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METHODS OF TEACHING NATURAL SCIENCES TO PRIMARY SCHOOL PUPILS ON THE BASIS OF A COMPETENT

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Keywords: method, teaching, natural sciences, primary school, pupils, practical, activities, competencies, "The world around us" and "Natural science".

Abstract: The article is dedicated to the problem methods of teaching natural sciences to primary school pupils on the basis of a competent. Competences are manifested in the form of basic and scientific competencies. These competencies always complement each other and contribute to the formation of practical activities. Basic and scientific competencies are general and specific. They are: 1. Basic competencies are competencies specific to all subjects. 2. Competences related to science, ie competencies specific to a subject. In particular, the special competencies formed in the lessons "The world around us" and "Natural sciences". Thus, the main goal of the competency approach is to form students who are well-developed, creatively active, able to have a conscious attitude to the environment, love nature and preserve its riches. Development of recommendations and developments aimed at teaching pupils natural sciences on the basis of a competent approach in the lessons "The world around us" and "Natural sciences". Organization of seminars, trainings, round tables for primary school teachers to improve their methodological skills in the organization of lessons "The world around us" and "Natural science" on the basis of a competent approach.

Introduction

In the XXI century, education is recognized as a key factor in ensuring sustainable development; and the concept of international education until 2030 identifies "quality education and the promotion of creative ability" as an urgent task. This requires the development of students' natural-scientific knowledge in the educational process, the identification of modern pedagogical approaches to the development of innovative technologies and methods of building a conscious attitude to nature. In particular, there is a special need to prioritize the creative components of equipping primary school students with natural science knowledge, to develop in them the skills of integrated perception of the natural landscape of the world on the basis of innovative approaches.

A number of scientific researches have been carried out in the world to improve the mentoring system of the composition of natural-scientific knowledge to the young learners to determine the axiological approach to scientific research activities. At the same time, special attention is paid to improve the technology of developing students' natural-scientific worldview, improving the

mechanisms of formation of scientific-innovative thinking in students based on the priorities and ideas of Pragmatic Pedagogy. It is important to improve the methodology of formation of natural sciences to the learners in the teaching the subjects of "The world around us" and "Natural Science", and to identify the features of teaching natural sciences on the basis of a competent approach.

A number of initiatives and ideas are being put forward in the country to improve the quality of education on the basis of modern requirements, update the curriculum of primary education, educational and methodical literature in accordance with international requirements, as well as create the necessary conditions for gifted learners. At the same time, it is important to improve the synergistic learning environment, aimed at teaching students natural sciences on the basis of a competent approach, the formation of holistic ideas about the universe and man. The Action Strategy for the further development of the Republic of Uzbekistan identifies the tasks of "stimulating research and innovation, creating effective mechanisms for the implementation of scientific and innovative achievements". This shows the importance of improving the methodology of teaching science to primary school students on the basis of a competent approach.

Literature review

The issues of formation of the level of knowledge and competencies of the person in our country are discussed by the scientists of our country R.H.Djuraev, R.G.Safarova, Yu.M.Asadov, M.M.Vahobov, B.Khodjaev, M.Mahmudov, R.Ibragimov, G.N. Najmiddinovas. The issues of teaching natural sciences in the educational process were studied by E.O. Turdikulov, A.G. Grigoryants, Sh.M. Mirzaakhmedova, M. Zaynitdinova, M. Musaeva, M.B. Rakhimkulova, N.J. Isakulova.

In the Commonwealth of Independent States (CIS) countries, psychological bases of formation of scientific concepts and worldview in pupils, issues of self-awareness and the development of attitudes are covered in the works of M.A. Danilov, M.N.Skatkin, L.S.Vigotskiy, P.Ya.Galperin, N.A.Menchinskaya, N.Borisova, S.Gessen, S.Djumadurdyev, A.Djurinskiy, V.Dyachenko, L.Jarova, V.Zagvyazinsky, L.Zankov, A.Krutsky, I.Nurminsky, E.Stones, A.Uman, G.Ruzavin, A.Usova, V.Shatalov, P.Erdniev. Pedagogical aspects of the formation of scientific knowledge in pupils are investigated by V.Andreev, V.Bukin, S.Bakulevskaya, O.Gazman, V.Danyushenkov, T.Ilina, A.Leontev, A.Mudrik, Yu.Orlov, V.Slastenin, N.V. Researched by Kuzmina, A.K.Markova, L.M.Mitina, A.V.Khutorskoy, I.A.Zimnyaya, andV.I.Baydenko.

