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USE OF THE MEMBERSHIP PRINCIPLE IN STUDYING SOLID PHYSICS AT SECONDARY SCHOOL

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ABSTRACT

This article describes the role of didactic principles in general secondary schools and the didactic basis for the application of the principle of continuity in the teaching of solid body types. The article describes the relevance of teaching physics in general secondary schools, the organization of lessons on the basis of modern technologies.

KEYWORDS: *General Secondary Education, The Principle Of Membership, School, Solid State Physics, Teaching Methods, Virtual Lessons, Modern Posters, Didactics, Private Method.*

INTRODUCTION

We know that teaching physics today is the basis for the development of science and technology. Students' knowledge about nature is formed in the process of studying a physics course in the study of the aggregate states of physical bodies and types of solids using didactic principles.

The requirements for teaching physics in general secondary schools play an important role in teaching the content of solid physics in general secondary schools. Because science, technology and everyday life today cannot be imagined without solids. Therefore, it is recommended to create new modern teaching aids and exhibitions using didactic principles in teaching physics. For this, it would be advisable to use new pedagogical technologies at all stages of teaching physics in general secondary education.

One of the most actual problems in teaching physics is to teach students to connect physical phenomena and phenomena with science and technology, production and life through practical and laboratory classes, based on basic knowledge of physics. At the same time, teaching certain areas of science or important topics using didactic principles relevant to the topics is also essential for the acquisition of knowledge by students. In particular, the identification of relevant areas of solid state physics, the search for modern communication and pedagogical technologies

and new technical means, modern visual aids and methods of preparing virtual lessons, which, in turn, contributes to an increase in the scientific potential and continuity of content from these teaching materials.

MAIN PART

The purpose of the physics course, which is taught as a general subject in general secondary schools in accordance with the state educational standards, curricula and programs, is to provide students with a fundamental knowledge of physics, solid-state types, physical phenomena and the physical landscape of the universe to develop the ability to think about the distribution of bodies in nature and the concept of solids, to reveal the dialectical connection between theory and practice, to increase the role of solids in nature and technology and to understand the physical processes, to prepare knowledge for everyday use and economic activities, technical creativity and to provide a foundation for further education. Today, the problem of integrating knowledge of natural sciences and knowledge of physics is one of the most pressing problems of modern education. In the process of teaching solid state physics in general secondary schools, there is an opportunity to find effective ways to teach solid physics based on the definition and content of integrative knowledge, the formation and development of a generalized set of integrative concepts in the minds of students.

In practical training in solid physics, it is important to know the physical properties of solids before determining their density. The property of a substance to retain its chemical composition as a result of external influences is called its physical properties. Such properties include the properties of solids such as color, density, solubility, thermal expansion, heat capacity, heat and electrical conductivity, magnetization. For example, when a metal is heated, when heat or electricity is passed through it, when its metal is exposed to a magnet, its composition does not change. The physical properties of metals are very handy in distinguishing and using them. For example, any metal has a specific luster, which is called its color. The rapid conduction of heat from a solid when it is heated is called its thermal conductivity. The faster the metal conducts heat, the faster and flatter it heats and cools. Therefore, when making and processing metal products, it is necessary to take into account that their size may change due to heat. In general, the ability to differentiate according to the physical properties of solids is achieved by the preparation of parts and parts by selecting alternatives. Here are some ways in which students can use the knowledge they have acquired in physics to study the content of solid physics:

1) Teaching students the concepts of solid physics;

2) Types of solids (crystalline and amorphous bodies, ceramics and polymers);

3) Performing experiments, experiments and laboratory exercises in solid physics.

4) Assignments and problems in solid physics.

5) Posters, booklets, presentations, animations and short videos on solid physics are prepared.

One of the main pedagogical problems of today is the principle of membership in the teaching of the content of solid physics, the selection of teaching materials in this discipline, their purposeful sequence, placement on the basis of interdisciplinary membership and their delivery to students in a short time.

Solid physics requires knowledge, skills, and competencies from the teacher. This will depend on the acquisition of professional knowledge, skills and competencies in the process of retraining and advanced training of advanced forms and methods of education, modern education and information and communication technologies, the development of scientific-methodological and organizational-methodological bases for the introduction of effective forms of teacher training. It was important for a physics teacher to first determine what knowledge, skills, and competencies he or she needs to develop in the process of deepening his or her mastery of "Solid State Physics Topics".

Concepts of solid physics, types of solids (crystals, amorphous, glass, ceramics, composites and polymers), and properties of solids, application of solids in science and technology and in everyday life are studied in the physics course of general secondary schools. The subject "Physics and methods of teaching it" is taught. In this subject, students develop knowledge, skills and competencies in the subject "Physics and its teaching methods." In teaching this subject, scientific concepts such as natural sciences, ecology, zoology, geology, chemistry, mathematics and geography are used.

This demonstrates continuity in the teaching of solid physics. The issue of ensuring the continuity of teaching the subject "Physics and its teaching methods" can be approached as follows:

● to divide the knowledge imparted by students into logically complete pieces of knowledge so that they can fully master the knowledge system;

● to show interdisciplinary connection, explaining that the subject of education is a model of the direction of a large field;

● logically correct structure of the text in the source of the subject of teaching, the sequence of topics is provided.

