

Development Of The Ecological Competence Of The Pupils At Training A Heat Transfer In Gases

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Abstract. In clause the development of the ecological competence of the pupils is investigated at training a theme: "Heat conductivity transfer gases" use of methodical aspects of inter subject connection.

Keywords: Heat conductivity, convection, radiation, protection from radiation, ultra-violet beams, infra-red beams, mirage.

INTRODUCTION

One of the most important issues is the development of environmental competence of students in secondary schools, and thus the introduction of modern methods of education in the educational process, improving the quality of education, training competitive personnel. The standard requirements based on a competency-based approach should strengthen the child's motivation to explore the world around him, demonstrating that he is prepared to seek, understand and apply in real life useful information for a lifetime, not out-of-life knowledge. This article examines the competent approach to education using the methodological aspects of interdisciplinary communication, teaching students to effectively use the competencies acquired in various situations in personal, professional and social life. [1]

Today, the level of human knowledge of the state of nature, its properties, methods of extraction, ways of use in production for the use of natural resources does not fully meet modern requirements, because in the process of mining and use of natural resources finding is becoming one of the key issues. To do this, each specialist must have personal qualities, knowledge, skills and abilities in the course of their work. The importance of science in doing this is immeasurable, and only through a scientific approach can people be taught the means and methods of establishing proper control over the forces of nature. The laws discovered in physics also play an important role in solving this problem. Examples of natural processes and their physical analysis are effective tools for inculcating environmental concepts in students and developing their environmental competence. Such physical processes may include heat transfer and heat transfer phenomena.

It is known that nature changes its temperature during the seasons. As a result, heat transfer is observed in nature. Heat transfer processes and its necessary and sufficient conditions maintain a dynamic balance in nature. The development of students' initial environmental competence in the study of heat transfer in physics classes in secondary schools is achieved through the use of interdisciplinary links and their consistent improvement. At the same time, students begin to develop their initial professional competence by methodologically explaining the interdependence of thermal conductivity, convection, and radiation. At present, in the teaching of "Thermal conductivity", "Convection", "Radiation, radiation protection", "The use of heat transfer in life and technology" in secondary schools, students are taught to form physical concepts and provide systematic knowledge of ecology, highlighting the aspects of the relevance of concepts to these phenomena and the development of integration in the education system is proving its relevance. Let's look at the information needed to develop students' scientific competence in the study of these topics.

When teaching the topic of thermal conductivity, it is useful to explain to students the following phenomena with the help of examples. There is a layer of air in the atmosphere and it captures almost half of the light coming from the Sun. Rays from the sun have different wavelengths, usually in wavelengths ($1\text{\AA} = 10^{-10}\text{m} = 0.1\text{nm}$). The short-wavelength gamma rays in these rays, up to 0.01 nm, are strongly absorbed by the nitrogen (N) and oxygen (O) atoms in the atmosphere. X-rays with wavelengths ($0.01 < \lambda < 10\text{nm}$) are strongly absorbed in the molecules of nitrogen (N₂), oxygen (O₂), and ozone (O₃) in the atmosphere. There are three types of ultraviolet light in the sun:

1. The farthest ultraviolet rays ($10 < \lambda < 40\text{nm}$)
2. Long ultraviolet rays ($40 < \lambda < 295\text{nm}$)
3. Near ultraviolet light ($295 < \lambda < 395\text{nm}$)

The farthest and farthest ultraviolet rays from the sun are strongly absorbed in the nitrogen (N₂), oxygen (O₂), and ozone (O₃) molecules in the atmosphere and almost do not reach the Earth's surface. Only near-ultraviolet light, purple light (390-450 nm), blue light (450-480 nm), blue (480-510 nm), green (510-570 nm), yellow (570-585 nm), to Only yellow or orange (585-620 nm) and red (620-760 nm) rays, ie rays with wavelengths from $\lambda = 390\text{nm}$ to $\lambda = 760\text{nm}$, reach the Earth's surface. These rays are not life-threatening, but serve to restore the activity of living organisms. Infrared rays have long wavelengths and can be divided into three types:

1. Near-infrared rays ($0.75 < \lambda < 1\text{mkm}$)
2. Medium infrared rays ($1 < \lambda < 15\text{mkm}$)
3. Long infrared rays ($15 < \lambda < 1000\text{mkm}$)

Infrared rays are absorbed and weakened by atmospheric water (H₂O), carbon dioxide (CO₂) and other molecular

compounds. The areas where gamma, X-rays, and ultraviolet rays from sunlight have a good effect on living organisms are great, and the means that lead to them and these radiation diseases are of great importance. Divided into components that cause changes in composition and reduce costs. If any active particles related to the composition of the atmosphere help, the reflection of rays from the Sun will improve. [2]

