IMPLEMENTATION OF THE PHYSICAL AND TECHNOLOGICAL BASIS OF UNIVERSAL ENERGY SOURCES IN TEACHING PHYSICS

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ABSTRACT

This article provides a brief overview of solar photovoltaic and heliotechnical elements in the school physics course, taking into account their age, ability, and grade levels so that students can adequately absorb the physics course curriculum in secondary schools. Taking into account the information presented in the article, it is practical for students to acquire knowledge, skills and abilities in the physical fundamentals of modern solar photoelectronics. The basics of applying the principle of consistency of broader interpretation of physics to solar data and solar photovoltaic elements.

Keywords: Non-conventional energy, consistency principle, photoelectric, heliotechnical, element, energy resources, quantum, geothermal energy, photoelectronics, bioenergy, semiconductor, photoelectric, optical, construction, phosphorus, electron, beam, silicon, pn-transition, diffusion, potential, power plant

INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

Physical education in general secondary schools Continuous physical education should formulate relatively simple, understandable topics and relevant information on solar photovoltaics at the school stage. Age, ability and grade levels should be taken into account when pupils are adequately absorbing information in the school physics program. The school physics course provides a brief overview of solar photovoltaic and solar energy elements. Therefore, to teach students the elements of heliotechnics in the system of secondary education, which are the basis of the natural sciences and rapidly developing physics, to arouse their interest in it, to explain physical phenomena and laws in nature, and to introduce new discoveries in physics. It is important now.

It is well-known that modern physics is inextricably linked to most natural sciences and plays an important role in the synergetic development of which there are opportunities for emergence of new directions. These include modern energy, biophysics, thermal physics, heliophysics, semiconductor physics, microelectronics and more. Therefore, materials used in the teaching of physics in general education schools can be synergistically linked to several disciplines. However, these data are not sufficient for students to acquire knowledge, skills and qualifications in the physical basics of modern solar photoelectronics.

It is well-known that the way of life of mankind and all spheres of science, technology and production cannot be imagined without energy sources. Currently, the amount of raw materials (coal, oil and gas) that make up energy sources is decreasing. This, in turn, necessitates the development and widespread introduction of new non-traditional and renewable types of energy. From this point of view, the gradual formation of knowledge about the possibilities in the field of renewable energy resources is important in the process of physical education. These data mainly illustrate the step-by-step formation of the physico-technological basis of non-conventional energy sources in physics training. Examples of non-conventional and renewable energy sources are solar photovoltaic, wind energy, geothermal energy and bioenergy. The most efficient and environmentally friendly of these types of energy is solar photovoltaic power, which has much higher efficiency and potential.

It is desirable for physics to form data on solar photovoltaics on the following topics: "Photo Effects (Internal Photo Effects) and their Use", "Solar Technology and Solar Energy Use." The main raw materials in solar photovoltaics are semiconductor elements. The electrical and optical properties of the semiconductor elements and their photoresistivity are very high. These

substances are also highly sensitive to external influences. Basically, it is desirable to bring elementary concepts and information about solar photovoltaics to physics students. Table 1 below presents the physico-technological fundamentals of converting solar energy into electricity.

Table 1

№	Topic Name	Basic information on the topic	Time
1	Theoretical foundations of converting solar energy into electricity	Physical mechanisms of generating electricity based on the light of the internal photo-effect	1 hour
2	The principle of working with solar cells	The formation of electron-coupled pairs based on the p-n transition in semiconductor materials	1 hour
3	Semiconductor multilayer solar cells	Physico-technological processes of formation of multi-layered hetero-solar elements	1 hour
4	Solar batteries and their new designs	Information on the technology of modern solar panels and new modern designs	1 hour
5	Solar batteries based photovoltaic power plants and their future prospects	The composition of photovoltaic devices, their functions, the possibility of generating electricity directly from solar photovoltaic devices and providing the population with electricity.	1 hour
6	Physical bases of heliotechnical devices	Conversion of mechanical energy to electrical, thermal, mechanical, compressed air by means of performing mechanisms (generators, compressors, electrolysis, etc.)	1 hour

As can be seen from the table above, there is sufficient general scientific and theoretical information on solar photovoltaic power from non-traditional sources of energy. Given the potential of the proposed topics, it would be appropriate to include semiconductors and their properties in the electromagnetism section of the physics course of secondary schools. Because semiconductor materials are not only raw materials in solar photovoltaics, their mechanisms of action are closely related to the fundamental laws of electromagnetism. In particular, the formation of p-transitions, the electron-coupled field action, and the physical processes in the surface layer are subject to certain regularities.

