

USE OF CREATIVE WORKS IN PHYSICS CIRCLES

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Abstract: *By giving creative tasks to students in physics circles, creativity skills are formed in them, and confidence is instilled in the application of physical laws in technology, production and life.*

Key words: *pendulum, period of oscillation, technique, creativity, acceleration of free fall, measuring tape.*

Introduction: Science begins with measurement. That is, if the students try to perform and make sure that the physical laws apply in life, technology, and production by measuring, their interest in science will increase. The level of mastery increases.

The main part: It is known that various forms of teaching can be used to teach physical concepts to students: lessons, excursions, practical work and laboratory training, independent research activities of students, preparation of abstracts, etc. However, when learning material related to physics, the use of circles often gives good results.

Circles have been shown to be appropriate by encouraging students to think creatively in introducing physical concepts [2].

Teaching physics in circles means teaching the structure of the Universe, introducing its founders, explaining the essential understanding of physical processes occurring in nature. Practical exercises are of great importance in teaching physics in circles [2]. Practical training is mainly conducted in the form of problem solving, laboratory work and seminar training. Problem solving is an integral part of the physics teaching process, in which theoretical knowledge is strengthened in every way, physical concepts are formed, physical thoughts are developed, the skills and competences of practical application of the acquired

knowledge are formed, developed and improved. Providing new information by solving physics problems, creating problematic situations and posing problems to students, developing practical skills and competencies, testing the strength of students' knowledge and imagination, strengthening, summarizing and repeating theoretical material, introducing technical achievements, students' creative abilities can be developed.

Physics, which is a fundamental science, is an experimental science in terms of its basic content. In this science, theoretical concepts and laws have their own empirical basis and practical proof. That is why it is very important to organize and conduct demonstration experiments and practical works, which are an integral and complementary part of lectures, in the teaching of physics. In circles, physical experiments - practical exercises play an important role in forming the scientific outlook of students.

In order to increase the effectiveness of the lesson, the teacher should know his subject, the methodology of teaching it, and the various forms of teaching students, and should connect it directly with life and the development of science and technology.

One of the types of independent work organized outside the classroom is circle training.

The circle creates an opportunity for various district, interesting independent work and helps to form an active creative person. In addition to industrially produced tools and equipment for performing practical work in the circles, simple, cheap, not requiring a lot of work, the use of artificial teaching-technical tools gives good results. Circle work allows you to apply theoretical knowledge acquired in physics classes in practical activities, for example, making tools and models. Making tools develops students' design skills, the ability to make different devices with their own hands, which is essential for a truly in-depth understanding of physics.

Therefore, this article presents one of the practical tasks that students can make with their own hands and get the results of experiments in physics circles.

Name of this creative assignment :

Determination of soil moisture and water container in it

It is known that the presence of water vapor in the air, that is, its humidity, characterizes the intensity of moisture loss or condensation from the soil, the loss of moisture by living organisms. The level of water supply of plants also depends on soil moisture.

Soil φ is the ratio of the mass of water contained in it to the mass of dry soil M :

$$\varphi = \frac{m}{M} \quad (1)$$

or in percentages

$$\varphi = \frac{m}{M} \cdot 100\% \quad (2)$$

Knowing the moisture content of the soil φ , it is possible to determine the water content in it. If the volume of the soil is equal to V , and its average density is equal to ρ

$$M_t = V \cdot \rho \quad (3)$$

, its mass can be determined from (3). A reserve of this volume of water

$$B = \frac{V \cdot \rho}{100\%} \varphi \quad (4)$$

It is found from the expression.

The purpose of the work: to develop skills in agricultural activities among the listeners; learning to determine soil moisture and water content in it.

Tools and materials: thermostat (drying cabinet, household electric or gas oven can be used), aluminum cups with lids, spring scale.

Order of work

1. Determine the mass M_0 of the glasses.

2. Place soil samples from different locations in beakers (25-30 g for a spring scale, 500-1000 g for a household scale).
3. Determine the mass M_1 of the cups with soil.
4. Place the glasses on a thermostat and dry them at 105°C for 5-6 hours.
5. Remove the glasses from the thermostat and close the lids and cool to room temperature.
6. Determine the mass M_2 of the cups with dry soil.
7. Find the mass of water that has turned into steam from the expression $m = M_1 - M_2$.
8. Find the mass M of dry soil from the formula $M = M_2 - M_0$.
9. Using the expression (2), calculate the φ of the soil in percent.
- 10.. Determine the average density ρ of the sample
11. Determine the water table for the volume of the soil using the expression $V = 0,5m \cdot 10m \cdot 10m$ (4).
12. Using table I, conclude whether the soil needs irrigation or not.
13. Write the obtained results in the following table:

Experiment number (glass number)	M_0 , kg	M_1 , kg	M_2 kg	M , kg	m , kg	φ %	ρ kg/m ³	B , kg	The need for irrigation
1									
2									
3									
4									

I - table

The type of soil	Normal soil moisture, %
Clay soil	33 – 35
Average sandy soil	26 – 28

Light loam soil	22 – 24
Sandy soil	12 - 15

Conclusion: Giving similar creative tasks in circles and carrying them out helps to increase the work of circles, the content of independent education, which is an integral part of pedagogical technology, and to improve its efficiency..

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