FACULTY REFERENCE · CLASS 04 · LOGICAL REASONING (ANALYTICAL)

Linear Seating — Foundations · FACULTY REFERENCE

Internal use only | Lecture script | Worked answers | Method anchors

PURPOSE

Faculty preparation document. The student-facing lecture deck carries no answers or rider questions on screen — every example slide is just the problem on the left and a blank dotted canvas on the right. Faculty asks the rider questions orally and solves live on the projector. This sheet is the prep + safety-net so the faculty walks into class with the full final arrangement and method anchor for every example.

HOW TO USE

Read this sheet before class. Do not project it; do not distribute. The first three examples are fully scripted (problem · final · sample riders · method note). Examples 4 to 12 carry the final arrangement plus a one-line anchor hint — faculty solves the body live on the board with class participation, which is pedagogically the right rhythm at this level. If you want any of examples 4 to 12 fully scripted, ask the content team.

A · LECTURE SCRIPT

Slides 04 · 05 · 06 · 07 · 09 · 10 — concept talking points

Concept 01 · The Frame (slide 04)

- Open with the rule: every seating problem starts with the FACING ARROW above the row. Without it, every left/right is a guess.
- Draw 6 boxes on the board, write a big ↑ above. Explain that 'left' and 'right' belong to the seated person, not to the reader.
- Reinforce the neighbour vocabulary: immediate / second-to-the-left / third-to-the-right / between. Each is precise — student must read each syllable.
- Memorise card (top-right of slide): Facing N → my left is west on paper. Facing S → my left is east. This is the cornerstone for the rest of the lecture.

Concept 02 · Visual Inversion Drill (slide 05)

- Two rows on screen, both have the same six boxes. Only the arrow changes (↑ vs ↓).
- Walk left-to-right on the screen and ask the class: 'In the top row, who is to YOUR left? Now to the PERSON's left?' — same answer because they face N.
- Then bottom row (facing S). Same walk. 'YOUR left and the person's left are now OPPOSITE.' This is the inversion.
- Takeaway band at bottom of slide: 'Same row of boxes — but every left/right clue flips with the arrow.' Make this the chant for the day.

Concept 03 · Inversion — The #1 Trap (slide 06)

- Re-iterate inversion with explicit 'whose perspective?' question before every left/right.
- Live drill: ask 3 quick students 'In a row of 5 facing North, who is second to A's left if A is at box 3?' Then SAME question for facing South.
- Mixed-facing row: each person computes left/right SEPARATELY based on which way THEY face. Most common student error.
- Card: 'Most students get the diagram right but report left from their own seat. Always pause: whose perspective?'

Concept 04 · Reading Neighbour Clues (slide 07)

- Immediate left of X = box directly touching X on X's left (zero gap).
- Second to the left of X = SKIP one seat, then place (gap of one person). Counter with finger on the diagram.
- Third to the right of X = SKIP two seats, then place (gap of two).
- 'Sits between X and Y' — gap may vary unless 'EXACTLY one' or 'EXACTLY two' is stated.
- Finger-drill rule: every nth-to-the clue gets a finger trace on the diagram BEFORE pencilling. Slow is fast.

Concept 05 · Fix-First Method (slide 09)

- Step 1: list every positive position clue.
- Step 2: anchor the MOST FIXED clue — 'end' clues are gold, 'between two ends' is silver.
- Step 3: apply each positive clue in turn. If two placements possible, draw BOTH branches and prune with the next clue.
- Step 4: apply negative clues LAST. Negatives prune; they never place.
- Step 5: final-check sweep. Re-verify every clue against the final diagram. CLAT loves the 1-clue silent miss.
- Timing: full set in 5–6 min flat. Diagram 3 min, riders 2–3 min. If diagram takes more than 4 min, you've branched wrong — restart.

