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FORMATION OF EXPERIMENTAL COMPETENCE OF STUDENTS THROUGH A" LOGICAL SCHEME " IN PHYSICS LESSONS

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Abstract:
The article describes the practical and methodological aspects of the method of "logical schemes" aimed at developing the "gymnastics of consciousness" of students when conducting practical classes in physics, including in order to form and enrich the practice of introducing modern teaching methods into physics lessons today.

Keyswords: innovative technology, physics, experimental issues, "Gymnastics of consciousness", "logical scheme", physical phenomenon, imagination, logical integration, competency approach.

Introduction

The changes associated with the adoption of innovative technologies in education are bringing about new socio-economic, political and cultural changes. Such changes, in the context of globalization, form a strong competitive environment in all areas, which, in turn, make new demands on the educational sphere. As a result, it is gaining significant relevance at all stages of Education, which is valued as the most unique capital, to increase the effectiveness of education and assessment of results, to provide the opportunity for future personnel to receive quality education during the educational process by improving teaching methods.

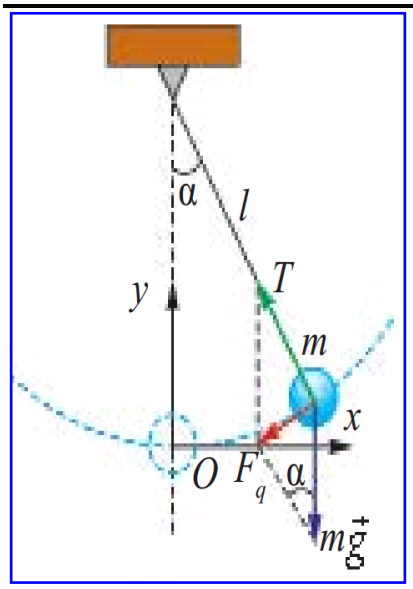
Therefore, today we want to recommend the method of "drawing up logical schemes" in laboratory classes in order to form and enrich the practice of introducing time-based teaching methods into physics lessons.

It is known that tasks related to logic, like mathematics, are called "Gymnastics of the mind". But, unlike mathematics, logical tasks in physics are interesting "mind Gymnastics", which allows you to test and practice thought processes from an sometimes unexpected side. To solve them, a quick mind, sometimes intuition, is needed, but not special ready-made knowledge, but thinking is required to be practiced.

Solving logical problems from physics consists in a detailed analysis of the state of the problem, the separation of opposing links between signs or objects.

Describing the process of solving experimental issues in the form of logical schema construction (MST), following the sequence, has a positive effect on students ' clear perception, vision and understanding of the essence of the physical phenomenon that is going on in the matter. In quantitative experimental problems, preliminary data is obtained experimentally and then mathematical calculations are carried out.

For example, we will focus on laboratory work on the topic "acceleration of the Earth's gravity"determination of" g "using a mathematical Pendulum" [1].



A mathematical pendulum is said to be a material point that hangs on a string that is weightless and does not stretch. When familiarizing yourself with a pendulum, a mathematical pendulum consisting of a material point with a length of l, a mass of m (Figure 1) is derived. From the equilibrium position α to the angle-deviated material point are two forces: 1) the force of gravity $\vec{p} = m \cdot \vec{g}$;
2) the tension force of the thread $\vec{F}$ acts.

We know that when the α - deviation angle of the mathematical pendulum is very small, we find the value of the oscillation period T from the formula;

$T=2\pi\sqrt{\frac{l}{g}}$ (1). in this: L is the length of the mathematical pendulum thread.

