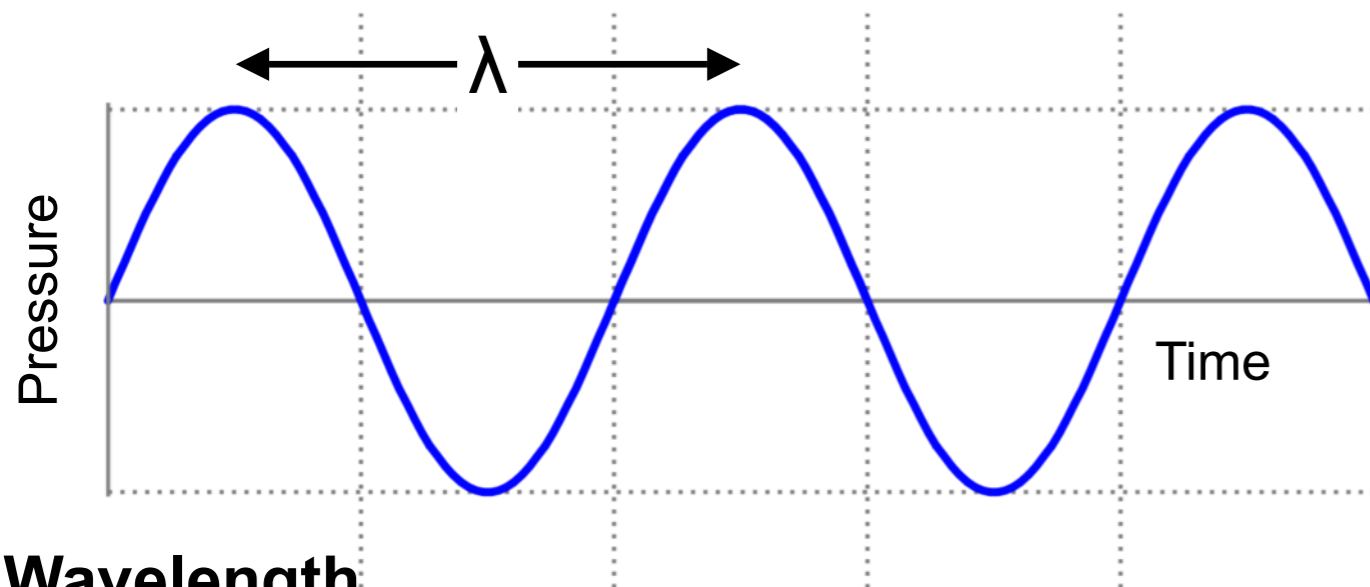


# More about sound waves - frequency, wavelength, speed

Sound is a pressure wave: the pressure of the air carrying the sound increases and decreases. The purest sound is a sine wave as shown below.



## Frequency

The pitch of the sound depends on the rate at which the pressure changes - this is known as the frequency of the sound. Middle C has a frequency of 262 cycles per second - the pressure changes from maximum to minimum and back to maximum 262 times a second. The unit of frequency is the Hertz - abbreviated Hz.

## Wavelength

The wavelength of a sound wave is the distance between two peaks. The symbol  $\lambda$  (the Greek letter lambda) is used for wavelength

$$v = f\lambda$$

## Wave equation - $v = f\lambda$

This simple equation links the frequency ( $f$ ), the wavelength ( $\lambda$ ) and the speed of sound ( $v$ )

The speed of sound in air is 340 meters per second. This gives the wavelength of middle C as 1.3 meters or about 4ft 3ins

## Organ pipe length

An organ pipe open at the top resonates at a wavelength equal to twice the length of the pipe, so a middle C organ pipe will be just over 2 feet long