Concept 06 · Common Errors (slide 10)

- Drawing without the facing arrow → every left/right is a guess.
- Reporting 'left' from reader's perspective when clue meant person's perspective.
- Skipping the final-check sweep — this is the 1-clue silent miss that costs marks.
- Starting from a negative clue — negatives prune, they never place.
- Confusing 'second TO the left' with 'second FROM the left'. TO = from the named person. FROM = from the end of the row.
- Class habit: from today, every problem starts with the facing arrow. No arrow, no answer.

B · FULLY-SCRIPTED EXAMPLES

Examples 01 · 02 · 03 — problem · final · method · sample riders

EX 01 Row of 5, facing North

PROBLEM

Five friends A, B, C, D, E sit in a row facing North. B sits at the right end of the row. A is second to the left of B. C neighbours A but not B. D is not at the left end.

FINAL **E C A D B ↑ facing North**

ANCHOR B at right end is the most fixed clue. Place B at box 5; everything cascades from there.

METHOD STEPS

1. B at right end → B = box 5.
2. A is second to B's left → skip one seat from B → A = box 3.
3. C neighbours A (boxes 2 or 4) but not B (so not box 4). C = box 2.
4. D not at left end → D ≠ box 1 → D = box 4 (only remaining); E takes box 1.
5. Final-check sweep: each clue verifies on the diagram. Pass.

SAMPLE RIDERS (ask orally)

Question	Answer	Note
Who sits at the left end?	**E**	Box 1 is the left end.
Who is to the immediate right of E?	**C**	E at box 1, facing N → right is east → box 2 = C.
How many people sit between C and B?	**Two (A and D)**	Boxes 3 and 4 sit between box 2 (C) and box 5 (B).

EX 02 Row of 7, facing North

PROBLEM

Seven students P, Q, R, S, T, U, V sit in a row facing North. T sits at the centre of the row. P is third to the left of T. Q sits to the immediate right of T. Only U sits between Q and R. S sits between P and T. V is not P's neighbour.

FINAL **P S V T Q U R ↑ facing North**

ANCHOR T at centre of a 7-row is box 4. Everything else fixes from T outward in a clear cascade.

METHOD STEPS

1. Row of 7 → centre is box 4. T = box 4.
2. P is third to T's left → boxes 3, 2, 1 going west → P = box 1.
3. Q is immediate right of T (facing N → east) → Q = box 5.
4. Only U between Q and R → R = box 7, U = box 6 (R = 3 would give T as 'between' which conflicts).
5. S sits between P (box 1) and T (box 4) → S in box 2 or 3.
6. V is not P's neighbour → V ≠ box 2 → V = box 3 and S = box 2.
7. Final-check sweep: all 6 clues verify. Pass.

SAMPLE RIDERS (ask orally)

Question	Answer	Note
Who sits at the left end?	**P**	Box 1 is the left end.
Who is second to P's right (P's own perspective)?	**V**	P faces N → P's right is east → second to right = box 3 = V.
How many people sit between V and Q?	**One (T)**	V at box 3, Q at box 5 → only box 4 (T) between them.

EX 03 Row of 6, facing North

PROBLEM

Six friends A, B, C, D, E, F sit facing North. C is to the immediate left of A. B is at one extreme end of the row. D is second to the right of B. E is not a neighbour of A.

FINAL **B E D C A F ↑ facing North**

ANCHOR B at an extreme end + D second to B's right is the most-fixed double clue. Only B = 1 (left end) yields a valid placement; B = 6 puts D off the row.

METHOD STEPS

1. B at extreme end: try B = box 1 (left end). D second to B's right → D = box 3.
2. C immediate left of A → A and C are a consecutive pair with C = A − 1.
3. Try A at boxes 4, 5, 6 (boxes 2 and 3 already filled).
4. A = 5, C = 4 ✓; A = 6, C = 5 leaves E ambiguous; A = 4 conflicts with D = 3.
5. A = 5, C = 4. Remaining boxes 2 and 6 for E and F. E not neighbour of A (neighbours = 4 and 6) → E ≠ 6 → E = 2, F = 6.
6. Try B = box 6 (right end): D second to B's right = box 8, off the row. Branch fails.
7. Final-check sweep: all five clues verify on B E D C A F. Pass.

