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**DEVELOPMENT OF THE OPTIONAL COURSE
"CHEMISTRY OF FOOD"****Horynyk O.**

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Abstract. *The work is devoted to consideration of a number of problems and principles that arise before pupils who seek to find answers to important, topical questions in the field of chemistry and beyond. As a solution to this problem, it is proposed to introduce optional courses, in particular "Food Chemistry", which will provide answers to many relevant questions and instill in pupils a desire to protect their health.*

Key words: *elective course, food chemistry, healthy lifestyle.*

Introduction.

Currently, the volume of information and the speed of its updating are constantly growing. A considerable amount of scientific research, previously unheard of discoveries are being made, especially in the field of natural sciences, including chemistry. However, the programs of general school courses do not allow the pupils to fully master the situation in the world here and now. It is very difficult for a modern child living in an era of rapid technological development to "keep up" with the times. She has many interesting and really relevant problematic questions that she cannot find the answer to in school textbooks, or even from experienced teachers. Moreover, the large amount of basic theoretical educational material and the limited number of study hours make it impossible to deviate from the lesson topic. Here, various sources of information come to the aid of the pupils - most likely, these are Internet sources, which will be used correctly by a truly interested pupils who seeks to understand our world and how it is organized. In the conditions of a modern school, one of the ways to solve this problem is the introduction of optional courses in certain branches of science, which more accurately and better illuminate interesting and relevant problems of today. One such urgent problem, for example, is the extremely high mortality from cardiovascular diseases caused by poor nutrition. This problem is relevant especially for schoolchildren, because in our young years we lay the foundation of our healthy and happy life.



We believe that the development of an optional course called "Food Chemistry" and its introduction into the 10th grade program, when pupils are already able to consciously choose their position in life, in particular, regarding nutrition, is relevant and necessary. After all, in order to build a successful and prosperous state, we need young, healthy, ambitious and educated specialists who are able to apply the acquired knowledge in a timely manner and improve throughout their lives.

The purpose of the article is to prove the relevance and necessity of developing an optional course "Chemistry of food", to develop a course of its practical classes and to show how interesting and necessary it is when studying a school chemistry course.

Basic outline of the material

1.1. Characteristics of the high school chemistry course

Now, at this stage of society's development, the importance of natural sciences is becoming more and more important. It is not by chance that in various countries of the world considerable attention is paid to improving the system of science education, including chemistry. At the same time, changes in the education system involve its openness and variability, a variety of forms and methods of organizing educational activities, i.e. differentiation of education. Chemistry is a natural subject that has a great potential of interest in its study and general development of pupils. Without knowledge and understanding of the chemical form of the movement of matter, it is impossible to imagine a modern scientific picture of the world. After all, the world that surrounds us is, first of all, the world of substances that are the basis of living and non-living nature. The purpose of studying chemistry in high school is to continue the formation of pupils scientific worldview, the development of the pupils personality, and the education of chemical and ecological culture [1]. Pupils should be able to explain chemical phenomena, basic chemical laws, understand the impact of chemistry on the environment, and be able to draw conclusions about the transformation of substances they observe.

The study of chemistry in high school is aimed at fulfilling the following most important tasks:

- deepening of knowledge about the most important chemical concepts, processes, theories, laws; expanding knowledge about the chemical nomenclature of substances;
- development of the pupils ability to acquire theoretical and experimental knowledge;
- formation of skills to analyze the properties of substances and chemical phenomena based on the acquired knowledge, assessment of the role of chemistry in the modern world, both in production and in everyday life;
- development of an ecological style of thinking and behavior, education of the ecological culture of the individual.

The chemistry program in high school is aimed at preserving integrity and systematicity in the study of the subject with the minimum study time allocated. The content of the study of chemistry is freed from complex theoretical material and includes material related to the everyday life of a person. In the 10th grade, the chemistry of organic compounds is studied at a qualitatively new level, taking into



account the knowledge acquired by pupils in primary and secondary school. The content of the program for the 11th grade includes sections related to the generalization and deepening of knowledge of general and inorganic chemistry. The program is aimed at generalizing knowledge about the role of chemistry in human development. The chemistry course ends with the topic "Chemistry and human progress". This topic examines the role of chemistry in solving energy, raw material, food, environmental problems, in creating new materials and technologies [2].

