

## Rhythmus – Open Music Lab

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### - What is rhythm?

Rhythm is the way that sounds occur over time. Of course, rhythm is particularly easy to identify if it repeats itself – but rhythm can also be something that continually shifts. Here are two beautiful rhythmic pieces by two pioneering electronic composers from the UK: **Delia Derbyshire**: <https://youtu.be/sj0BuTEyNGI> and **Daphne Oram**: [https://youtu.be/hjsIT0O\\_ld0](https://youtu.be/hjsIT0O_ld0)

These composers were inventing the electronic instruments and sounds they were using – you can hear that they aren't exactly trying emulate the sounds of drums, but finding their own new sounds to create rhythms with. Listen to the way these pieces shift over time.

Another very different example – **Philip Glass's 'One Plus One'**. This is made up of two possible rhythmic phrases – a rhythm of 1 beat and a rhythm of 1 beat followed by two shorter beats. The performer chooses how to group those phrases, how many times to play each, etcetera. The performer just hits a table to make the rhythm. <https://youtu.be/dS-bJWB-5IY>

Rhythm is not just a musical concept; there are types of rhythm all around us. But the perception of musical rhythm is believed to be uniquely human, and to use very specific areas of the human brain – neurologist Oliver Sacks observed that patients with dementia or brain damage who were not able to walk would nonetheless be able to dance to rhythmic music. For more about that, see **Oliver Sacks's book *Musicophilia***.

### - How do we measure and write rhythm?

There are many different ways to do this, and it's possible to come up with your own way (and a good idea to, in my opinion). But if we follow the 'music theory' of Western European art music, we tend to think of rhythm in terms of *division* – dividing up time into equal segments over which the rhythm occurs. The easiest way to divide something is to split it in half – so that's what we tend to do.



In this diagram the note at the top (a *semibreve*) lasts for four beats. The note below (a *minim*) lasts for two beats, the one below (a *crotchet*) for a single beat, the one below that (a *quaver*) for half a beat, the one below that (a *semiquaver*) for a quarter of a beat, the one below that (a *demisemiquaver*) for an eighth of a beat.

### - Metre / Time Signatures

When we say **metre** or **time signature** we mean how many **beats** there are in each measure of music (called a **bar**).

Two very common time signatures within Western music are

$$\frac{4}{4}$$

and

$$\frac{3}{4}$$

The number above tells us how many beats there are in the bar; the number below tells us the length of those beats. In this case, 4 below means a quarter beat – a **crotchet**, because it's a quarter of a semibreve (see the chart above). So 4/4 is 4 crotchets which you count by saying

1 2 3 4 1 2 3 4 ...

and leaving an equal amount of time between each number. 3/4, on the other hand, is 3 crotchets, so you could count it like this

1 2 3 1 2 3 ...

A really good introduction to simple time signatures is this beautiful piece by **Moondog** called 'From One to Nine.' Moondog was a composer who built his own instruments and played on the streets of New York dressed as a Viking. In this piece he goes through the time signatures (he calls them 'tempos') of 1/4, 2/4, 3/4, 4/4, 5/4, 6/4, 7/4, 8/4, and 9/4. You can count along and easily hear how many beats there are in each bar as the piece develops. Have a listen here: <https://youtu.be/7jVPcX36luA>

3/4 is very connected to a type of European dance called a **waltz**, which has a rhythm of three even beats with an accent on beats two and three – think of it as *oom pa pa oom pa pa oom pa pa...* A famous example would be Tchaikovsky's waltz from the ballet **Swan Lake**: <https://youtu.be/CShopT9QUzw>

Incidentally – a really interesting variation of the waltz form is the Peruvian **Vals Criollo**, which takes the same *oom pa pa* pulse but adds many very expressive rhythmic variations inspired by the variety of cultures that make up Peru's coastal region. Listen to <https://youtu.be/bjPLq1vAQ58> or <https://youtu.be/KrwGljyIyzE> for

examples of this - and compare it to the Tchaikovsky. It is based on the same rhythmic principal, but the end result is totally different.

### - Dividing by other numbers

Above, I showed that you can divide beats up easily in multiples of two to create rhythms. But actually you can divide a beat by any number you like. When you divide a beat by another number in this way to create equally space shorter beats, it's called **a tuplet**. The most common tuplet is the **triplet**:



This is a way of dividing the beat into groups of **three**. Some time signatures, like 6/8 or 9/8 or 12/8, automatically divide in this way. Listen to this beautiful song by Louis Armstrong, the famous North American Jazz composer:

<https://youtu.be/CWzrABouyeE>

If you listen to the piano and drums in particular you can hear the beat is in 4 groups of three (a total of twelve short beats). Like this

1 2 3 2 2 3 3 2 3 4 2 3

That's a group of 4 triplets.

### - Swung Rhythm

So far, we've seen rhythm as divided equally – but swung rhythm works by making the gaps between some beats longer than the gaps between others. The result is something in between a division of three and a division of two.

