Wagner: Liebestod (Love Death) from Tristan und Isolde

...in the opera “Tristan und Isolde,” Tristan and Isolde consummate their love... in death.
THE OBJECTIVE

PHYSICAL PROPERTIES

**Sound** = the *human* perception of vibrations in air (transmission of energy through a medium)

Properties: pitch (how high/low), loudness (how loud/soft), duration (how long), timbre (tone color).

**Pitch** = the perceived highness or lowness of a tone, determined by frequency (v) of the vibration - measured in cycles (vibrations) per second (hertz = hz)

**Tone** = a sound with a constant, specific pitch, [noise = a sound with indefinite pitch]

Range of human hearing (at best): 20 - 20000 cycles per second - range of music: 20-4000cps

All the keys of the piano with ranges of voices and instruments

![Keyboard Diagram](image)

Each key upon the piano makes a discreet tone with a specific frequency when played.

Each tone represented on the piano is assigned an alphabetic name, and a note on the grand staff

an **octave** occurs when there is a *ration* of 1:2 between the frequency of two tones

Two pitches, an octave apart, will sound similar, one higher, one lower,
And will have the same alphabetic name.

For example a0=27.5Hz, a1=55Hz, a2=110Hz, a3=220Hz, a4=440, a5=880Hz, etc. 
or c4=261.63 (middle C), c5=523.26, c8=4186.08

On the piano keyboard, which essentially covers the range of pitches in music, there are just over 8 octaves, each of which is divided in this fashion. Thus each alphabetic name is used at least 8 times.
the octave is divided into **12 equally spaced pitches**
white keys on the piano are assigned a b c d e f g
black keys are named in relation to the white keys, e.i. f#, gb

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All twelve tones of an octave
Thus each tone has its own graphical representation: notes on a staff.
black keys are named in relation to the white keys, e.i. f#, gb
# = Sharp = one key higher
b = Flat = one key lower

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- amongst these 12 pitches we find the:
  * half-step = the distance between any two adjacent pitches (*Jaw’s theme*) = $1/1.0595 = \text{ratio } 1/12^{\text{th}} \text{ root of 2},$
  * whole step = the total distance of 2 adjacent half-steps (*Chopsticks* opening sound)

Each octave on the piano is divided this way, giving us the 88 pitches (keys) of the piano.
A **scale** is a set of pitches chosen from these 12 pitches, within an octave. The set of pitches is often chosen according to established patterns of whole steps and half steps. Common patterns are known and recognized by the ear (in order from low to high) as:
- **The Major scale:** 7 pitches + the octave of the 1st: \( W W h W W h W W h \) "happy"
  
  \( do re mi fa sol la ti do \)

- **The minor scale:** 7 pitches + the octave of the 1st: \( W h W W h W W h \) "sad"
  
  \( do re me fa sol le te do \)

- **Pentatonic scale:** 5 pitches: all the black keys on the piano

Such patterns can start on any of the 12 different pitches that divide an octave...Key

A **key** is the name of a set of pitches that make up a scale. Each scale is named after its first pitch and the specific pattern of whole steps and half steps. Example:

- C Major = \( W W h W W W h \) starting on C
- f minor = \( W h W W h W W \) starting on F

The resulting set of pitches are "duplicated" in octaves to give the composer a **full palette of pitches** from which to begin composing a piece of music.

A key is also a **gravitational system** with the first pitch of the scale as the gravitational center. Composers must manipulate this system to create music that is expressive.

**Modulation** is the change of key within a composition. The set of pitches and gravitational center change.

**Tonic Key** (Home Key) - A piece of music often begins and ends in a particular key. But in between it may **modulate to other keys, thus creating tension.** The music may return to the tonic key a number of times, each time, releasing that tension created by going away from the tonic key; i.e. starting at home, going out, coming back home...**this too is used to make music expressive.**

Each key, though difficult to identify purely sound by most people, has a unique sound. Major and minor keys are sometimes been used to convey specific moods. Two examples:

- **D Major** – noble, regal  
  *Bach Suite No.3 in D: 1st movement opening*
  
  [http://www.youtube.com/watch?v=ytGjzBclG0I](http://www.youtube.com/watch?v=ytGjzBclG0I)

- **c minor** - funeral  
  *Beethoven: Symphony No. 3, 2nd movement*
  
  [http://www.youtube.com/watch?v=MF1KRUYiUjM](http://www.youtube.com/watch?v=MF1KRUYiUjM)