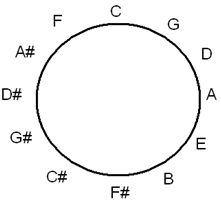
**Diagram: Circle of Fifths**

This diagram streamlines the process of raising/lowering by perfect fifths, which is useful for Pythagorean tuning.

In the diagram to the right, starting from any given tone of the twelve-tone scale, count clockwise to raise by fifths, or counterclockwise to lower by fifths.

If you’re unfamiliar with this “circle of fifths,” you should verify for yourself that the above arrangement of tones corresponds to what you see on a piano keyboard when you count seven semitones to the right to raise by a fifth, or to the left to lower by a fifth.

EXAMPLE: If we use Pythagorean tuning with A as our “base,” then how do we tune an F?

Answer: Starting from A, we count *four* places in the *counterclockwise* direction to reach F.

So, using the Pythagorean tuning method, starting from an A, we’d *lower* by fifths four times (raising by octaves when necessary) to tune an F. (In other words, if we base a Pythagorean tuning system on A, then F would correspond to “L4”, using the notation introduced in class for raising/lowering by fifths.)

*Comment: In theory, we could also count eight places in the clockwise direction to get from C to F, corresponding to raising by fifths eight times. This would be a variation on the usual Pythagorean twelve-tone scale, in which we raise at most six times and lower at most five times. In general, we want to find the “shortest path” from the base to the target.*

EXAMPLE: If we use Pythagorean tuning with C as our “base,” how many times must we raise or lower by perfect fifths to tune a B?

Answer: Starting from C, we count *five* places in the *clockwise* direction to reach B. Therefore, starting from C, we’d *raise* by fifths five times to reach a B.