The purpose of our research is as follows: to analyze the expediency of conducting optional classes in the "Chemistry of food" course in high school, as well as to consider the approach to this problem in modern publications and sources. The topic is relevant, as the issue is widely discussed among pupils and encourages them to independently search for information in order to navigate the level of a conscious consumer in the food industry and protect their health. We suggest reading this course in the 10th grade, as pupils are not overloaded with preparation for external independent assessment and admission to higher educational institutions.

1.2 Analysis of the issues of recent research and publications in the field of school chemistry course

More and more scientific works in the field of study of the school chemistry course and training of competent specialists are inclined to the fact that the chemistry teacher should teach information that is really related to everyday life and the future professional activity of the graduate. Such material is already included in the new high school chemistry curriculum.

When studying all subjects in high school, the following meaningful lines are consistently revealed: "Environmental safety and sustainable development", "Civil responsibility", "Health and safety", "Entrepreneurship and financial literacy". The meaningful line "Health and safety" is closely related to all topics, since the main value of a person is his health and the main task of an individual is to preserve it. Pupils should realize that on the one hand, chemistry can be a threat to humans, and on the other hand, it can be useful, and it is important for health care.

As a result of the implementation of this content line, the schoolchild learns to follow safety rules when using various chemicals. The pupils should be able to explain chemical phenomena, basic chemical laws, understand the impact of chemistry on the environment, and be able to draw conclusions about the transformation of substances they observe.

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ecological culture of the individual. learns safe behavior in the laboratory, at home and in the environment. A schoolchild should be aware that health directly depends on the purity of water, air, and food products (which is why the development of the course is dedicated) and follow a healthy lifestyle [1].

The implementation of the assimilation of such material is possible with the help of optional laboratory classes on the appropriate topic, where interested selected pupils will be able to see for themselves the harmful effects of some of their favorite food products on their young, just formed, vulnerable body.

The optional form of education in pedagogy was thoroughly investigated, in particular, the essence of optional classes, their tasks and functions in the educational process, the relationship of optional classes with mandatory classes and extracurricular work were studied. However, the potential possibilities of electives have not yet been fully realized and realized. According to research data, in foreign pedagogy, compared to the domestic one, a more diverse and wider network of optional courses has been created, and a significant variability of their use in mass pedagogical experience has been achieved. Optional education is used to relieve the burden of educational programs and ensure the possibility of development of pupils according to their abilities and interests.

Ukrainian researcher Hrabovy widely reveals the importance of a chemical experiment in mastering the content of school chemical education [3, 4]. A feature of optional classes in chemistry is the possibility of conducting a larger number of practical classes. Optional classes involve the following forms of work: collective and group. An individual approach to pupils is carried out through the management of their research activities. In electives, schoolchildren form and develop self-education skills, both by studying literary sources and by experimental research [5]. During the independent performance of a chemical experiment, pupils have the opportunity to control chemical reactions, to see that they obey general laws, that what may seem incomprehensible at first turns out to be simple. The latter makes it possible to widely use scientific achievements in practical activities.

So, optional classes deepen pupils' knowledge, increase their independent cognitive activity.

A modern chemistry teacher, while organizing the work of electives, should remember that an elective is a special form of organization of education, which is chosen by pupils voluntarily. And motivation motivates pupils to work on electives. In his activities, the teacher must take into account the reasons for the pupils' choice of electives. Therefore, first of all, pupils are tested and their answers are analyzed [6].

Today, it is important to improve the training of teachers. A chemistry teacher should not only be a bearer of various knowledge, universal values, but also a bright personality.

The modern training of a chemistry teacher in a pedagogical university is a multi-component system of pedagogical education and is built on the basis of the interconnection of various types of pupils activities, a combination of theoretical and practical knowledge and skills [7].

