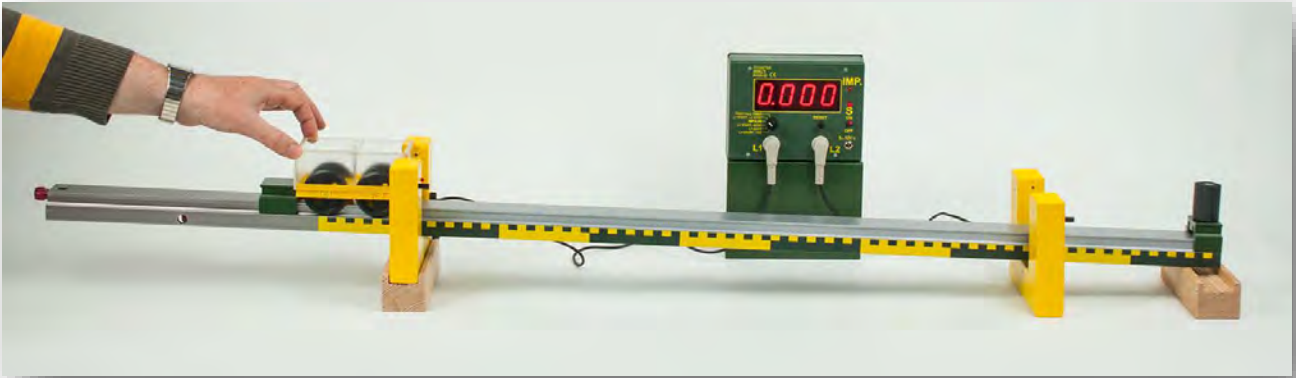


PATH - TIME LAW OF A UNIFORMLY ACCELERATED MOTION

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Material

Item-no.	Qty.	Description
DS101-3B	1	Stand rail with scale, L=1000 mm
P7210-5C	1	Stand rail NTL, L=300 mm, SE
P5310-1S	1	Rail bond SE, universal
DS103-1H	1	Holder for guide rail
DM362-1E	1	Baffle block
DS102-2G	1	Clamp saddle
DM300-2A	1	Dynamics trolley, demo, 50 g
P1312-2A	1	Car body for trolley SE
P1320-4A	2	Light gate "demo" 04
P1321-3K	2	Block for light gates
P3120-2Z	1	Universal timer "inno"
P3120-5B	1	S-shaped assembly platform

PATH - TIME LAW OF A UNIFORMLY ACCELERATED MOTION

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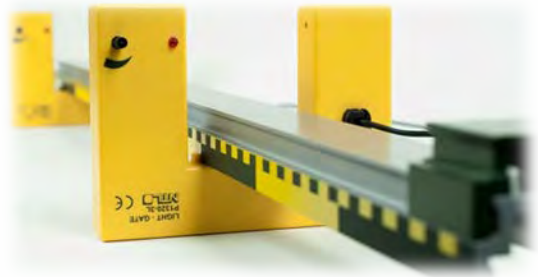
Purpose

To understand the Path-Time law of a uniformly accelerated motion: $s(t) = a/2 \cdot t^2$
 (Increase of the total path with the square of time - whereby for $t = 0$: $s = 0$ and $v = 0$)

Preparation

Connect the 100 cm stand rail and the 30 cm stand rail with the support of the rail bond; afterwards fix the holder for guide rail on the right side of the track and attach the baffle block to this holder.

Place the blocks for light gates at a distance of 100 cm at the table; one light gate is placed at the left block and the second light gate is placed at the 70 cm mark. Afterwards place the track on the light gates and make sure that the small bridges of the light gate are exactly on this mark.



Place the universal timer "inno" on the S-shaped assembly platform for a better visibility and connect the two light gates to the universal timer, afterwards put the switch into the "L1 START – L2 STOP" position. Attach the car body to the trolley, place the trolley on the track and test if it can pass through the light gates without touching them.

The trolley is placed in front of the left light gate in a way so that it just does not activate the light gate; use a clamp saddle as an indicator to find the correct position easier when repeating the experiment.

Experiment 1

Turn on the universal timer and adjust the brightness controller of the light gate so that the diode is just not lighting up.

