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Psychological Principles of Forming The Propaedeutic Knowledge of The 4th- 6th form Pupils in Chemistry

The urgency of the research. The psychological science confirms that one of the factors, influencing the formation level of the 4th- 6th former's knowledge, skill and habits is the peculiarities of their age. The transition to systematic learning the fundamentals of sciences needs a knowledge generalization in a certain subject by establishing a connection between an acquired knowledge and a knowledge in another branch and one's life experience .

The 9-13-year-old children's nature requires increasing a range of educational services for meeting their potential cognitive wishes, which are impossible to be performed within the school syllabus. Solving this contradiction is seen in introducing optional courses, including ones in chemistry.

Embedding optional classes in chemistry in the 4th – 6th forms need to take into account the fact of possible children's overload. Any overload leads to the fatigue of the child's organism and so to a gradual loss of interest in a certain branch of knowledge. Therefore, it was reasonable to begin a propaedeutical course of chemistry education during the last year of studies at the primary school when a child has already adapted to learning and he or she has an eminent curiosity. The main peculiarity of the young school age children's development is intensifying their cognitive activity under the influence of school learning. At this age, the support and development of interest in learning are a very important feature. From a psychological point of view, the child's awareness of his or her own success in learning plays a significant part in cultivating perseverance, purposefulness and wish to achieve an aim. Developing an interest in school subjects, and to chemistry in particular, depends on an organized social environment and especially on teaching conditions spreading to the conditions at school, in a family and in a child's pastime network.

An analysis of published work. The analysis of the references [2, 3, 6, 7] has shown that the optional courses, having to meet the most various needs and abilities of the children in the primary, secondary and high schools, in the countries of Western Europe, North America, Japan and others, have a traditionally deep intra-school choice.

In such countries as the USA, Japan, Canada, Israel, the United Kingdom, Ireland, Spain, Italy and France, optional courses are based on integrated courses of natural science which run through all the years of studies in the secondary school of general education. According to another model, in the Netherlands, Germany, China and in the post-Soviet period countries, optional classes are organized for the students of the 7th-11th (12th-13th) forms who study an independent course of chemistry [5].

Thus, in the primary school in Japan, elementary conceptions of chemistry are gained by schoolchildren in the 1st-2nd forms in the course "Life experience" which embodies natural science, the elements of geography, physics, biology, chemistry and social science. This course is aimed at socialization of a child in the surrounding world. The cognition of the substance and energy, atoms, molecules and ions, on the interconnection of animate and inanimate nature, on the other hand, are put into it [6]. Approximately the similar content of integrated courses in natural science and social science is also characteristic of the primary schools in the countries of Western Europe and North America.

At the same time, in the schools of these countries the implementation of the scientific and methodical approach to including chemistry information not only in compulsory integrated courses of natural science in the primary school, but also in organizing independent courses of chemistry with pupil's free choice, is observed.

In such a manner, we have taken into consideration the research results of the psychologists who revealed a positive or negative influence, made by the primary groups, on their members in the process of performing any activities with them. Till now we have not managed to find published works in methodology of teaching chemistry which would bring to light methods of teaching the subject or its separate themes with taking into account the unity of cognitive and emotional spheres of the personality of pupils at the age 9-13.

The purpose of the article is to describe an experimental confirmation of the influence of the 9-13-year-old pupils age and psychological peculiarities on their cognitive activity at the optional lessons in chemistry.

The account of the main material. As a rule, an optional propaedeutic lesson in chemistry is arranged due to a variation part of the school curriculum. It's working up and instilling into school life oblige rapid rates of the scientific and technical progress, achievements in the sphere of the mental development of man and a mechanism of the cognitive process among the junior and middle school age pupils.

It is reasonable to give the primary school pupils some elementary knowledge at the scientific level about the variety and classification of substances and materials in chemical combinations which they meet in everyday life or get to know them by means of media education. It is very important for a man in his school days to come to know the complicated connections that exist in the system of the "environment-society-man".

Taking into consideration these facts and arguments, an optional course in the chemistry knowledge propaedeutics of the 4th-6th formers under the general title "Chemistry around us" has been worked out. The propounded course is based on the following conceptual positions:

1. A chemical experiment is considered to be the main method of cognizing the substances, surrounding a child.

2. Applying the principles of intersubject connections and polytechnic education.

3. Following the "positive egocentrism" principle, which expects a child's opinion from the standpoint of "I and substances around me".

