METHODS OF TEACHING PHYSICS WITH THE USE OF WORLD PRACTICE

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ABSTRACT

The article analyzes the innovative strategic goals of conducting practical training in physics in the formation of independent thinking and competencies, focuses on its advantages.

Keywords: Teaching physics in foreign countries, physical quantities, fluid pressure density, students, pallets

МЕТОДИКА ОБУЧЕНИЯ ФИЗИКЕ С ИСПОЛЬЗОВАНИЕМ МИРОВОЙ ПРАКТИКИ

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АННОТАЦИЯ

В статье анализируются инновационные стратегические цели проведения практических занятий по физике, формирование навыков самостоятельного мышления и компетентности, акцентируется внимание на ее преимуществах.

Ключевые слова: Преподавание физики в зарубежных странах, физические величины, плотность давления жидкости, студенты, поддоны

ЖАХОН АМАЛИЁТИДАН ФОЙДАЛАНИБ ФИЗИКА ФАНИНИ ЎҚИТИШ УСЛУБИЁТИ

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АННОТАЦИЯ

Мақолада физикадан амалий машғулотлар олиб бориш, мустақил фикрлаш ва

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компетентлик қобилятларини шакиллантиришдаги инновацион стратегик мақсадлари тадқиқ қилинган хориж тажрибаси таҳлили, унинг афзалликларига тўхталиб ўтилган.

Калит сўзлар: Хорижий давлатларда физика ўқитилиши, физик катталиклар, Суюқлик босим зичлиг, ўқувчилар, брусок

INTRODUCTION

One of the main tasks of the modern education system is to train the next generation to be well-rounded, world-class and competitive. As a proof of our opinion, in 2020 a number of Presidential decrees and resolutions aimed at improving the education system were adopted. In particular, on "Measures for the development of education and science in Uzbekistan in the new era of development" (PF-6108, 11.06.2020) and "Talented" aimed at increasing the aspirations of the younger generation to science, further strengthening their intellectual and creative potential. decrees and resolutions "On measures to improve the system of youth selection and academic lyceums" (PQ-4910, 12.03.2020). In addition, these decrees and resolutions set as a priority the improvement of the teaching of exact and natural sciences and the use of foreign experience in the creation of new generation textbooks.

LITERATURE ANALYSIS

The role of textbooks in the practice of educating students, fulfilling the requirements of modern competence is invaluable. Creating a new generation of textbooks is one of the positive solutions to this problem, but only 4-5 years after the creation and implementation of this manual, we will have high school graduates who meet the above requirements. This situation requires mobility on this issue, and we all know that the rapidly evolving scientific and technological progress does not wait for us. Therefore, we should try to simultaneously adapt the students currently studying in secondary schools and academic lyceums to the above requirements. Implementing such a requirement requires a creative, creative approach to the lessons taught by science teachers.

It is known that in the last decade, in addition to ILTS certificates, additional certificates in mathematics and physics are required for admission of academic lyceums and high school graduates to foreign educational institutions on a grant basis. It is no secret that in order to obtain such certificates, additional training is provided in non-governmental educational institutions or

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with qualified tutors. In any case, we have had some experience in preparing students for the test in order to obtain such a certificate. The right question arises as to how foreign experience in teaching physics differs. According to our experience and data in the literature, there is almost no difference in the theoretical data studied, but there is a difference in its distribution by classes. The basis of the topics covered each year is the same, but becomes more complex and expansive from year to year. This allows students to be taught on a principle from simple to complex. According to the analysis, the main difference is in the physical issues given in the practical training. This difference was also noted by the Russian teacher Yu.L. Bashkatov, who worked in a specialized secondary school in the Republic of Korea.

In addition, the textbooks used in physics courses in the Presidential schools established in our country and the literature we use also confirm the above. This difference is mainly in the number of physical quantities that need to be determined in the issues used in the consolidation of theoretical knowledge and in the control work. In our country, in secondary schools in grades 6-8, practical classes are limited to the issues covered in the textbook or manual, while in grades 9-11, mainly A. A set of issues is used under the editorship of Rimkevich. Other sets of problems used in general secondary education are similar to the above, i.e. each problem requires finding only one physical quantity e.g., time, speed, path, power, energy, and so on. In control cases using such issues, each issue is evaluated up to 5 points. This approach gives good results in consolidating and assessing the knowledge of highly gifted students. Because it can find several intermediate quantities using the given ones to determine the required physical size and then link them together. However, average learners are not always able to determine the intermediate sizes that should be used. In addition, in secondary schools, as well as in specialized schools, students gradually consolidate their theoretical knowledge in a "step by step" manner.

DISCUSSION AND RESULTS

The issues presented in the practical training in foreign countries require the identification of several physical quantities, from simple to complex. Giving questions in this form seems to help the reader, and the sequence begins to identify the required sizes. This stimulates the student's self-confidence and interest in science. From such problems we give examples of various branches of physics.

Problem 1: A diagram of the forces acting on two pallets is described.

