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## METHODOLOGICAL FOUNDATIONS AND SOLVING INTEGRAL PROBLEMS BY PHYSICS WITH LABOR TRAINING

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**Abstract:** This article aims to focus on the creation of a competition for problem-solving and problem solving that will enhance the attitude of general education students to integrating learning.

**Keywords:** creative initiative, integrative environmental content, physical and ecological basis, useful labor, frontal absorption, defoliation, chlorinated water, didactic principle, diffusion phenomenon.

**摘要：**本文旨在着眼于创建一个解决问题和解决问题的竞赛，以提高通识教育学生对整合学习的态度。

**关键词：**创造性主动性，综合环境内容，物理和生态基础，有用劳动，正面吸收，落叶，氯化水，教学原则，扩散现象。

### I. INTRODUCTION

Linking physics with labor education, organizing a competition on the formation and solution of issues of environmental content, and its conduct is not only a means of educating students, but also a means of activating their cognitive activities, raising their interest in studying and socially useful labor. Most teachers showed that the practical work they have done and are doing in this area, has a positive role and relevance of the competition in the educational process.

The goal of organizing and conducting competitions on the formation and solution of issues of environmental content, linking physics with Labor Education, is not without quantitative indicators, but rather a qualitative indicator, that is, more precisely the educational activities of students.

It is also possible to organize and conduct extra-curricular activities of students in physics (Olympics, conferences, contests for the

production of visual aids, etc.) using integrated environmental materials.

While each student feels the responsibility of keeping up with his or her classmates and moving their classroom to the forefront, they integrate physics and read more literature. As a result, their knowledge, practical skills and competences scale and the content deepens. Mass and individual forms of Organization of the competition for the selection, compilation and resolution of issues from physics on the basis of materials of integrated environmental content enrich the content of the educational process, increase the students' responsibility and interest in reading.

The results of our research work, which we conducted in physics lessons using materials of integrated environmental content, confirm that it is worthwhile to conduct a competition on the selection, compilation and solution of issues among the groups in the lesson.

The physics teacher divides the students into groups taking into account their knowledge,

skills and qualifications. In assessing the competition on the selection, structuring and resolution of physics issues in the integrated environmental context of students, it is necessary not only to be based on accurate results, but also to take into account the creative initiative of each student.

Below we give an example from competitions on selection, compilation and resolution of issues of integrated environmental content from physics:

Organizing a competition on the selection, structuring and resolution of issues of integrated environmental content from physics. For the purpose of the lesson can be a lesson on the formation, development of knowledge, skills and competences on the selection, compilation and solution of issues on the basis of competition, teaching students, studying the physical foundations of materials with integrated environmental content. In order to activate the performance of students in the lesson, we invited them to be in groups in the organization of their competition. In order to determine the winner of the competition group, we elect one member of the jury from each group. To each of the members of the jury, a specific task is determined.

It is appropriate to use qualitative, quantitative, graphic and experimental issues when conducting a competition on the selection, structuring and resolution of issues of integrated environmental content from physics. Objectives of the competition lessons:

## **II. EDUCATIONAL:**

strengthening students' knowledge.

## **III. MORAL:**

teaching students to work as a team, to form in them knowledge, practical skills and competences related to the ecology of the country.

## **IV. DEVELOPING:**

teaching students the ability to apply their theoretical knowledge in practice, to understand the physico- environmental essence of environmental phenomena, to form practical skills and competences.

Competition lesson and its structure

1. By frontal inquiry of student knowledge.

2. Competition of captains. Selection, compilation and solution of problems.

3. Competition of captains. picking up and checking their notebooks or sheets by the jury

4. Competition of captains. Graphic, table-based tasks aimed at developing students' thinking skills based

on environmental knowledge. Selection, structuring, explanation of the physico-environmental fundamentals and laws of technical and technological processes in matters of integrated environmental content from physics. To show the correctness of the above points, below we will give examples from the examinations conducted with integrated environmental content from physics.

## **VIII class**

Selection and solution of problems in physics in integral environmental context using diffusion phenomena.

- I. The physics teacher in collaboration with the teachers of biology, chemistry and labor education will provide team members with pre-

arranged questionnaires to practice.

Task for the first team: Explain the defoliation of cotton from an environmental point of view.

Task for the second team. Explain the environmental consequences of defoliation in plant nutrition by diffusion through physics, biology, and chemistry point of view.

II. The captains of each team are assigned tasks to draw up a separate problem. It will take 10 minutes to resolve these issues. Each team captain performs an independent compilation and resolution of the issue in the whiteboard.

Assignment to the captains.

1. Which of the following is best for diffusion nutrition? On a thin leafy plant or on a thick leafy plant? Why? Explain both cases from an environmental point of view.

