International Journal of Advanced Science and Technology
Vol. 29, No. 8, (2020), pp.3421-3428

Methods Of Constructing And Solving İntegrative Problems İn Connection With Physics And Labor Education

M.Muxliboev[1], B.Kurbanov[2], A.Toychiev[3], N.Boymatov[4]
[1,2] *Gulistan State University, docent*
[3,4] *Gulistan State University, teacher*

Abstract

The purpose of this article is to focus on the development of problem-solving competitions that serve to increase the attitude of secondary school students to nature while providing integrative knowledge.

Keywords– *creative initiative, integrative ecological content, physico-ecological foundations, useful labor, frontal inquiry, defoliation, chlorinated water, didactic principle, diffusion phenomenon*

1. Introduction

By linking physics with labor education, organizing and conducting competitions to create and solve environmental problems is not only a means of educating students, but also a means of activating their cognitive activities, interest in learning and socially useful work. The practical work of most teachers in this area has shown that the competition has a positive role and importance in the educational process.

The purpose of organizing and conducting competitions on the creation and solution of environmental problems, linking physics with labor education, is not a quantitative indicator, but a qualitative indicator, that is, more precisely, activates the learning activities of students.

Through the use of materials of integrative ecological content, it is possible to organize and conduct extracurricular activities of students in physics (Olympiads, conferences, competitions for the production of visual aids, etc.).

Each student reads and searches more literature, integrating physics with a sense of responsibility not to lag behind their peers, to try to bring their class team to the forefront. As a result, their knowledge, practical skills, and competencies expand in scope and content deepens. Mass and individual forms of organization of competitions on the selection, construction and solution of problems in physics on the basis of materials of integrative ecological content enrich the content of the educational process, increase the responsibility and interest of students in reading.

The results of our research confirm that it is expedient to hold a competition between groups in the classroom on the selection, construction and solution of problems using materials of integrative environmental content in physics lessons.

The physics teacher divides the students into groups based on their knowledge, skills, and abilities. In evaluating the competition for the selection, construction and solution of physics problems of students in an integrative ecological context, it is necessary not only to be based on concrete results, but also to take into account the creative initiative of each student.

The following is an example of a competition for the selection, creation and solution of integrative environmental problems in physics:

I. Organization of competitions on selection, construction and solution of problems of integrative ecological content in physics. The course can be a lesson on the formation, development of knowledge,

ISSN: 2005-4238 IJAST

skills and abilities to teach students to choose, compile and solve problems on the basis of purposeful competition, to study the physical basis of materials of integrative ecological content.

In order to activate the activities of the students in the class, we suggested that they be divided into groups when organizing their competition. In order to determine the winner of the competition group, we will select one member of the jury from each group. A specific task is assigned to each member of the board.

It is appropriate to use qualitative, quantitative, graphical and experimental problems in the competition for the selection, construction and solution of problems of integrative environmental content in physics. The purpose of the competition:

Educational: Strengthening students 'knowledge.

Educational: To teach students to work as a team, to form in them knowledge, practical skills and competencies related to the ecology of the region.

Development: To teach students to apply the acquired theoretical knowledge in practice, to explain the physical and ecological nature of environmental phenomena, to develop practical skills and abilities.

Competition lesson and its structure

1. By frontally questioning students 'knowledge.

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

3. Competition of captains. The method of checking students 'environmental knowledge is to collect and check their notebooks or sheets by board members.

4. Competition of captains. Graphic, tabular assignments aimed at developing students' thinking skills on the basis of environmental knowledge. Selection, construction of problems of integrative ecological content from physics, explanation of physical and ecological bases and laws of technical and technological processes.

To demonstrate the validity of the above considerations, below are examples from examinations conducted in an integrative environmental context from physics.

VIII class

Selection and solution of problems in the context of integrative ecology from physics using the phenomenon of diffusion.

I. A physics teacher, in collaboration with biology, chemistry, and labor education teachers, provides pre-prepared questions and assignments to team members for practice.

Assignment to the first team: / Explain self-defoliation from an ecological point of view.

Assignment to the second team. Explain the ecological consequences of defoliation in terms of physics, biology, chemistry in the feeding of plant leaves by diffusion.

II. Each team leader is given a separate quality task assignment. It will take 10 minutes to resolve these issues. Each team leader completes the problem independently on the board.

ISSN: 2005-4238 IJAST

Assignment to the captains

1. In which one is diffusion feeding better? In a thin-leaved plant or in a thick-leaved plant? Why? Explain both cases from an ecological point of view.

2. In which one is it better to feed cotton or other agricultural crops by diffusion? Is it in the area where the cotton gin is located or in the area where the oil refinery is located? Why? Explain both cases from the point of view of ecology, linking physics to the subjects of biology, chemistry, labor education.

III. When team leaders select, create, and solve a quality problem, other team members solve a pre-prepared quality problem.

I. Why do single-celled organisms survive without a special respiratory organism?

2. Why cannot multicellular organisms survive without a special respiratory organism? Solve both issues from an integrative and ecological perspective.