The main issues of the formation of basic and scientific competencies to the learners in foreign countries have been studied by such scholars as N. Khomsky, G. Hamel, S. K. Prahalad, T. F. Gilbert, J. Raven, Mr. Walo Hutmacher.

The analysis shows that, even though researches have been conducted on the development of knowledge, skills and abilities in students, the psychological basis of the formation of natural-scientific concepts and scientific worldviews, the development of self-awareness and self-concept, the issue of improving the methodology of teaching subjects "The world around us" and "Natural Science" to pupils on the basis of a competency-based approach to teaching has not been sufficiently studied yet.

Discussion

The main criterion for choosing the content of education based on a competency approach is the individualization of the student, the ability to apply their knowledge in solving problems of a practical nature. The scope of such a theory includes: teaching is a continuous process for a person to master and re-experience experiences; previously developed training courses should be modernized; the teaching material should be close to the students' experiences,

daily lives; the quality of education depends on the extent of learners acquiring the competencies.

Competences are manifested in the form of basic and scientific competencies. These competencies always complement each other and contribute to the formation of practical activities. Basic and scientific competencies are general and specific.

They are:

1. Basic competencies are competencies specific to all subjects.
2. Competences related to science, ie competencies specific to a subject. In particular, the special competencies formed in the lessons "The world around us" and "Natural sciences".

Thus, the main goal of the competency approach is to form students who are well-developed, creatively active, able to have a conscious attitude to the environment, love nature and preserve its riches.

When designing the process of teaching science to primary school pupils on the basis of a competency approach, attention should be paid to:

Clearly indicate what knowledge should be provided to pupils in the process of teaching science on the basis of a competency approach;

To take into account the interest of students in the study of natural sciences and their tendency to apply it in practice; clear expression of natural sciences and teaching methods based on the interests and needs of primary school pupils;

Selection and methodological substantiation of pedagogical technologies used in the process of teaching natural sciences on the basis of a competency-based approach to primary school pupils;

Expanding the opportunities for methodological services based on the primary school teacher to provide students with a deeper mastery of teaching methods and technologies based on a competent approach to natural sciences.

The process of teaching natural sciences on the basis of a competent approach has the following objectives:

To choose educational materials, questions, games, multimedia tools for students in the lessons "The world around us", "Natural sciences" aimed at teaching natural sciences;

Clear consideration of interests, learning tendencies, desires and needs; to control the ability of students to apply the knowledge learned by themselves and their classmates in practice, to evaluate the results of their own and their peers' activities, to form the experience of caring for the environment;

Protection from adverse events related to natural disasters, the development of skills to protect their health, the ability to comply with hygienic requirements;

Selection and presentation of educational materials to the pupils, that serve to expand the cognitive activity related to the study of natural sciences;

To teach students to use cognitive methods related to the acquisition and application of natural science knowledge;

To accustom students to the use of methods of conscious communication with nature; to develop the experience of independent study of natural sciences in primary school students and their application in their practical activities,and others.

The following table describes the process of teaching natural sciences to primary school pupils on the basis of a competency-based approach.