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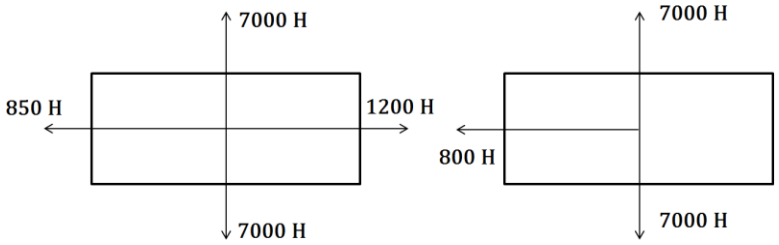


a. In which diagram the pallet moves with acceleration to the right.

b. Write the name of the forces acting on the pallet.

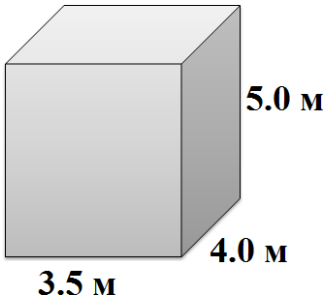
v. Find the resulting force acting on each pallet.

Issue 2: The weight of the fluid causes the fluid pressure to drop vertically. The pressure of the liquid column is given by the formula P = pgh.

a. Write the name and unit of each quantity given in the formula

b.Using the formula, express the pressure in Pascal (Pa) units using the basic units of the SI system of units.

Issue 3. The container shown in the figure is filled with a liquid with a density of 850 kg / m^3.



Calculate and calculate the pressure of the liquid at the base, ie P = pg, using the general pressure formula

s. Calculate the volume, mass, and weight of the liquid in the container.

d. Calculate the face of the base of the container

e. Pressure pressure on the base of the container $= \frac{\text{power}}{\text{surface}}$ calculate using the expression

f. Use P = pgh to check your answer

As can be seen from the examples given, these issues are no different from the issues we

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have worked on. Only in working on these issues are students taught to process information by focusing from simple to complex. In some cases, even the formulas to be used are given, it is only necessary to calculate or find the name and unit of the physical quantity in the formulas.

This means that the goal of educational technology in them is not only "Production" but also "Information Processing". Through such technologies, they achieve the effectiveness of the educational process not only through the focus and diligence of their students, but also through the formation of their independent processing and retrieval of information.

It also solves several tasks by testing students' knowledge through tests using similar types of problems, namely:

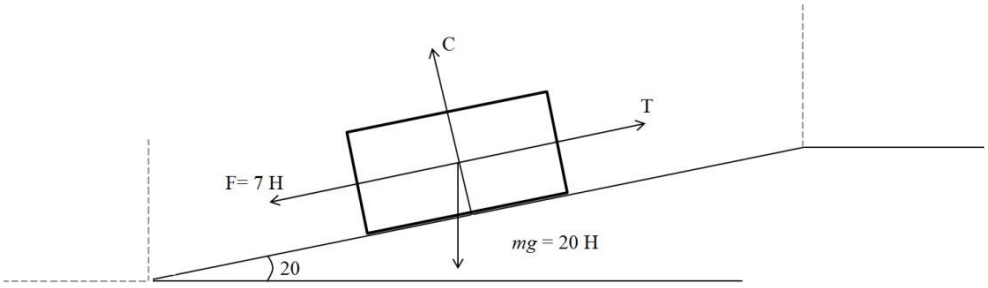
students are almost never assessed as “unsatisfactory,” which does not discourage students;

the student and the teacher find out to what extent they have mastered the topics covered;

the work to be done according to the general performance of the group of students will be clear.

In this way, students will be able to understand the essence of teaching physics, and it is advisable to choose examples in their assessment.

The picture shows a wooden pallet on a 1.7 m long sloping plain. The pallet is pulled by a rope along a sloping plane at a constant speed of 0.6 m / s



a. Explain what is meant by the work done.
b. Discuss whether the pallet can be in equilibrium according to Newton’s first law.
s. Explain that the reaction force acting on the pallet does not work.
d. Write the work done by the force T when moving the pallet up the slope, the potential energy of the pallet, and the formula for the work done by the force F.

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e. Determine the force T from the formula written in section d-.
f. Calculate the force required to move the pallet along the slope at a constant speed.

CONCLUSION

From the problems in the example above, it can be seen that the problem conditions are almost indistinguishable from the assignments given in physics textbooks and problem sets used in school, but the physical quantities to be found differ in their multiplicity and the requirement to explain the expressions used.

Based on the above considerations, it can be concluded that physics teachers in schools and academic lyceums specializing in physics and mathematics in the Republic should use them in practice through an approach similar to the issues presented in grades 7-10. In addition, it would be expedient to introduce the course "Teaching Physics in Foreign Countries" as a elective subject for students studying physics in pedagogical institutes and universities of the country. Then the graduates will be able to get acquainted with and compile such types of issues, and thus have the opportunity to use foreign experience in the process of teaching physics in secondary schools.

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