misconceptions & interventions

- **A neat picture is enough. If it looks tidy, a partner can build it.** Point back to Drawing A versus B: neatness helps reading, but without part + material + size the partner still invents the missing facts. Have them add one full label and re-check with the partner.
- **Writing just 'wood' or 'card' on a part is a finished material label.** Ask which piece and how long or wide in centimetres. Model upgrading 'wood' to 'lolly-stick back, 12 cm' on the board pattern.
- **During the swap, pupils point and invent details that are not on the page.** Gently stop them and ask 'where does the page say that?' Keep the sketcher silent so the labels (not the designer) are being tested.

Differentiation

Emerging	Developing	Proficient
As they point to each piece, give a spoken checklist: part name, material, size in cm. Coach one full label at a time on the Design Brief page.	Fast finishers add a three-step build order under the sketch on the same page, or check that every join is labelled.	Mark one measurement that must be exact for the stand to stay upright and say why; after the swap, name the single label change that would most improve a partner's build order.

Cross-curricular hook

Link to Maths Measures: sizes must be in centimetres, not 'big' or 'small', so a partner can read exact lengths.