2. In which of the following is the best diet for cotton or other agricultural crops by diffusion? Is it the area where the cotton cleaning plant is located or the area where the oil refining plant is located? Why? Explain both cases from the point of view of ecology, linking physics to the subjects of biology, chemistry, labor education.

III. Team captains resolve a problem that has been prepared in advance by other team members during the selection, drafting and resolution of the problem.

1. Why do single-celled organisms live even without a special respiratory organism?

2. Why can't multicellular organisms survive without a specific respiratory organism? Solve both problems from an integrative and environmental point of view.

It should be taken 5-7 minutes to select, compile, and solve such problems. Then the sheets are collected and the other 2-3 minutes are discussed to select a quality issue, compile and

solve it on a blackboard. The physics teacher, in consultation with chemistry, biology and labor education teachers, examines each student's choice of physics in an integrative environmental context, and records and evaluates them individually (individually and collectively).

IV. After the examination of the selected, structured and solved problems in the whiteboard by the students, the team captains will report.

V. If there is time left, students in the class will be given more problems so that they will not be idle.

1. In which of the following is the best nutrition for plants by diffusion? In the area where the alfalfa is planted or in the oil refinery? Why? Explain both in terms of integrative ecology.

2. Which of the following is the best case of diffusion? Is the K-700 a plowed field with a wheeled tractor, or a plowed field on a DT-75 chain Tractor? Why? Explain the environmental consequences of both tractors in the field.

Assignment to the third team.

1. How to use the diffusion phenomenon more effectively in agriculture, including cotton?

2. give examples of ineffective use of the phenomenon of diffusion in agriculture.

1. Does diffusion occur in solids?

2. What is the underlying mechanism for the exchange of gas in the atmospheric air, allowing the transfer of carbon dioxide from the soil to the atmosphere and the reversal of oxygen?

II. The task for students to work independently

1. Which of the following is the best case of diffusion? In a field that is irrigated with clean water or in a chlorinated water field? Why?

2. In what cases of the substance the diffusion is more frequent? In liquids or in gases? Why?

Thus, the proper organization and conduct of the competition lesson will be not only educational but also moral. In these lessons, students learn to respond not only on their own behalf, but also on behalf of all their classmates. In addition, students will learn to listen to their friends' comments and analyze their responses.

#### Organizing Olympiad

It is one of the extracurricular forms of work held in Olympiad. The tasks of the Olympiad are as follows;

1. Make an annual report of the results of the selection, compilation and resolution of problems of environmental content by linking physics with Labor Education.

2. Exchange of experiences between schools.

3. To identify the students' weaknesses in the organization and conduct of extracurricular work.

4. To show the interaction of physics with educational sciences.

5. Providing students with career guidance.

6. To develop students' interest in learning by interacting with the subject.

The environmental materials available around the school play an important role in addressing these challenges as they are an integral part of the environment.

The following didactic principles should be followed when selecting materials for school olympiad:

1. Studying the physical, chemical, biological phenomena and regularities of environmental materials around the school, in

terms of topics and questions, in terms of readiness, development, interest, and interest of students in different classes.

2. Formation of necessary theoretical knowledge, practical skills and skills in students.

3. All work should contribute to the formation of a love and scientific outlook for their country.

4. Particular attention should be paid to the selection of evidence and the interrelationship of agricultural production events.

5. The linking of problems and questions with life needs to meet modern requirements.

Our observational and pedagogical experiments have shown that it is advisable to conduct the school Olympiad in two types:

- I. Within the school, that is, among the classes.

- II. Inter-schools.

From physics, we will get acquainted with the following types of school Olympiads with integrated environmental content.

First round

Conducting school Olympiad.

Members of the physical and labor education groups, as well as students of this class can take part in the Olympiad.

The organization and carrying out of such Olympiad should be taken into account.

- I. The responsibility for the Olympics lies with the physics teacher.

- II. Olympiad problems and questions are formulated by a physics teacher in consultation with chemistry, biology, and labor education teachers using environmentally friendly materials.

- III. The answer to the problems and questions should be in writing only.

**VI class**

1. Normal human blood temperature is 26.50 °C. If the average square velocity of a molecule, which is part of the blood plasma in the blood of an infected person, increased by 1,005 Vkv, then what was the temperature of human blood?

