

# The Harmonic Series

Harmonic	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Approximate notation																
Frequency [Hz]	64	128	192	256	320	384	448	512	576	640	704	768	832	896	960	1024
Cents	0	1200	1902	2400	2786	3102	3369	3600	3804	3986	4151	4302	4441	4569	4688	4800
<b>Equally tempered</b>																
Cents	0	1200	1900	2400	2800	3100	3400	3600	3800	4000	4200	4300	4400	4600	4700	4800
Frequency [Hz]	64	128	192	256	323	384	456	512	575	645	724	767	813	912	967	1024

## Pythagorean Fifths

$\frac{1}{1}$	$\frac{3}{2}$	$\frac{9}{8}$	$\frac{27}{16}$	$\frac{81}{64}$	$\frac{243}{128}$	$\frac{729}{512}$	$\frac{2187}{1024}$	$\frac{6561}{4096}$	$\frac{19683}{8192}$	$\frac{59049}{32768}$	$\frac{177147}{65536}$	$\frac{531441}{262144}$				

## Ditonic (Pythagorean) Comma

$\frac{1}{1}$		$\frac{531441}{262144}$		$\frac{1}{1}$		$\frac{531441}{524288}$										

The ditonic comma is the name given to the ratio difference of 531441:524288  
 This can also be expressed in cents from the following calculation:

$$702 \text{ cents} \times 12 = 8424 \text{ cents}$$

$$1200 \text{ cents} \times 8 = 8400 \text{ cents}$$

The difference of (approximately) 24 cents is equivalent to (approximately)  $\frac{1}{4}$  semitone