Table 1.
Description of the pedagogical process aimed at teaching primary school pupils natural sciences on the basis of a competent

Content of educational process	Description
The aim and result:	Teaching natural sciences to primary school pupils based on a competency approach. Formation of basic and scientific competencies in pupils.
Ensuring that learners are able to act independently in situations involving the application of scientific knowledge in practice:	- Formation of competencies to apply natural science knowledge in their activities; - Be able to analyze the studied natural phenomena; - development of actions related to natural situations as a part of cognitive activity; - Work with natural materials and understand their importance for the environment; - Involve students in small-scale research on natural phenomena; -To understand the phenomena of nature and to express their feelings towards them.
Formation of basic competencies in primary school pupils:	- To teach pupils to communicate on the basis of acquaintance with natural phenomena in the environment; - Creating conditions for self-development on the basis of mastering natural sciences; -Teaching certain knowledge on the basis of interdisciplinary connections in order to ensure mathematical literacy and mastery of innovations; -Ensuring the study of cultural heritage in the territory of the Republic; - Formation of emotionally valuable attitude towards underground and surface resources.
Principles based on the process of teaching natural sciences to primary school pupils on the basis of a competent approach::	- Orientation to practical activities; - General character; - Integration; - Proactive approach; - Person-centered approach; - Focus on self-development; - Continuity and continuity; - Variability.
Methods used in the process of teaching natural sciences to primary school students on the basis of a competent approach:	- Cooperation; - Posing problems related to natural phenomena to pupils; - Research; - Project; - Mental attack; -Experiments related to natural phenomena.
Forms of teaching natural sciences to primary school students on the basis of a competent approach:	- Traditional and non-traditional lessons (lessons-trips, lessons-quizzes, lessons-discussions, etc.), excursions, work with literature, organization of nature observation, role-playing games, problem-solving lessons, seminars and workshops. -Extracurricular activities: science clubs, optional classes, intellectual and creative classes and didactic games, science weeks, exhibitions, trainings, Olympiads; -Forms of educational cooperation: independent, individual, in pairs, micro groups, group, frontal.
The composition and types of	- Information blocks, texts, additional materials provided in

teaching materials aimed at teaching primary school students natural sciences on the basis of a competent approach:	textbooks; - Tasks aimed at the implementation of reproductive and effective activities; - Creative assignments; - Demonstration materials; - Speech expressions; -Tasks aimed at solving problems and demonstrating their experience; -Defining a system of natural values that are important for pupils.
Technologies used in the teaching of natural sciences to primary school students on the basis of a competent approach:	-Developmental educational technologies; -Cooperation technology; -Problem-based learning technology.

Research Methodology

In the lessons "The world around us" and "Science" there are a number of special goals to expand the practical activities of students. They are: to teach students to compare the phenomena given in nature with the information given in the textbooks; to provide additional learning materials for students to study natural phenomena, identifying their needs and interests for understanding; creating simulation situations so that students can apply their knowledge in practice; organization of situational games with students in order to teach them to overcome the difficulties that arise during excursions in nature, travel; create situations for working on questions and assignments that allow you to master the methods of knowing natural phenomena; transfer of actions related to natural objects to new objects; creating conditions for each student to understand the different aspects of the natural environment that surrounds them and to be able to perform practical actions related to that environment, and so on.

General competencies in the following disciplines are formed in the teaching of natural sciences in primary school:

1) Observation, identification, understanding and explanation of natural, socio-economic processes and events (including the names of planets in the solar system, natural processes and events, night and day, seasons) , should know about climate change, the nature of the Republic and its regions);

2) To be able to correctly use geographical objects, place names (in this case, students must be able to correctly say and write the names of places where they live, the names of regions and cities in Uzbekistan);

3) Practical use of globes, geographical atlases and maps (students should be able to show their homeland on the globe and map, the natural map of Uzbekistan should show the area where they live, the highest mountains, plains, rivers, and others in the country);

4) Nature protection and ecological culture (in this case, the student must have competencies such as the nature of the place of residence, natural resources, objects, their protection, their economical use). The general competencies in this subject are the same in the primary school classes "The World Around Us" and "Natural Science", but the requirements for them are determined in each class depending on the age of the students and the subject.

