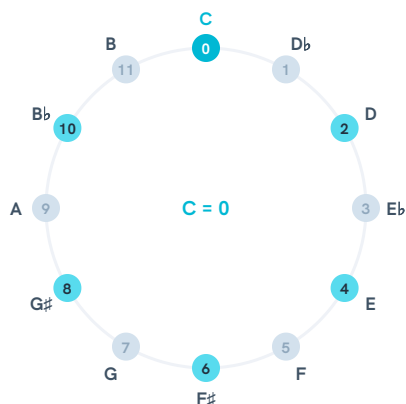


Repeat the Steps, Find the Loop

Build two non-diatonic collections by repeating a step pattern, then discover how few distinct pitch-class sets a transposition can produce.

1 · THE CHROMATIC PITCH-CLASS CIRCLE (C = 0)



Number each of the 12 chromatic pitch classes from **0 (C)** to **11 (B)**, moving one semitone clockwise per step. Enharmonic notes share the same number — F# and Gb are both pitch class **6**.

A **pitch-class set** is a collection of distinct numbers from 0-11. Two sets are the same if one is a transposition of the other.

2 · REPEAT A STEP AND BUILD A COLLECTION

Start on C (= 0). Apply the step pattern, wrapping from 11 back to 0. Stop when you return to the start.

Whole-tone 6 notes

Step: 2 – 2 – 2 – 2 – 2 – (2)

PC set: 0 2 4 6 8 10

C · D · E · F# · G# · Bb

Octatonic (half-whole) 8 notes

Step: 1 – 2 – 1 – 2 – 1 – 2 – 1 – (2)

PC set: 0 1 3 4 6 7 9 10

C · Db · Eb · E · F# · G · A · Bb

3 · TWO ORIGINAL LINES — EVERY NOTE BELONGS TO ONE COLLECTION

WHOLE-TONE LINE



OCTATONIC (HALF-WHOLE) LINE



Try it Pick any starting pitch in the whole-tone collection. Apply the same whole-step pattern. List the six members. Check: are they the set C/D/E/F#/G#/Bb or the set Db/Eb/F/G/A/B? Those are the only two whole-tone sets. Try the same test for the octatonic collection (three possible sets).



Listen: scan or visit tissimo.co/worksheets/symmetric-collection-step-loops

Ascending collection references & melodic lines · quarter note = 72

Self-check: Whole-tone cardinality 6 · Octatonic cardinality 8 · Both step-sums = 12 · Distinct whole-tone sets 2 · Distinct octatonic sets 3 · A transposition by 2 semitones keeps the whole-tone set unchanged.