



Fretboards, Tunings, Capos, and Sounding Pitch

<https://musicreason.com/resources/fretboards-tunings-capos-and-sounding-pitch/> · Last updated 2026-09-06

A tuning decides what an open string sounds. A fret shortens a string by a fixed number of semitones. A capo does the same thing a fret does, to every string at once. None of these three change how chromatic pitch itself works; they only change which physical location produces which sounding pitch.

Find a sounding pitch, standard 6-string tuning

Standard tuning, low E string, fret 12, no capo: sounds E, one octave above the open string. [Fretboard Note Explorer](#) and [Fret Position Calculator](#) both use this identical open-pitch-plus-fret-plus-capo arithmetic; a capo simply adds its own fret number to every string's calculation at once.

Fret 12 is always an octave, on any string, any tuning

Twelve frets always add twelve semitones, exactly one octave, regardless of what pitch the open string starts on. This holds for every tuning. [Guitar Tuning Explorer](#) supports, standard or alternate, because it follows from equal temperament, not from any particular tuning choice.

Shape and sounding key are two separate labels

A capo on fret 2 playing a "G shape" sounds in A: the shape you finger never changes, but every open string, and therefore every note in the shape, sounds two semitones higher. [Capo Fretboard Mapper](#) shows the full fretboard remapped for a chosen capo position; [Capo Finder](#) works the problem backward, from a target sounding key to a capo-and-shape combination.

Tension depends on three things together, not gauge alone

[String Tension Calculator](#) computes tension from a string's unit weight, its scale length, and its target frequency together. A heavier string tuned to a lower pitch can land at a similar, or even lower, tension than a lighter string tuned higher, which is why gauge alone does not predict tension.

Frequently asked questions

Why does fret 12 always sound an octave above the open string?

On any correctly intonated fretted instrument, fret 12 sits at the halfway point of the vibrating string length, and halving a string's length raises its pitch by exactly one octave regardless of what note the open string is tuned to.

Does a capo change the chord shape or the sounding pitch?

Neither, by itself, and both together: the shape you play stays identical, but the capo shortens every string's vibrating length by the same amount, raising the sounding pitch of that shape by a fixed number of semitones equal to the capo fret.

Does a heavier string gauge automatically mean higher tension?

Not automatically. String Tension Calculator computes tension from unit weight, scale length, and target frequency together; a heavier string tuned to a lower pitch can land at a similar or even lower tension than a lighter string tuned higher.

Where this shows up

EAR TRAINING

Fretboard Note Explorer

PITCH AND TUNING

Guitar Tuning Explorer

PITCH AND TUNING

Fret Position Calculator

PITCH AND TUNING

Capo Fretboard Mapper

PROGRESSION AND ARRANGING

Capo Finder

PITCH AND TUNING

String Tension Calculator