Analyzing teaching methods and their application in optional chemistry classes,



research methods proved to be the most effective. After all, practical and laboratory work, which is not enough for pupils in chemistry lessons, allows you to understand the practical application of theoretical material from the chemistry course.

1.3. The history of chemistry electives for high school pupils

Currently, electives are becoming almost the most important in general secondary education institutions, as high school is becoming specialized. Let's consider the experience of introducing electives into the educational process [8].

The purpose of teaching chemistry in secondary education institutions was to provide conditions for pupils to form a natural and scientific picture of the world and master the basics of chemistry. The introduction of elective courses in chemistry into the educational process was designed to bridge the gap between general and special education (in secondary special educational institutions and higher education institutions, pupils chose a narrow specialty, in secondary school there were no specializations), to create conditions for the individualization of education for gifted children, and to improve the quality of knowledge.

The prerequisites for the introduction of electives were the need for a differentiated approach to education. Elective classes, which were chosen according to the interests of pupils, allowed them to acquire deeper and more extensive knowledge of individual subjects and gave the opportunity to consciously choose a future profession.

It should be noted that at the time when electives were introduced, teachers experienced significant difficulties during the preparation and conduct of elective classes, which was due to the lack of special educational and methodical literature and the need to find appropriate forms and methods of organizing optional classes. But this problem was successfully solved in a short time: within two years, a sufficient amount of educational and methodological literature for pupils and teachers was published.

Pedagogical institutes and teacher improvement institutes have also started systematic work on training chemistry teachers to conduct optional classes.

A detailed examination of the experience of implementing electives in schools shows that among pupils preference was given to electives that were more related to the main course. The domestic experience of introducing electives in high school by our contemporaries deserves attention [6; 7; 8].

According to scientists, optional courses (electives) are educational courses, the content of which is not directly related to the mandatory educational content and which are chosen by the Pupils to deepen his erudition, to master new areas of knowledge and human activity. The name "facultative" comes from the Latin *facultatis* - possible, optional, provided by choice [7].

The effectiveness of the education system increases significantly if the knowledge and skills acquired during optional classes are actively used in lessons based on the interrelationship of tasks, content and teaching methods.

Elective classes at school are conducted on a voluntary basis at the choice of pupils and with the aim of deepening knowledge of individual courses, sections or topics of an educational subject, necessarily taking into account the preferences of pupils and their wishes in parallel with the study of compulsory subjects. This is one



of the effective forms of differentiated education, which is designed for the development of cognitive interests, abilities and the formation of professional orientation of schoolchildren, mastering the methods of scientific research.

So, based on the results of the analysis of the historical and modern national experience and scientific developments, we determined the theoretical foundations of the elective as a form of organization of education, namely: the concept of "elective" and the functions of the elective and the features of the organization of an optional class in chemistry in high school.

1.4. Prerequisites and principles of successful completion of electives

A pupils spends more than 11,000 hours at a school desk. How many of them can be called a lesson? Not in terms of the form of organization of education, but as a lesson, as a science of life? Pedagogical practice allows us to state that the motivation of educational activities, which refers to the long-term perspective, is ineffective. The Pupils wants to make sure even now that the knowledge he receives will be useful in his life. Then, without additional incentives (such as grades), the Pupils will learn successfully. As an example, it is possible to cite optional classes - optional classes, without homework and graded assessment. Optional classes and elective courses are effective forms of socialization and professional orientation of schoolchildren, which largely lay the foundation of the future specialty, establishing certain connections between general education and the future profession of a young person. Or, if a high school Pupils did not consider it necessary to change the educational institution for the III degree, and the study profile does not completely meet his needs, then electives can play a compensatory function here.

The teacher's practice allows us to assert that the effectiveness of the education system increases significantly if pupils actively use the knowledge and skills acquired in optional classes in lessons, when the relationship between tasks, content and teaching methods is carried out in all organizational forms of the classroom-lesson system. Therefore, the teacher gives the opportunity to use optional knowledge, skills and abilities acquired by pupils in chemistry lessons, thereby creating situations of success, motivating pupils to further active activities for self-improvement and self-development.

