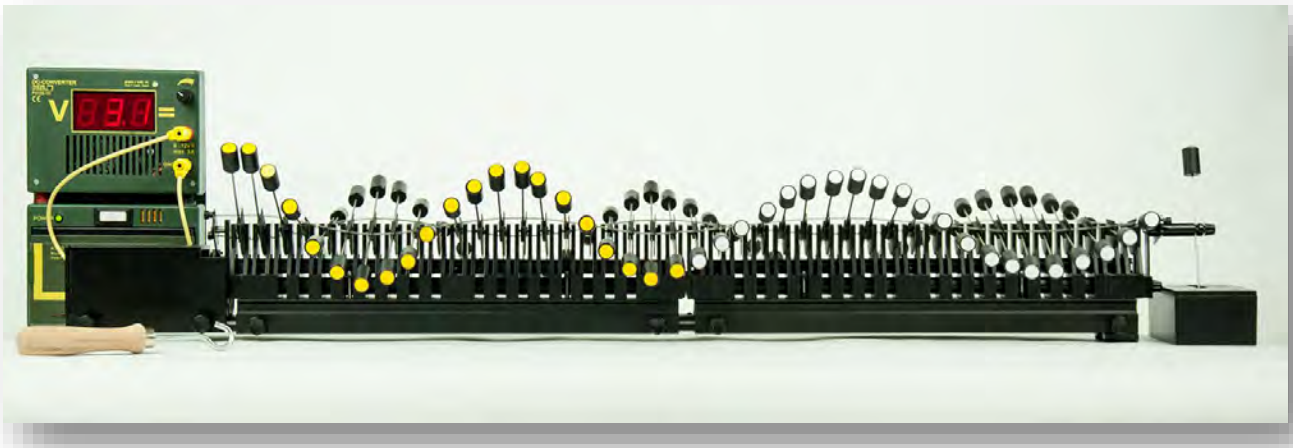
WAVELENGTHS AS A FUNCTION OF THE OSCILLATION MASSES

SWD 03.07



Material:

Item Code	Qty	Description
DW405-1A	**1**	**Oscillation module 1 – set consisting of**
DW405-1A1	1	Oscillation module 1 with brake
P5312-1A	2	Little base with damping
DW405-3SK	2	Coupling spring 38 cm, for wave demonstrator
DW405-3F	1	Fixed end plate for wave demonstrator
DG205-1G	1	Hook metal, with handle
DW405-2E	**1**	**Oscillation module 2b, Set consisting of**
DW405-2E1	1	Oscillation module 2b with brake
P5310-1S	1	Rail bond SE, universal
DW405-3SL	2	Coupling spring 80 cm, for wave demonstrator
DW405-2A	**1**	**Wave demonstrator - Electrical driving unit consisting of**
DW405-2A1	1	Motor drive for wave demonstrator
P5310-1S	1	Rail bond SE, universal
DW405-2D	**1**	**Wave demonstrator - Mechanical damping unit consisting of**
DW405-3P	1	Pendulum bearing for wave demonstrator
DW405-2DP	1	Pendulum for damping unit
DW405-2DW	1	Water trough for damping unit
P3120-1B	1	Rechargeable battery, “inno”, 6V/10 Ah
P3120-1K	1	DC Converter "inno"
P3120-4A	1	L-shaped assembly platform
DG507-25	2	Safety connecting lead, yellow, 25 cm

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Purpose

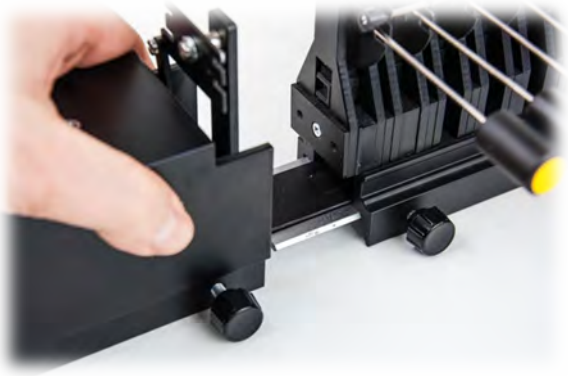
We want to investigate whether different pendulum masses (oscillation masses) influence the wavelengths at the same frequency.

Setup

The two oscillation modules are coupled with the rail connector, thus we get a "wave machine" with a length of 80 cm.

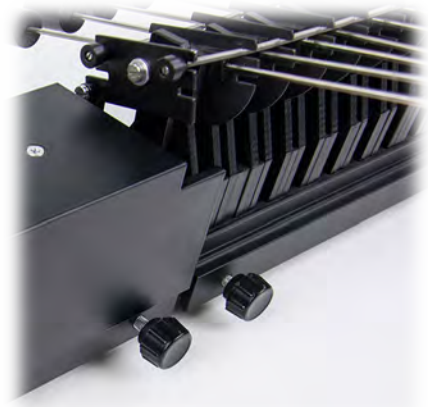
The pendulum bodies of the oscillation module 2b have around half the mass of the bodies of the oscillation module 1.

It should be noted that the two brake springs must also be coupled.
The pin of one spring must snap into the hole in the second spring.



The driving unit is mounted at the end with the long brake spring with the help of the rail connector.

At the end with the short brake spring, the second pendulum bearing (part of the damping unit) is mounted.



The two 80 cm long coupling springs are hooked into the upper slit of the pendulum.

The pendulum bearing and the driving unit are also included.

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The water trough of the damping unit is filled almost to the brim with water (filling quantity approx. 260 ml).

The lid of the water trough is put on and the water trough is pushed directly to the end of the vibration module 2a.

The pendulum of the damping unit is inserted into the pendulum bearing.

The pendulum plate is lowered into the trough so that it is completely under water.

Then the pendulum is screwed to the axis of the pendulum bearing.

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Make sure that the pendulum can swing freely, if necessary the water trough must be moved accordingly.

The little bases are inserted and screwed tight at the outer ends of the wave machine.

The driving unit is supplied with an infinitely variable DC voltage (at least 0 - 6 V).

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Experiment

The drive unit generates a periodic oscillation with a frequency of around 1 Hz.
This is achieved with a supply voltage of around 3 V.

As soon as the wave pattern is no longer changing, the brake unit is suddenly and strongly tightened, so we can "freeze" the wave movement.

Immediately afterwards the power supply is set to zero and switched off.

We measure the wavelengths on modules 1 and 2b with a measuring tape and compare them.

Result

It can be observed that a longer wavelength arises in oscillation module 2b than in oscillation module 1.

The lower mass of the pendulum bodies therefore causes a greater wavelength.