The following is the result of mastering the content of education in primary school students based on the experience of activities related to the formation of a system of basic and scientific competencies in the lessons "The world around us" and "Natural Science". (Figure 1)

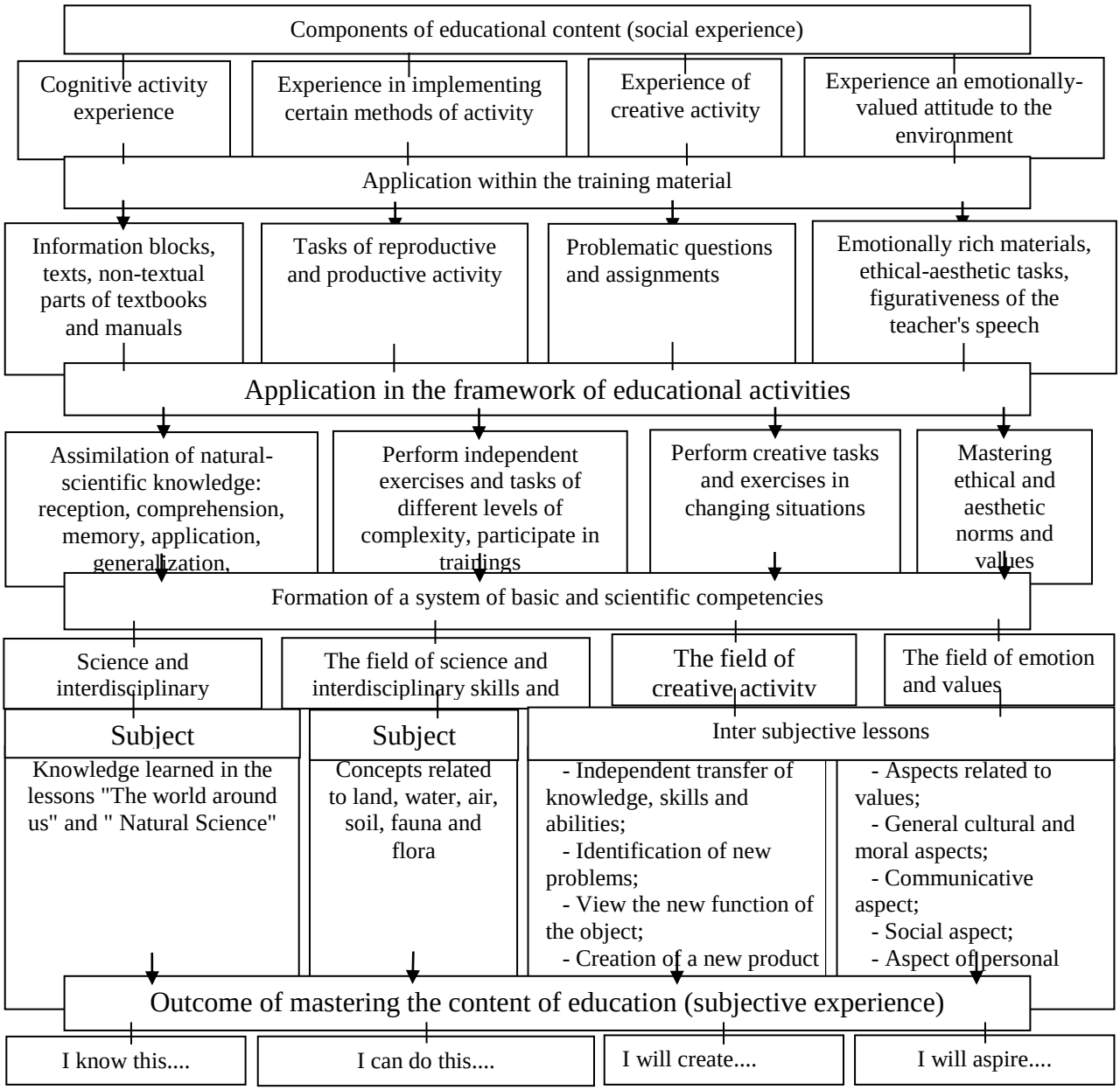

Figure 1. Experience in the formation of a system of basic and scientific competencies in the teaching of Natural sciences to primary school pupils

In the lessons "The world around us" and " Natural science", the following methods help to reduce the emotional pressure on students, increase their sense of enjoyment of nature and its phenomena:

1) Encouragement: application, praise, reward, gratitude;

2) Control: testing to determine the level of discomfort and calmness of the primary school student; monitoring the emotional state of the class and individual students in order to correct behavior.

