



Solving Problems is an Important Part of Learning Physics

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Abstract:

The article analyzes the important aspects of solving problems in physics in the organization of modern education, bringing education closer to real life, project education technology, which is an important factor in the development of the student's personality, describes the algorithm and stages of project education technology.

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Introduction

Solving problems in physics is a necessary element of educational work. Tasks provide material for exercises that require the application of physical laws to phenomena occurring in certain specific conditions. Therefore, they are of great importance for concretizing the knowledge of students, for instilling or the ability to see various specific manifestations of general laws. Without such concretization, knowledge remains bookish and has no practical value.

Problem solving contributes to a deeper and more durable condition of physical laws, the development of logical thinking, intelligence, initiative, will to perseverance in achieving the set goal, arouses interest in physics, helps the skills of independent work and serves as an indispensable tool for the development of independent judgment [1-6]. Problem solving is one of the methods of understanding the relationship between the laws of nature.

Solving problems in the lesson sometimes allows you to introduce new concepts and formulas, to find out the studied patterns, to approach the presentation of new material. The content of physical tasks expands the circle of students' knowledge about the phenomena of nature and technology [7-14]. In the process of solving problems, students are directly faced with the need to apply the knowledge gained in physics in life, they are more deeply aware of the connection between theory and practice. Problem solving is one of the important means of repetition, consolidation and testing of students' knowledge.

The goal of personality-oriented learning is the development of the student's personality, the desire for the transition to self-development, self-knowledge, self-determination, the formation of interest in my own self, who I really am, can, if I want, be successful no worse than others, namely in physics, i.e. cognition of oneself as a subject of physical educational activity, independent choice of educational goals, tasks and forms of educational work. In other words, the student becomes the true center of the educational process.

Materials and Methods

Physics studies the most general properties and laws of motion of matter, it plays a leading role in modern natural science. This is due to the fact that physical laws, theories and research methods are of decisive

importance for all natural sciences. Physics is the scientific basis of modern technology [15-19]. Electrical engineering, automation, electronics, astronautics and many other branches of technology developed from the corresponding branches of physics.

Studying physics, students become familiar with a number of natural phenomena and their scientific explanation. Getting acquainted with the history of the development of physics and technology, students begin to understand how a person, relying on scientific knowledge, transforms the surrounding reality, increasing his power over nature. All this is important for the formation of a scientific picture of the world in schoolchildren.

The main form of organizing physics lessons at school is a lesson. This form of organization of training sessions allows you to combine the work of the class as a whole and of a separate group of students with the individual work of each student.

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School physical education, the task is, firstly, the formation of thinking and activity, and secondly, in terms of function, it is a means, a tool for the reproduction of thinking and activity in learning conditions, and thirdly, it is an object of study and research. Hence the peculiarities of the attitude. The figure below clearly shows the mutual transitions "sign" (sign system) - "object (phenomenon) of nature", and in the course of working with the task there is a change in sign systems (reformulation of the requirement, change in the language of the task, etc.). It is in these relationships and transitions that thinking is realized (expressed). It is necessary to work with signs on the board and in notebooks, it is better to experiment with objects, but you can also depict them, realizing that this is a designation of reality.

In most cases, educational physics problems are formulated within the framework of the rules of the theory, in fact, they are connected and aimed at mastering the knowledge of this theory. It's not bad. But it is necessary. What is important is to pose and solve the problems of describing reality. It is then that the model nature of our ideas is revealed, it is then that creative skills are formed to find (build) the necessary solution methods, to understand their limitations. Here is a huge resource of interest in physical knowledge.

Learning activity for solving problems is an exciting (joint, intense, emotional, necessarily productive) activity to achieve victory over oneself, over the material of the problem. It is not so important what reference books you use, what advice you need, how quickly you decide. The main thing is to master the methods of scientific thinking and activity.

There can be no applied relationship to a problem, for example, simply to solve for an assessment. Evaluation is important, but the norms of evaluation must change along with the objectives. We must not forget experience: in order to be able to solve problems, you need to solve them.

Using a personality-oriented approach when solving problems in physics, I help the child to open up, self-actualize. In this case, I'm talking about an individual approach.

Personally oriented lesson. A modern personality-oriented lesson requires the teacher to create conditions for the maximum influence of the educational process on the development of the child's individuality

The question arises: "How to work in the lesson with the whole class and at the same time with each student?":

Their activities in the lesson are strictly taking into account personality-oriented activities:

I use problematic creative tasks;

I use tasks that allow the student to choose the solution himself: verbal, graphic, conditionally symbolic;

I discuss with the children not only the type of tasks that I liked and why, I also wanted to perform such tasks, but what to do differently;

I encourage students to choose and independently use various ways of solving problems;

Self-assessment is very important, since a third of students have low self-esteem;

Assessment (encouragement) when questioning in the lesson not only the correct answer of the student, but also the analysis of how the student reasoned, which method he used, why and where he was mistaken.

I believe that success in work becomes possible thanks to pedagogical support, which means:

Believe in each student and in his capabilities;

Evaluate not a person, but actions, deeds;

See the value not only of the result, but of the very process of interaction with the child;

Show attention to each child constantly, rejoicing in his independent actions, encouraging them;

I am not in a hurry with conclusions;

I help everyone in the search for their "I".

Conclusion

Thus, I organize the work of students in the classroom when solving problems, based on the principles of personality-oriented learning: the child has his own individual capabilities in learning activities; the child learns in the lesson from another student and from a teacher; the child is successful in learning when he feels good.

When solving problems in physics within the framework of the concept of student-centered learning, each child has the opportunity to include his own personal functions, his experience becomes in demand, and the student collective presents an opportunity for joint development.

Through solving problems, I try to form in students an idea of the integrity of the world, the unity of man and nature, man as a part of nature, for which he, the only being endowed with reason, is responsible. Within the framework of its subject, individualization of learning is realized in several ways. They differ in the goals and degree of orientation towards the personality of the students. Individualization helps students to understand their natural inclinations, inherent in them as biological beings.

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