TABLE OF CONTENTS LOCAL HISTORY MATERIAL FOR USE IN THE PROCESS OF STUDYING PHYSICS

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ABSTRACT

In this article, the authors reveal the possibilities of the content of industrial and local history material for use in the process of teaching physics.

Keywords: Analysis, local history, principle, process, agricultural engineering, law, regularity, pressure, temperature, development, plants, soil, seeds.

INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

The analysis of a number of pedagogical and methodological manuals shows that often any use of local history material in teaching physics is considered to be the implementation of the principle of the connection of learning with life. In fact, this is far from the case.

In our opinion, it is advisable to proceed from the following requirements when determining agricultural material of a local history nature on the topic of use:

1. Local history material should not just relate to the environment, production, and be specific to agriculture.
2. Local history material should serve not only as a means of visibility or an example of a general order in teaching, but also as a means to help students deepen their knowledge both in theory and in the application of physical laws.
3. Physical processes and phenomena selected for the purpose of study must be special, unique and typical of the area.
4. Digital, tabular, graphical and other data should reveal the prospects for the development of agricultural machinery and technology.
5. Local history material should be comparable to the material on agricultural machinery, agricultural production in the Republic of Uzbekistan as a whole.

For the purpose of purposeful selection of local history material in physics, we were guided by the following pedagogical principles:

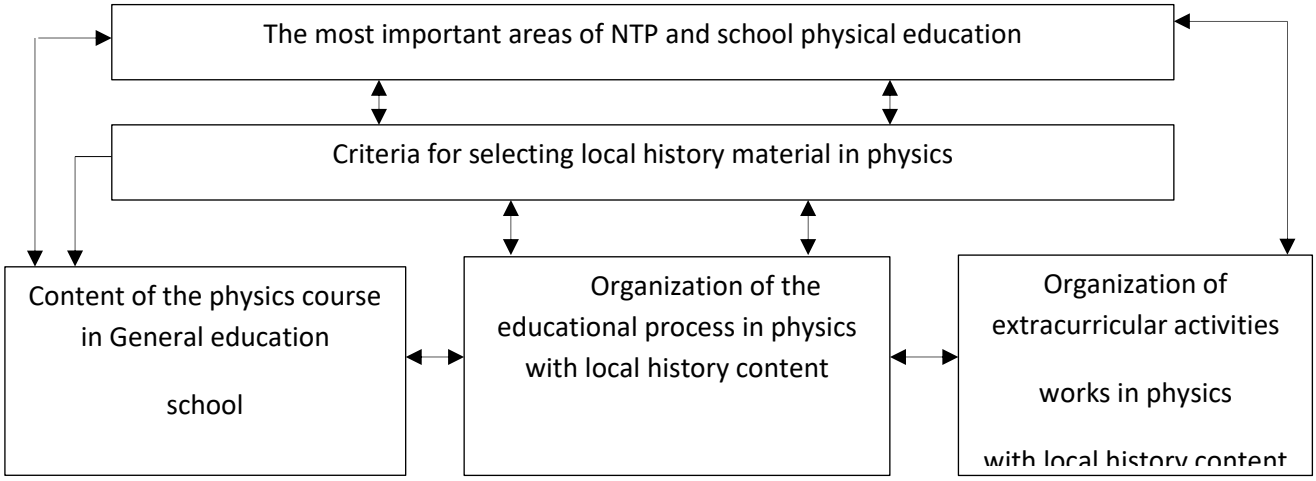
1. The selected local history material on physics should be organically connected with the studied issues of the physics program and contribute to the implementation of the main educational and educational tasks facing the teacher of physics at a secondary school.