● to use of more innovative technologies in teaching topics;

● updated of educational visual aids, including; effective use of communication technology, modern posters, virtual lessons, didactic material, presentations in modern form, animations on the topic, documentaries on various topics, equipment and other technical means.

● to take into account the level of knowledge, psychological characteristics, learning conditions and abilities of students in the description of topics;

● the level of motivation of students to practical activities and didactic materials that cover the content of the textbook;

● to take into account the young psychological characteristics of the student's personality in teaching.

Solid State Physics Part of the structure of a physics course is therefore important for the basic study of a physics course.

It is known that the topics in Physics are related to the concepts of natural sciences, mathematics and natural sciences (chemistry, biology, geography, astronomy, etc.). Important attention should be paid to the composition and stages. The analysis of the physics course should take into

account the existence of two directions in the design of the program of these disciplines: inductive and deductive.

In the development of new programs at the level of modern requirements, a position has been taken that takes into account the “general” and “specific” relations inherent in the new data related to physics. Therefore, the knowledge of problems, new information in the field of physics, the "general" as well as “special” properties of events and phenomena allow us to draw reasonable conclusions. Therefore, the structure of the physics curriculum based on the principles of deductiveness and inductance is of great scientific and educational importance.

In understanding the general laws of “Physics and its teaching methods”, it is important to know the properties that indicate which general concept this “Physics” belongs to. The secondary properties identified in this case describe the individual features of the "Physics and its teaching methods.” The program is based on the generalization of the first stage of the knowledge acquired in the “Physics and its teaching methods”, the study of specific physical concepts, phenomena and laws and the relationship between them. In the formation of these concepts from a set of visual aids representing the types of solids, concepts and phenomena of solid physics, including: modern posters, films, photographs, symbols, actions, schematic presentations, physical animations and diagrams and their descriptive information (story, text) will be important in increasing the effectiveness of the course for use. Because they allow students to master the concepts of the first stage of generalization by organizing analytical-synthetic activities on the basis of accurate data.

In the general secondary physics course, students further increase the level of thinking activity, analysis and synthesis, comparison, identification of generalized concepts in the process of reading and learning. This means that while types of solids, concepts in solid state physics, events and phenomena are described on the basis of play and observation, students are first required to master the concepts of physical and solid state physics and types of solids.

In order to form an understanding of the components, it is necessary to analyze them and draw conclusions from their internal properties and causes, in some cases from natural or historical interdependencies. This methodological approach provides for the study of “parts” in the first stage of education “Physics and its teaching”. In “Physics and its teaching” in the following link, the specifics of teaching are studied first, the specific aspects of the subject, and then the general aspects. Because in general secondary education (mathematics, chemistry, biology, geometry, geography, technological education, etc.) the aspects of teaching sciences related to general didactic teaching methods are close and complementary.

The connection between the sequences of topics is also important in the study of specific aspects in “Physics and its teaching.” Because in the study of the concepts of “Physics and its teaching” in the teaching of "types of solids, concepts of physics of solids and the physical properties of solids" the general and special cases are mastered by the requirements, in practical and laboratory classes students learn about solids, physics of solids will acquire relevant concepts as well as skills in the process of mastering the physical properties of solids.

RESULTS AND ANALYSIS

The science of physics has arisen since ancient times as a result of observation and analysis, as well as a result of human needs. For this reason, in all parts of the world, where every science

and technology is developed and rapidly developing, objects of scientific research and obtaining the results of scientific research are of great importance in the study of solid state physics. In particular, there are dozens of research institutes in all parts of the world. These research institutes are mainly concerned with the problems of "solid state physics", which today is one of the most important branches of physics. Therefore, for teaching and students' interest in these topics "Solid State Physics", the organization of training on the basis of appropriate didactic principles will be effective in obtaining knowledge by students.

The main goal of teaching solid state physics is to acquaint students with the content of solid state physics, types of solids, concepts, ideas, theories, applications of solid state physics, etc., as well as natural phenomena and laws studied by students, and the role of solids in everyday life understanding is useful for the development of solid state physics.

When the lessons of solid state physics are organized using didactic principles, it becomes easier for students to understand the content of the material, the ability to understand concepts, laws and phenomena in the material develops, knowledge expands, intellectual potential increases, and the worldview expands.

In short, it helps a lot to understand how incomparable the role of solids is in modern rapidly developing science and technology, as well as in everyday life.

CONCLUSION:

In conclusion, to improve the content of teaching solid state physics in students and from simple to complex in the formation and development of concepts of solid state physics, we believe that didactic principles have a good effect if they use the principle of continuity. Therefore, in addition to the principle of continuity for a deeper and more complete understanding of these phenomena, modern pedagogical technologies, modern posters, virtual lessons, didactic materials and communication technologies are sufficiently used to increase interest in physics serves to stay. The principle of membership is both a pedagogical and psychological problem at the same time and requires the educator to implement it in a reasonable way.

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