Try counting this – but leave the numbers in italics silent:

1 2 3 1 2 3 1 2 3 1 2 3

This is an extreme version of what swing does instead of a normal 1 2 3 4 – it makes the lengths between the beats uneven, but with a pattern. This video shows the difference between a **straight** and a **swung** rhythm:

[https://www.youtube.com/watch?v=bKV\\_VLxLwAs](https://www.youtube.com/watch?v=bKV_VLxLwAs)

### - Syncopation and Offbeat

Now we're starting to see the ways we can escape from the rigidity of equally divided rhythms... Many rhythms avoid the principal beats altogether, finding the space in between them (the **offbeat**). Rhythm that avoids the principal beats is called **syncopation**. An example of syncopated rhythm is **Bossa Nova**, a style of music

developed in Brazil combining the influence of European music with the influence of the many Africans that were brought to that nation. [https://youtu.be/g6w3a2v\\_50U](https://youtu.be/g6w3a2v_50U) Try listening to this and counting the straight 1 2 3 4 along with it. You'll find that the guitar part only occasionally hits the same time as your count. It emphasises the **offbeat** instead.

### - Thinking of Rhythm as Addition instead of Division

Many cultures have seen rhythm very differently to the system of division that we introduced earlier. Turkish music, for example, is made up of groups of beats called **usüller** that are then added together – for example, a group of 2 beats and a group of 3 beats could be added together to make a group of 5 beats. This video (in Turkish) shows a teacher teaching these short measures to a percussionist, and combining them to make rhythms <https://youtu.be/Fx7b7AFR7KQ>

Here's an example of a Turkish rhythm in nine beats, made up of a four beat measure followed by a five beat measure:

## Aksak

“The *Aksak* is composed of one *Sofyan* (4-beat) and one *Turk Aksak* (5-beat). It consists of six ground beats.”<sup>07</sup> “It is probably the most commonly used usul of the *Aksak* type.”<sup>08</sup> Sometimes the basic *Aksak* usul is also called *Yürük Aksak*.

*Aksak* rhythms can be perceived and counted in different ways:

- a four-count followed by a five-count;
- a four-count followed by a two-count and a three-count;
- three consecutive two-counts followed by a three-count;
- a six-count consisting of a long three-count followed by a short three-count.

a)	1	2	3	4	1	2	3	4	5
b)	1	2	3	4	1	2	1	2	3
c)	1	2	1	2	1	2	1	2	3
d)	1	2	3	4	1	2	3	4	5

  

DÜM      TEK      KA      DÜM      TEK      TEK

CD Track 01

For more of these, have a look at

<http://www.channelingstudio.ru/texts/Ritmi%20turchi%20in%20in%209.pdf>

### - Polyrhythm

So we've seen plenty of ways to create different types of rhythm. But once we combine different rhythms on top of each other – making a **polyrhythm** – we are able to turn these simple ideas into something very complex indeed. The principle of

polyrhythm is the basis for much of southern and western African music. For example, listen to <https://youtu.be/6EizGPaeNvQ> - there are amazing contrasts between the different rhythms happening at the same time, and it's hard to say any one rhythmic strain is more important than any other. Indonesian Gamelan music like this [https://youtu.be/L\\_93HkMujys](https://youtu.be/L_93HkMujys) also uses many different instruments playing different rhythms at the same time to create hypnotic rhythmic texture.

There are many ways to create polyrhythms. One way is to combine different divisions at the same time – trying adding a beat in triplets on top of a beat divided into four (this is called a **hemiola** and is very important in Sub Saharan African rhythm). Another way is to have two different time signatures heard at the same time (**polytempo**). You can also have two versions of the same rhythm heard at once, but one starting slightly later – much like a sung **canon** (like *Bruder Jacker*, for example). This is the technique that composer Steve Reich uses in his piece **Clapping Music** <https://youtu.be/hH1j06bMHDQ>

Here two performers start by clapping the same rhythm. One of them stays doing the same throughout, the other gradually shifts the rhythm along by one beat at a time. The score looks like this:

The image shows a musical score for Steve Reich's 'Clapping Music'. It consists of two parts, CLAP 1 and CLAP 2, each represented by a staff with a treble clef. The tempo is marked as  $\text{♩} = 144-168$ . The score is divided into three systems, with measures numbered 1 through 12. In each system, CLAP 1 plays a steady rhythm of quarter notes, while CLAP 2 plays the same rhythm but shifted by one beat in each measure. The score ends with a double bar line and the instruction 'Repeat bar 12, then end.'

### - Further Reading

For more about music and the brain: **Oliver Sacks, *Musicophilia***

For more about minimalist composers and their use of rhythm: **Alvin Lucier, *Music 102***

For a thought-provoking political discussion of the use of African and African-American voices and musical techniques within white Avant Garde music (by Steve Reich in particular) - Siarhei Biareishyk, ***Come out to show the split subject*** [https://academiccommons.columbia.edu/download/fedora\\_content/download/ac:177710/CONTENT/CM93\\_Biareishyk.pdf](https://academiccommons.columbia.edu/download/fedora_content/download/ac:177710/CONTENT/CM93_Biareishyk.pdf)

For more on Turkish Rhythm:

<http://www.channelingstudio.ru/texts/Ritmi%20turchi%20in%209.pdf>