In order to overcome the problems that arise in the lessons "The world around us" and "Natural science", it is necessary to ensure the following in the learning process: to equip the classroom in accordance with the objectives of the lesson; clear definition of the goals, objectives, methods and technologies used by the teacher, clear planning of the activities of the teacher and students at each stage of the lesson; problem-solving, developmental, practical tasks for students in the classroom; collaboration in lessons based on the topic, the use of technologies that encourage dialogue; effective use of heuristic and learner-activating methods in the classroom; organization of work situations on tasks

that encourage students to think independently; to repeat what they have learned, to create conditions for students to engage in creative collaboration with their classmates; correct distribution of time.

The organization of the lessons "The world around us" and "Natural science" on the basis of a competent approach is determined by:

1) Diagnostic nature of the purpose of the lesson, ensuring that the knowledge and concepts acquired by pupils are incorporated into practical activities;

2) Taking into account the ease of abstraction and assimilation of information in the description of educational materials provided to pupils in the lessons of "The world around us" and "Natural science";

3)The adequacy of the stages of mastering educational materials to the structure of the didactic process;

4) Introduction of new tools, methods and technologies in the educational process, as well as ICT, information methods;

5) The ability of the teacher to effectively use innovative technologies in the teaching process;

6) Ensuring personal motivation in the activities of teachers and learners;

7) To ensure that in each lesson there are tasks that serve to form communicative competence in students, and others.

In the lessons "The world around us" and "Natural science" pupils are taught the subject in several stages:1) Theoretical knowledge of nature;

2) Topics related to the study of the environment;

3) Assignments for the development of practical activities of pupilss in the development of the environment;

4) Exercises that serve to form creative activity in students;

5) Types of work that expand the opportunities of natural science to create practical experience for pupils.

Based on the above considerations, the content of the teaching materials presented in the lessons "The world around us" and " Natural science" are as follows:

Figure 2

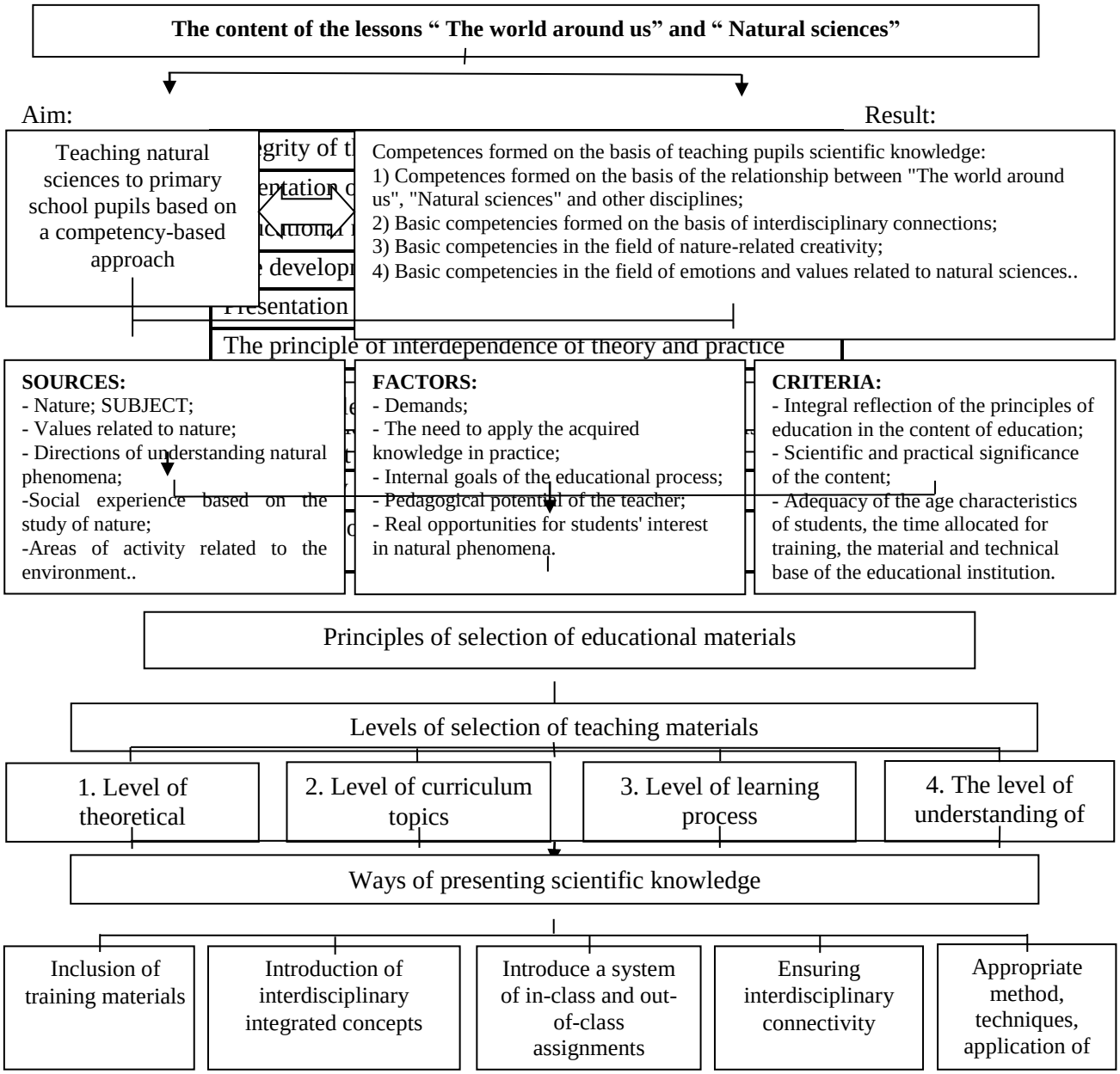

Figure 2. Content model of teaching materials presented in the lessons "The world around us" and "Natural sciences"

During the research, we have used certain methods and techniques to convey natural science knowledge to students in the lessons "The world around us" and "Natural sciences". They are:

1) Description of lesson materials based on the existing knowledge and experience of students, trips to nature, solving problem-based tasks based on natural science, excursions, and others;

2) Effective use of the method of integration in the enrichment of students' natural-scientific knowledge and the formation of their skills of rational attitude to nature;

3) Formation of students' love for nature in the process of independent learning;

4) To instill in students a sense of love and respect for the nature of Uzbekistan, its priceless natural resources in the course of the circle;

5) Using of observations to teach specific aspects of the nature of Uzbekistan;
6) Observation of animate and inanimate nature in the lessons aimed at teaching students to communicate with nature, the organization of situations for their comparison;
7) To arouse students' interest in natural sciences through radio, television, Internet and other mass media, and others.
Extracurricular activities such as "Respect for Nature", "Nature and Man", "Birds are our friends" and by engaging pupils in them, a love for the riches of nature is awakened in them. Excursion classes are also important in this area. For example, it is recommended to organize a trip to the zoo or the Museum of Nature.

Analysis and results

The following methods were used in the experimental work aimed at teaching pupils love to the nature on the basis of a competency-based approach in the lessons "The world around us" and "Natural science": 1. The method of pedagogical observation. 2. The method of organizing questionnaires. 3. Conversation method. 4. Interview method. 5. Interactive methods (Ice breaking, brainstorming, boomerang, B.B.B., Problem solving, template lesson, cluster). 6. Pedagogical experimental method. 7. Mathematical statistics.