Features of optional classes are that they unite pupils by interests and are aimed at deepening knowledge of certain disciplines or scientific problems, they are conducted with a small group of pupils at a frequency determined by the work plan. Educational programs are developed for each elective. They can be state or author's. From the point of view of educational tasks, the following types of electives can be distinguished: from the in-depth study of educational disciplines, from the study of professionally oriented disciplines (programming, maintenance of computer equipment, etc.). Each type of elective classes can be theoretical, practical or combined.

The experience of organizing and conducting optional training by the teacher and pupils during practice - gives grounds to assert that only if the participants of the educational process comply with certain pedagogical conditions and principles, they will fulfill the tasks set before them and live up to expectations regarding the socialization of schoolchildren, the education of life competence in them .



The teacher considers the following to be the most important of them:

From the institution's administration:

- software-methodical support for the implementation of the variable component of work training plans;
- creation of appropriate material and technical conditions: classroom for classes, access to the Internet, etc.;
- staffing is not based on the principle of "top-up", but the selection of qualified specialists, because extracurricular forms of work require high skill, the ability to interest and motivate through the learning process itself, because the teacher is deprived of such a familiar toolkit as evaluation, achievements on DPA or external examinations;
- drawing up a schedule of classes taking into account the wishes of pupils and teachers as much as possible;
- promotion of teachers' creativity and initiative.

From the side of teachers:

- eradicating the stamp of "second-rateness" of this form of extracurricular work;
- thorough preparation of the teacher for optional classes;
- awareness of the importance of optional courses as those chosen by the child himself, respectively – interesting and necessary for him;
- focus of pupils' activities on self-development and self-actualization;
- maximum consideration of individual characteristics and interests of pupils, which gives space to their own mental and social initiative.
- availability of training, focus on the zone of nearest development;
- management of pupils' independent mental work;
- development of initiative and proactivity;
- connection with educational work;
- informality, curiosity, emotionality in approaches to teaching.

From the side of the pupils:

- voluntary nature of participation (means the right to choose a course, not free attendance);
- awareness of one's capabilities and aspirations, one's purpose in life;
- the ability to make choices, make decisions and bear responsibility for the decisions made.

We try to make full use of the advantages of the optional form of education, approaching the preparation and organization of these classes creatively, responsibly, carefully thinking over the content of the classes, using new facts, forms and methods of work that are not yet known to the pupils, which would increase their interest.

The elective course "Food Chemistry" developed by us contains three sections: 1. Introduction. 2. Chemical composition of food products. 3. Balanced, complete and adequate nutrition. Each section includes theoretical lessons and practical work. The course program provides pupils with the chemical composition and methods of assessing the quality of food products.

Studying the optional course is aimed at the following tasks:

- Acquaintance of pupils with modern problems of quality of food products;



- formation of abilities and skills to observe and explain chemical phenomena;
- formation of experimental and practical skills of food quality assessment;
- development of health care skills.

The program is designed for 17 hours (1 hour per week), of which 8 hours are allocated to theoretical classes, and 9 hours to practical classes. We have prepared methodological materials for teachers for conducting lectures and practical classes.

Topics of practical classes:

1. Detection of organic compounds in food products.
2. Determination of physical parameters of fats. Detection of impurities of vegetable oils, margarine in butter.
3. Properties of proteins.
4. Study of the quality of cow's milk.
6. Study of the composition of the soft drink "Coca-Cola" and its effect on the human body.
7. Study of the assortment and evaluation of the quality of bread and bakery products.

The introduction of this type of optional courses will help to prepare the Pupils for the modern realities of life and acquire the necessary knowledge that will help preserve his health.

That is, in our pedagogical activity, we practice the principle of openness, dynamism in work, and focus on results. In teaching and educating our pupils, we are guided by the principle: "Don't teach children how to live. Live by them", which we confirm with our daily pedagogical practice.

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