This course, in its turn, includes several optional courses with such

titles as "Substances in the kitchen" (the 4th-5th forms), "Substances in the first aid kit" (the 4th-6th forms), "Chemistry of the orchard and vegetable garden" (the 6th form), "Household chemical goods" (the 6th form), "Chemistry and cosmetics" (the 6th form), "Chemistry and a motor vehicle" (the 6th form). The optional courses consist of one or some chapters. Thus, the optional course "Substances in the kitchen" has a chapter "What we eat and drink", and the optional course "Substances in the first aid kit" consist of two chapters: "Inorganic substances in the first aid kit" for the 4th or 5th formers and "Organic substances in the first aid kit" for the 5th or 6th formers. In general, we advise to conduct the whole course "Chemistry around us" according to the principle of succeedingness in the sequence, shown in Table 1.1.

Table 1.1.
The distribution of the optional courses according to the forms

No in order	The title of the optional course	The title of the chapter	Form	Term	The amount of hours
1	Substances in the kitchen	What we eat and drink	4th, 5th	I	18
2	Substances in the first aid kit	Inorganic substances in the first aid kit	4th, 5th	II	18
		Organic substances in the first aid kit	5th, 6th	I	18
3	Substances in the bathroom		5th, 6th	II	18
4	Household chemical goods		6th	I	18
5	Chemistry of the orchard and vegetable garden		6th	II	18
6	Chemistry and a motor vehicle		6th	I/II	18
7	Chemistry and cosmetics		6th	I/II	18

The aim of the course is propagandizing chemistry knowledge among children and developing their interest to chemistry as a science on the examples of introducing the world of substances and the activities of scientists through historic information and cultivating their emotional and positive outlooks at the environment. The themes of the lessons are aimed at the formation of elementary ideas of the substances in inanimate and animate nature, at the classification of substances into natural and man-made ones. This is achieved owing to laboratory experiments, home practical work with some actual material on the level of perception and ideas. Doing simple chemical experiments, schoolchildren adapt their skills in working with substances of different aggregate states, both chemistry laboratory and at home, master the rules of behavior in the laboratory and first medical aid precautions against getting dangerous to the skin or the eyes.

The leading task of the optional classes was to develop the cognitive interest through the subject and manipulation activity in the pupil's experiment which is a prototype of industrial technological processes or an element of the research activities of scientists.

The elaboration of the curricula of optional lessons, the content and the means of its adoption was based on J.A. Komensky's approach that is often called encyclopedic [1, p. 127]. Taking into consideration the principle of simplicity, we tried as widely as possible to represent the chemistry branch of human knowledge equal to the level of pupil's age peculiarities, in addition to that not to pass by biologists of the child's development influence. According to J.A. Komensky's theory, teaching should take notice of the organs of sense, i.e. elaborated curricula must develop the intellectual activity through the analysers of sight, hearing, tactile sensations, emerging during the subject and manipulation activity. However, this principle did not contradict the demands and other rules of elective learning.

We based ourselves upon the investigations, proved in recent 40 years, concerning the fact that the child's abilities for learning develop in three conventional stages.

B. Bloom's research results indicate that in most cases the development of man at the beginning of his life takes place in the geometrical progression and later it gradually reduces. He came to a conclusion that " both girls and boys get about 50 per cent of intelligence which they have at the age of 17 (according to the tests), since the moment of conception to their four-year-old age, about 30 per cent more – from the age of 4 to the age of 8, and

the last 20 per cent – from the of 8 to the age of 17”. Even those researches, who throw doubts on the argumentation of standard of intellectual tests, will probably agree with these results, if only “intelligence” is replaced by “ability for learning” [1, p. 291].

Then he analysed schoolchildren’s vocabulary, understanding a text and general progress in studies since the birthday till the age of 18. The conclusion is “... a child receives about 33 per cent of academic skills, having at the age of 18, till the age of 6; about another 42 per cent – since the age of 6 till the age of 13, and the last 25 per cent – between the ages of 13 – 18” [1, p.291]. And a purposeful creation of the cultural surroundings is necessary for this.

The investigation concerned the 9 – 13 – year- old children whose main feature is a rapid development of their cognitive abilities. It is characteristic of them to take an interest in everything, surrounding them. They wish to know everything, they are able to be rather active in their occupations, they show violent energy, if they are only organized. At this age the organs of sense, first of all, the visual analyser develop intensively. A child can both see objects and perceive their smells, tastes, shapes and sizes.

