



Studying the movement of a body thrown horizontally

Purpose of work: To measure the initial speed of a body thrown horizontally.

Instruments and materials:

053 - metronome.

055 - curved groove - with a ruler;

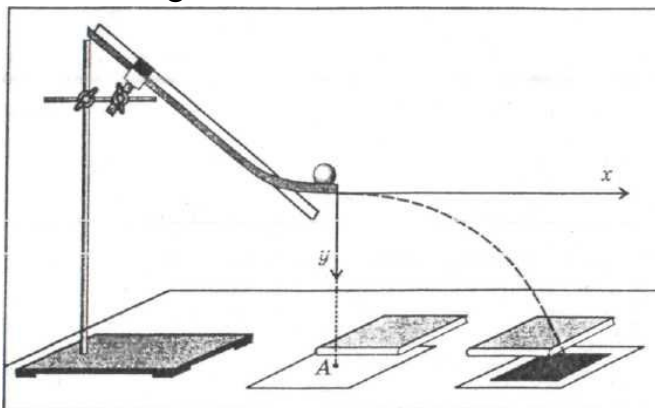
093 - ball;

000 - tripod

001 - with couplings and foot;

Theoretical part: The

ball rolls along a curved groove, the lower part of which is horizontal. After detaching from the chute, the ball moves along a parabola, the apex of which is at the point where the ball separates from the chute. Let's choose a coordinate system as shown in the figure.



The initial height of the ball h

$$h = \frac{gl^2}{2v_0^2}$$

and the flight range L are related by the relation ... According to this formula, when the initial altitude decreases by 4 times, the flight range decreases by 2 times. By measuring h and L, you can find the speed of the ball at the

$$v_0 = l\sqrt{\frac{g}{2h}}$$

moment of separation from the chute using the formula

Workflow

1. Assemble the installation shown on the board.
2. Start the simulation. The ball will roll down the chute and fall onto the table.
3. Enter in the Table the height of the fall of the ball (h) and the flight range (l)
4. Make a formula to calculate the initial speed of the ball

$$v_0 = l\sqrt{\frac{g}{2h}}$$

5. Repeat this experiment 3 times, changing the height of the gutter.
6. Please note that the table also calculates the ratios of flight range and altitude $\frac{L1}{L2}$ and $\frac{h1}{h2}$.
7. Table:

No.	h (m)	Flight range L, m	Initial speed v_0	$\frac{h1}{h2}$	$\frac{L1}{L2}$
1	40	...		x	x
2	30	...			
3	20	...			

8. Make a conclusion: sure

A. that when the initial altitude decreases by 4 times, the flight range is reduced by 2 times.

B. We were convinced that when the initial altitude is reduced by 2 times, the flight range is reduced by 2 times.

C. We were convinced that when the initial altitude is reduced by 2 times, the flight range is increased by 2 times.