

Material:

Item Code	Qty	Description
DE751-3A	1	Oscilloscope, two-channel, 30 MHz, with VGA
DG500-4A	1	BNC to 4-mm socket adapter
DW340-2M	1	Measuring microphone "inno"
P3120-1G	1	Function generator with digital display "inno"
P3120-1B	1	Rechargeable battery, "inno", 6V/10 Ah
P3120-4A	1	L-shaped assembly platform
DS085-1R	1	Round base with stand tube, uni
MB240-1LS	1	MBC Loudspeaker with nose
DS617-1H	1	Holder for MBCs "compact"
	4	Connecting lead

Additionally recommended:

- 1 VGA – Connecting cable
- 1 TV or data projector

Goal:

How do sound waves change when we change pitch and volume?

Setup:

- The BNC junction is plugged into the socket of channel 1 of the oscilloscope.
- The amplifier of the measuring microphone is connected to the osci with two cables.
- The "inno" function generator is plugged together with the battery and this unit is attached to the assembly platform.
- The loudspeaker is fixed in the round base with the holder.
- The loudspeaker is connected to the function generator with two cables.
- Settings on the function generator:

Frequency fine:	very low (left)
Frequency rough:	1000 Hz
Waveform:	Sine
Amplitude:	very low (left)

Experiment 1:

We switch on the oscilloscope with a measuring range of 1 V, 1 ms.

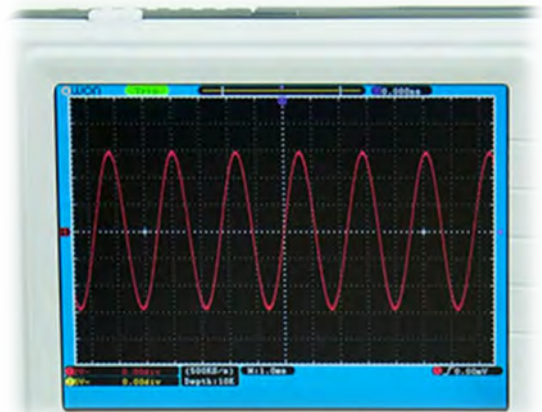
We switch the microphone amplifier to "10 x".

The measuring microphone is held at a distance of about 5 cm in front of the loudspeaker.

The function generator is switched on.

We set a frequency of about 100 Hz and increase the amplitude enough to see a nice waveform on the screen.

The frequency is then slowly increased while watching the screen.



Result:

If the frequency is changed at the function generator, the pitch changes

This change is visible on the oscilloscope screen as the wave becomes longer or shorter.

Experiment 2:

Keeping the frequency constant, we now change the amplitude.

Result:

If you change the amplitude, the volume of the generated sound changes

This change is visible on the oscilloscope screen as the wave becomes higher or lower.

Experiment 3:

While keeping the amplitude constant, we change the frequency.

We now try to show that some frequencies are perceived by our ear as louder, although the amplitude remains the same.