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METHODS OF INTERDISCIPLINARY INTEGRATION IN THE TEACHING OF "ELECTROMAGNETISM" IN PHYSICS AT SCHOOL

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ABSTRACT
The article provides analytical information and recommendations on the study of the specifics of teaching electromagnetism in physics in the general secondary education program, the role of the subject and its interaction with other disciplines.

Keywords: Physics, Imagination, microorganism, magnifying glass, microscope, X-ray machine, continental swimming.

INTRODUCTION
The physics course has many interesting examples that illustrate the phenomena, concepts, and laws of physics. Using these examples will allow students to demonstrate the unity of the laws of nature, the importance of physics in explaining natural phenomena, to reveal the physical phenomenon being studied in a new context, and to deepen knowledge of physics and increase interest in studying these two sciences**.**
Given the extensive experience of practical work in the school, these links are perfectly explained in a special guide. For the physics course, biophysics material is selected in three main areas: materials that allow students to demonstrate the unity of the laws of nature, and materials that show that the laws of physics can be applied to living organisms; materials widely used in biology and medicine that allow the demonstration of physical methods of action and investigation, and finally, materials that introduce students to certain areas and results of bionics.
In the first case, examples such as information about the size, speed, and mass of various living organisms can be used. To visualize the size of molecules (in a seventh-grade physics course), comparisons are usually made with larger objects (for example, the smaller an apple is on Earth, the smaller a molecule is on an apple). These examples are not enough. It would be more appropriate to compare the size of the

molecule with the size of viruses, microorganisms, and the like that are known to students. The following is an interesting example: The linear size of a housefly's eye is about 1 mm, consisting of several tens of thousands of facets, and the size of the molecules is on average 100,000 times smaller than the size of a single facet.

In the second direction, in addition to examples of physical devices known to be used in biology (magnifiers, microscopes, X-ray machines, etc.), students can be told about the structure of the device that measures human blood pressure.

The third direction is to get acquainted with the elements of bionics: the following examples can be recommended for the technical use of radar devices: insects, birds, dolphins and fish swimming, the structure of the body of a mole (excavator to design) study.

The importance of linking biology to instilling in students an interest in reading and strengthening the connection between teaching and life cannot be underestimated. Lots of interesting examples. The Cucumber plant is designed in such a way that as the fruit ripens, the pressure of the liquid increases, the fruit separates, and due to the reactive action, the seed is pushed to one side and thrown from the stem.

As fish and whales descend, they strengthen the muscles of their bodies and stand at depth because the swimming bladder (in fish) or the lungs (in whales and dolphins) are compressed, reducing the repulsive force..

The concept of pressure (the effect of an insect spear, the need for an elephant's foot to be wide, etc.) and the Archimedean force (adaptation of plants and animals to living in water) can be cited as examples of living nature in the topic "Movement and Forces" (Class VII). . Interesting issues can also be used, such as calculating the Archimedean force acting on a whale and comparing it to the weight of the whale, explaining why the whale can be partially and completely in equilibrium in water.

Many aspects of geography related to physics are studied first in a geography course (swimming of continents, wind formation, etc.) and then in physics classes. The most important thing is to explain the issues covered in the geography course. For example, wind formation is based on a vague explanation that warmer air (for example, on land during the day) rises, and is replaced by colder air from the sea. What is clear is that no body can rise on its own without a force (a force greater than its own weight). The reason for the formation of wind is the difference between the pressure at the surface, which is low in density and pressure, and the pressure at the surface, which is high. As a result, air moves from the liquid to the ground, as in special containers.

It is with the Department of Electromagnetism that the course of geography is linked to the explanation of issues such as electricity and water circulation in nature. In the course of geography it is studied as a cause of transport of moisture, heat and

minerals, and in the course of Physics it is studied as an example that helps to study the changes in the aggregate of water, atmospheric pressure and others.

A distinctive feature of the interdependence of the electromagnetism department of physics and the interdependence of technology science is that the technology course is a practical application of the knowledge acquired by students in physics lessons. There are two ways to use the connection between a physics course and a technology course.

Before explaining new material in physics lessons, it is important to identify the knowledge and practical skills that students have acquired in the field of technology, which will serve as a basis for explaining concepts such as friction, pressure, and work energy. Students should be asked: did they feel the pressure in the metal welding, did they feel the specifics of the structure of the different welding, how did the results of the work depend on the impact, the pressure of the welding on the metal, and so on? The same analysis can be used for gluing, sawing and welding.

The development of modern science and technology is the interaction of knowledge, practice and experience requires organic bonding. Physics is separated from production when taught, why do students need this science, why do they study it they do not understand the need. Students are only interested in physics not focused on increasing, but developing their technical activity, science and technology highlighting the role and importance of their achievements in modern production and strengthening their polytechnic training. Including,

“Electric capacity”, “Capacitors”, “Semiconductor devices”, “Electromagnetic” vibrations and waves ”to its practical significance during the course attention is positive to the development of students' technical and creative abilities affects.

An organism as students explore the problem of the magnetic field of a current the magnetic properties of the tissue, the tissue is somewhat like water diamagnetic, so it is generally under the influence of an external magnetic field learn about non-magnetization. However, paramagnetic substances in the body, molecules, ions (no ferramagnetic particles in the body). Magnet the field affects them and affects many life processes, e.g. the condition of the cells, the respiration of the tissues, the human nervous system, and affects others. Also keep in mind that the conductor the lower the resistance, the greater the current will be Failure to do so can have serious consequences

The second way is for students to complete special tasks related to the study of physics in technology classes. For example, we give the following task: When welding a metal, pay attention to the following: what are the differences between the effects of the right and left hand on the ego, try to process the detail with one hand, and then (give it a

homework assignment) possible) show and explain these forces in the drawing, why their directions are different, why it is inconvenient to work with one hand, why the clamp should be mounted on a massive table, and so on.

In short, for educational purposes, it is useful to draw students' attention to the movement and energy savings during work, to follow the rules of placement of measuring instruments, to record their readings (in electrical work). Explanation and new approaches are important in teaching electromagnetism to other disciplines.

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