

EXPLANATION OF INFORMATION ABOUT MODERN ENERGY SOURCES USING MODELS

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Annotation: *This article describes the methodical description of organization of students' knowledge of modern energy sources using various models in the teaching of physics in secondary schools. These suggestions and recommendations can be used in the process of teaching physics in secondary schools.*

Keywords: *modern energy sources, general education schools, competence, solar panel, model, inverter, helio technics, semiconductor.*

In teaching physics at school, in the process of explaining the concepts of modern energy sources to students through various models in class and group activities, students directly observe the connections between the nature and quantities of physical processes taking place in energy sources. By analyzing the obtained results, scientific ideas about modern energy sources are formed. Below we give methodological recommendations for using models of modern energy sources in physics lessons and group activities.

Solar panels are predicted to make up 70% of renewable energy sources as the main future electricity source. Solar panels cannot be used directly. Additional types of equipment are required for this. The following figure describes the devices needed to use a solar cell and their connection order.



Figure 1. Model showing the process of obtaining electricity from solar energy.

When using a solar panel, devices such as a controller, battery, and inverter are used.

The controller is responsible for controlling the constant current from the solar panel. Charges the battery with sufficient voltage and disconnects when the battery is fully charged.

The battery is charged during the day and provides consumers with electricity at night.

The inverter serves to convert the 12 V direct current from the battery into the 220 V alternating current.

From the model shown in Figure 1, the 7th-grade physics course "Current sources", the 8th-grade physics course "Power of electric current", "Connections in the household electrical circuit", the 9th-grade physics course "Heliotechnics. Use of solar energy in Uzbekistan", 10th-grade physics course can be used to explain the topics "Electrical conductivity of semiconductors" and in extracurricular activities.

Figure 2 shows the simplest construction of biogas production. The device consists of four parts. It consists of a biological waste production device - 1, a used raw material release device - 2, a crop biogas transfer device - 3, and a main raw material storage – 4, a tank bioreactor. The device can be used in the 9th-grade physics course for teaching the topic "Specific heat of combustion of fuel", as well as in group exercises.



Figure 2. The simplest biogas generator.

Information about the mechanisms of wind energy generation and utilization can be obtained using the system of physical devices presented in Figure 3. The system consists of the following main devices: wind generators with the horizontal and vertical axis of rotation, alternating current voltmeter and ammeter, switch, connecting wires, and consumer.

Physics can be used in circle training mainly to determine the power of the wind generator during the stronger windy part of the day or with the help of artificial ventilation.



Figure 3. A system of devices representing the mechanism of obtaining electricity from wind energy.

Thus, the use of interactive educational technologies, layouts, and device systems to convey information about modern energy sources to students in class and group activities leads to the following results:

general activity of students in the course of the lesson and interest in the subject increases; will have an idea about the physical processes occurring in modern energy sources; experimental measurement of physical quantities describing modern energy sources, problem-solving skills are formed based on the basic formulas representing connections between quantities.

REFERENCES:

1. Habibullayev P., Boydedayev A., Bahromov A., Burkhanov S. Physics: Textbook for the 7th grade of general secondary schools / -Tashkent, 2017. "National Encyclopedia of Uzbekistan". - 174 p.
2. Habibullayev P., Boydedayev A., Bahromov A., Usarov J., Suyarov K., Yuldasheva M. Physics: Textbook for the 8th grade of general secondary schools / -Tashkent, 2019. "Teacher". - 174 p.
3. Habibullayev P., Boydedayev A., Bahromov A., Usarov J., Suyarov K., Yuldasheva M. Physics: Textbook for the 9th grade of general secondary schools / -Tashkent, 2019. "Gafur Slave". - 172 p.
4. Bahramovich NA STRUCTURE AND DIDACTICAL POSSIBILITIES OF THE ELECTRONIC TRAINING MANUAL ON ASTRONOMY DEVELOPED FOR PUPILS OF THE 11TH GRADES OF SECONDARY SCHOOLS BASED ON MEDIA EDUCATION //Archive of Conferences. - 2020. - T. 5. – no. 1. – S. 40-42.

5. Dadaboyeva, FO "ADVANTAGES OF STEAM TECHNOLOGIES IN TEACHING PHYSICS IN GENERAL SECONDARY SCHOOLS." E Conference Zone. 2022.