All the material studied in the course of physics is divided into theoretical and local history (physical and technical), in which the invariant and variable parts are distinguished. We have developed and used the following criteria for selecting local history material for the school physics course:

- compliance of local history material with the most important directions of scientific research and development, the most common types of modern agricultural machinery and technology;

- organic combination of local history material with the content of theoretical questions, topics, sections of the school physics course;

- implementation of local history material in the process of forming physical, technical and local history knowledge, skills and abilities of rural schoolchildren, their creative development (scheme 1).



Overloading classes with a large number of facts can fill the memory of students with secondary material, interfere with the assimilation of the main thing, obscure the main purpose of the lesson and move away from the program.

In order to optimize the use of local material we have compiled a card index of order of study material on engineering and technology rural production sections of the physics course. On separate cards are specified literature topic of the lesson, crevices-cue material, tasks for observation and independent work of students, etc.

This library card makes it possible to avoid accidental use of local history material in the process of teaching, provides a systematic presentation taking into account the program, didactic and methodological requirements.

2. Local history work in physics is part of the school - wide work on a comprehensive study of the technique and technology of agricultural production. It is based on the most important pedagogical principle of the connection of learning with life. The selected local history material should contribute to Polytechnic education.

It is important to acquaint students not only with the physical properties of a particular agricultural crop, but also with what physical measures of influence can be applied to it in order to achieve the greatest productivity, what is the physical essence of these activities.

The connection of the school physics course with the most important processes for the environment should be carried out in order to foster the interest and desire of students to work in the field of agricultural production and theoretical training of students in this direction.

3. Local history material intended for use in lessons and extracurricular activities, when composing and solving physical problems should be scientifically reliable, pedagogically appropriate.

When processing the selected material, special attention should be paid to the use of accurate data taken from reference books and technical documentations.

4. The selected local history material must correspond to the age of students and their theoretical training in physics, labor training. The volume and content of local history material, the place and method of familiarization with it are determined by the teacher depending on the level of General development, interest, age of students and the topic of the lesson in physics.

5. Local history material is a significant base for the development of independent and research activities of students. Because of this, the department of physics should provide for

independent and research work of students in order to develop their basic skills for conducting simple research.

The chapter shows the principles of selection of local history material of a physical nature. In the section of mechanics, it includes some physical issues of agricultural cotton farming, physical basics of the device and operation of agricultural machinery.

When studying molecular physics and heat, students should get a full understanding of the physical patterns of growth and development of rural crops. Thus, it is of great importance that they understand osmotic phenomena in plant nutrition, why high cotton yields cannot be obtained on saline soils, and understand the physical results of spraying or pollinating cotton with defoliants, etc.

Much attention is paid to the method of studying the phenomenon of osmosis and osmotic phenomena. It is proposed to draw an analogy between osmotic phenomena and processes in gases, phenomena and processes in gases, and phenomena in dilute solutions (with the same approximation that occurs when applying the laws for an ideal gas to real gases). The method of studying Van't-Goff's laws using Avogadro's law applied in experienced teaching is given. This is necessary not only for a better understanding of osmotic pressure and its role in regulating metabolism in plant organisms, but also for expanding the physical phenomenon. This is also necessary for a conscious attitude to experiments when determining the timing of cotton irrigation by the magnitude of the sucking force of the leaves.

Under the electricity section, the study of local history issues is divided into two parts. The first is related to the use of electric energy in cotton farming, the second-to the influence of electricity on the growth and development of agricultural crops, in particular, cotton. It includes questions about the electro-ion culture of agricultural plants, the nature of biopotentials and bio-flows in plants, the effect of soil electrification on plant growth and development, the effect of high-frequency currents and fields on plants, and others.

The chapter deals in detail with questions about atmospheric electricity and its influence on plant organisms, about the electroionoculture of cotton, as well as some issues of aeroionification in agriculture.

Int importance of cotton growing belongs to semiconductor devices that is necessary for accurate measurement of soil and plant temperature, humidity and electrical conductivity of soil and plants, and the absorption capacity of plants. These devices, unlike others, have some advantages. In experimental teaching, much attention was paid to the study of the properties of these semiconductors and their application. When studying optics, students should learn the scope of its application and its laws.

