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## ORGANIZATION OF TEACHING LESSONS IN PHYSICS WITH DIGITAL LABORATORY

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**Annotation:** Physics is called experimental science. Many laws of physics are discovered through the observation of natural phenomena or special stage experiments. Experience confirms or refutes physical theories. The sooner a person learns to conduct physical experiments, the more he can hope to become an experienced physicist. The purpose of the article is to teach the possibilities of using Vernier digital lab to develop research skills.

**Keywords:** Student Physics Experiment, Software Lab, Vernier, Movement, Temperature, Project Activity, ICT.

### INTRODUCTION

Teaching physics is a conducive environment for applying a systematic activity approach, starting with a physics course, based on the specifics of the science. includes high school sections, and learning and understanding them requires advanced imaginative thinking, analysis, and comparison skills.

Particularly effective methods of work are experimental and project activities, problem-based learning, the use of new information technologies, such as modern elements educational technologies. These technologies allow the process of adaptation to the individual characteristics of students, creating the preconditions for the child's participation in the regulation of their learning activities, depending on the content of education of varying complexity.

Only by engaging in the process of scientific knowledge in the field of educational physics can a student's level of motivation be increased. Experiments are one of the most important ways to motivate students, because the ability to experiment is the most important skill. This is the pinnacle of physical education.

The experience of physics allows the practical and theoretical problems of the course to be integrated into one whole. As they listen to the learning material, school children begin to get tired and their interest in the story diminishes. Physical experience, especially independent experience, alleviates the inhibitory state of the brain in children. During the internship, students are actively involved in the work. It helps to develop students' skills of observation, comparison, generalization, analysis, and inference.

The student physics experiment is a method of general education and polytechnic preparation of schoolchildren. It should be short-lived, easy to set up, and clearly focused on mastering and applying the training material.

The experience allows students to organize independent activities, as well as develop practical skills and competencies. My methodical piggy bank includes 43 frontal experimental assignments for seventh grade alone, excluding software lab work.

During a lesson, the absolute majority of students will be able to complete and complete only one experimental task. So I chose the

smaller experimental tasks they do not take more than 5-10 minutes.

Experience has shown that conducting frontal laboratory work, solving experimental problems, performing short-term physical experiments is several times more effective than answering questions or working on textbook exercises.

But, unfortunately, it is not possible to show many events in a school physics classroom setting. For example, these are microworld events or fast-moving processes or experiments with non-laboratory instruments. As a result, students have difficulty learning because they cannot mentally imagine. In this case, the computer comes to the rescue, which can not only create a model of such events, but also allow

The modern educational process cannot be imagined without the search for new, more effective technologies that contribute to the formation of self-development and self-education skills. Project activities fully meet these requirements. V project work The purpose of teaching is to develop students' independent activities aimed at learning new experiences. It is the involvement of children in the research process that activates their cognitive activity.

Qualitative verification of phenomena and laws is an important feature of the study of physics. It is no secret that not everyone is capable of mathematical thinking. When a child is first introduced to a new physical concept as a result of mathematical changes, then the search for it appears physical meaning, many children have simple misunderstandings and strange "worldviews" that actually have formulas and events are only needed to describe them.

Experimental physics is the study of the world of physical phenomena, the observation of events, the acquisition of experimental data for the analysis of observations, the establishment of a connection between this phenomenon and a previously studied phenomenon, the introduction

of physical quantities and their measurement. allows .

The new task of the school was to form a system among school students, a universal movement, as well as experimental, research, organizational independent work experience and personal responsibility of students, to make learning goals personally important, ie education powers that define new content.

The purpose of the article is to explore the possibilities of using Vernier digital lab to develop school students' research skills.

The research activity involves several steps, ranging from defining the goals and objectives of the research, proposing a hypothesis, to conducting the experiment and presenting it.

Research can be both short-term and long-term. In any case, its implementation mobilizes a number of skills in students and allows the formation and development of the following universal educational activities:

- Systematize and generalize the experience of using ICT in the educational process;
- assessment (measurement) of the impact of individual factors on the results of activities;
- planning - determining the sequence of intermediate goals, taking into account the end result
- control in the form of deviation from the standard and comparison of the method of action and its result with the given standard to identify differences;
- compliance with safety regulations, the optimal combination of forms and methods of activity.
- ability to communicate in a team;
- ability to present the results of their activities to the audience;
- Development of algorithmic thinking necessary for professional activity in modern society. .

Vernier digital laboratories are equipment for large-scale research, demonstrations, laboratory

work for physics, biology and chemistry, design and laboratory work. research activities students.

The laboratory includes:

- Vernier Go distance sensors! Harakat
- Vernier Go temperature sensor!

Temperature

- Adapter Vernier Go! Reference
- Heart rate sensor (manual heart rate monitor)
- Light sensor Vernier TI / TI light probe
- A set of teaching materials
- CosView interactive USB microscopy.

Using Logger Lite 1.6.1 you can:

- Collect and display data during the experiment

- Show data in different ways of choice - in the form of graphs, tables, displays of measuring instruments

- data processing and analysis
- Import / export data in text format.
- Watch videos of pre-recorded experiments.

The lab has a number of advantages: it allows data to be obtained that are not available in traditional learning experiments, and allows the results to be easily processed. Digital laboratory mobility allows you to conduct research beyond the scope of the classroom ... The use of the laboratory allows you to implement a systematic - activity approach in lessons and classes. Experiments with the Vernier Digital Lab are visual and effective, allowing students to gain a deeper understanding of the topic.

By applying a research approach, it is possible to create conditions for students to acquire scientific experience and analytical skills. In addition, reading motivation increases to actively participate in the lesson or course process. Each student will have the opportunity to conduct their own experiment, get results, and tell others about it.

Thus, we can conclude that the use of Vernier digital laboratory in the classroom allows students to develop their research skills, which

increases the effectiveness of teaching and helps to achieve modern educational goals.

## References.

1. Proxorov A.M. Physics // TSE, 3rd edition - T. 27. - P. 337.
  2. Volkenstein M.V. Theoretical basis of physics Natural science // Theory of physics. - M.: Nauka, 1980.- P. 36,
  3. Vayskopf V. XX asr fizikasiar. - M.: Atomizdat, 1977.- P. 2-10.
  4. Academician L.A. Artsi memories.action. - M.: Nauka, 1988.- P. 239.
  5. Newton I. Optics. - M.: Gostexizsanalar, 1954.- P. 280, 281, 306.
  6. P LANK M. Pictures of the physical world. - M.: Nauka, 1966.- P. 23.
  7. Boltzman L. Articles and speeches. - M.:Ilm, 1970.- P. 35, 56.
  8. Scientific life.- M.: Science, 1973. -S. 180, 198.
  9. Langevin P. Selected Works. -M: USSR Academy of Sciences Publishing House. 1960.— P. 658.
  10. Lomonosov M. V. Selected. - M.: Nauka, 1986.- T.G.S. 33,
  11. Amper A.M. Electrodynamics. - M.: Publishing House of the Academy of Sciences of the USSR, 1954 - p. on.
  12. Born M. Physics in the life of my generation. - M., 1963 - p. 84, 190.
  13. A.G.Sto's open speeches and lecturesletova.- M., 1902.- P. 236.
- Mach E. Knowledge and Deception: Essays on Research Psychology. - M., 1909- S. 188.