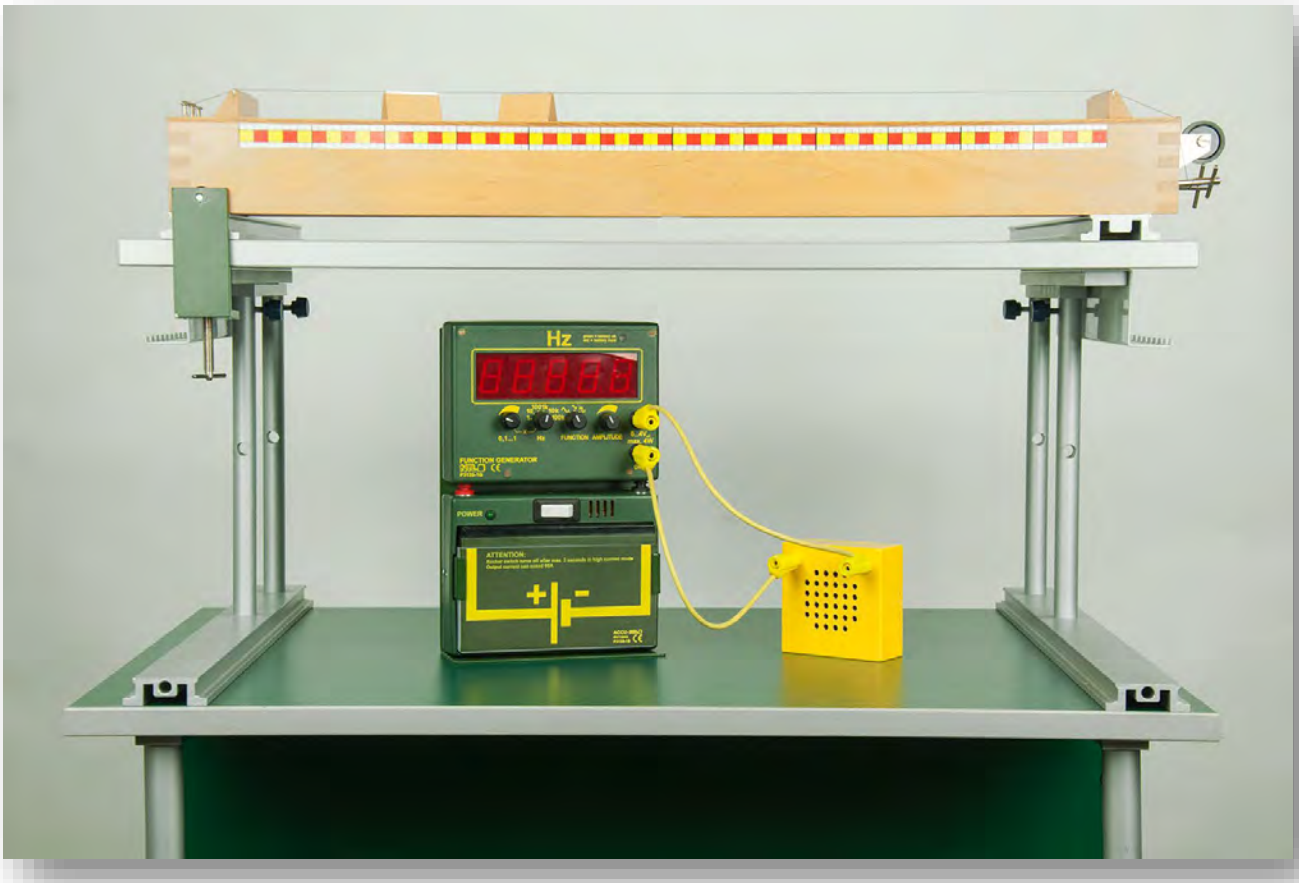
MONOCHORD – STRING LENGTH AND FREQUENCY

AKD 03.02



Material:

Item Code	Qty	Description
DW250-1M	1	Monochord
DS500-1G	1	Screw clamp, jaw width approx. 50 mm
P3120-4A	1	L-shaped assembly platform
P3120-1G	1	Function generator with digital display "inno"
MB240-1LS	1	MBC Loudspeaker with nose
P3120-1B	1	Rechargeable battery, "inno", 6V/10 Ah
DW260-2S	1	String, e'
DW260-3S	1	String, g'
	2	Connecting lead

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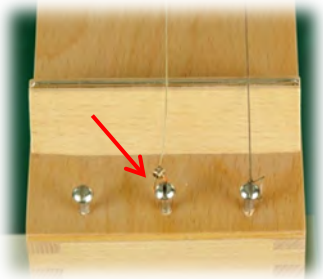
Goal:
The tone depends on the length of the string.

Setup:
The monochord is placed on the edge of the table and fixed with the screw clamp and one string is fixed to one of the screws.



The string is fixed to a tension stem so that you can tune it.

The monochord is tuned to c1 = 261 Hz. To do this, the function generator is connected to the loudspeaker and a battery. The frequency is set on the switched-on function generator. The amplitude changes the volume.

Experiment 1:
The effective string length can be changed by means of a so-called bridge.
The string length is determined which is necessary to achieve the tone c2 = 523 Hz which is one octave higher. Again, the function generator can be used for this purpose. (For the frequencies see table below).

Result 1:
The bridge must exactly halve the string length.

Experiment 2:
Without changing the string tension, the notes of the c - major scale are to be produced. For this purpose, the corresponding string lengths are adjusted by moving the bridge. (In the table below you can find the proportional length of the string for the respective tone).

Result 2:
The relative frequencies are inversely proportional to the string length.

Note:

	c1	d	e	f	g	h	a	c2
Frequencies	261	293	329	349	391	440	493	523
Ratios	1	$\frac{8}{9}$	$\frac{4}{5}$	$\frac{3}{4}$	$\frac{2}{3}$	$\frac{3}{5}$	$\frac{8}{15}$	$\frac{1}{2}$

Depending on the source, the frequencies may differ marginally.