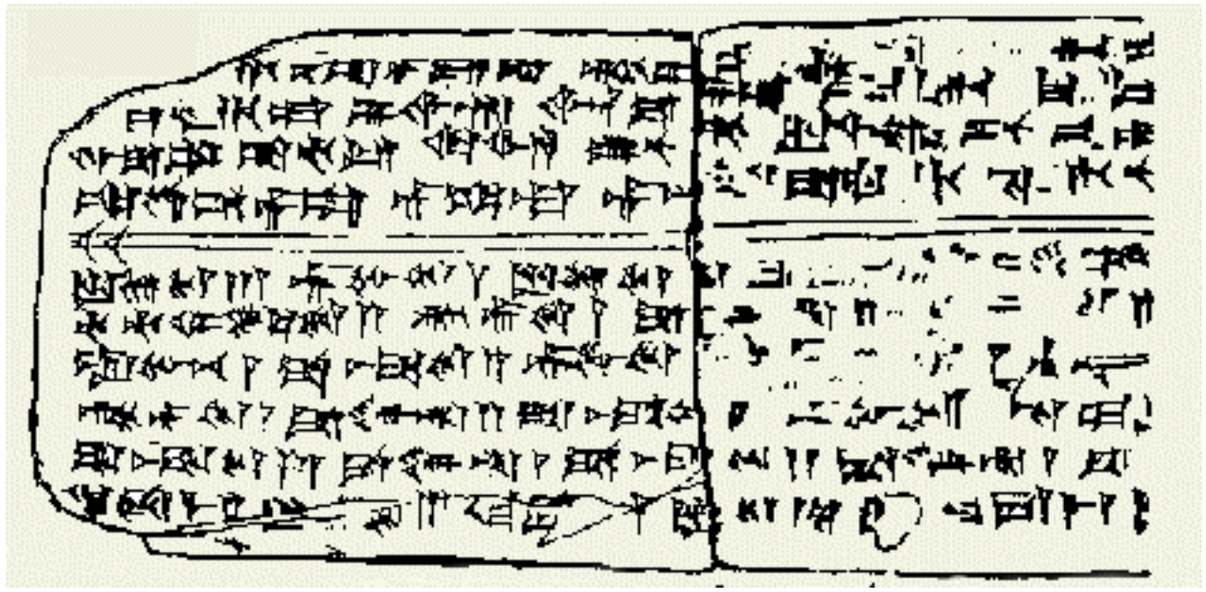
Recording music

Sound

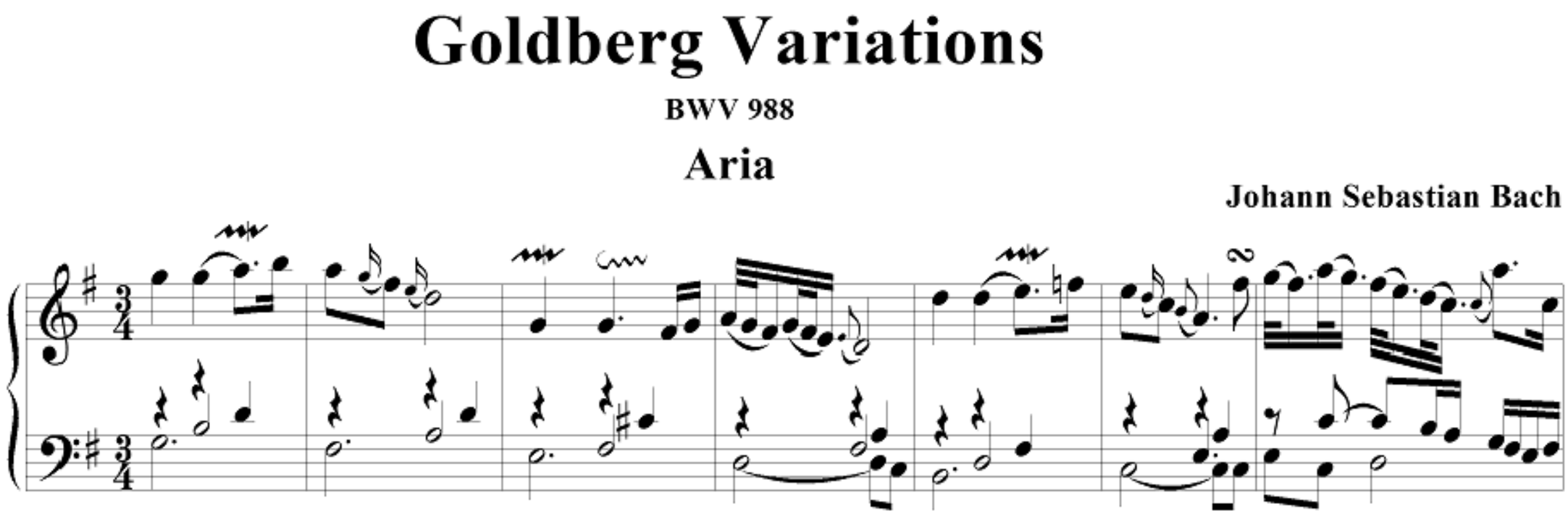
Music notation (historical)



