

# Chapter 1

## Fundamentals

### 1.1 Pitch

**Definition 1 (Pitch)** *Pitch is the property of the sound which allows a relative ordering of perceived sounds on a frequency-related scale.*

On a keyboard, pitch goes up to the right of the keyboard, while it goes down on the left.

Pitches are expressed through **notes**. There are 7 note names<sup>1</sup>, which are repeated in **octave registers**, identified by the bottom number.

$$\cdots A_3 B_3 \underbrace{C_4 D_4 E_4 F_4 G_4 A_4 B_4}_{\text{Octave register 4}} C_5 D_5 \cdots$$

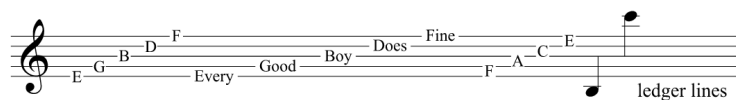


Figure 1.1: Treble clef

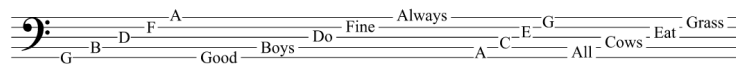


Figure 1.2: Bass clef

**Definition 2 (Octave)** *The distance / interval between two notes with the same name.*

<sup>1</sup>C-B in anglophone countries, C-H in Germany and Do-Si for the rest of Europe.

Figure 1.3: The Grand Staff (a specific stave *system*)

**Definition 3 (Middle C)** The  $C_4$  pitch, usually located in the middle of a keyboard (on the instrument) and always annotated in the middle of the grand staff, shared by the two staves.

**Definition 4 (Accidental)** A symbol placed before a note to raise / lower its pitch by a given amount.

An accidental is effective only for a measure. They affect the entire piece if they are placed before the clef in a **key signature**.

$\flat$	Flat	−1 half step
$\sharp$	Sharp	+1 half step
$\flat\flat$	Double flat	−2 half steps / −1 whole step
$\sharp\sharp$	Double sharp	+2 half steps / +1 whole step
$\natural$	Natural	Cancels preceding accidentals

There exists also **half-accidentals**, whose altered notes cannot be played on a keyboard.

**Definition 5 (Half step)** On the keyboard, the distance / interval between one key (either black or white) and the next (either black or white).

**Definition 6 (Whole step)** The interval made up of two half steps.

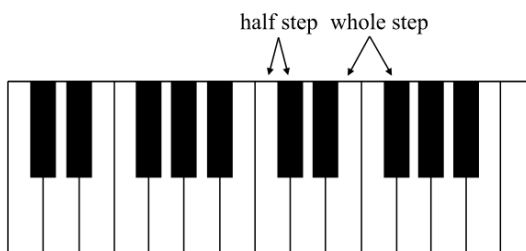


Figure 1.4: Half steps and whole steps

**Definition 7 (Enharmonic)** Which has the same sound, but different name.

## 1.2 Rhythm

**Definition 8 (Beat / pulse)** *The basic pulse underlying measured music and thus the unit by which musical time is reckoned.*

**Definition 9 (Tempo)** *Speed of the beat.*

The tempo is usually expressed through metronome markings in **BPM / Beats Per Minute**.

### 1.2.1 Time signatures

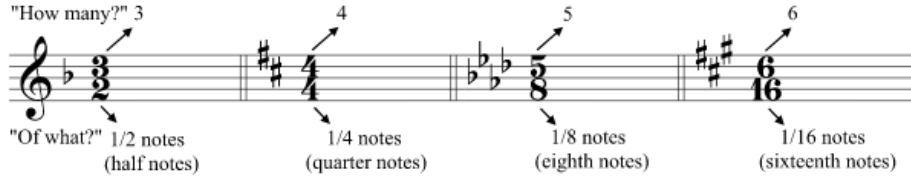


Figure 1.5: Meaning of the time signatures

### 1.2.2 Note / rests durations

Both notes and rests last for certain duration, which is always a  $2^n$  number of beats, where  $n \in \mathbb{Z}$ . Common values for  $2^n$  are the following ones:

$$\left\{ 4, 2, 1, \frac{1}{2}, \frac{1}{4} \right\} \text{ beats}$$

Values different from these ones can be gathered through **ties** and **dots**. A dot adds  $\frac{1}{2}$  the value of the note dotted, while a double dot adds  $\frac{1}{2} + \frac{1}{4}$  the original value.