It is advisable to take 5-7 minutes to select, compile and solve quality issues of this content. Then the sheets are picked up, and in the remaining 2-3 minutes the quality issue is discussed, selecting, composing, and solving them on the board.

The physics teacher, in consultation with the chemistry, biology, and labor education teachers, examines each student's chosen, formulated, and solved problem from physics in an integrative environmental context and records the grade (individually and collectively).

IV. Team captains report after quality issues are selected, structured, and resolved by students on the board.

V. If time remains, students in the class will be given more complex quality questions so that they are not left out.

1. In which one is it better to feed plants by diffusion? In the area where alfalfa is planted or in the area where the oil refinery is located? Why? Explain both in terms of integrative ecology.

2. In which of the following is the diffusion phenomenon better? Is it a field plowed with a K-700 wheeled tractor or a field plowed with a DT-75 chain tractor? Why? Explain the environmental consequences of both tractors operating in the field.

Assignment to the third team

1. How can the diffusion phenomenon be used more effectively in agriculture, including cotton?

2. Give examples of inefficient use of the diffusion phenomenon in agriculture.

I. Assignment for the competition of captains

1. Does diffusion also occur in solids?

2. What is the main mechanism by which gas is exchanged in atmospheric air and carbon dioxide is transferred from the soil to the atmosphere and oxygen is transported in the opposite direction?

II. Assignment for students to work independently

1. In which one is the diffusion phenomenon better? A field irrigated with clean water or a field irrigated with chlorinated water? Why?

2. In which cases of a substance is the diffusion event faster? In liquids or gases? Why?

Thus, the proper organization and conduct of a competitive lesson will have not only educational but also pedagogical significance. In such lessons, students learn to answer not only on their own behalf, but on behalf of all their classmates. Students also learn to listen carefully to their peers 'opinions and analyze their responses.

II.4 *Holding the Olympics*

The Olympiad is one of the extracurricular activities.

Olympic objectives include;

1. Make an annual report on the results of the selection, formulation and solution of environmental issues, linking physics with labor education.

2. Exchange of experiences between schools.

3. Identify students' weaknesses in organizing and conducting extracurricular activities.

4. Demonstrate the interaction of physics with the disciplines.

5. Guide students in career choices.

6. To develop students' interest in learning by interacting with academic subjects.

Environmental content materials available around the school play an important role in solving these tasks, as they are an integral part of the environment.

The following didactic principles should be followed in the selection of materials for the School Olympiad:

1. To study the physical, chemical, biological phenomena and laws of environmental materials around the school, the level of development, interests of students in different grades on the content of the topic and questions.

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

3. All work should contribute to the formation of love and scientific outlook towards one's country.

4. The main focus should be on the selection of evidence and the interrelationship of events at agricultural production facilities.

5. The structure of quality issues and the connection of questions with life should meet modern requirements.

ISSN: 2005-4238 IJAST

Our observations and pedagogical experiments have shown that it is expedient to hold the school Olympiad in two rounds:

I. In school, i.e. between classes

II. Inter-school

In physics we get acquainted with the following types of school olympiads with integrative ecological content.

The first round

Holding an Olympiad inside the school

The Olympiad is open to members of physics and labor education clubs, as well as interested students in the same class.

The following should be taken into account when organizing and conducting such an Olympiad.

I. The responsibility for the conduct of the Olympiad rests more with the physics teacher.

2. Olympiad questions and questions are compiled by a physics teacher in agreement with teachers of chemistry, biology, labor education, using materials of ecological content.

3. The answer to the question and questions should be in writing only.

VIII class

I. Normally the temperature of human blood is 26.50S. What was the temperature of human blood when the average square velocity of the molecule contained in the blood plasma in the blood of a person infected with the external environment increased to I.005 Vqv?

Given

t= 26,5^{0}Ñ

V_{KB} = I, 005 $V_{кв}$

T=?

Solution.

Average quadratic velocity

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

m- is a single molecular mass

$m_K = \frac{\mu}{N_A}$ - the above formula is normal

is written for.

$V_{кв} = \sqrt{\frac{3KT}{\mu}} = \sqrt{\frac{3RT_H}{m}}$ find the temperature for the diseased blood.

ISSN: 2005-4238 IJAST

$$T = \frac{V^2_{кв}}{3R} = \frac{(1{,}005)^2 * 3\kappa T_H * m}{3\kappa m} = 1{,}010025 \bullet T_H = 1{,}010025.310 = 309{,}5\ K$$

which was. t= 309,5 - 273 = 36,5(^{0}C).

Answer: T= 309,5 K or t=36,5^0 Ñ

2. Explain the physical, chemical, biological nature of the use of radioactive isotopes in agriculture from an ecological point of view.

The second round

The following is taken into account when conducting inter-school Olympiads:

I. The responsibility of the physics teacher for the conduct of the Olympiad.

2. The Olympiad begins with the introductory speech of the President and ends with the generalized results.

3. Organization of exhibitions in the Olympiad demonstrating the physical basis of integrative ecology (achievements of agricultural production techniques and technological processes).