The objects or their properties, features and peculiarities, which excite children’s true reaction, are perceived in the first place. Another peculiarity of this age perception lies in the fact that the visible, vivid and lifelike are taken better, clearer and more emotionally than, for example, symbolic and schematic representations. Visual aids occupy a significant place in teaching younger schoolchildren. For a successful teaching activity, it is necessary to use all the kinds of visual aids at the lessons: subject, graphic and verbal. It is better for this age children to see the objects and phenomena of reality which must be comprehended.

The principle of visual aids, scientifically proved by J. A. Komensky, is especially valuable in teaching chemistry for junior age children.

The skill observing the world phenomena and perceiving them correctly plays a great part in mastering scientific knowledge of the primary school pupils. The first skills of observing have been acquired by a child before going to school – in the course of playing games. Taking into account the fact that the playing activity takes a considerable place at this age, in our investigation, we have propounded tasks with elements of playing games, they are chemistry crosswords and riddle stories. The pupils were making up chemistry rebuses and doing homework in the form of pictures without assistance.

Elements of playing games were often at the lessons, but they were not dominating methods of teaching chemistry. A preference was nevertheless shown in a chemical experiment which had a particular influence on the emotional and volitional sphere of pupil state of mind.

Just at the junior school age, the mental reflexion of reality, manifesting at the level of conception and including a wide range of phenomena (image memory, imagination, etc.), is active. These mental state phenomena take place due to the cognitive processes of a child who observes chemical experiments, solves tasks in nature protection and substance extraction, etc.

The pupils at this age are mostly attracted by the striking phenomena an adult passes by indifferently. Children learn to observe natural phenomena, to notice the most essential in them, to analyse and group these phenomena. Even the most passive and feeblest children hasten, display an intelligent activity, when a teacher brings for his lesson, for example, "true" samples of inanimate nature (minerals, metals and non – metals, hard salts, liquids in glasses, or during excursions he lets his pupils observe objects and phenomena of reality.

According to J. Piaget, pupils from the age of 7 till the age of 11 gradually obtains an ability to meditate logically, to arrange their knowledge, to classify objects, to solve intellectual problems and to draw right conclusions [1, p. 326]. At this age a relative balance is set up between excitement and block, between the first and the second signal systems. Pupil's perception becomes more adequate, their attention gets steadier, their attention gets steadier, their logical thinking develops, and they gained life experience and acquired knowledge do not enable to come to conclusions using only notions.

In the course of the ascertaining experiment we have formulated a principle of transmitting emotions of a pupil's group. It is known that the emotional and volitional sphere of children's state of mind is an essential factor of their cognitive activity. In preparing and carrying out chemical experiments, demonstrating filmstrips and video films, which accompanied solving heuristic sums, a unity of the cognitive and emotional sphere of the personality of pupils was taken into consideration.

Some modern investigations show that for the development of personality, for instance, of the mentioned pupil, the "emotional mind" is dominating in comparison with the "academic intellect" [1, p. 177]. A success of the educational and any other activity of man depends on this. It is explained by producing endorphins – chemical substances which

are stimulators of pupils emotional raising. Brain endorphins have an influence on secreting acetylcholine being responsible for spreading some new information in different areas of the brain that comes to in through certain analysers. Besides that, acetylcholine is responsible not only for memorizing a new piece of information, but also for restoring an old one.

The unity of the academic intellect and the emotional mind was especially important in the interpersonal cooperation of the pupils of the group in class. Here, emotions played a part of the "carrier" of the group dynamic effects, i.e. positive emotions, breaking out in one or two pupils as a result of a "discovery", insight, solving a problem, etc. were delivered and transmitted to other children, who did not at that moment have a content emotional "base".

Transmitting the positive emotions has an effect on the intensification of the cognitive potential of the educational process participants, on their desire to think and act faster together with everybody. Thus, in studying the topic "Water", one of the pupils, having seen and heard the water formula name for the first time, exclaimed joyously: "In my shoes I can't go, they leak H₂O". This amused all the pupils and stimulated them to memorize the water formula quickly. Meanwhile, the children, looking at one another, had nice pleasant smiles, which meant understanding one another and feeling in the shape of non-verbal emotional expression. Emotional stimulation was particularly distinctly watched in solving chemistry rebuses and crosswords. This activity thrilled the children so that we made it our rule to give tasks in making up rebuses, inventing chainwords and so on.