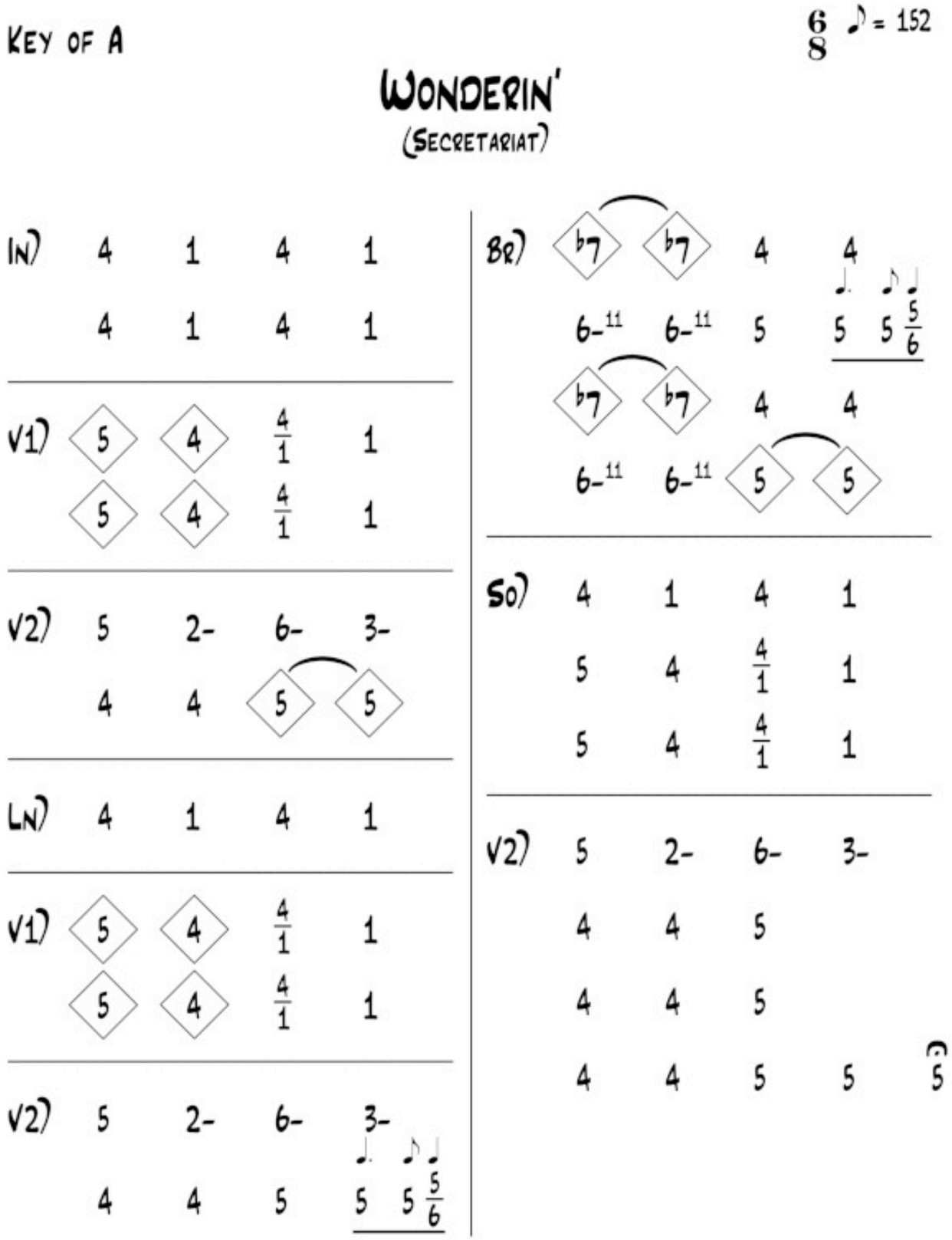
Babylonia, ~1400 BC

Korean 15th century

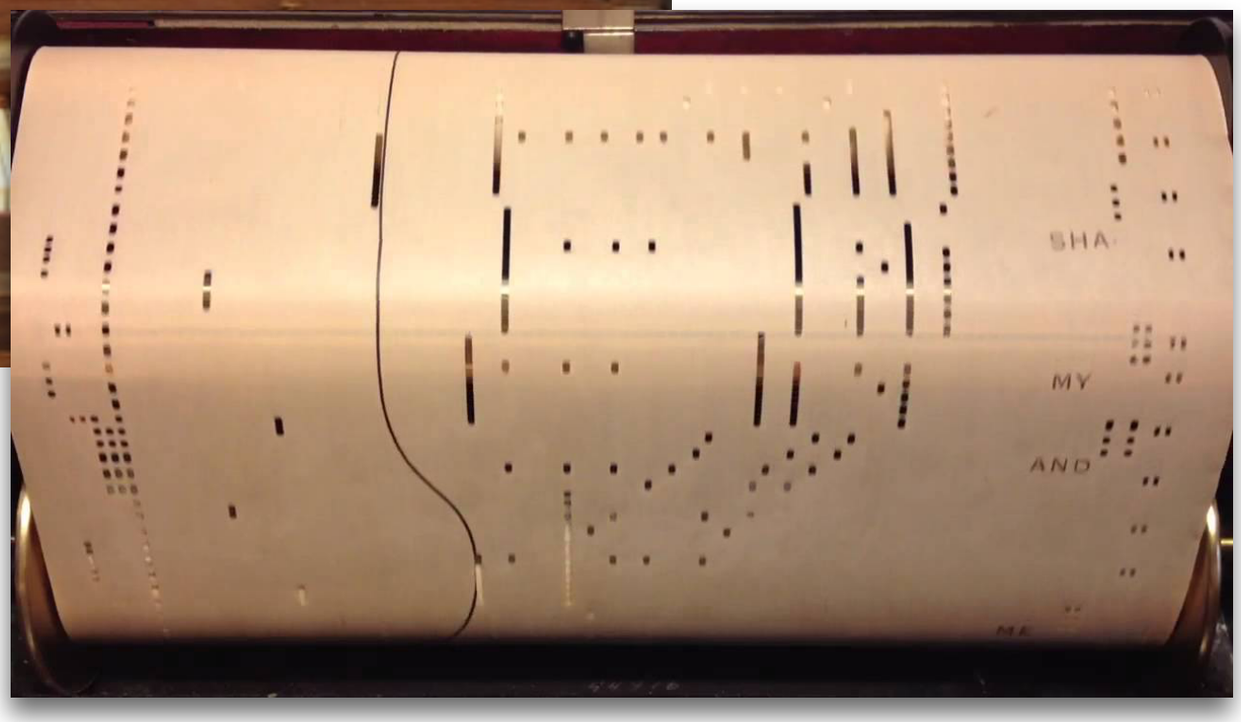