Table 2

“Indicators of the effectiveness of the methodology of teaching pupils science based on a competency-based approach in the lessons "The world around us" and "Natural sciences"

(after the experience in percentage**)**

№	Criteria	Experience group n_1=379			Control group n_2=361		
		high	medium	low	high	medium	low
	Know the names of the planets in the solar system	59	31	10	24	23	53
	Natural processes and events, the ability to distinguish day and night	52	30	18	21	27	52
	They know the seasons, the changes in the weather	51	34	15	22	26	52
	Knowledge of the nature of the Republic and its regions	49	37	14	25	27	48
	Geographical objects, place names are correct	56	29	15	26	25	49
	Be able to use globes, geographical atlases and maps in practice	54	30	16	24	27	49
	Know the nature and natural resources of the place where he lives	51	28	21	24	28	48
	Knowing the rules of protection of natural objects, their economical use	50	34	16	29	22	49
	Distinguish between pets and wild animals	50	35	15	23	27	50
	To know the names of birds and be able to care after them	53	29	18	25	29	46
	To know the names of plants and be able to care for them	54	33	13	24	28	48
	Herbariums can collect	50	34	16	25	25	50
	Be able to apply their knowledge of natural phenomena in practice	52	34	14	21	30	49
	To know the importance of water in nature	48	34	18	26	28	46
	Total:	**729**	**452**	**219**	**339**	**372**	**689**
	Average:	**52,1**	**32,3**	**15,6**	**24,2**	**26,6**	**49,2**

3- table.
“Indicators of the effectiveness of the methodology of teaching science to students on the basis of a competency-based approach in the lessons of "The world around us" and "Natural science"
(before and after the experiment)

Groups	Number of pupils	Levels of mastery before the experiment			Levels of mastery after the experiment		
		High	Medium	Low	High	Medium	Low
Experiment group	379	99	102	178	197	121	61
Control group	361	87	94	180	87	97	177

The diagram corresponding to these selections looks like this (3-4 diagrams):