4. Olympic questions and questions are compiled by members of the jury in accordance with the physics program.

5. Olympiad participants to answer questions and questions independently in separate rooms, keeping the peace.

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

7. The winner of the Olympiad is determined by the number of points accumulated in relation to the answers to the questions and questions, and the more popular in the classes, the better the number of correct answers.

below is a sample plan for the Olympics.

The members of the Olympiad Board are the head of the school, teachers of physics, chemistry, biology, labor education, class teachers of the classes participating in the Olympiad.

Duty officers are formed and each of them is given separate instructions.

The chairman of the board briefs the students on the goals and objectives of the Olympiad, introduces its agenda and the rules of the Olympiad.

Olympians walk from the hall to the classroom attached to them. There they receive a sheet of paper with questions and questions under the supervision of board members.

Below are examples of schools olympiad issues and questions.

VIII class

1. Toxic substances are mainly distributed in the air in the form of aerosols. find the average square velocity of an aerosol particle with a thickness of 10 cm and a density of 3,102 kg / m3 at a temperature of 270S.

2. The concentration of mercury in the air in the workplace is 10%, and the worker inhales 2 liters of air with each breath. If the respiratory rate is 25 beats per minute, find the mass of mercury that the worker swallowed during the 8-hour run. Atmospheric pressure in the working room is 760 mm wire. ust. ga, the temperature is 200S ga teng.

3. Determine the specific heat capacity of the soil contaminated with diesel fuel.

Required tools and materials: scales, level board, calorimeter, thermometer, power supply, heating wires, glassware, water, soil, stopwatch, connecting wires, switch.

The specific heat capacity of water is 4200 J (kg.grad).

IX class

1. A student weighing 50 kg swallowed 0.5 mkKi of radioactive sodium due to carelessness and lack of environmental knowledge. If the natural activity output is 50%, find the activity after one day.

2. Radon baths are used for therapeutic purposes, activity I, 5. 10 If Ki, what is its activity after I0 day?

3. Determine the refractive index of oil obtained from radioactively irradiated seeds.

Required tools and materials: a glass of cottonseed oil, a ruler, a light bulb, a battery, a screen.

Our observation showed that many students find it difficult to solve experimental problems in the set of problems and questions currently in use.

The positive side of constructing and solving experimental problems of integrative ecological content from physics is as follows.

1. Students are creative and interested in selecting, constructing, and solving experimental problems in physics.

2. The condition of experimental problems of integrative ecological content from physics must be vital, not abstract.

3. The condition of the experimental problem realizes the real connection of the studied educational material with practice and regional production.

4. Increases students' interest in physics, chemistry, biology, labor education and the study of the scientific basis of materials of ecological content.

5. Develops in students such qualities as observation, attentiveness and strict adherence to the understanding of materials of ecological content.

6. Thinking develops during study trips.

In summary, the factors that affect the level of knowledge of students in creating and solving

environmental problems on an integrated basis are as follows.

1. Students have developed the ability to approach the theoretical issues of ecology independently and creatively.

2. Abstract thinking and logical thinking developed in students.

3. Practical skills and abilities are formed in students.

4. Entrepreneurship, thrift, entrepreneurship, creativity are formed in students.

5. Prepares students for indirect material production.

References

1. Mirziyoev Sh.M. Together we will build a free and prosperous democratic state of Uzbekistan. T: Uzbekistan -2016.
2. Mirziyoev Sh.Critical analysis Strict discipline and personal responsibility should be the daily routine of every leader T: Uzbekistan 2017. 104 p.
3. Mirziyoev Sh.M. Decree of the President of the Republic of Uzbekistan dated February 7, 2017 No PF-4947 "On the strategy of further development of the Republic of Uzbekistan" "People's speech", February 8, 2017
4. Karimov.I.A Uzbekistan aspires to the XXI century.- Tashkent Uzbekistan, 1999.-44 p.
5. Alimov TA, Rafi? Ov AA Causes of ecological errors, -Tashkent, 1991, -70 p.
6. Baratov P. Nature protection, -Tashkent, 1991, - 254 p.
7. Boliev M. N. "Advanced pedagogical technology" Samarkand, 2005.
8. Golish L.V., Fayzullaeva D.M. Design and planning of pedagogical technologies: a textbook .. - T .: "Economy" edition., 2011. 206 p.
9. Ziyomuxammedov B., Abdullaeva Sh. "Advanced pedagogical technology": methodical manual T .: "Abu Ali Ibn Sino" 2001
10. Ishmuhamedov R.J. "Ways to increase the effectiveness of education through innovative technologies." Tashkent, 2003.
11. Q.Olimov and others. "Methods of vocational education" Tashkent-2006.

Information from the website:

1. Кейс-метод. Окно в мир ситуационной методики обучения (case study).-www.casemethod.ru.
2. www.uftuit.uzpak.uz/xallieva/mavzu/7.DOC • 559 КБ
3. WWW.eco.@.ru.