Let's list the main physical questions of local lore, proposed for inclusion in the course of physics.

Mechanics

1. Inappropriateness of a breakthrough in the purification of cotton from weeds.
2. Taking into account friction when processing the soil of cotton fields.
3. Decomposition of forces on cotton-processing and soil-processing tools.
4. The physical meaning of shifts along the horizontal and vertical cracks in the hooks of hook mechanisms.

5. The physical meaning of the changes that are made in the plow body when the plow is added or separated.
6. Application of the simplest mechanisms in agricultural machines.
7. The physical meaning of installing counterweights on cotton harvesters.
8. The use of shock absorbers under the motors of agricultural machines.
9. Prospects of application of vibroblades and compactors, vibratory.
10. Physical bases of the action of the installation for mechanized irrigation.

Molecular physics and heat

1. Physical basis of measures to change the thermal conductivity of the soil.
2. Swelling of cotton seeds when soaking before sowing.
3. Physical principle of disinfection of cotton seeds.
4. Frost.
5. Physical justification for pre-watering cotton and vegetable crops before the expected freeze.
6. Physical reasons for planting cotton seedlings and other agricultural crops in the evening.
7. Reasons for the difference in moisture loss by the plant in cloudy and clear weather.
8. The physical meaning of harrowing after rain.
9. Osmosis. Osmotic pressure. The analogy with the processes.
10. It is impossible to get a high yield of cotton on highly saline soils. The physical meaning of washing cotton fields.
11. Physical bases of nutrition of cotton and other agricultural crops.
12. The manner in which mineral substances in the plant cells.
13. The physical reasons for the ban are to pour the collected cotton on wet ground, although the cotton fiber is not wetted with water.
14. Physical phenomena that can determine the timing of cotton irrigation.
15. Physical bases of operation of heat engines used in agriculture.

Electricity

1. The importance of electricity for the life of agricultural plants.
2. Influence of the electric field on seed germination and yield of cotton and other agricultural crops.
3. Information about the nature of biopotentials.
4. Plant power sources.
5. Dependence of the EMF of plant current sources on the requirements of the plant in water. Practical use of this dependency.
6. Electrical resistance of plants and the reasons for its change.
7. Determination of cotton requirements for irrigation based on measurement of its resistance.
8. Electrification of the soil. Prospects of its application for increasing the yield of cotton and other agricultural crops. Restrictions imposed on the choice of electrodes used for soil electrification.
9. Influence of the electromagnetic field on the growth and development of cotton and other agricultural crops.
10. Prospects for the use of current HF and UHF in the cotton industry.
11. Application of semiconductors in agriculture.
12. Determination of raw cotton moisture by electric method.

Optics

1. The value of light in plant life.
2. The use of sunlight by cotton and other crops, depending on the height of the Sun above the horizon and the methods of sowing.
3. Differences in the influence of different types of solar radiation on the growth and development of plants.
4. Application of the laws of light reflection to determine the grade of cotton fiber.
5. Physical bases of operation of greenhouses and greenhouse devices.
6. The physical basis for greater efficiency of plastic films in greenhouses compared to glass coatings.
7. Information about the physical nature of photosynthesis. The value of the photo-chemical reaction for the life of agricultural plants.

Independent and research work of students in physics is not intended to make all students, for example, cotton growers, but it can still play a significant role in the development of students ' interest in technology, the surrounding reality.

It should be emphasized that in physics textbooks there is almost no material on the connection of the course of physics with agricultural production. The only exception is the experimental physics textbook for class XI. The high school physics course is currently quite abstract, with little connection to life, to technology in General, and to agricultural production in particular. This is a violation of one of the main principles of didactics - the principle of the connection of learning with life. This has a negative impact on the level of Polytechnic training of students, and contributes to the generation of formalism in knowledge.

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