Today, the thermal conductivity of the atmosphere is increasing. This is due to the fact that harmful gases and fumes from car engines, exhaust gases from various wastes, smoke rising from the leaves of trees and plastic containers mix with the atmospheric air and change the average temperature of the air. In addition, one of the factors contributing to the rise in temperature is greenhouse gases. As a result of the combination of various industrial gases rising from the Earth's crust to the atmosphere with atoms N₂, O₂, O₃ in the atmosphere, it rains on the surface in the form of acidic and other mixtures, resulting in a decrease in N₂, O₂, O₃ gamma, X-ray and causes it to transmit ultraviolet light. After explaining this information to the students, their attention should be paid to preventing the release of various gases and dusts into the atmosphere as much as possible, not to be indifferent to environmental wastes, planting more trees, caring for them, the atmosphere. more use of environmentally friendly equipment that does not adversely affect the air.

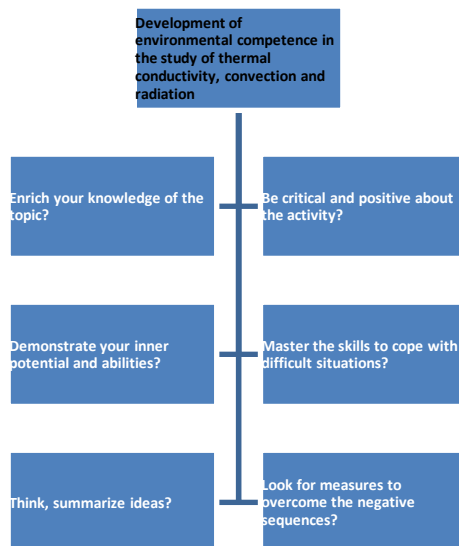
In explaining the phenomenon of convection, the concepts of the importance of convection in nature and its positive and negative consequences are given. In this case, the implementation of interdisciplinary links in the process of explaining the topic is effective. The use of natural geographic data is important in explaining the phenomenon of convection. It is said that all the processes that take place on Earth are caused by sunlight. Due to convection, a large amount of air mass is heated for a long time. Cold currents blow in those places, causing constant winds. If dirty dust or bacteria accumulates in a certain area, it will spread over long distances due to convection and pollute the air, which can spread the disease. In order to prevent this from happening during the training process, it is explained that various wastes should not be thrown into the convection flow path. This can be seen in the example of Garmsel and Afghan winds in the republic. When the Garmsel wind blows, the water in the canals, rivers and lakes evaporates, the water dries up, the crops dry up, the ears of grain dry up, and the trees dry up. It is said that this is a great loss to the economy. It is said that the only way to combat convection is to plant trees in warmer climates. Another way to deal with the negative effects of convection is to increase the number of reservoirs. The hot wind evaporates the water and increases the humidity. Evaporation from crops and trees is reduced. In this way, students are taught that natural resources can be protected from the negative effects of convection. [3]

Radiation. "Radiation protection". The teaching of the use of heat transfer in life and technology is illustrated by examples of the eclipse of rays from the Sun into the atmosphere. Atmospheric air can easily transmit light from the Sun, and examples show that sunlight absorbs more black matter and less white matter. Depending on the conditions, two white and black bodies are taken and heated under the influence of sunlight. Which one has the highest temperature is measured and its physical nature is explained. Sunlight warms the soil during the day and cools it at night. If the Earth's surface is covered with green vegetation, it will heat up slowly during the day and cool down slowly at night. In the open, the opposite is true. In the spring, on cloudless clear days, the Earth's surface radiates the heat it receives from the Sun during the day into the air by irradiating it at night, causing it to become extremely cold and even freeze. This can cause frostbite.

In summer and autumn, when the air is covered with clouds, the heat released into the air by radiation from the Earth's surface at night raises the temperature. In this case, the air is humid, which negatively affects the yield of crops. [4]

Based on the above information and the described methodology, the author organized a study of practical actions to develop students' environmental competence in strengthening the topics of thermal conductivity, convection, radiation in secondary schools. Students were given assignments to complete tasks related to the topic independently. In order to strengthen the topics, it was found that the following table can be used to develop students' environmental competence. (Table 1)

Table 1



CONCLUSION

The use of the above methodology in the teaching of physics awakens in young people the ability to use natural resources wisely and effectively, knowing the laws of nature, to protect and increase their sense of responsibility for nature, and thus students' environmental awareness. competence is developed. In addition, in the process of education, taking into account the climatic conditions of the country, the physical and chemical properties of soils are studied. the concepts of planting and caring for ornamental trees and the idea of caring for nature are formed.

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