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## Experiment at Physics Lesson and After-Hours

*No doubt, all our knowledge begins with experiments.*

*Kant Emmanuel.*

*The German philosopher (1724-1804)*

**Key words:** *knowledge, experience, experiment, logical thinking, interest in the subject, physical phenomena.*

**Annotation:** *this article teaches physics and out-of-class experiments using a variety of physical laws, which in turn enhances and enhances their knowledge, develops logical thinking, and creates an interest in learning physics based on advanced pedagogical and information communication technologies, is given.*

Physical experiments in an entertaining form introduce students to various applications of the laws of physics. Experiments can be used in lessons to attract students' attention to the phenomenon under study, with the repetition and consolidation of educational material, at physical evenings. Interesting experiences deepen and expand students' knowledge, contribute to the development of logical thinking, instill interest in the subject.

The laws of physics are based on facts established by experience. And often the interpretation of the same facts is changing in the course of the historical development of physics. The facts accumulate as a result of observations. But in doing so, only they can not be limited. This is only the first step to knowledge. Next is an experiment, the development of concepts that allow qualitative characteristics. To make general conclusions from observations, to clarify the causes of phenomena, it is necessary to establish quantitative relationships between the quantities. If such a relationship is obtained, then a physical law is found. If a physical law is found, then there is no need to put experience in each individual case, it is enough to perform the appropriate calculations. Having studied experimentally the quantitative relationships between the quantities, it is possible to reveal regularities. On the basis of these regularities, a general theory of phenomena develops (3, p. 69).

Consequently, without experiment there cannot be rational teaching of physics. The study of physics assumes extensive use of the experiment, a discussion of the features of its formulation and the observed results.

Principles of teaching physics for junior students should be as follows:

1. Give more demonstrations, the opportunity to touch the student with all hands, because the flow of words, although necessary, does not impress children;
2. It is necessary to involve everyone in the educational process. It does not happen that all the students understand everything at once. Let first understand one, and others will understand the material in a different context, hence the need for a multivariate study and gradually the others will join the understanding;
3. Go forward on the subject, but periodically return to the incomprehensible, multiplying the group of those who understood the material;
4. To take into account that many children are difficult to capture abstract concepts and they need to explain how to think;
5. Students should know where the ideas came from. If we are talking about the structure of an atom, then we must talk about how people guessed it (1, p. 27-28).

It is not necessary to bring children to physics from grade 7. Pupils of the 7th grade, children who already have enough life experience of communication with the surrounding world, already observed many phenomena, but could not explain, experimented, but did not explain the received. Therefore, by the 7th grade, they themselves can tell a teacher of physics something, and we again begin to speak elementary to them.

Another thing in the 5-6 grade. At a younger age, when children are more interested in acting and doing with their hands, it is easier to teach to observe and see phenomena, revealing the cause-effect relationships. Then, going to the 7th class, it is easier to bring them a mathematical basis to substantiate the phenomena, which would immediately advance the solution of problems.

Today is the 21st century. But in the 21st century we must learn. Computerization of schools, the Internet has changed a lot in teaching. Excellent methods of conducting practical work on the computer are important and necessary. But physics is a science that should give ideas about phenomena in the surrounding world, not only virtually, but also realistically (2, p. 54).

Children should see physical phenomena in the surrounding world, they must touch what is possible, connect what they see with what they are told at school.

In my work in physics classes with kids, it is desirable to choose a method that can be called: "Physics is around us!" (5, p. 37).

The advantages of this method are that children can see the amazing, unusual, in the surrounding world. The proposed experiments can be easily reproduced at home or on the street without

particularly complex equipment. But any experiment can be explained both at the level of the baby and at a deep level of a high school student. Simple and cheap. To see, touch, change the parameters and conditions of the experiment. Use an active way of studying physics. There are also ample opportunities to associate with physical laws poetry, painting, music, other sciences, and here are great aesthetic and moral opportunities.

The effectiveness of the method is likely to be that it is characterized by:

- 1) simplicity and cheapness;
- 2) the ability to see and touch the physical phenomenon;
- 3) an active way of studying physics;
- 4) the opportunity to work with those who do not have good abilities (4, p. 112).

On the first lesson you can give the guys a "Trip to the country of physics" where, in particular, it says: "You are just starting a journey into the country of physics, into creativity, into science. Dare! Abilities, like muscles, grow in training. Great discoveries are not for everyone, but whoever does not dare to try, probably will not open anything".

The child begins to explore the world, listening to the surrounding sounds, watching the surrounding bodies, tactfully studying them. In this case, all activities should be built in the form of games - experiments. The child becomes a seeker, thirsty for knowledge, indefatigable, creative, persevering and hardworking in accordance with the implementation of the requirement of the State educational standard. Skills of research work of schoolchildren are a very important educational and educational component of pre-university training of senior pupils. As a result of my work on development of research skills of students in classes and after school hours, I consider successful participation in various olympiads and contests.

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