Naturally, the principle of transmitting emotions as a didactic principle is represented in our research for the first time, and, that is why, in having to be tried in the educational process more than once in order to have a permanent status side by side with the famous teaching principles. At the same time this principle, like others described didactic principles of teaching chemistry and principles of selecting and constructing the content and structure of the optional course "Chemistry around us, is based on modelling the process of forming the 4th-6th form pupils propaedeutic knowledge in chemistry.

The pupils of the 4th form can elementarily operate with problem judgements, they have every opportunity to master a system of knowledge within their comprehension. Thus, for example, when a pupil was asked "Why are roads powdered with a mixture of sand and salt in winter?", he answered "Because fresh water freezes at the temperature of 0°C, and salt

water – at a lower temperature”.

Another pupil, receiving her teacher’s question “Why are water pipes laid deep in the ground?”, answered “Because during hard frosts the water in the pipes will freeze and can break a pipe apart, for the volume of water at freezing enlarges”. It affirms the fact that the pupils of the 4th form are already able to understand and explain the phenomena of physics and chemistry. Moreover, children make such judgements, not only from their life experience or knowledge drawn from telecasts, but from the lessons of natural science and, of course, from the classes of the optional course “Chemistry around us as well. In teaching 9-13-year-old children, it is important to take into account the data of information psychology, connecting with adopting notions from telecasts, demonstrating videofilms and other audiovisual means.

At the pre-juvenile age, a pupil’s aspiration for being an adult begins to manifest itself. At the age of 10-11, the formation and consolidation of a new system of relations with the surrounding reality – with other people, a collective body, studies – perceptibly take place.

The peculiarities of sex differences of 10-13-year-old children should be taken into consideration, when they become less obedient, dissociate themselves from grown-ups by their own indifference and lack of attention to educational information. At the juvenile period of their development, boys remain behind girls, according to physical parameters and in their progress in studies. Taking an increasing interest in designing devices and being fond of cars, motorbikes, technical appliances, radio and television equipment, etc. are characteristic of this age boys.

The 10-11-year-old children are emotional in the sense that their intellectual activity and their judgements are coloured with emotions. The things, older pupils do not respond to, provoke lively affections in the children at the age of 10-11. Their emotionality also comes to light in the fact they cannot conceal and restrain manifestations of their emotions. On the face of a 5th -form pupil with his very sincere facial expression, a teacher can read what the boy feels: satisfaction or displeasure, fear, surprise, understanding, desire to know an object closely, etc. Certainly, such a reaction on outer irritants can be seen in any age people, but it is especially typical of the 10-11-year-old children. Though, we observed the same emotional state in the 4th formers.

The emotionality of the considered age children is also revealed in their great yielding to affects, momentary and emotional outbursts of joy or sorrow; in addition to that, children jump, laugh or cry loudly,

resent violently. These states are short-term, superficial and they often develop into opposite states. Thus, for example, at the lesson with the theme "Common salt" (the 5th form) a teacher can suggest pupils painting the devices for filtration and evaporation of sodium chloride solution in coloured pencils or felt-tip pens. Such work captivates pupils, and a teacher stimulates the cognitive function, setting new cognitive tasks, and in this way, directing the educational process. For instance, one of the pupils demonstrated his picture to all the classes and joyfully said how nice it was. At the same time the teacher did not repress the pupils' emotions and high spirits, but the other way round, he tried to take advantage of this situation as completely as possible, and having encouraged the other, he gave them new tasks of creative character. For example, their homework was to write a short composition "Common salt in my life".

The learning activity at the age of 10-11 stimulates, first and foremost, the development of mental processes of spontaneous cognition of the surrounding world – sensations, perceptions, observations. The pupils of the 5th form are distinguished by sharpness and freshness of perception, a sort of "contemplative curiosity", that is explained by age peculiarities of the higher nervous functioning and a relative prevalence of the first signal system. A 10-11-year old pupil with interest perceives the surrounding life, which every day discovers something new before him. The weakness for an extended, organized and goal-seeking analysis in apprehending is distinctive of this age pupils.

