

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. Have a ruler ready for the live model. Hand out Investigation Journal Design Brief pages and rulers only — no junk box or build kit today.

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 board beats. 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 must not talk the partner through.
- **What makes a sketch clear enough to build?:** Whole-class engineering talk only. Draw out joins, centimetre sizes, and complete labels. Give one minute to fix a single label on their own Design Brief. 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 — no spoken walkthrough.



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.