

**Effectiveness of ecological laboratory work in the teaching of physics in connection with labor education**

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**Abstract:** *This article aims to conduct environmental education through interdisciplinary links.*

**Key words:** *Ecological education, upbringing, interdisciplinary communication, technological education, laboratory work, efficiency.*

The process of socio-economic globalization taking place in the world is reflected in the education system. Particular attention is paid to technological education, which is an important step in equipping with basic knowledge and increasing literacy. Different countries have different approaches to the problem of individual approach to the process of technological education. During the growing season of cotton, the temperature is high in the topsoil during the day and the same in the identified soil layers at night. First, when the air is cold, it is important to maintain the same specific heat capacity and temperature of the soil in different layers of the soil, i.e. at certain depths. Second, the thermal conductivity of the soil is of great importance for plant life, as the soil cools down after a long time, and vice versa, cooling can be rapid.

The indicated laboratory work can be done by students in class and in extracurricular activities, as well as in production practice.

We will see below how some of the lab work is done in different classes.

**Investigate the effect of an electric field on a seed**

**Purpose.** To acquaint students with the quality of germination of seeds sown under the influence of electric fields, to acquaint students with the research work of Uzbek scientists working in the field of electric field effects on seeds and other plant seeds.

**The content of the work.** It is known that dry seeds are dielectric. If a seed is introduced into an electric field, it is polarized under the influence of an electric field. As a result, the germination of seeds is qualitative and the yield is high.

No	The subject of laboratory work	Classes		
		VII	VIII	IX

1.	Determination of soil and seed moisture.		+	
2.	Determination of soil and seed capillaries.		+	
3.	To study the effect of electric current on cotton.		+	
4.	Ultrasound treatment before sowing the seeds.			+
5.	Experimental determination of the effect of electromagnetic waves and isotopes on the seed.			+

Researchers from the Tashkent Institute of Experimental Plant Biology and Nuclear Physics conducted a series of laboratory studies on the effects of electric field radiation and X-rays on different varieties of seeds.

Under the influence of an electric field on the seed, germination is accelerated. It turns out that the seeds of the plant in a stimulated dose in the electric field will be more fertile.

It has been shown that seed growth and development are accelerated under the influence of an electric field. For example, up to 6 ts of wheat seeds in an electric field or 25 percent higher in quality and yield of seeds sown than in controlled wheat depends on the direction and how long the electric field is affected.

Accelerating seed germination is of great economic importance. Early germination of seeds, in turn, saves seeds economically. An electrophore machine, an anode battery, can be used as an electric field to irradiate the seed in a school setting. The electrophoresis machine generates an electric field between the flat capacitor plates.

The potential difference between the capacitor plates using an electrophore machine is measured using a C-96 kilovoltmeter. It is found that the voltage is close to 18 kV when the distance between the conductor balls of the electrophore machine and the discs with a diameter of 40 cm is 3 cm.

To process a seed in an electric field, it is necessary to place the seed on the bottom of the plate of the electric machine, and then create an electric field. It is environmentally friendly to have a normal electric field value.

To achieve high accuracy, each experiment should be performed three times at different times on the seeds standing in 3 packs in an electric field of the same voltage.

The seeds intended for the experiment must be of the same variety, of the same mass, and of the same shape. During the preparation of the experiment, the student learns that the electric field strength acting on the seed is 1-6 (kV / cm) and the field exposure time is 1-5 (s).

**Equipment.** Electrophore machine flat capacitor, paper bag with seeds, scales and stones, 2 identical pole breakers.

### Practical part

1. Make 6 paper bags with 100 pieces of seeds of different sizes in each.

2. Construction of an electrical circuit consisting of capacitor plates and switching device of the electrophore machine. To do this, the wire from the conductor ball to the electrophore machine, to the capacitor plates is placed in a single-pole switching device.

3. Record the number of seeds on the bottom condenser plates. The balls are placed at a distance of 3 cm from the capacitor. The electric field strength is  $E = 6 \text{ kV / cm}$ . By connecting the switch, it is necessary to record with a stopwatch how long  $t \leq 10 \text{ s}$  is in the electric field of the seed.

4. Put the seeds in the bag in the electric field and write down the magnitude of the electric field strength ( $E$  and  $t$ ).

5. Repeat the experiment at  $E = 6 \text{ kV / cm}$ ,  $t = 5 \text{ s}$  and  $t = 2 \text{ s}$  for the seeds in the other bag.

Perform the experiment at an electric field voltage of  $E \leq 10 \text{ kV / cm}$  and complete the table.

### Questions for self-examination

1. How does the electric field affect the seed?
2. What should be the magnitude of the electric field voltage acting on the seed?
3. How can the seed be processed in an electric field?
4. What physical properties of seeds change when they are processed in an electric field?
5. How can the results of the experiment be verified?

In short, it would be expedient to develop this laboratory work in practice and to integrate science and production so that farms and dehqan farms could achieve productivity.

### References

1. Mirziyoev Sh.M. Decree of the President of the Republic of Uzbekistan No. PF-4947 of February 7, 2017 "On the Strategy for further development of the Republic of Uzbekistan" "People's speech", February 8, 2017
2. Golish L.V., Fayzullaeva D.M. Design and planning of pedagogical technologies: a textbook .. - T.: "Economy" edition, 2011. 206 p.
3. Q. Olimov and others. "Methods of vocational education" Tashkent-2006.

### Information from the website:

1. Keys-method. Okno v mir situatsionnoy metodiki obucheniya (case study) .- [www.casemethod.ru](http://www.casemethod.ru).
2. [www.uftuit.uzpak.uz/xallieva/mavzu/7.DOC](http://www.uftuit.uzpak.uz/xallieva/mavzu/7.DOC) • 559 KB

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