

Musical Instruments (10.2)

I called some genres of music 'noise'! (think 'heavy metal' or even 'opera'!). In my opinion they may be noise, but scientifically they are NOT. They are in fact, music.

Scientifically → music – results from a regularly oscillating object (string, air column, skin of drum) and a picture of the resulting wave will show a regular repeating pattern.

→ Noise – does NOT result from a regularly oscillating object and a picture of this sound will NOT show a resulting wave without a regular repeating pattern.

Music terms

Loudness – greater amplitude means a louder sound

Pitch – pitch is how high/low a note is. The higher the frequency is, the higher the note is.
The lower the frequency, the lower the note.

Quality / richness – is a function of which harmonics are being played together , how loud each harmonic is and how they blend together.

Take a look in chapter 10.2 for pictures of a string vibrating in more than one harmonic. This is a 'rich' sound. Look further in this chapter to see a picture of an air column vibrating in more than one harmonic. This is also a 'rich' sound.

New formula – STRINGS only

You may know that when you 'fret' a guitar string and make it shorter, the note gets lower (lower pitch). There is a relationship between length of the string and the frequency the fundamental standing wave produces (assuming the string used and its tension is the same)

Please note: this formula works ONLY for strings! Please put on your formula sheet.

$$f_1 L_1 = f_2 L_2 \quad \text{where 'f' is frequency (Hz) and 'L' is length (m)}$$