### 1.2.3 Meters

**Definition 10 (Meter)** *Describes the number of beats in a measure / bar and how they are divided.*

**Simple meters** break the beat into 2 parts, while **compound meters** break it into 3 parts.

They can be **double** (2 beats / bar), **triple** (3 beats / bar) or **quadruple** (4 beats / bar).

The meter is traditionally identified by the time signature.

When a piece shifts between time signatures / meters often the composers employ a **metric modulation**.

Simple or Compound?	Duple, Triple, Quadruple?	Beat Grouping	Beat Division	Example Time Signatures
Simple	Duple	2	2	$\frac{2}{4}$ $\frac{2}{8}$ $\frac{2}{2}$ $\frac{2}{16}$
Simple	Triple	3	2	$\frac{3}{4}$ $\frac{3}{8}$ $\frac{3}{2}$ $\frac{3}{16}$
Simple	Quadruple	4	2	$\frac{4}{4}$ $\frac{4}{8}$ $\frac{4}{2}$ $\frac{4}{16}$
Compound	Duple	2	3	$\frac{6}{8}$ $\frac{6}{4}$ $\frac{6}{16}$
Compound	Triple	3	3	$\frac{9}{8}$ $\frac{9}{4}$ $\frac{9}{16}$
Compound	Quadruple	4	3	$\frac{12}{8}$ $\frac{12}{4}$ $\frac{12}{16}$

Figure 1.6: Meters

**Definition 11 (Metric modulation)** *A change in tempo or subdivision, suggested by a change of meter.*

### 1.2.4 Triplets

**Definition 12 (Triplet)** *Rhythmic grouping of notes which would typically not occur in the specified meter.*

**Definition 13 (Duplet / Triplet / Quadruplet / Quintuplet)** *Common triplet instances.*

**Definition 14 (Drag triplet)** *A common type of triplet, made up of quarter notes. They are called in this fashion because the rhythm seems to drag.*

A drag triplet is also a common example of **hemiola**.

**Definition 15 (Hemiola (rhythm))** *In rhythm, playing a pattern of 3 against a pattern of 2 (e.g. a drag triplet against 2 quarter notes).*

### 1.2.5 Accents and syncopation

A certain meter / time signature usually implies a certain beat hierarchy. That is, some beats are played with stronger / weaker emphases:

- 4/4: ● · ○ ·
- 12/8: ● · ○ · (es. *Nightmare King*)
- 2/4: ● ·
- 6/8: ● · (es. *White Palace, Tarantella Napoletana*)
- 3/4: ● · · (es. *Valse di Fantastica*)
- 9/8: ● · ·

- 3/8: • (feels like 1 beat per measure)
- 2/2: ••

This should also explain why some pieces are better written as 2/4 over 4/4: because the beat hierarchy in the measures is different.

**Definition 16 (Downbeat)** *The first beat in a measure. Usually it is played with a very strong emphasis.*

Through **accents**, **ties** and **rests** it is possible to alter this rhythmic framework, obtaining **syncopation** in the process.

**Definition 17 (Syncopation)** *Playing music with a stronger emphasis on the weak beats and / or a weaker emphasis on the strong beats.*

Through syncopation some notes can also be played on the *offbeats*.

**Definition 18 (Offbeat)** *Which is not a beat.*

### 1.2.6 Irregular meters

These meters can be explained by thinking of normal meters with an uneven beat duration. That is, every measure has a fixed number of beats, but with different beat durations.

- 5/4: 5 uneven beats (es. *Mars, Bringer of War, Cinco de Chocobo*)
  - 3 + 2 : • • • ◦ •
  - 2 + 3 : ◦ • • • •
- 7/8: 3 uneven beats (3-2-2, 2-2-3).
- 13/8: 5 uneven beats (3-3-2-2-3, etc.).

### 1.2.7 Swing

**Swing** can be conceptualized as a way to write 6/8 in 4/4. The metronome text usually shows whether the 8th or 16th notes should be swung.

The opposite of a swing rhythm is called **straight** rhythm.

## 1.3 Dynamics

Dynamics hint at the volume of a given music segment. Often they range between *ppp* and *fff*. The intermediate dynamic *mf* is often used as a standard base volume.

*n* stands for *niente*, and it is usually used at the end of a decrescendo.

*fp* means to play the note as *f*, but then quickly fade to *p*.

*sfz* and *rfz* instead indicate to play a single note stronger than the surrounding ones.

## 1.4 Control structures

In a concert score setting often some parts do not need to play for a long number of measures. This situation is notated through a **multirest**.