Music notation



Music notation

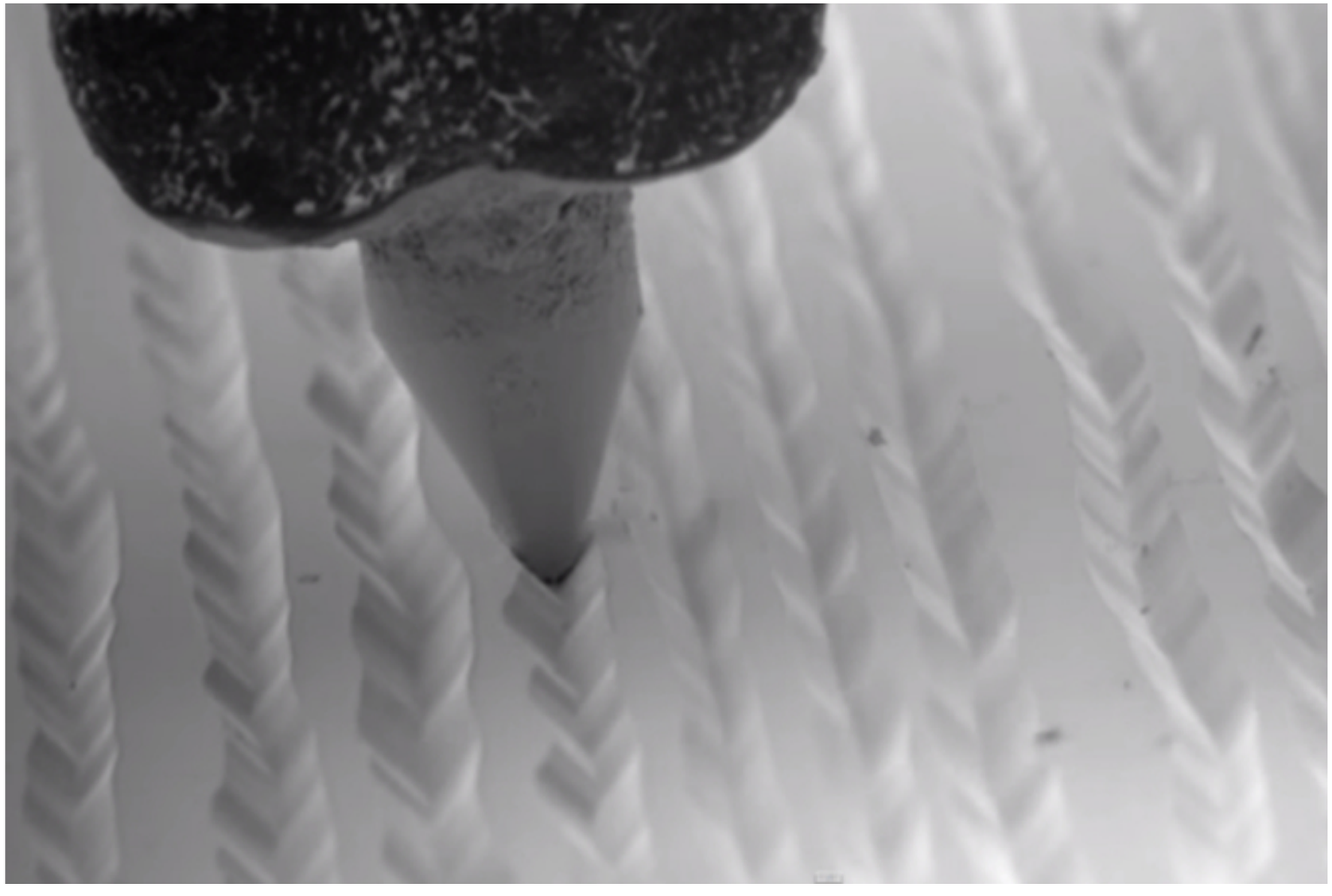


Player piano