If, as a result of the experiment, we can determine T and ℓ we can find the value of g- from the Formula (1). We Square the dual side of (1):

$T^2 = 4\pi^2\frac{\ell}{g}$ (2) from this; $g=\frac{4l}{T^2}\pi^2$ (3),

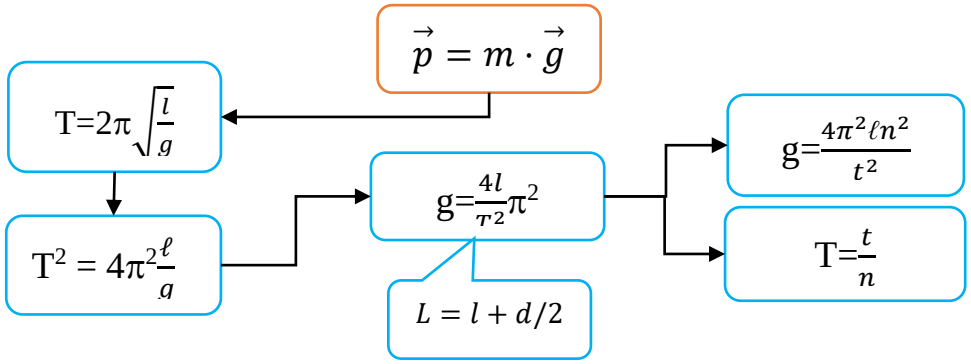
here: $T=\frac{t}{n}$ (4). We put (4) th in the 3rd formula, resulting in the basic formula for calculating " g: $\mathbf{g=\frac{4\pi^2\ell n^2}{t^2}}$ **(5).**

The procedure for performing work.

First measure the length of the L between the millimeter draw and the OB of the pendulum thread and assemble the device as in (Figure 1).

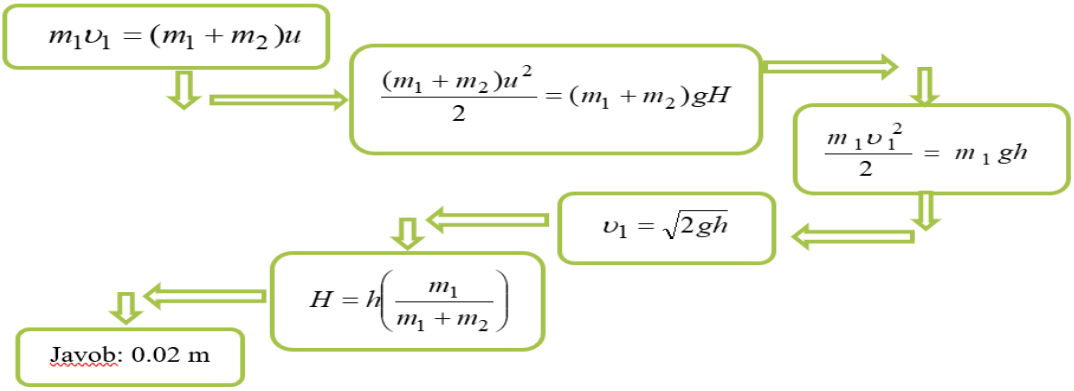
The diameter of the sphere is repeatedly measured using a stencil to find the mean value and determine the radius. At that time, the pendulum length is calculated as: $L=\ell+\frac{d}{2}$ or $L=\ell+r$ (6).

Now we will describe the above through the MST:



Issue. The two spheres are suspended in parallel threads so that they touch each other. The mass of the first sphere is m**1** = 0.2 kg, and the second is m**2** = 0.1 kg. The first balloon was deflected and released so that the center of gravity rose to a height of h = 4.5 cm. Collisions: 1) elastic, 2) What height do balloons rise when they are inelastic?

MST of problem solving:



MST solves tasks in sheep:

- content of practical activity experience in students,
- Organization of effective preparation processes for social life and development of competency of educators through the formation of base competencies,
- great attention is paid to preparing students for life by organizing educational processes based on a competency approach,
- Tasks such as the introduction of innovative forms and methods of education into the process of practical training in physics were defined.

-setting priorities for the systematic reform of Education, reveals qualitatively new aspects of the spiritual and moral and intellectual development of the growing young generation.

The methodology for the use of the MST method in physics lessons in practical and lobaratory training forms a logical integration of theory with practice. As a result of applying MST to the course process, students have deep knowledge of the physics course, helping to form a scientific worldview, the ability to think logically, mental development, the potential for self-realization.

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