### 1.4.1 Repeats

Repeats are sometimes highlighted with wings-like decorations, with the only purpose of making them stand out more.

**Definition 19 (Segno)** *Used as a landmark in a **D.S.** marking. **D.S.** means to play from the segno.*

**Definition 20 (Coda)** *Used as a landmark in a **Al coda** marking. **Al coda** means to play till the coda, then to continue playing the separate coda.*

Note that during a **D.C** or **D.S.** notation, repeats are *not* performed for a second time.

## 1.5 Articulations

There a variety of articulations used to tell the player how to produce the sounds. The meaning of these often varies from instrument to instrument:

**Definition 21 (Staccato)** *Play the note short, lightly and briefly detached from the next and the previous ones.*

**Definition 22 (Accent)** *Emphasize the note, with a quick attack and a gentle decay / release.*

**Definition 23 (Marcato)** *Emphasize the note with a strong attack and a quick release / decay.*

**Definition 24 (Tenuto)** *The player should be careful as to keep the note for its whole duration.*

**Definition 25 (Staccatissimo)** *A stronger staccato.*

**Definition 26 (Spiccato)** *Exclusively used in string instruments. Means to lightly bounce the bow upon the strings.*

**Definition 27 (Portato)** *A legato-staccato. Usually means to play the notes with a light disconnection between them.*

**Definition 28 (Upbow & Downbow)** *Indicates a corresponding motion of the bow on string instruments. The downbow is usually stronger.*

**Definition 29 (Closed / Mute & Open)** *Usually used on percussion and brasses. These indicate whether the sound should be muted (through the sordino, the hand, etc.) or left open to ring.*

**Definition 30 (Tremolo (single-note))** *Repeat the note  $2^n$  times, where  $n$  is the number of strips on the stem.*

**Definition 31 (Tremolo (two-note))** *Quickly alternate between the notated pitches. The actual speed of the tremolo is usually derived from context (usually: one strip  $\Rightarrow$  8th notes).*

**Definition 32 (Arpeggio)** *Play a series of notes in a quick sequence, but not simultaneously.*

**Definition 33 (Glissando)** *A quick run through all the notes between the notated ones. On piano, usually only the white notes are played.*

Often a glissando may be actually notated note per note, in which case it is called a **run**. Notes in a run should not be played too carefully; instead, the player should focus on the whole sequence speed.

A glissando is a *discrete* change of pitch, but some instruments are able to produce a *continuous* change of pitch (e.g. trombone, timpani, strings, voice).

**Definition 34 (Portamento)** *A continuous glissando.*





# Chapter 2

## Scales

### 2.1 Major scale

**Definition 35 (Tetrachord)** *A 4-note scale segment with the following steps:  $W - W - H$ .*

**Definition 36 (Major scale)** *A 8-note scale made up of 2 tetrachords, joined by a whole step.*

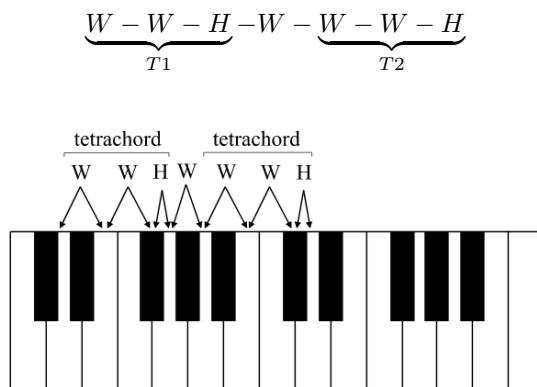


Figure 2.1: Tetrachords in a (D) major scale

A major scale uses all the 7 notes in order. No one is skipped and there are no duplicates.

#### 2.1.1 Key signatures

There are 15 major key signatures:

- 1 with no accidentals: C Major.
- 7 with 1 to 7 flats.
- 7 with 1 to 7 sharps.



Figure 2.2: Major key signatures (sharps)

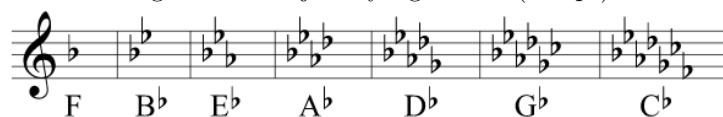


Figure 2.3: Major key signatures (flats)

A key signature can be quickly identified with the following mnemonic:

- With *sharps*: +1 half step from the last “sharped note”.
- With *flats*: the second to last flat is the key (along with the flat).