**Given**  $t = 26.50^\circ\text{N}$  **Solution**  
Average square velocity  
 $V_{\text{KB}} = 1,005 V_{\text{KB}}$

$$V_{\text{KB}} = \sqrt{\frac{3\kappa T_H}{\mu}} = \sqrt{\frac{3RT_H}{m}}$$

$T = ?$   $m$  is the mass of a single molecule

$$m = \frac{\mu}{N_A} \quad \text{the above formula}$$

is normal

$$T = \frac{V_{\text{KB}}^2}{3R} = \frac{(1,005)^2 * 3\kappa T_H * m}{3\kappa m}$$

$$= 1,010025 \cdot T_H = 1,010025 \cdot 310 = 309,5 \text{ K}$$

**Answer**  $T = 309,5 \text{ K}$

2. Explain the environmental impact of soil electrification on cotton growth and productivity.

The noise level in the working room is 80 dB. Sound absorbing material hanging on the wall of the room to reduce the noise of a person reduce the noise level by 1500 times, what is the noise level in the workplace?

1. The noise level in the working room is 80 dB. Sound absorbing material hanging on the wall of the room to reduce the noise of a person reduce the noise level by 1500 times, what is the noise level in the workplace?

**Given** **Solution**

$L_1 = 80$   $L_2 = ?$   
The volume level expressed in dB is found

in the relation

$$\frac{J_2}{J_1} = \frac{1}{1500}$$

$L_2 = ?$

$$L = 10 \lg \frac{J}{\sigma}$$

Here: Conditional 0o Level of Jo-Volume ( $I_0 = 10^{-12} \text{ W/m}^2$ ) When volume changes, volume level changes as follows:

$$\Delta L_{\text{K}} L_2 - L_1 = 10 \lg$$

In this case, It will be  $L_2 =$

$$L_1 + 10 \lg$$

By setting the numeric values, the following is found:

$$L_2 = 80 + 10 \lg = 80 - 10 \lg 1500 = 80 - 10(\lg 1,5 + 3) = 80 - 10 * 3,176 =$$

$$48,24(\text{dB})$$

**Answer:**  $L_2 \text{ K}$

$$48,24 \text{ dB.}$$

or  $t = 36,5^\circ \text{N}$

2. Explain the physical, chemical, and biological significance of the use of radioactive isotopes in agriculture from an environmental point of view.  
Second round

The following should be considered during the inter-school Olympiad:

1. The responsibility of the physics teacher for the Olympics.
2. The Olympiad starts with the opening speech of the chairman and completes the results.
3. Organization of exhibitions in the Olympiad showing the physical bases of integrated ecology (achievements of agricultural production techniques and technological processes).
4. The Olympiad questions and questions are made by the jury in accordance with the physics program.

5. The Olympiad participants may independently answer the problems and questions in a separate room while maintaining peace.

6. The answer to the problems and questions should be only in writing.

7. The winner of the Olympiad is determined by the higher the number of points scored on the answers to problems and questions, and the more popularity in the classes is the greater the number of correct and correct answers.

The following is an example of how to organize Olympiad

The Olympiad jury will consist of the deputy of school director according to educational work, teachers of physics, chemistry, biology, and labor education and classroom leaders participating in the Olympiad..

The winner of the Olympiad is determined by the highest number of points scored on the questions and problems. In terms of classes, the greater popularity is determined by the number of good, correct answers

Offrs are formed, each will be given separate instructions. The chairman of the jury explain briefly the students about the goals and objectives of the Olympiad and introduces its agenda and rules.

The Olympians go from the gym to the classroom. There they receive a sheet of problems and questions under the supervision of the jury.

The following are examples of school Olympic problems and questions.

### VII class

<sup>1</sup>. Toxic substances are mainly dispersed as an aerosol in air. Find the mean square velocity of the aerosol particle at a temperature of 27 ° C

at a thickness of 10 cm and a density of  $3 \cdot 10^2 \text{ kg} / \text{m}^3$

2. The concentration of mercury in the air at the workplace is 10%, and the worker absorbs 2 liters of air

every breath. If the breathing rate is 25 times per minute, determine the amount of mercury absorbed by the worker during the 8-hour run. Atmospheric pressure in the operating room is 760 mm of wire. in the upper part and 200C.

3. Determine the specific heat of the soil contaminated with solar oil.

Necessary tools and materials: scales, leveling boards, calorimeters, thermometers, power supplies, heating cables, glassware, water, soil, stopwatch, connecting wires, switch.

The specific heat capacity of the water is 4200 J (kg/gr).

### VIII class

1. A student weighing 50 kg absorbed 0.5  $\mu\text{K}$  of radioactive sodium due to negligence and lack of knowledge about the environment. If the yield of natural activity is 50%, find activity during the day.

2. Radon tubes are used for cure, if activity is 1,5.10 Ki, how much is its activity for 10 days? Determine the refractive index of oil obtained from radioactively irradiated seeds.

Necessary tools and materials: oil obtained from radioactively irradiated seeds, glass, ruler, light bulb, battery, screen.

As we have observed, many students find it difficult to solve experimental problems in a set of problems and questions that are currently being used.

