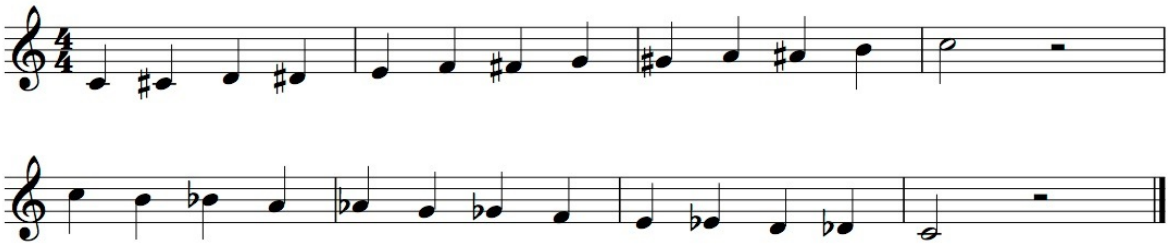
Pitch & Intervals

Pitch refers to our perception of a sound vibrating at a stable frequency. We hear that sound as a musical note. When we are singing with pianos or orchestral instruments, we are almost always singing at *concert pitch*, where the A above middle C is tuned to a frequency of 440 Hz.

In Western music, the smallest *interval* between notes is the *semitone*. We group semitones together into a twelve-note *chromatic* scale (the thirteenth note being the same as the starting note, one *octave* higher). The finishing note's frequency is exactly twice that of the starting note, so if an A above middle C's frequency is 440 Hz, the A above that will be 880 Hz.



Try singing this chromatic scale up and then down. Get a starting note from the piano, and check the ending note. You will probably not finish precisely in tune!

Tuning is a different process for instrumentalists and singers. Most players tune their instruments, such as guitars, flutes and violins, to an agreed pitch, usually concert pitch, before they begin to play. Vocalists must find their starting pitch by ear. For all musicians though, tuning is a constant process of listening and adjusting to maintain a good ensemble.

For singers, tuning can drift for various reasons, for example if we struggle to hear an accompaniment. Poor breath support can result in the pitch going flat. Tension and stress can send it sharp. It is important that we learn good vocal technique so that we can adjust the pitch when needed.

What is singing in tune?

A small number of people have *absolute (or perfect) pitch,* an ability to sing a given note without any external cue. Perfect pitch is very rare (and not particularly desirable - people with perfect pitch can find fluctuations in tuning very uncomfortable). Most musicians strive to achieve good *relative pitch,* where they can hear and reproduce intervals accurately, ie with good *intonation.*

Most of us can hear when something is out of tune. We might not be able to identify immediately whether a chord or interval is sharp or flat, but we sense that something is "wrong".

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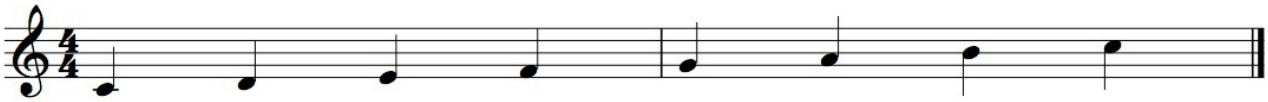
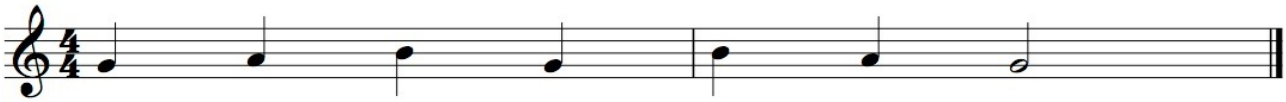
Western tuning isn't perfect

The tuning system we use in Western music is based on the eight-tone scale, for example a major scale from middle C:



The problem is that it's impossible to tune an eight-tone major scale accurately. Early instruments had to be re-tuned for each key they were played in. Modern pianos use *equal temperament*. This means that the difference in frequency between each semitone is exactly the same. An equal temperament instrument can be played in any key without re-tuning, but the pay-off is that all the intervals (except the octaves) are very slightly out of tune!

The upshot of all this is that when we are singing with a piano or other instrument, we have to be vigilant about staying in tune. In particular, in major keys, we have to concentrate on keeping the third and seventh notes "bright".



Try singing this melody, thinking "bright" on the major third intervals.

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