## 2.2 Minor scales

In contrast to major scales, there are 3 different minor scales. They all follow the following formulas, while the melodic minor is only used as an *ascending* scale (the *descending* part is the same as the natural minor scale).

### 2.2.1 Key signatures

In respect to the major keys, minor keys can be derived by adding 3 flats (or subtracting sharps and adding flats if needed).

In doing so, the corresponding major scale will also have three of its scale degrees lowered, resulting in what is called a **parallel** minor scale.

**Definition 37 (Parallel scale relationship)** *Two major / minor scales with the same 1<sup>st</sup> scale degree.*

On the other hand, if it is the key signature to be shared, then we call it a **relative** minor key.

**Definition 38 (Relative key relationship)** *Two major / minor key signatures with the same key signature.*

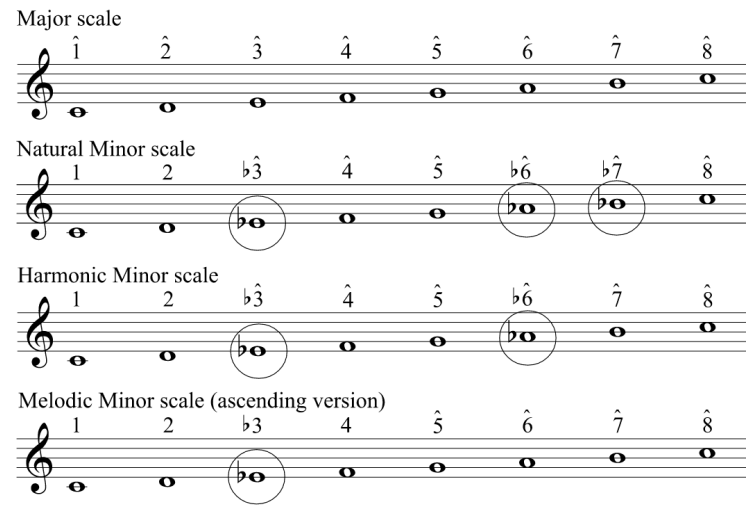


Figure 2.4: Minor scales

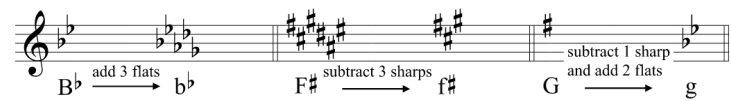


Figure 2.5: Parallel relationship

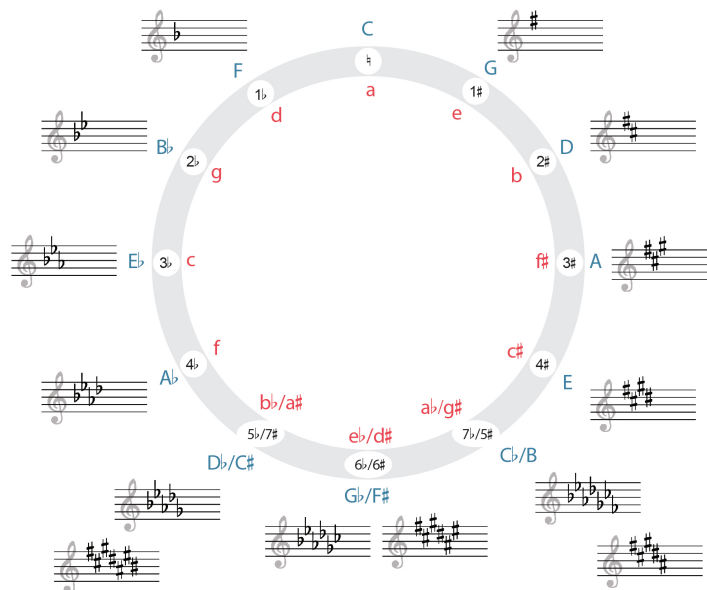


Figure 2.6: Circle of fifths

## 2.3 Circle of fifths

The circle of fifths is a convenient aid for the visualization of both minor and major keys and scales:

- To the right, we add sharps / remove flats and we go up a  $5^{th}$ .
- To the left, we remove sharps / add flats and we go down a  $5^{th}$ .

## 2.4 Key signature identification

Given a piece of sheet music we can devise its key signature as follows:

1. Through the number of flats / sharps we restrict ourselves to 2 key signatures: a major one and a minor one.
2. The tonic can help us do the final discrimination. Usually the tonic note is located at the beginning / end of the piece either in the lower or upper parts.