

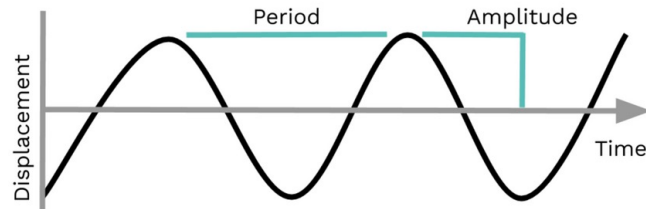
# Numeracy - Knowledge Organiser

## GLOSSARY

<b>Amplitude</b>	The volume of a sound, measured in Decibels (dB)
<b>Frequency</b>	The pitch of a sound, measured in Hertz (Hz)
<b>Waveform</b>	A visual representation of a sound wave
<b>Period</b>	The time it takes for a wave to complete one cycle/oscillation
<b>Peak Programme Meter (PPM)</b>	Used to measure the peak levels in a track
<b>RMS (Root Mean Squared) Meter</b>	Used to measure the average loudness of a track
<b>VU (Volume Units) Meter</b>	An analogue meter that uses a needle to measure the volume of a track

## WAVEFORM GRAPHS

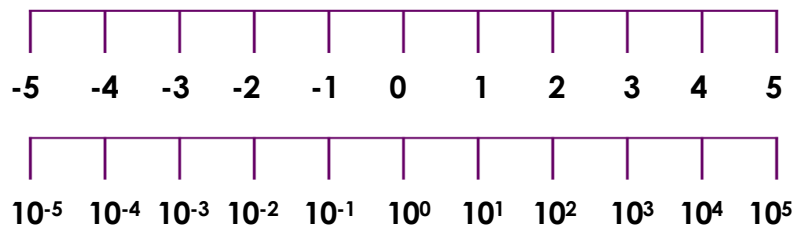
- Represents the displacement (amplitude) of a sound wave over time



- Period (T) and Frequency (F) are inversely correlated:
  - $T = \frac{1}{F}$
  - $F = \frac{1}{T}$

## LOGARITHMIC SCALES

- Used to represent orders of magnitude as a linear change



- The scale increases exponentially
- Examples of use include VU (dB) meters and EQ filters

DECIBEL SCALES			
<p>Sound pressure level</p> <p>0 dB</p> <p>10 dB - Threshold of hearing</p> <p>20 dB - Broadcasting studio</p> <p>30 dB - Recording studio</p> <p>40 dB - Bedroom</p> <p>50 dB - Quiet office</p> <p>60 dB - Living room with music or television playing quietly</p> <p>70 dB - Conversational speech</p> <p>80 dB - Busy residential road</p> <p>90 dB - Inside bus</p> <p>100 dB - Inside underground train or alongside mainline railway</p> <p>120 dB - Airport</p> <p>120 dB - Loud car horn one metre away</p> <p>130 dB - Pneumatic drill</p> <p>Threshold of pain</p>	Peak Meters	RMS Meters	VU Meters
	<ul style="list-style-type: none"><li>Give a temporary measurement of the highest volume of the signal</li><li>Used to help avoid distortion/clipping</li></ul>	<ul style="list-style-type: none"><li>Give an average measurement of the volume by considering both the amplitude and duration of the peaks</li></ul>	<ul style="list-style-type: none"><li>Measures the average volume of a track over time using a needle</li></ul>

FREQUENCY AND MUSICAL INTERVALS	
Interval	Frequency
Octave Higher	$f = n \times 2$
Octave lower	$f = n \div 2$
Perfect 5 <sup>th</sup> Higher	$f = n \times 1.5$
Perfect 5 <sup>th</sup> Lower	$f = n \div 1.5$
Perfect 4 <sup>th</sup> Higher	$f = n \div 0.75$
Perfect 4 <sup>th</sup> Lower	$f = n \times 0.75$

THE HARMONIC SERIES	
<ul style="list-style-type: none"><li>Acoustic resonators such as wind and string instruments can produce different frequencies using the harmonic series</li><li>Each note (harmonic) is a multiple of the fundamental frequency</li></ul>	
<div><math display="block">f_h = f_f \times n</math><p>Where:</p><ul style="list-style-type: none"><li><math>F_h</math> = The frequency of the harmonic</li><li><math>F_f</math> = The fundamental frequency</li><li><math>n</math> = The order of the harmonic</li></ul></div>	