

WAYS TO TEACH STUDENTS TO SAVE ENERGY THROUGH PHYSICS TEACHING AT SCHOOL

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<https://doi.org/10.5281/zenodo.11079829>

Abstract. *This article presents ideas on how to teach students about energy conservation through physics teaching in secondary schools, how to produce electricity as much as possible and more efficiently, and in the process, do less harm to the environment. It is explained that every saved energy is of great importance in protecting the environment and keeping the air clean.*

Keywords: *energy, energy saving, school physics course, energy in nature, electric energy, electric lamps, atmospheric air, air pollution, economy and ecology.*

Introduction. Energy plays an important role in society's life. It allows you to multiply the possibilities of meeting the needs of various household appliances. The development of human civilization is closely related to the amount and types of energy used. However, today's development of the national and world economy is causing excessive use of energy resources and, in connection with it, their decrease in volume. Today, one of the biggest problems facing the countries of the world is to get as much electricity as possible, more efficiently and to do less damage to the environment while getting it. Because we all know that electricity is the most convenient energy to use. In this regard, many countries of the world are implementing a number of practical projects. Extensive work is being done in this field in our country. The decision of the President of the Republic of Uzbekistan dated February 16, 2023 PQ-57 "Measures to accelerate the introduction of renewable energy sources and energy-saving technologies" [1] is a clear example of this.

Methods. Today in Uzbekistan, not only the effective use of alternative energy sources, but also the rational use of energy and its conservation are relevant. It is necessary to explain these concepts to the younger generation.

One of the most effective ways to do this is to teach students about energy conservation in school physics courses. Based on research on how to save energy more effectively in schools, we have developed the following rules and distributed information sheets to every teacher and student. It is necessary for teachers to conduct educational activities aimed at forming feelings of economy and economy in the use of electricity among students and their parents. Daylighting lights should be turned off, electrical panels and light bulbs in basements should be turned on only when work is being carried out in these rooms. Such careful use of electricity can save up to 30%.

Results. In the 7th grade physics lessons of secondary schools [2], while explaining the topic "The law of circulation and conservation of energy in nature" to the students, it is a must for the teacher to direct the students to energy saving. In these processes, energy can be converted from one type to another. For example, part of the mechanical energy of a body moving under the influence of friction is converted into heat. The sun's light energy heats the Earth's surface, the heat causes water vapor to rise from water bodies and wetlands into the atmosphere, rain falls from the formed clouds, this precipitation forms water in rivers, the potential energy of river water is converted into kinetic energy when it falls from a high dam, the kinetic energy of water turns a turbine in hydroelectric power plants, and electric energy is generated, and electric energy is

converted into light energy through electric lights in apartments, and so on. In this way, energy does not disappear in nature, it only changes from one type to another. This is the law of conservation of energy. The law of conservation of energy is defined as follows - in nature, energy never disappears from existence and does not exist from nothing, it only changes from one form to another or from one body to another body and remains quantitatively unchanged. By explaining the cycle of energy in nature, students will be able to use existing electricity wisely and create renewable energy sources.

Discussion. In secondary education, it is possible to teach thrift with direct examples by teaching physical knowledge, including the topic "Energy conservation".

The following is given in the textbook: money is paid for the use of energy. The amount of this money depends on the consumed electricity. You will get acquainted with the full meaning of the concept of energy in higher classes. The electricity consumption in the apartment is determined by the meter. The numbers on it show the consumed electricity. There are different types of electric meter. It is necessary to spend it sparingly, since money will be paid for the consumed electricity. If it is not necessary at home, it is not necessary to turn on the lights, to work in the next room with the volume of the TV turned up. Playing games on the computer for a long time is harmful to health, in addition to consuming a lot of energy.

After imparting the above knowledge, we believe that it will be appropriate to teach the following. One of such methods is to increase the students' interest in science without changing the study hours based on the knowledge they have gained in physics, to gain confidence in science achievements in life and to create conveniences for themselves, Creating physical problems about incandescent and energy-efficient modern light bulbs, which students currently see, but do not pay attention to, providing students with information such as their appearance, structure, lighting clarity, safety, energy efficiency can be one of the teacher's actions in forming a perfect generation. Also, it would be appropriate to calculate the efficiency of energy-saving light bulbs.

Calculations show that an incandescent light bulb bought by the dozen is actually much more expensive than a modern light bulb. Therefore, a modern energy-saving light bulb saves both electricity and money. In addition, by saving electricity, we protect nature from greenhouse gases and other harmful substances released into the environment during electricity production. Also, we can use the saved energy for a longer period of time [3].

Also, the saved energy is of great importance in protecting the environment, i.e. in keeping the atmosphere clean. For example, 6.0 tons of waste are released into the air during the production of 1 kWh of electricity in thermal power plants using coal and other fuels.

In addition to electricity production, metallurgy, construction, chemical industry, and vehicles contribute significantly to the deterioration of ecology, i.e., air pollution.

In the field of ferrous and non-ferrous metallurgy, 123,600 tons of waste are released into the atmosphere, 95,000 tons of which are sulphide anhydride gas. Nonferrous metallurgical plants emit extremely harmful pollutants such as heavy metal aerosols, sulfuric acid, cyanides, and fluorides.

Construction enterprises produced 27.6 tons of waste, a certain amount of which consists of dust and smoke. In cities like Ohangaron, Bekobad, Karshi, Navoi, Nukus, the main source of air pollution is the construction industry and cement production.

The contribution of the chemical industry is approximately 3% of the total air pollution. As a result of contamination of the air with sulphide anhydride gas with dust, smoke, etc., a vortex

is formed in humid and quiet air in industrial regions. It can be dangerous to people's lives due to harmful fog.

Transport plays a major role in air pollution. 60% of US air pollution comes from automobile emissions. In large cities such as New York, Los Angeles, Tokyo, Tashkent, Samarkand, the level of air pollution is 80-90%.

Car exhaust gases contain harmful substances. Along with carbon dioxide, sulfur and nitrogen compounds, carcinogenic substances such as 3,4 benzopyrene and lead are released into the environment. 25-27% of lead comes out with gases released into the atmosphere. There are more than 500 million cars in the world today [4].

Summary. From the above, it can be seen that teaching students about energy efficiency through physics education not only makes the activities high-quality and compatible with life, but also encourages environmental sustainability. From this point of view, lesson plans, demonstrated experiments, slides, and electronic software are created on the topics of the school physics course [5-12], it is necessary to make a permanent recommendation to the education

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