# WHY-1 — n=4→5 Forces the Octad (The Hinge Demo + Receipts)

Claim (one line): n=4 canonicalizes to a unique palindromic rest on a 4×4 parity grid.
Extending to n=5 cannot preserve that rest without opening exactly eight legal insertion classes.
Those eight classes are the minimal octet that drives CQE's 8-view chamber.

n=4 palindromic rest (schematic)                    n=5 requires exactly 8 inequivalent insertion classes



Mirror lanes shown as dashed lines; rest is fixed under both. Schematic: labels 1–8 mark the distinct classes under dihedral symmetries with parity.

## Setup & invariants
Alphabet {1..n}; covering contains all permutations as contiguous factors.
Invariants: determinism, lockstep mirror, idempotent canonicalization, minimal local motion (Δ-lift).

## n=4 → unique palindromic rest (why)
4×4 chamber saturates with 4! windows via local overlaps that admit mirror fixes.
Any non-palindromic fork increases local defect count and is repaired back to the palindrome.

## n=5 → the obstruction
Any direct insertion of '5' preserving one mirror breaks the other unless a new gate opens.
Enumerating minimal lawful insertions under the invariants yields exactly 8 classes (not <8, not >8).

## Consequences (downstream)
Octet is necessary and sufficient → 8-view chamber becomes minimal cover.
Enables E8 embedding at n=8; Golay/Leech legality at n=24; two-slice codec at n=32.

## Receipts (what to ledger on paper)
• 4-bit commit for {OPTICS/THERMAL/… or abstract rails}
• Mirror votes, view votes, OPE/FCE debts, Δ-lifts applied, strict thresholds before/after.
• Page hash (Merkle-style) over rest+fourbit+receipts.

## Falsifiers (how to break the claim)
F1: lawful n=5 extension with <8 or >8 classes under same rules.
F2: n=4 cover that cannot be repaired to a palindrome without new rules.
F3: a 'palindromic' n=5 class that fails idempotent replay.
F4: rotation/mirror mapping outside the octad orbit.

## One-evening worksheet
Draw 4×4; build the n=4 palindrome by local overlaps.
Try all 16 placements for '5'; allow ≤1 local Δ-repair; bin by symmetry+parity → count 8.
Record thresholds and a 4-bit commit; repeat on a second sheet to confirm idempotence.