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Important Aspects of Using Modern Methods in the Process of Solving Qualitative Problems in Physics

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Abstract:

In this article, the methodology of solving complex problems in physics using new modern methods. Today, the educational process in a number of developed countriesregarding the use of modern pedagogical technologies that guarantee their effectiveness The methods that make up the foundations of a large experience are called interactive methods is being conducted. Interactive educational methods are currently the most common and of all types is one of the widely used methods in educational institutions. At the same time, There are many types of interactive educational methods, which are almost part of the educational process suitable for the purposes of the implementation of all tasks are now available. In practice, separate the ones suitable for specific purposes and use them accordingly possible In this case, interactive educational methods are currently used for certain purposes caused the problem of choosing the right one to increase.

Keywords: *Natural resources, physics problems, laws of hydrodynamics.*

Introduction: "Physics Teaching Methodology" main tasks of the subject: - to familiarize students with the scientific-methodical and psychological pedagogical bases and content of the physics course of educational institutions; - arming with knowledge about the methods and tools of teaching physics; - formation of students' knowledge of scientific and methodical analysis of didactic material, teaching to choose a teaching method taking into account the characteristics of the educational material, teaching students to plan their educational work in the process of teaching physics; - applying theoretical and practical training of physics to students. American scientist D. Poya said about the heuristic learning method: "The purpose of heuristics is to search for methods and rules that lead to innovations." He recommends implementing the essence of the heuristic method through a consistent plan as follows:

1. Understanding the setting of a problem or practical task.

2. Making a plan to solve the problem.

3. Implementation of the established plan

During the implementation of this plan, teachers will find answers to the following questions.

1. What is unknown in the problem?

2. What is known about the issue?

3. What are the terms of the matter?

4. Have similar issues been resolved before?

If students are given practical and laboratory training on the basis of such a plan, students will not have difficulty solving problems in physics and will try to apply physical processes to life.

For example, at the Tashkent State Agrarian University, the Department of Physics has a science of physics and meteorology, in which meteorological processes have physical quantities such as pressure, temperature, and air humidity.

Problems solved by logical reasoning based on physical laws and physical formulas are called qualitative problems. Arithmetic calculations are not performed in problems of this type. Qualitative problems have many methodological advantages. The method of solving these problems, based on the laws of physics, which consists in making logical conclusions, serves as an excellent school of thought. Qualitative problems clearly explain physical phenomena and their laws to students, teach them to apply theoretical knowledge in practice, educate the right attitude towards calculation problems, teach to solve any problem, start with the analysis of its physical content. Questions related to quality are given in order to strengthen the material learned in the lesson. We know that the hydrodynamics department of physics solves mostly qualitative problems. Quantitative issues are hardly solved in this section. Quality issues are diverse in terms of theme, content and complexity, that is, there are simple and complex issues related to quality. Examples of qualitative problems and methods of solving them are fully presented in the literature. It is possible for the liquid to flow in two modes:

1. At low v speeds – laminar (layered, without mixing)

2. At high v speeds - turbulent (collective).

Laminar flow.

The fluid is not stirred, the velocity profile is a parabola.

Turbulent flow.

Clumps are formed, intensively mixed and flowed, the profile is complex

The Reynolds number serves as a criterion for the transition from laminar to turbulent

$$\mathrm{Re} = \frac{\rho \cdot \mathrm{v}_{\text{cp.}} \cdot d}{\eta} = \frac{\mathrm{v}_{\text{cp.}} \cdot d}{\nu}$$

Problem ***1*** *Water flows through a pipe with variable sections in a horizontal direction. The speed of water in the upper part of the pipe is 40 cm/s. If the diameter* d_1 *of the wide part of the well is 1.5 times larger than the diameter* d_2 *of the narrow part, determine the speed of water in the narrow part* v_2.

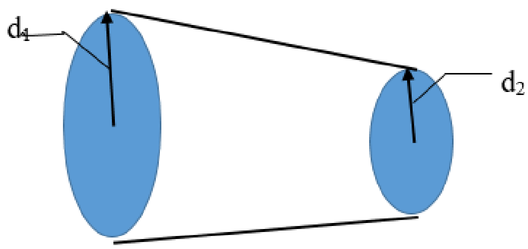
Given: **Solution: We write the continuity equation for the flow of liquid in a pipe:** $V_1=4$

$V_1S_1= V_2S_2$ (1)

$d_1/d_2=1.5$

In this case, S_1 and S_2 are cross-sections v1 in the narrow and wideparts of the pipe v_2 are the velocities at the corresponding points.

v2 are the velocities at the corresponding points. V_2=?



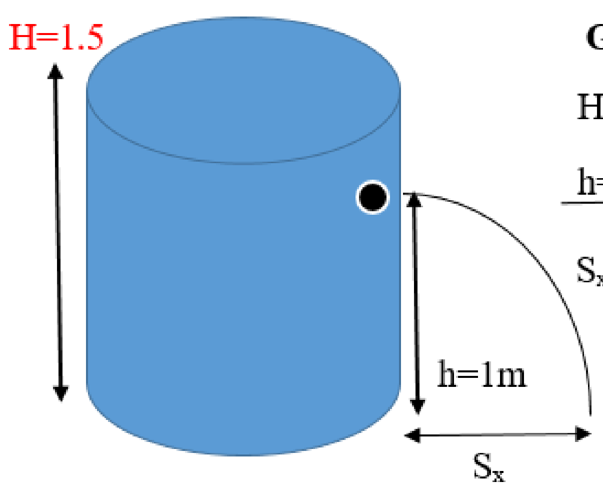
$S=\frac{\pi}{4}d^2$ (2) We take formula 2 to 1 and pour it $V_1\frac{\pi}{4}d_1^2=V_2\frac{\pi}{4}d_2^2$ (3) the formula is derived

$V_2=V_1d_1^2/d_2^2$ (4) this formula is the result formula of our example, we bring the results to this formula

Solution : V_2= 40m/s $\frac{9}{4}$=90m/s the water flow speed in the narrow part of the pipe is 90 m/s

If students are taught to work with new methods of such issues, it will be very useful in the purposeful use of natural resources in agricultural irrigation. 'rinli will be.

Problem 2. *A tank with a height of H = 1.5 m is filled to the brim with water. A hole with a small diameter is formed at a distance of h = 1 m from the upper border of the tank. How far from the tank is the flow of water coming out of the hole to the floor?.*



Given:

H=1,5m

h=1m

S_x=?

$mgh=mv^2/2$

$v=\sqrt{2gh}$

$H-h=\frac{gt^2}{2}$

$S_x=v*t=\sqrt{2gh}*\sqrt{\frac{2(H-h)}{g}}$

Conclusion

Students have practical knowledge of how to use natural resources and how to use them for their intended purpose, to comply with the laws on nature protection, to preserve the integrity of natural complexes, to prevent damage to living and growing environments of living nature objects, and not to violate the rights of users of other natural resources. They must acquire skills.

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