

The 5th International Young Naturalists' Tournament
Municipal Autonomous Institution of General Education of the city of Novosibirsk
«Gymnasium №12»

Science Fight 4. Problem № 21 «Trampoline»



*«12FM» team,
8th mate
chnmk@mail.ru*

Condition of the problem

Stretch a rubber membrane and investigate how a small ball bounces off the membrane depending on the degree of stretching regarding the fixed height of the falling ball

Hypothesis

The bigger the degree of stretching, the bigger the height on which the ball bounces.

The aim of the study

To determine the dependence of the height of bouncing from the degree of stretching of the membrane.

The tasks of the research

- To design the experimental installation
- To define the dependence of the height of bouncing from the degree of stretching of the membrane using plastic balls
- To define the dependence of the height of bouncing from the degree of stretching of the membrane using metal balls

Theoretical part of the study

In physics, **elasticity** is the ability of a body to resist a distorting influence or deforming force and to return to its original size and shape when that influence or force is removed.

Experimental part of the study

The purpose is to find the dependence between the degree of stretching and height of the falling ball.

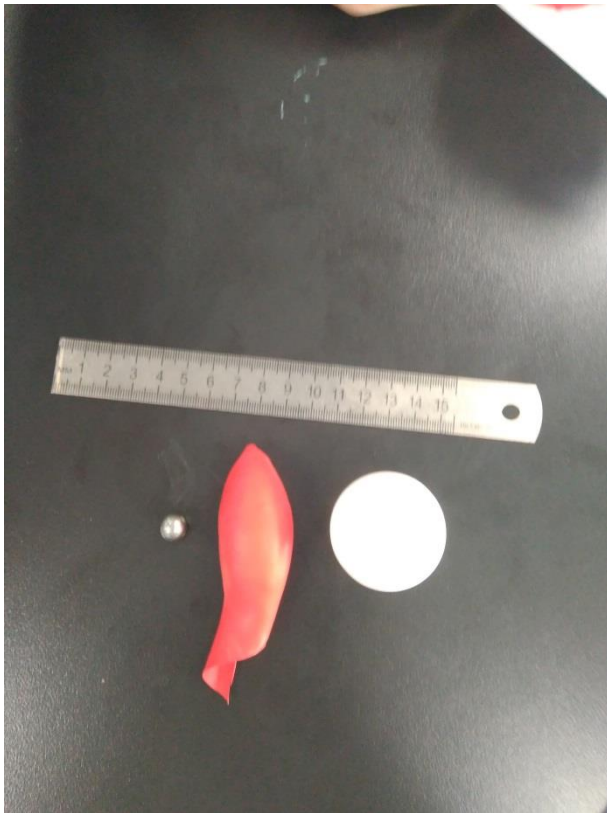


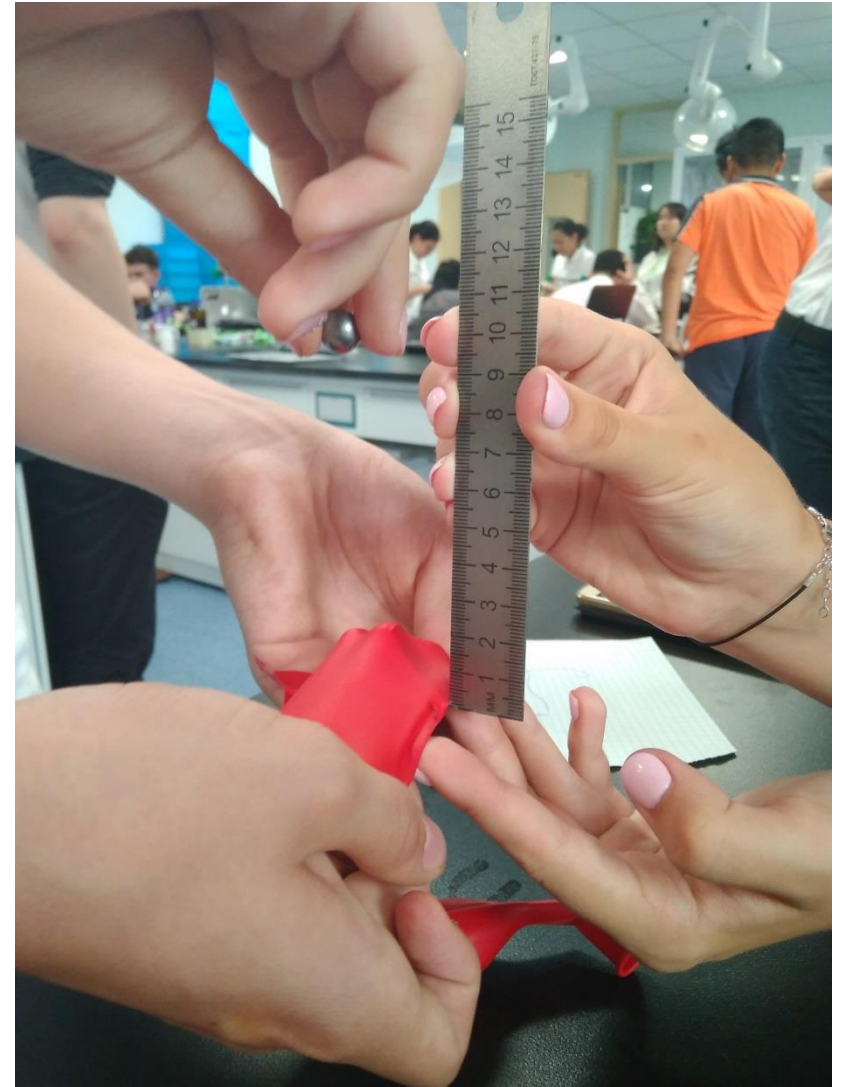
Photo of experimental installation

Equipment:

1. Metal balls;
2. Plastic balls;
3. A ruler
4. A rubber balloon.
(membrane)

Experiment 1. The dependence between the degree of stretching and height of the falling metal ball.

| The length of a stretched rubber membrane, cm | The height of falling ball, cm | The height of bounced ball, cm |
|---|--------------------------------|--------------------------------|
| 3 | 10 | 5 |
| 4 | 10 | 7 |
| 5 | 10 | 8,5 |
| 6 | 10 | 9 |
| 7 | 10 | 9,5 |



Experiment 2. The dependence between the degree of stretching and height of the falling plastic ball.

| The length of a stretched rubber membrane, cm | The height of falling ball, cm | The height of bounced ball, cm |
|---|--------------------------------|--------------------------------|
| 4 | 10 | 4 |
| 6 | 10 | 5 |
| 8 | 10 | 7 |
| 10 | 10 | 9 |
| 12 | 10 | 11 |

The statistic error is 0.1 cm (in all experiments)

Conclusion: the more the rubber is stretched, the higher the ball bounces off.

Conclusions

Thus, during performing the experiments, our hypothesis was confirmed. The tasks were completed.

We made the conclusion that the more the rubber is stretched, the higher the ball bounces off. The height of a bounced ball depends on a mass of a ball, so the metal ball bounced better than the plastic one.