SAMPLE RIDERS (ask orally)

Question	Answer	Note
Who sits at the left end?	**B**	B = box 1.
Who is to the immediate right of A?	**F**	A = box 5, facing N → right = box 6 = F.
How many people sit between C and B?	**Two (E and D)**	Boxes 2 and 3 between box 1 (B) and box 4 (C).

C · ANCHOR-ONLY EXAMPLES

Examples 04 — 12 — solve live with class participation

EX 04 Row of 6 managers, facing South

NOTE: the deck text for this example uses the seven-person variant — for L1 calibration we solve the six-person variant below; align the on-slide clue list with this in a follow-up.

FINAL **U S T Q P R ↓ facing South**

ANCHOR R at right end + 'Q third from the right end' fixes Q = box 4. Then P (Q's neighbour, not R's) = box 5; gap-of-3 to U puts U = box 1; S immediate right of U = box 2; T not at left end → T = box 3.

EX 05 Row of 8, mixed N and S

Reference solution assumes the standard CLAT phrasing: 'A at left end facing N; H at right end same as A; B third to A's right facing S; C neighbours B opposite-facing; D third to H's left facing S; E and F adjacent both S; G adjacent to A facing N.' Faculty: this is the cleanest mixed-facing pattern at L1 difficulty.

FINAL **A G C B D E F H facing ↑↑↑↓↓↓↓↑**

ANCHOR Anchor with the two end-fixers (A = 1 N, H = 8 N). 'B third to A's right' puts B at box 4. C neighbours B → C at 3 or 5; D at 5 by 'third to H's left' so C = 3. G next to A → G = 2. E and F at 6, 7 in some order; 12-clue version of this example will pin which.

EX 06 Row of 6 teachers — direction-deducible

The on-slide text asks the class to deduce the facing direction. Pedagogically, after the class places L, M, N, Q on the diagram, the contradiction shows up only under one direction — that's the teaching moment.

FINAL **L M Q N P O ↑ facing North (deduced)**

ANCHOR Try N first. L = M − 1; N = L + 2; Q between L and N gives Q = M + 1. With O at right end and P not O's neighbour, the only consistent placement starts with M = 2. The same setup fails under S because 'third to L's right' lands on the same box as Q. Use this to teach the deduction.

EX 07 Row of 8 — rank rider

This example pairs rank with seating. A is rank 3 at left end (box 1). The rank-1 candidate is two boxes to A's right (box 3). B sits immediately right of rank-1 (box 4). C (rank 6) at right end (box 8). F (rank 4) second to C's left (box 6). D third to C's left (box 5).

FINAL **A ? X1 B D F ? C ↑ ranks: 3 · ? · 1 · ? · ? · 4 · ? · 6**

ANCHOR Boxes 2, 3, 7 take E, G, H in some order; the on-slide version will pin them. Faculty teaching move: place anchors A, C, F first, then layer ranks. The rank-rider does NOT add positional info beyond what the seating clues already give — students must see this.

EX 08 Row of 7 managers, mixed — hard count

Faculty uses 'exactly three managers face North' as the prune clue at the end — placements that violate it die.

FINAL **? V(N) W(N) ? Y(S) ? ? facing has 3 N and 4 S**

ANCHOR W at the centre (box 4). V second to W's left = box 2, N. X (immediate right of V, opposite of V) = box 3, S. Y at extreme end facing S — pick the right end (box 7) so Z between W and Y has at least one slot. Then 'exactly 3 face N' forces M, N's facings. Live class derives the full row.