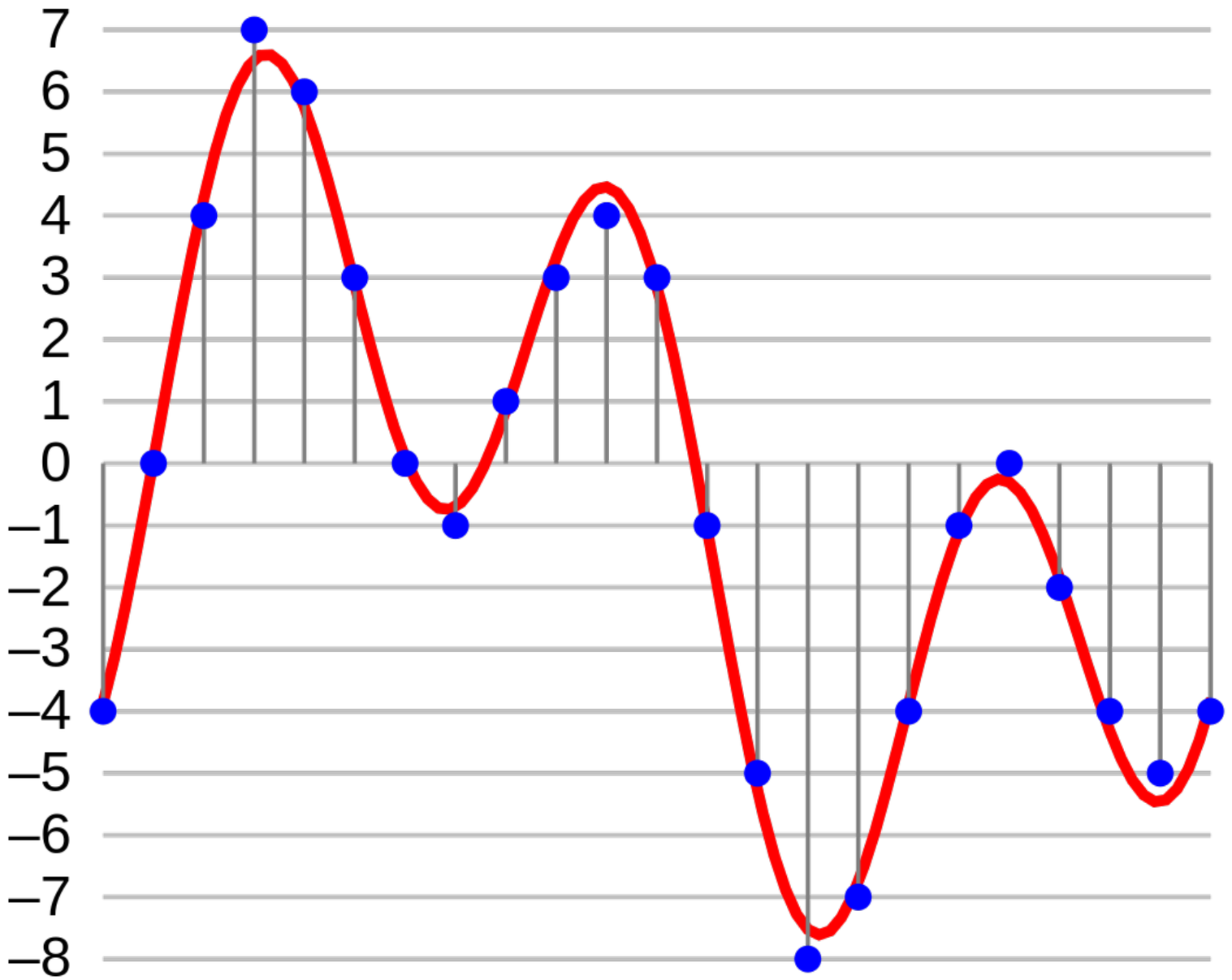


Records

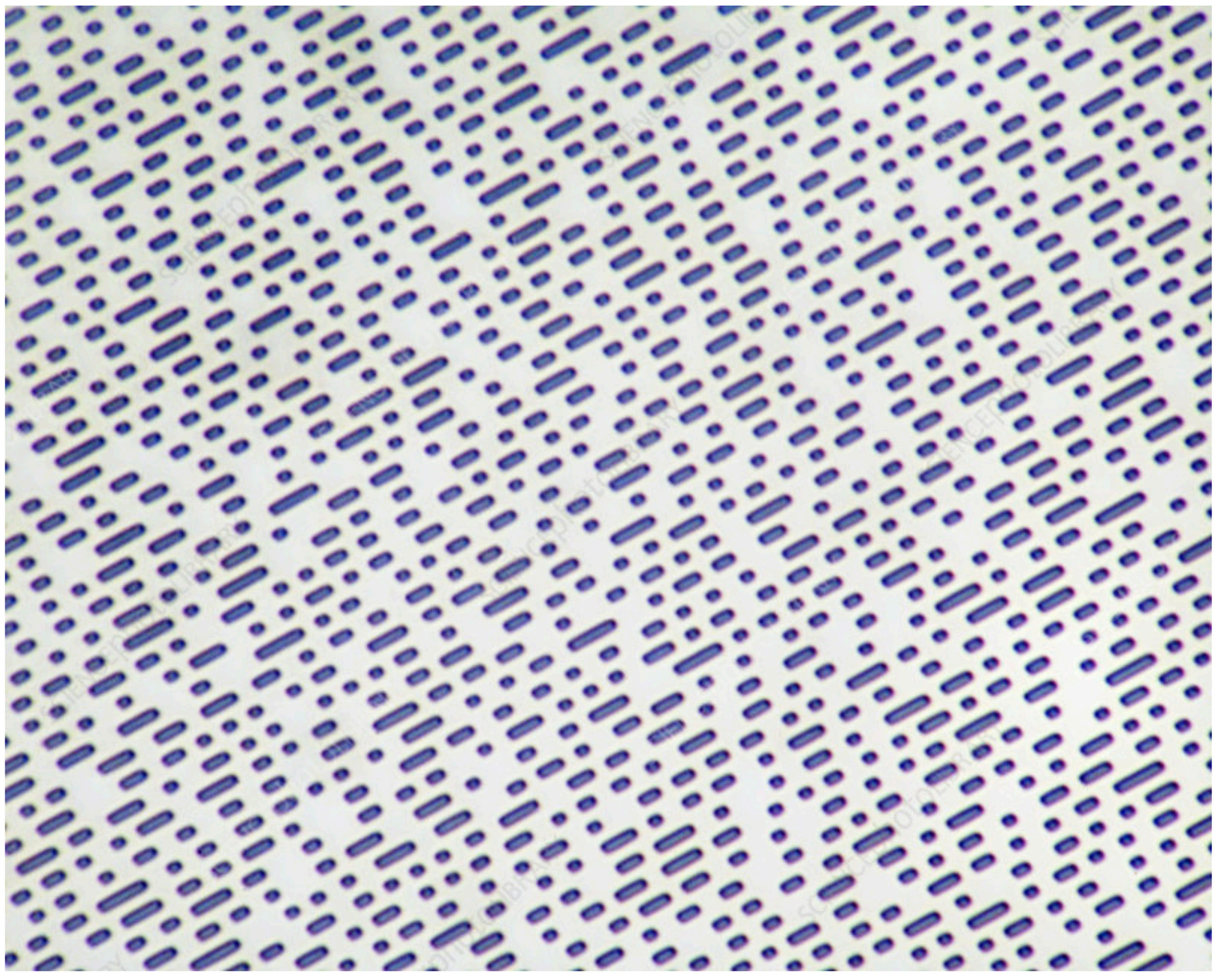
Side 2 Stereo
HUNKY DORY
4 QUEEN BITCH (David Bowie)
5 THE BEWLAY BROTHERS (David Bowie)
DAVID BOWIE
A GEM PRODUCTION
BOWIE



