

# Nydalyzer™

- Measure intervals
- See how Pythagorean tuning works
- Find the tones belonging to chord symbols
- Identify enharmonic equivalents
- Examine scales, keys and modes

The dots on the rim of the big disc represent Pythagorean pitches, showing how they correlate to the twelve equal-tempered pitches being represented by inwards extended ruler markings. There are 10 cents between each ruler marking.

The dots have been slightly adjusted so that they correspond to 53-ET. This means that the octave is divided into 53 equal steps. 53-ET is a very good approximation of the Pythagorean tuning system.

P = perfect
M = major
m = minor
a = augmented
d = diminished
da = doubly augmented
dd = doubly diminished

To measure intervals: simply point P1 to a tone and read the intervals to other tones.

To find the tones of a key: point P1 to the beginning tone of the corresponding major scale, and read the tones to which the perfect and major intervals point.

Intervals like, for example, 9, 11, and 13, correspond to intervals 2, 4, and 6, respectively ( $2+7=9$ ,  $4+7=11$ ,  $6+7=13$ ).

The backside features the circle/spiral of fifths. You can look at the pattern of a chord along the spiral, and then shift that pattern a certain number of steps clockwise or counter-clockwise to find the same chord transposed to another tone of your choice. If you want to transpose a piece from, let's say, C major to G major, then all you have to do is to move every tone or chord one step clockwise along the spiral of fifths.

To find the tones in the key of C major, simply pick the sequence F C G D A E B from the spiral of fifths (these correlate to: subdominant, tonic, dominant, supertonic, submediant, mediant, and leading tone). With these tones, you can build three major chords on F, C, and G, respectively; and three minor chords on D, A, and E, respectively. The remaining tone, B, is a so-called leading tone because it wants to resolve into C. You can start anywhere on the spiral of fifths to derive the tones of any particular key - the tones always come in the same sequence.

Intervals can be assessed by the relative position between tones along the spiral.

It is also possible to see how many sharps or flats a certain key signature in traditional notation would have. C major has no sharps or flats in the key signature. For each step clockwise, you add one sharp to the key signature. Conversely, for each step counter-clockwise, you add a flat sign.

The so-called enharmonic equivalents of a tone can be easily found since they are written next to each other along the radius of the spiral.

## Assembly

If you just want to try out the Nydanalyzer, then print and cut out the disc on this page and on page 3, and put them together with a lapel pin badge or a suitable earring. Otherwise follow these instructions:

Print out the three discs. Cut out the three discs roughly. Put carpet tape (which is adhesive on both sides) on a piece of cardboard and apply the disc from this page. Then cut out the disc. Do the same procedure with the disc from page 3. Then, put carpet tape directly on the backside of the disc from page 4. Cut out the disc from page 4 and apply it like a sticker on the backside of the disc from page 3 (make sure it's rotated properly to match the opposite side).

The best way to assemble the two discs, that you have prepared, is to use eyelets. Be sure to use eyelets consisting of two parts (eyelet+washer); otherwise the eyelet will eventually cut its way through the cardboard. You can usually buy eyelets where they sell sewing materials. Do not hammer too much on the eyelet as this could prevent the discs from rotating freely in relation to each other. Be careful when cutting out the holes for the eyelets - it's important that the discs are well centered if readings are to be correct.