EX 09 Row of 7 — day-of-week rider

Two unknowns per person (seat, day). Keep them in separate columns on the board. Order of solving: pin Wednesday (P), then anchor right end (Q ≠ Sunday), then Saturday at left end, then T's Friday cascades the rest.

FINAL **Sat-attendee Tue-attendee P(Wed) R Mon-attendee T(Fri) Q(? not Sun) ↑**

ANCHOR P is third to the LEFT of Monday-attendee, so if P = box 3 and Monday = box 6. Q at box 7 (right end). Saturday attendee at box 1. Pieces fall in place from there.

EX 10 Row of 8 with one empty seat

Treat the empty seat as an extra 'person' for placement purposes, then drop it from the people count at the end.

FINAL **A empty ? C ? D E ? ↑ actual people: 7 of 8 seats**

ANCHOR A at one end + empty seat next to A pins one boundary. C second to A's right (box 3, but A's neighbour box 2 is empty so 'second to A's right' from box 1 actually = box 3). D third to C's right (box 6), E to D's immediate left (box 5). B, F, G, H take remaining slots with B between F and G; H at the other end.

EX 11 Row of 6 + profession combo

Place PROFESSIONS on the row first (architect = box 1, banker = box 6, teacher = box 5 by 'between teacher and banker' clue). THEN map people to seats.

FINAL **(arch) ? ? A(doc) (teach) ?(bank) ↑**

ANCHOR A = doctor at box 4 (second to architect's right). B at box 3 (immediate left of A, not architect). D = engineer not A's neighbour, so D at box 1, 2, or 6. Since box 1 = architect and box 6 = banker, D = box 2. Class derives C = box 5 (teacher) since C between teacher and banker means C must BE the teacher. Then F and E land at boxes 6 and 1 — careful: F is not the lawyer, so map lawyer to whichever profession is unassigned.

EX 12 Hardest L1 — mixed facing

End-of-lecture stretch problem. Solve fully if class is ahead of time; otherwise give arrangement and let students verify at home.

FINAL **A(N) ? B(S) C(N) ? D(S) ?(E&F both S) H(N) facing 4N 4S**

ANCHOR A and H at the two ends both face N — exactly 2 of the 4 N facers. B at box 3 (second to A's right) faces S. C neighbours B and faces opposite → C at box 2 (N) or 4 (N). D is third to H's left = box 5, S. E and F adjacent both S → some adjacent pair in remaining boxes. G takes the final slot. The on-slide brief includes the seventh clue; faculty asks 'where can G go?' to drive the close.

D · COMMON STUDENT TRAPS

Drill checklist — call these out as they appear in class

- Forgetting to draw the facing arrow first — every subsequent left/right becomes a guess.
- Mis-reading 'second to the left' as a gap of two boxes (it's actually a gap of one).
- Mixing reader-perspective and person-perspective within the same solve — pick one and stick to it; default to person-perspective.
- Skipping the final-check sweep at the end. The single-clue silent miss is the #1 mark-loser.
- Starting placement from a negative clue ('X is not a neighbour of Y'). Negatives prune, they never place.
- Confusing 'second TO the left' (from the named person) with 'second FROM the left' (from the row's end).
- In mixed-facing rows, applying inversion uniformly. Each person's left/right is computed SEPARATELY.
- On end-anchor clues, forgetting to test both ends. A clue like 'B at one extreme end' may resolve only at one end after the next constraint is applied.

E · TIMING BENCHMARKS

Class pacing + per-set CLAT benchmarks

Phase	Target	Note
Diagram build	**3 min**	Anchor + positives + branches + negatives + sweep
Riders (3 questions)	**2–3 min**	20–60 sec each, depending on directness
Full CLAT set	**5–6 min**	Hard cap. Beyond 6 min, you've branched wrong.
First diagnostic restart	**⩽ 4 min in**	If the diagram hasn't converged by 4 min, restart the branch.
Practice 01 sheet	**24 min flat**	5 puzzle sets, ≈ 4.8 min per set including riders.