Digitizing sound

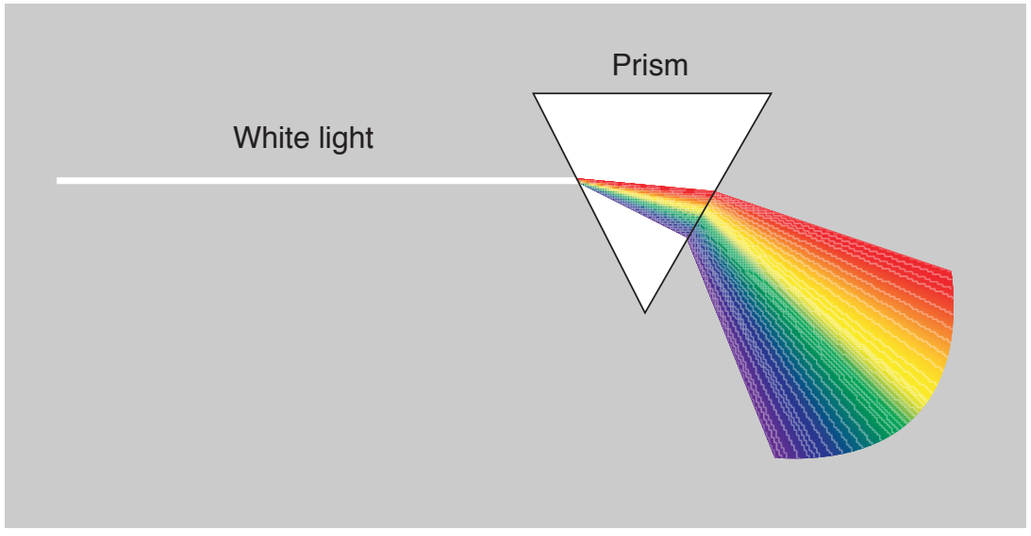


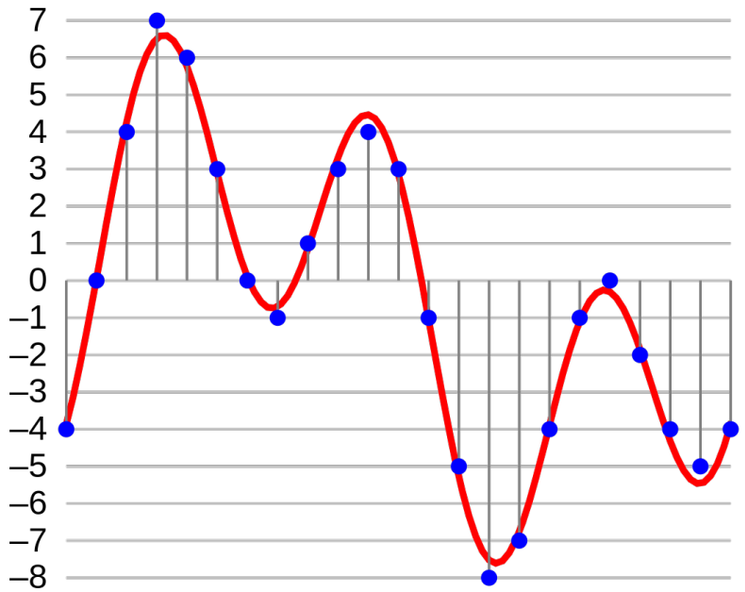
Compact Disks