Pupil's perception is tightly connected with actions, with the practical activity. To perceive an object means to do something with it, to take and to touch it. A 10-11-year-old pupil apprehends, on the whole, everything that corresponds to his needs, that comes into his life, his activities. If a much younger pupil is interested in separate facts and isolated phenomena, in the 5th – 6th forms he is curious in revealing causes, regularities, connections and interdependencies between phenomena. The 11 -12 years of age pupils begin to explain the future realistically and to understand abstractions.

Learning interests start to be differentiated in the children from 10 -11 years of age. If much younger pupils take an interest in studying in general, the pupils of the 5th form certainly emphasize what they like most of all. Of course, this is favoured by such factors as increasing a number of school disciplines and, above all, teaching them by different teachers, each of whom has his style and image, created by him. But at the beginning of the juvenile age, we can, all the same, trace some unsteadiness

of interests, tied with gender peculiarities and revaluation of values that, in the first place, depends on the contents of many subjects. We had to watch this in Gymnasium № 10 in Melitopol (Ukraine), where the pupils of the 5th form of different groups attended three optional courses (in mathematics, in chemistry, in Ukrainian literature) simultaneously. Some of them attended, at first, both the optional course in mathematics and that in chemistry, but later they decided to take only one direction.

The 9 -13 – year – old children's gender differences should also be taken into consideration. The girls at this age in their intellectual actions orient themselves towards the outer strategy, for example, they calculate using counting sticks or their own fingers, but the boys in most cases rely on their memory. It is typical of them to act in this way, in case of the individual approach to studying or in doing original work. If there is a frontal test or doing a group task, almost all the children rely on the inner strategy and their work using their own memory [4, p. 318 - 329].

The 10 -11 -year– old children, as it was mentioned above, have vividly expressed emotionality. The objects, their properties and the phenomena, caused children's ingenuous emotional reaction, are perceived in the first place. Another peculiarity of perception in this age consist in the fact that the visual, coloured, lively is apprehended better, more impressive and more emotionally than, for instance, symbols, signs and schematic representations. Therefore, the demonstrative chemical experiment actually becomes a method of cognition and teaching chemistry even in the primary school. Physical and chemical phenomena of solving substances of various colours, diffusion, interference of different solutions with forming precipitations, gaseous substance, etc. cause not only a surprise, but also questions and producing a thought. Visual aids take a considerable place in teaching junior schoolchildren both in class and in representing creative home tasks – solving a piece of potassium permanganate in water, observing interference of baking soda acetic acid with forming bubbles, etc.

The pupils of 10 -11 years of age can continually keep attention during all the lesson, but, in addition to that, a teacher should distinctly put an aim of a lesson, claim an organized, concentrated subject or intellectual activity, preserving and supporting attention under certain conditions (a duty of learning, understanding concrete task, habitual conditions of work, pleasant conditions of activity). Short stops are useful, but there is no need to arrange breaks at work. It is very important to change schoolchildren's kinds of work, in this case they will not be tired. A

variety in working stimulates their steady attention.

In educating the junior school children and particularly, pre-juvenile children, a considerable role belong to working in two forms, characteristic of this age – in the form of self – service and in the form of hand - making. Taking into account such a typical of this age feature, we should especially underline pupils chemical experiments, and carrying them out cultivates pupils' skills in working with chemical glassware, dry substances, small parts, etc.

The consolidation and development of junior school age pupils' habits and skills of self – service is a good psychological basis for cultivating children's respect for adults work, understating the role of labour in peoples life and readiness for a long – term physical tension.

Most pupils of this age (9 – 13 – years-olds) like classes where they can do something with their own hands and show their creativity and skills. The real enjoyment is the fact that they make necessary and useful things with their own hands. Such lessons form pupils' skills in planning a following activity and them finding ways and means of its applying. Thus, in preparing an experiment of paint diffusion in water, pupils act in the system of the most developed and outside offered requirements [2, p. 82 - 83]. If we miss even a small operation or use the wrong device or detail needed how all this becomes visible in the results of work. So, at these lessons, pupils intensively master a skill in planning an order of their operations before hand and foreseeing devices necessary for their performing.

Taking into consideration age peculiarities, emotional sphere and sensual perception of chemical phenomena, one can correctly organize the educational process at an optional course lesson and form pupils' assiduity, diligence, disciplined state and tidiness. At this age, an ability to regulate a strong-willed behavior gradually develops, a skill in restraining yourself and controlling your deeds appears, persistence and skills in overcoming the difficulties increase.

