

Sketching and communicating a design

Lesson at a glance

Open by voting on two board drawings of the same book stand — a bare outline versus one with part, material and size labels — and name what Drawing B adds. Model the three-part label pattern on a simple stand, then wipe it so pupils invent their own desk book-stand on the Investigation Journal Design Brief page. Partners swap in silence, describe the design and attempt a three-step build order from the page alone. Close with a talk on which labels helped and which left people stuck.

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: part, material, size in cm) on the board or IWB, and have a ruler ready for the live model. Keep the Investigation Journal Design Brief pages and rulers stacked at your desk, ready to give out once the model sketch is covered — they are the only materials today, so leave the junk box and build kit shut.

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

No special hazards. This is a paper-and-ruler sketching lesson with no cutting tools or build kit required.

**Teaching moves**

- **Getting Started:** Show Drawing A and Drawing B of the same book stand. Hands up for which a partner could build without questions. Capture two or three missing elements from A (part names, materials, sizes) on the board and park them — do not hand out pages yet.
- **What makes a design sketch clear?:** Invite the class to name what Drawing B adds, then seal the three-part label rule: part name, material, size in centimetres. Head off ‘neat picture is enough’ by asking what still goes wrong if a label only says ‘wood’.
- **Model a clear annotated sketch:** Think aloud a desk book stand in about six minutes: outline first, pause for ‘what is still missing?’, then write three labels (e.g. card base 15 cm wide; card back 12 cm tall; tape join). Before pages go out, clear or cover the finished sketch so pupils cannot copy it — say the model showed the pattern only.
- **Sketch your design:** State constraints once: base about A5, freestanding, junk-modelling materials named on labels only, product is the sketch. Circulate and coach thin labels (‘wood’) into full ones (which piece, how long?). Fast finishers add a three-step build order under the sketch on the same page.
- **Swap sketches: can your partner understand?:** Pair, swap, one silent minute reading, then two minutes speaking per role using the four prompts on the board. Offer stems: ‘I can see the... is made of...’; ‘I would build it by first...’. Stop anyone inventing unwritten details — ask ‘where does the page say that?’ The sketcher stays quiet rather than talking the partner through.
- **What makes a sketch clear enough to build?:** Keep this as a whole-class engineering talk, drawing out joins, centimetre sizes and complete labels. Then give one minute to fix a single label on their own Design Brief, and 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 outline a three-step build order without help. Weak swaps usually stall on missing join labels or vague materials (‘card’ with no size); one added label often unblocks the reader.

Misconceptions & interventions

- **A neat outline is enough — if it looks tidy a partner can build it.** — Point back to Drawing A versus B: neatness without part, material and size still forces guessing. Ask them to add the missing two facts on one piece.
- **Writing just ‘wood’ or ‘card’ on a part is a full material label.** — Ask ‘which piece, and how long?’ and model the full pattern aloud: ‘lolly-stick back, 12 cm’.
- **During the swap, pupils point and invent details that are not on the page.** — Stop gently and ask ‘where does the page say that?’ If it does not, the sketcher adds one label and the reader checks again from the page alone.



Differentiation

Emerging	Developing	Proficient
• As they point to each piece, give a spoken checklist only: part name, material, size in cm — keep them on the same Design Brief page. • Pair with a supportive reader who uses the sentence stems and names what the page already shows.	• Coach one thin label into a full part–material–size note, then check a partner can use it in their description. • If finished early, add one missing join label and re-test with the reader.	• Mark one measurement that must be exact for the stand to stay upright and say why on the same page. • Add a clear three-step build order under the sketch and test whether the partner follows it without help.

Cross-curricular hook

Link to Maths Measures — pupils read and write lengths in centimetres on every main part label.