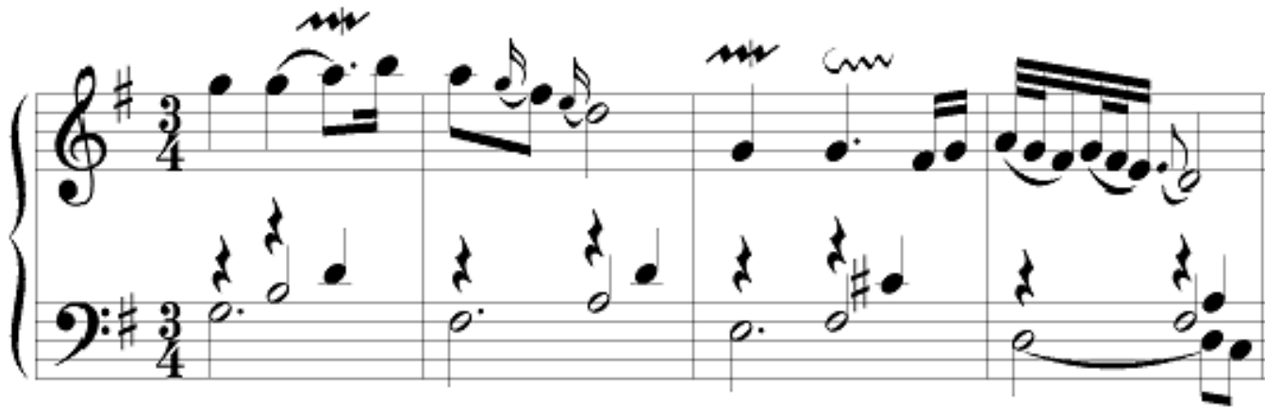


Notes vs. wave

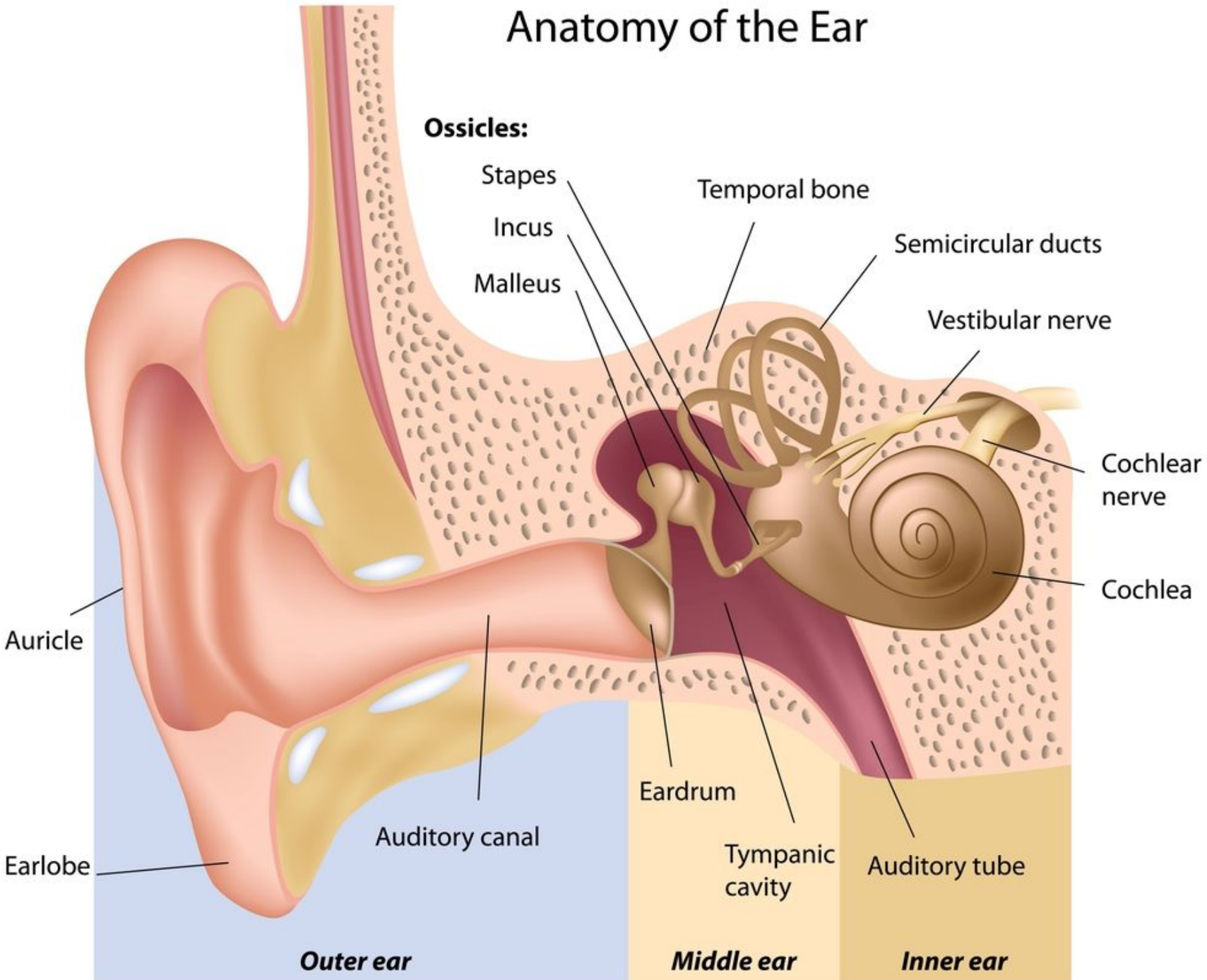
- Can represent as either amplitude vs. time or notes



