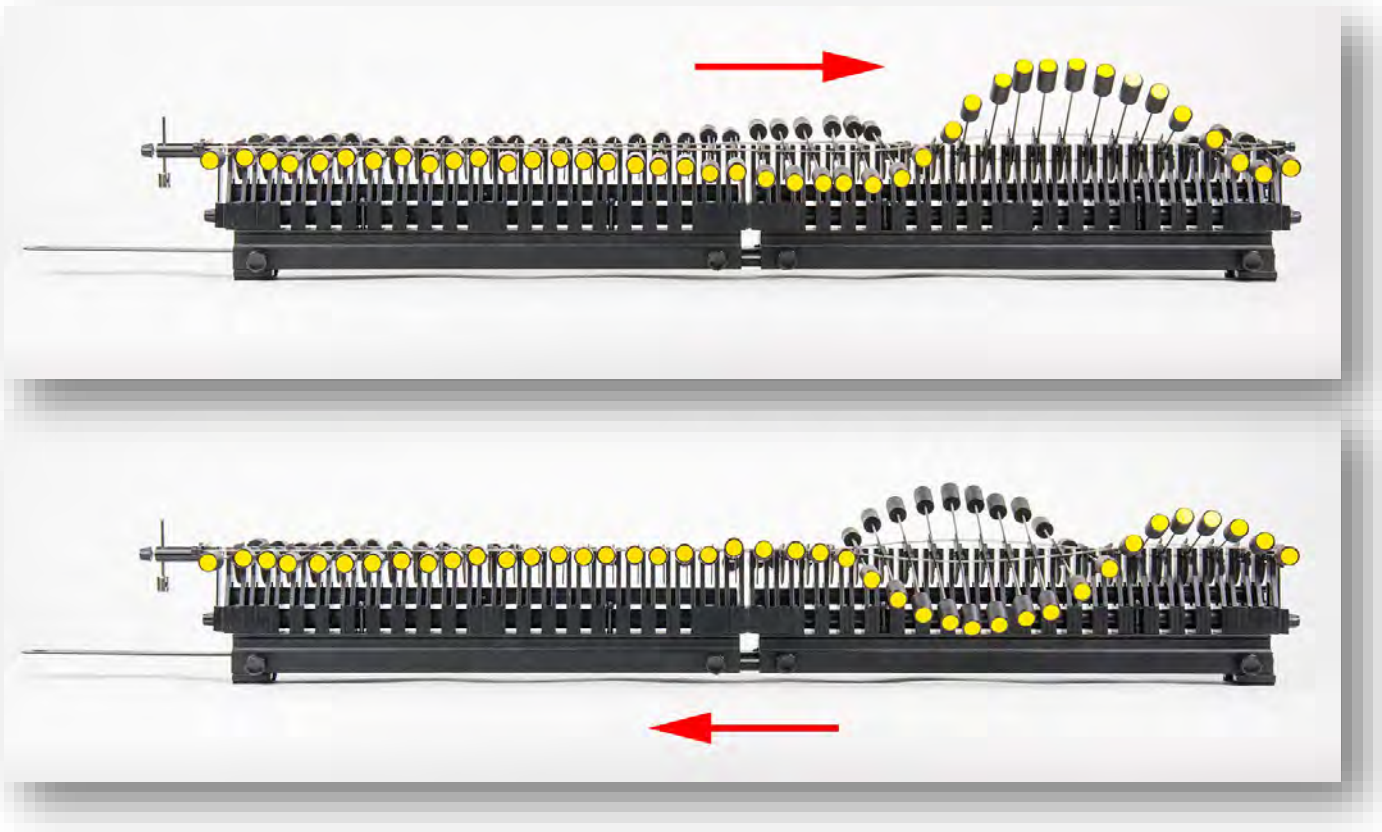
REFLECTION AT THE FIXED END

SWD 03.02



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
DW405-3F	1	Fixed end plate for wave demonstrator
DW405-3P	1	Pendulum bearing for wave demonstrator
P7230-4E	1	Bearing pin
DG205-1G	1	Hook metal, with handle
DW405-1E	**1**	**Wave demonstrator - Module II consisting of**
DW405-1E1	1	Oscillation module 2a with brake
P5310-1S	1	Rail bond SE, universal
DW405-3SL	2	Coupling spring 80 cm, for wave demonstrator

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Purpose

The aim of this experiment is to investigate whether the transverse wave is reflected at a fixed end or not. If yes - in which form?

Setup

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

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

The pendulum bearing is mounted at the end with the long brake spring.

The bearing pin is screwed tight in the vertical slot of the pendulum bearing.
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At the end with the short brake spring the fixed end plate for wave demonstrator is mounted.

