

getting the physics straight

source-medium-detector model of radiating

separation of pitch (perceptual) from frequency (physical)

separation of loudness (perceptual) from amplitude (physical)

inverse square law of loudness

an account consistent with a helpful description of energy

vibrations: amplitude and frequency

representing the topic effectively

using the act of hearing as a starting point

the box of vibrations

using a few coherent models well

variations in density, as groups of particles move to and fro

particular teaching challenges

using a consistent model of energy

exploiting the source-medium-detector model

putting the amplitude and frequency characterisation to effective use

being clear about vibrations and waves

developing the inverse square law

dealing with existing ideas

hearing as a result of something travelling from the object heard

avoiding being drawn into using the phrase 'sound energy'

sound filling spaces, not as travelling vibrations

sound not running out, but being spread out

the varying speed of sound, depending on the medium

separating the real from the model

selected teaching principles

systematic use of teaching models

linking ideas from different areas

giving an explanation as telling a story - moving from one description

linking physical depictions to more abstract representations