The positive side of drawing up and solving experimental problems of physics with integral environmental content is as follows:

1. Students are creative and interested in the selection, design and solution of experimental problems in physics.

2. The condition of experimental problems of integral environmental physics must be viable, not abstract.

3. The conditions of the experimental issue provide a real connection of the study material with practice and country production.

4. Increases students' interest in physics, chemistry, biology, labor education and research of the scientific basis of environmental materials.

5. Develops traits such as observation, attentiveness, and adherence to the understanding of environmental materials.

6. During the educational journey, thinking develops.

In summary, the following are the factors that influence the level of cognitive development of students in creating and solving environmental issues on an integrated basis.

1. Students have developed the ability to independently and creatively approach environmental theories.

2. Students have developed abstract thinking and logical thinking.

3. Students have developed practical skills and qualifications.

4. Students have developed initiative, austerity, entrepreneurship and creativity.

5. Indirectly prepares students for material production.

## REFERENCES

1. Mirziyoyev Sh. M. We will jointly restore the free and prosperous democratic state of Uzbekistan. T:
2. Critical analysis, rigid discipline and personal accountability should be the daily routine of every manager's work T: Uzbekistan 2017. 104

p.

Mirziyoyev Sh.M. Decree of the President of the Republic of Uzbekistan dated February 7, 2017 N PF-4947 "On action strategies for further development of the Republic of Uzbekistan" "Xalq suzi" February 8, 2017.

Karimov.I.As Uzbekistan aspires to the 21st century. - Tashkent Uzbekistan, 1999.-44 p.

Golish L.V., Fayzullaeva D.M. Designing and planning pedagogical technologies: a manual. – "Economics", 2011. 206 p.

Ziyomammedov B., Abdullaeva Sh. "Advanced Pedagogical Technology": A manual: "Abu Ali Ibn Sino" 2001

Ishmuhamedov R.J. «Ways to increase the effectiveness of education using innovative technologies». Tashkent 2003.

Q.Olimov and others. "Methods of vocational education" Tashkent-2006

9. Hashimova Naima Abitovna Градиенты и скалярные отношения инвестиционного потенциала. <http://aknuk.uz/v/2016-1.html>

10. Hashimova Naima Abitovna Инвестиционный климат и его влияние на инвестиционный потенциал. <http://aknuk.uz/v/2016-1.html>

11. Hashimova Naima Abitovna Сущность инвестиционного потенциала и закономерности инвестиционных полей в экономике.

<https://dba.uz/medias/media/other/306/jurnal-2016-2-min.pdf>

12. Hashimova Naima Abitovna Механизмы формирования инвестиционного потенциала: сущность и принципы построения.

[http://iqtisodiyot.tsue.uz/sites/default/files/m-aqolalar/31\\_N\\_Xashimova.pdf](http://iqtisodiyot.tsue.uz/sites/default/files/m-aqolalar/31_N_Xashimova.pdf)

13. Hashimova Naima Abitovna Generation of investment potential.



Uzbekistan.pdf

27. Hashimova Naima Abitovna, M.L. Tursunkhodjaev. Development Of Channels Of Intellectual Capital Movement In The System Of Innovative Cooperation In <https://archives.palarch.nl/index.php/jae/article/view/1326>
28. Hashimova Naima Abitovna, Saidkarimova MatlyubaIshanovna Usmanova Rano Mirjalilovna. Economic Mechanisms Of Formation And Use Of Intellectual Capital In The System Of Innovative Cooperation Of Education, Science And Production. [https://ejmcm.com/article\\_3306\\_78391695fa6cbb298b8a05ab46787d00.pdf](https://ejmcm.com/article_3306_78391695fa6cbb298b8a05ab46787d00.pdf)
29. Hashimova Naima Abitovna. The Essence of the Investment Potential and Patterns of the Investment Fields in the Economy. <https://www.izu.edu.tr/docs/default-source/duyuru/adam-bildiri.pdf>
30. Hashimova Naima Abitovna, I. Bakiyeva. Logical Organization of Investment Climate and its Influence on Investment Potential. <http://higherlogicdownload.s3.amazonaws.com/INFORMS/a19154ba-c5e4-4a42-af42-c6b23c694b8/UploadedImages/MRIJ%202017%20Final%20Online%20Version.pdf#page=77>
31. Hashimova Naima Abitovna. Стратегия и приоритетные направления развития инвестиционного потенциала на долгосрочную перспективу <https://ifmr.uz/page/materialy-xi-foruma-ekonomistov-strategiceskoe-planirovanie-vaznyi-faktor-stabilnosti-ustoicivogo-socialno-ekonomiceskogo-razvitiya-strany-i-regionov>