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

The pendulum bearing and the fixed end plate for wave demonstrator are also included.

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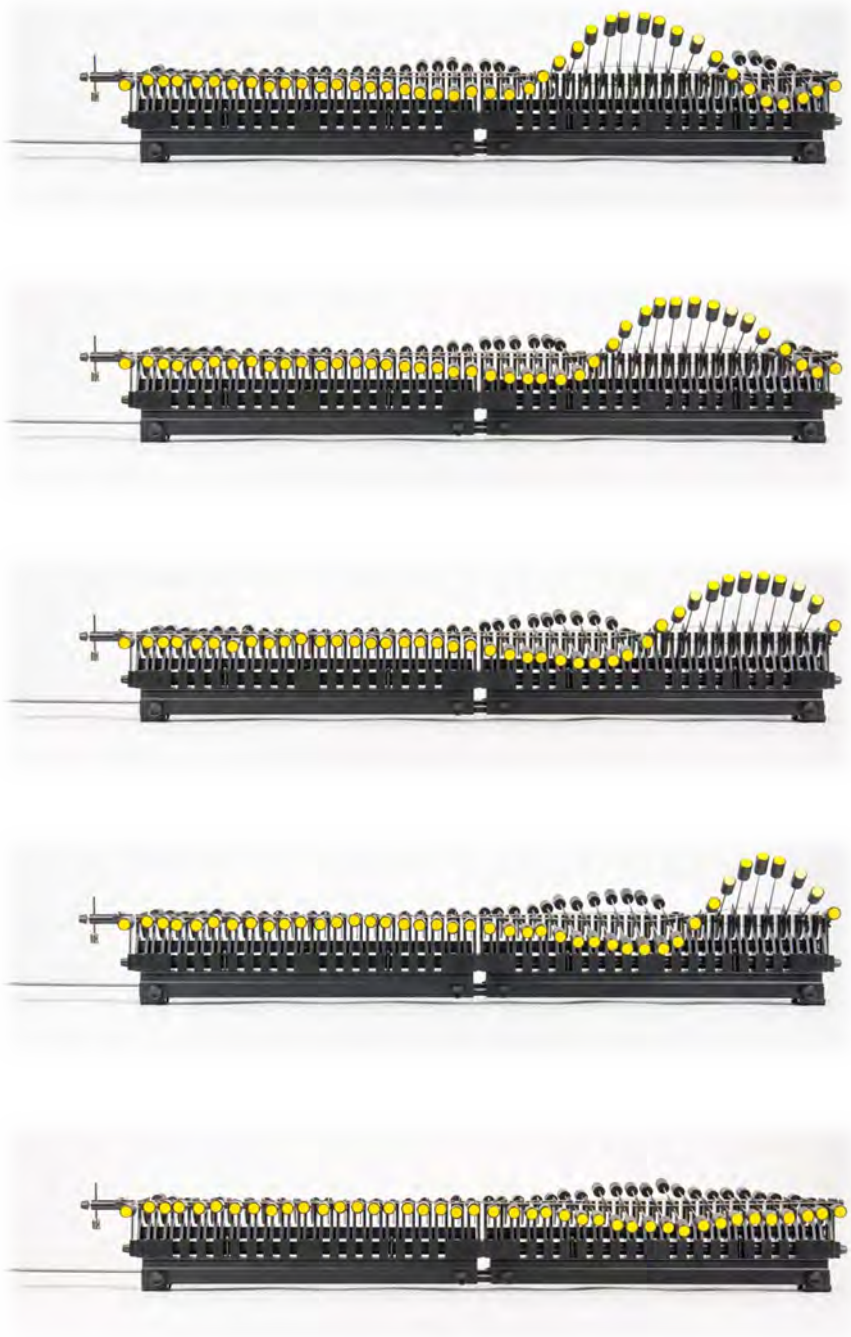
Experiment 1

All pendulum rods are brought into a horizontal position.

The bearing pin is deflected by hand about 20 - 30 ° and then turned back to the starting position. This movement should be done quickly.

The first pendulum body of the oscillation module is thereby deflected in an up and down movement and then returned to the starting point again.

Observe the movements of the pendulums!



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Result

The up and down movement creates a wave crest.

The wave propagates along the entire length of the spring.

When the wave hits the fixed end, a force is exerted on the plate and the corresponding counterforce causes a "swing through" on the opposite side.

So the fixed end causes the wave to reflect.

However, the reflected, returning wave is no longer that high (half-wave).

Experiment 2

A “valley” of wave is now created and the course of the wave movement is observed again.

Conclusion

In the case of the reflection at a fixed end (no swinging out there), a “valley” of wave returns as a wave crest and a wave crest as a “valley” of wave.

There is a phase jump of half an oscillation.