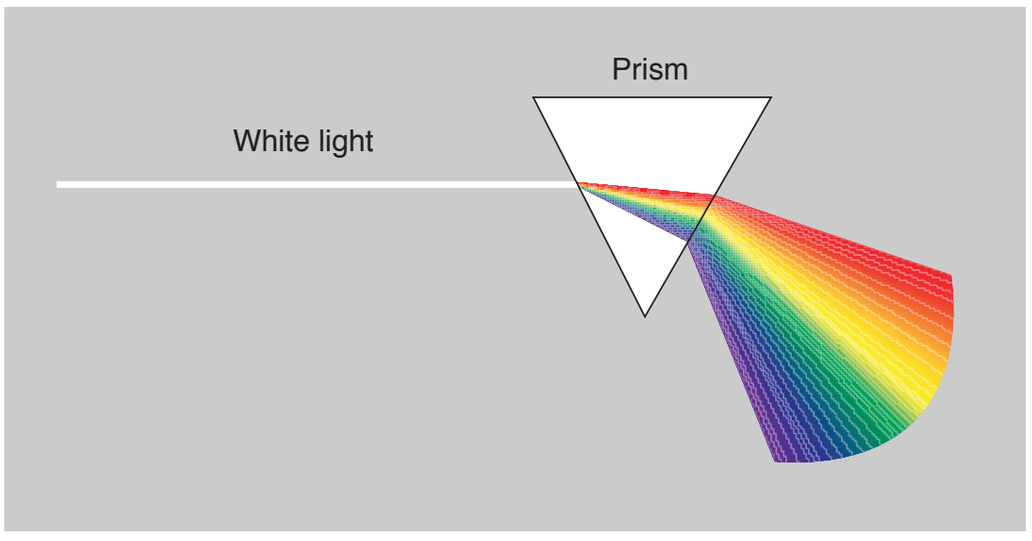




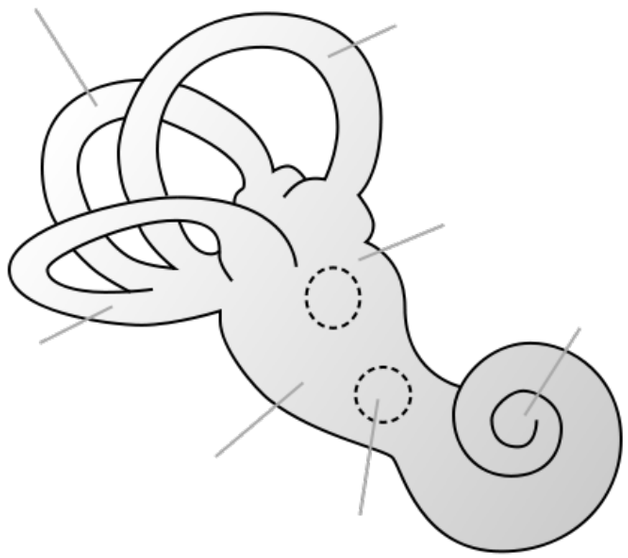
Human ear


Anatomy of the Ear
Ossicles:
Stapes
Incus
Malleus
Temporal bone
Semicircular ducts
Vestibular nerve
Cochlear nerve
Cochlea
Auricle
Auditory canal
Earlobe
Eardrum
Tympanic cavity
Auditory tube
Outer ear
Middle ear
Inner ear

Splitting into notes (or colors)



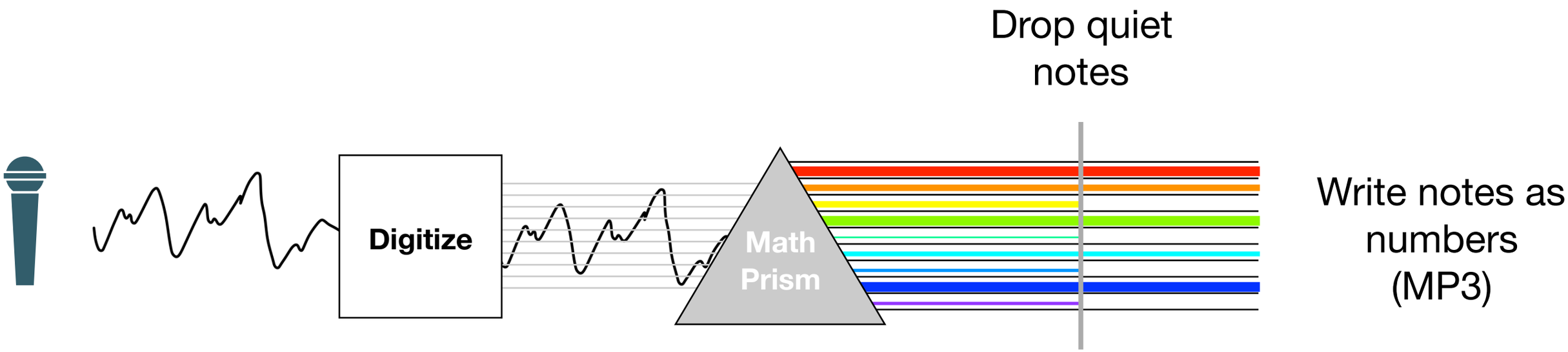
Cochlea

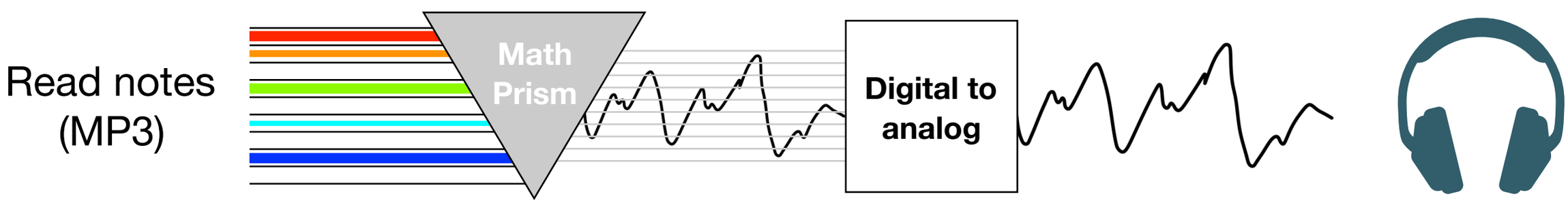


Math
Prism

(Fourier Transform)

MP3 compression





Compression

- Lossy compression is imperfect
- Requires lots of math (modern computing)