Wherever possible, elementary concepts and information should be as simple, accessible and understandable as possible in secondary schools. As an example, the p-n transition process takes into account the dependence of the mechanism on which different elements are formed, as well as the sensitivity to external influences. Semiconductor elements mainly use silicon in solar photovoltaics. At this, the boron or phosphorus (F) elements are diffused to form p-transition in silicon. These elements also have diffusion to the silicon element at different temperatures. Such data and figures should be indicated in the schematic tables. The use of animation and visual aids in developing students' knowledge and skills is very effective. From this point of view, it is also important to use animated visual aids to help students gain knowledge and skills in solar photovoltaics. As an example, the animated illustrated process of moving electrons and holes in the p-n (potential barrier) in a photo effect event provides a clear picture for the reader. At the same time, it is more convenient to understand the nature of physical laws. There is a need to develop the physico-technological principles of solar photovoltaics in the physical education process, taking into account the age of students and their worldviews. [2]

Teaching students the physical basics of modern energy technology should be based on materials on renewable and new energy sources and the use of energy in various sectors of the economy. It is desirable to integrate the issue of energy technology in education because the

use of solar energy is also used in the integration of physics, chemistry, mathematics, technology and technology. Wind devices and airflow, as well as any moving body, will have mobility energy. This kinetic energy is converted to mechanical energy by means of a wind wheel or other working body.

According to the function of wind devices mechanical energy can be converted into electrical, thermal, mechanical, and therefore compressed air energy by means of executive mechanisms (generators, compressors, electrolysis, etc.). Different types of wind engines can be used to convert the air flow kinetic energy to mechanical energy. Wind instruments are used to convert kinetic energy of air into electricity, for example, " Whister " and 'Acro-Cruft'.

The main mechanism for converting wind energy into electricity is the wind turbine. It has more detail than any other turbine. The wind rotates the blades fastened to the volt and they rotate together. So the blades and the hose together form the rotor. There are also contacts that rotate and stop the turbine blades. The generator rotates and generates electricity. The generator, controller and other devices are placed in a box behind the blades. Anemometer determines the wind speed and transmits this information to the controller. When the wind speed reaches 15-23km / h, the wind unit will rotate and automatically stop when the speed increases to 100km / h. The speed of some new models of wind units is driven by the wind. Some new models also change in speed, which makes them more efficient. Large-capacity megawatts turbines are large in size, and their new models are capable of generating between 2 and 5 MW of electricity. They are usually placed on islands close to shore so strong winds can turn them. Such wind units are currently used in the UK, Germany, Denmark and other countries. [3]

In these references, the topics covered in this issue are those that reflect the basic concepts of solar photovoltaics and elements of solar energy. In addition to these recommended topics, independent work using abstracts, magazines and other media can also be used to develop knowledge and skills. The advancement of modern science and technology has brought unprecedented advances and innovations in the field of physics. Discoveries in the field of solar photovoltaic research have led to the development of this field. In order to convey this information to the students, the teacher will need to use every possible opportunity to make the learning process interesting and effective, and to make the classroom an excellent learning experience. At the same time, the use of new innovative pedagogical technologies and non-traditional types of lessons will give positive results. As a requirement of the time, the introduction of elementary information on solar photovoltaics, topics, training, physical and technological foundations of renewable energy sources, the principles of use, principles and possibilities of using photovoltaic devices in the classroom not only in physics classes, but also in elective courses and circles. It should be considered, because now and in the future, the whole of human life will be spent without energy, without energy It's impossible.

REFERENCES

1. Muminov RA, Tursunov MN, Abdiev UB, Sattarova ZS Welding microstructure microstructure on the front frontal polar structure SE ispolzovaniem selective pokryty // Heliotechnics. - Tashkent, 2008, №1, - C. 54-59.
2. U.B.Abdiev, B.N. Niyazov, Y.T. Turaev, B.F. Mirzamurodov, Formation of Physical and Technological Concepts of the Transformation of Solar Energy into the Teaching of Physics, Scientific and Methodological Journal "Physics, Mathematics and Informatics", Tashkent, 2010, №1, p. 54– 57.
3.Rudak M.S. Veterinary and gelioenergetic cadastre Republic of Uzbekistan. Tashkent. Search Go to. 2003.