Conclusions. The formation of the 9 – 13 – year-old pupils' propaedeutic knowledge in chemistry is possible at optional lessons. However, the scientific and methodical argumentation of methods of teaching chemistry the 9 – 13-year-old pupils in optional lessons is almost unknown to a wide circle of teachers. Our experimental investigation has proved that methodology of teaching chemistry the senior pupils in optional lessons can be an example, although a fair one. But the principal thing, needed by a treatment of propaedeutic optional courses in chemistry

for pupils of the 4th - 6th forms, is obligatory taking into account age, psychological peculiarities and gender differences of children as well as a serious correction of already existing attempts of chemistry knowledge propaedeutics.

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Abstracts

OLEKSANDR MAKSYMOW, TETYANA SZEWCZUK, LILIIA ARABADŹY. **Podstawy psychologiczne kształtowania propedeutycznej wiedzy chemicznej u uczniów klas IV-VI.** Artykuł przedstawia znaczenie propedeutycznej wiedzy chemicznej na zajęciach pozalekcyjnych wśród uczniów klas 4-6 uwzględniając wiek, płeć, stan emocjonalny uczniów oraz percepcję zjawisk chemicznych i historycznych danych naukowych, wykonanie podstawowych bezpiecznych testów z różnymi substancjami. Scharakteryzowano zasady dydaktyczne, a także formy, metody oraz eksperyment chemiczny, według których odbywały się zajęcia pozalekcyjne z chemii pt. «Chemia wokół nas». Po raz pierwszy została zaprezentowana zasada translacji emocji, która była zastosowana na wybranych zajęciach.

Wyrazy kluczowe: zajęcia pozalekcyjnych z chemii, zasada translacji emocji, dydaktyka, chemia

ОЛЕКСАНДР МАКСИМОВ, ТЕТЯНА ШЕВЧУК, ЛІЛІЯ АРАБАДЖІ. **Психологічні основи формування пропедевтичних знань з хімії в учнів 4-6 класів.** Стаття присвячена обґрунтуванню пропедевтики хімічних знань на факультативах серед учнів 4-6 класів з урахуванням їх вікових особливостей, статі, емоційного стану і чуттєвого сприймання хімічних явищ, історичних відомостей з науки, виконання елементарних безпечних дослідів з речовинами. Схарактеризовано дидактичні принципи, на яких організовано навчання хімії на факультативних заняттях. Вперше презентовано принцип трансляції емоцій, за яким проводились окремі заняття. Описані форми, методи і такий засіб як хімічний експеримент, що застосовувались у факультативному курсі «Хімія навколо нас».

Ключові слова: факультативні курси з хімії, вік дитини, гендерні відмінні, принцип трансляції емоцій.

АЛЕКСАНДР МАКСИМОВ, ТАТЬЯНА ШЕВЧУК, ЛИЛИЯ АРАБАДЖИ. **Психологические основы формирования пропедевтических знаний по химии у учеников 4-6 классов.** Статья посвящена обоснованию пропедевтики химических знаний на факультативах среди учеников 4-6 классов с учетом их возрастных особенностей, пола, эмоционального состояния и чувственного восприятия химических явлений, исторических научных сведений, выполнения элементарных безопасных опытов с веществами. Охарактеризованы дидактические принципы, на которых организовано обучение химии на факультативных занятиях. Впервые представлен принцип трансляции эмоций, по которому проводились отдельные занятия. Описаны формы, методы и как средство химический эксперимент, которые использовались в факультативном курсе «Химия вокруг нас».

Ключевые слова: факультативные курсы по химии, возраст ребенка, гендерные особенности, принцип трансляции эмоций.

OLEKSANDR MAKSYMOW, TETYANA SHEVCHUK, LILIIA ARABADZHI. **Psychological principles of forming the propaedeutic knowledge of the 4th- 6th form pupils in chemistry.** The article is dedicated to the argumentation of chemistry knowledge propaedeutics among the pupils of the 4th- 6th forms taking into consideration their age peculiarities, sex, emotional state and sensual perception of chemical phenomena, historic information on the science, carrying out elementary safe experiments with substances. Some didactic principles, on which teaching chemistry is organized at optional lessons, are characterized. A principle of transmitting emotions, according to which some lessons were conducted, is presented for the first time. Some forms, methods and such a means as a chemical experiment, applied in the optional course «Chemistry around us», are described.

Key words: optional course in chemistry, child's age, gender differences, principle of transmitting emotions.