Afterwards push the "reset"-button on the universal timer. Let the trolley move down the track.



Measure the time that the trolley needs to travel from the first light gate to the second light gate and note the measurements in the chart below.

Distance (in m)	0.1	0.2	0.4	0.6	0.7
Time (in sec.)					

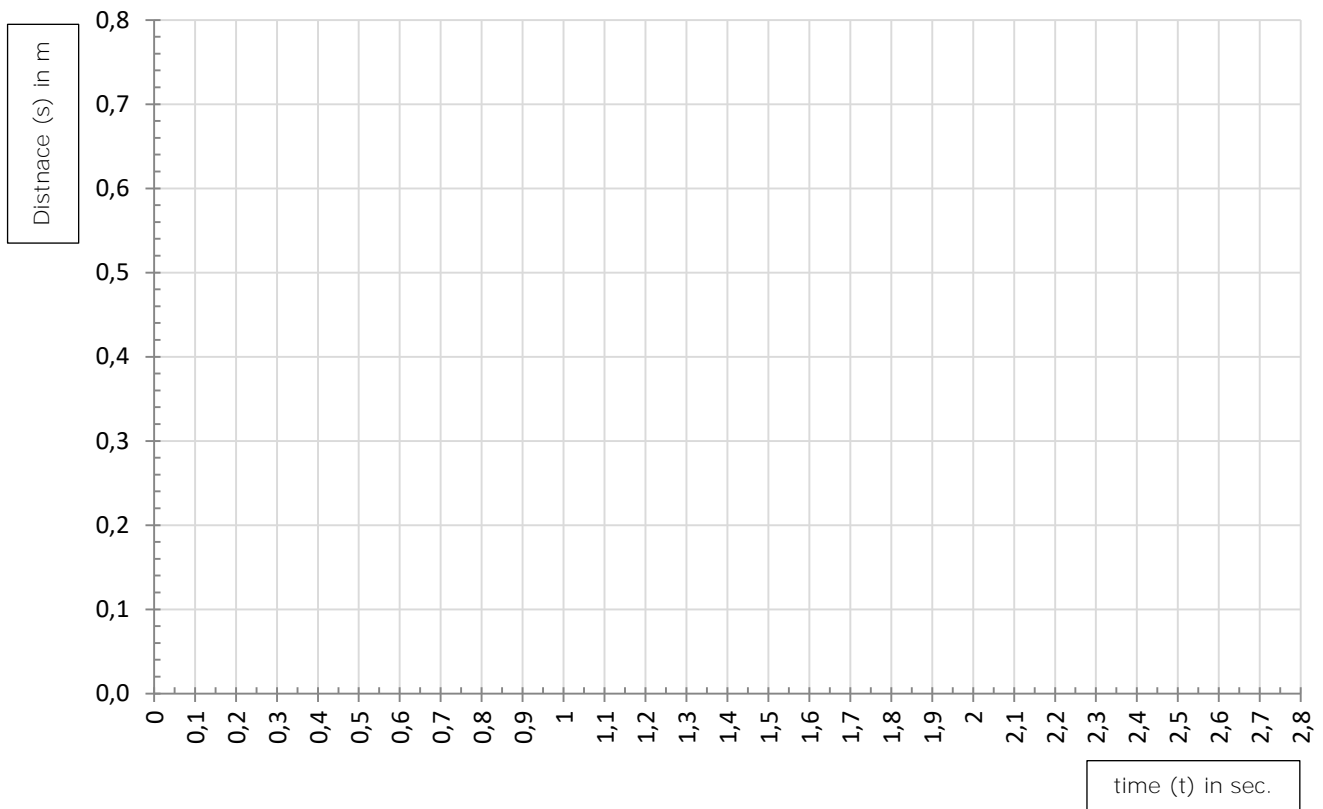
PATH - TIME LAW OF A

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UNIFORMLY ACCELERATED MOTION

Move the right light gate from the 70 cm mark to the 60 cm mark, repeat the measurement and note the results in the chart. Repeat this at the 40cm, 20cm and 10 cm mark.

Create a path-time diagram from the measured values:



Concluson

What can you see from the diagram?