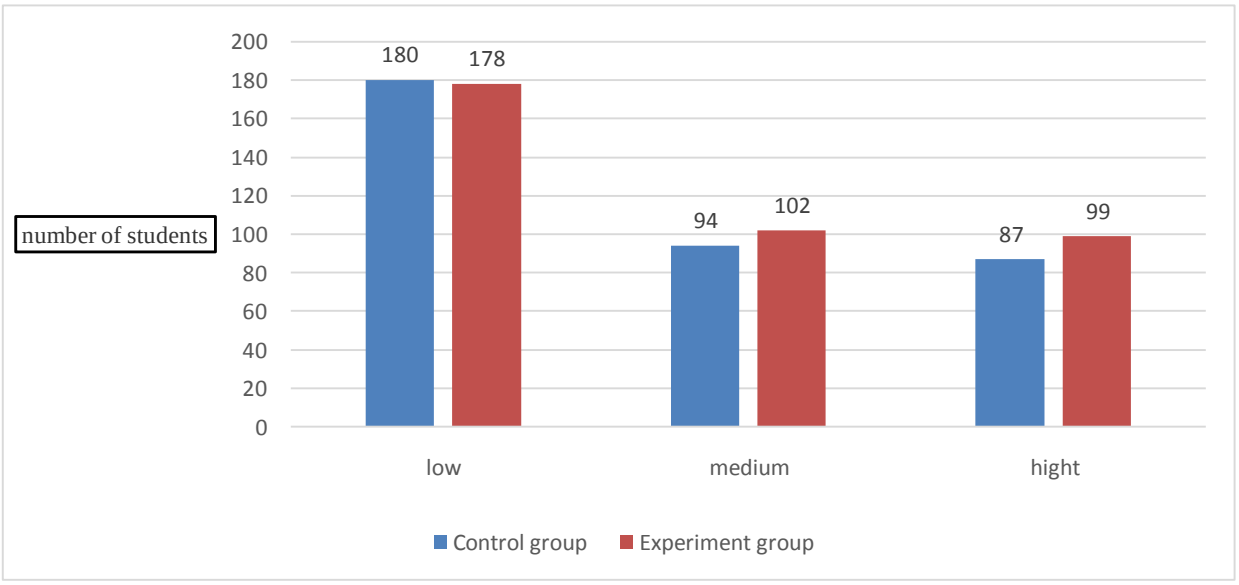

Diagram 3. Before experience

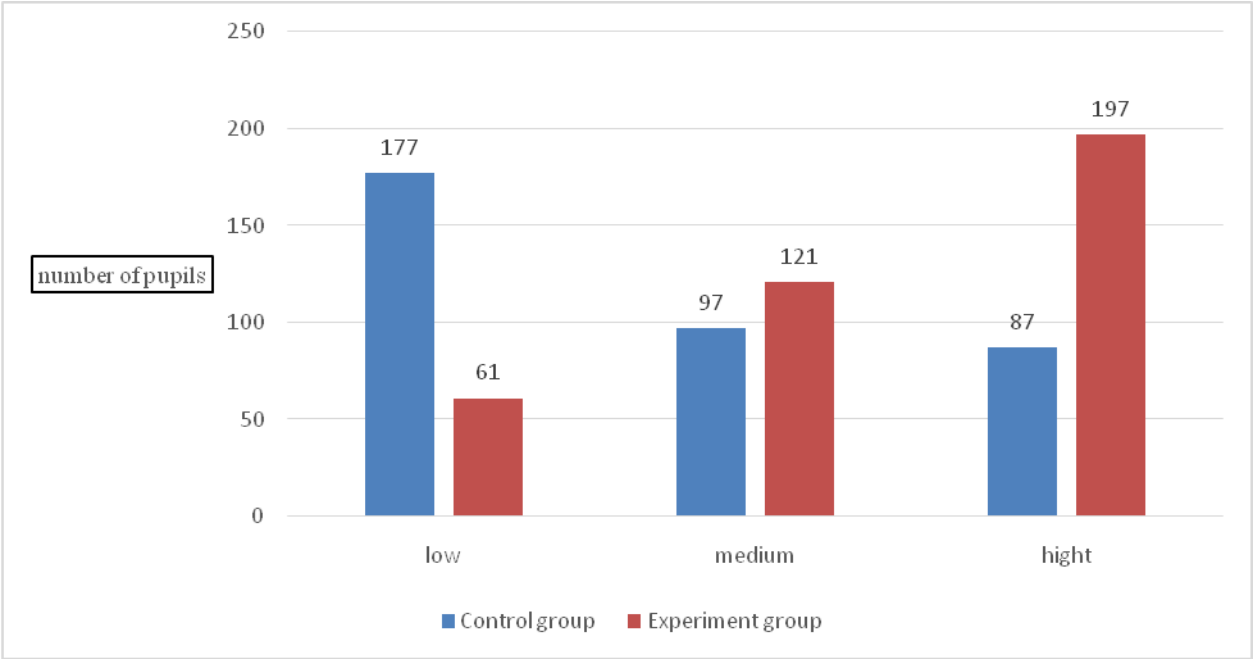

Diagram 4. After experience

Based on the above results, we have conducted a mathematical-statistical analysis of the experimental work. At the end of the analysis, the quality indicators of the results were as follows:

$$K_{усб} = \frac{(\overline{X} - \Delta_x)}{(\overline{Y} + \Delta_y)} = \frac{2{,}36 - 0{,}07}{1{,}75 + 0{,}08} = \frac{2{,}29}{1{,}83} = 1{,}25 > 1;$$

$$K_{ббб} = (\overline{X} - \Delta_x) - (\overline{Y} - \Delta_y) = (2{,}36 - 0{,}07) - (1{,}75 - 0{,}08) = 2{,}29 - 1{,}67 = 0{,}62 > 0;$$

From the results it can be obtained that the criterion for evaluating the effectiveness of teaching is suddenly large, and the criterion for assessing the level of knowledge is greater than zero. It is known that mastery in the experimental class is higher than mastery in the control group.

This means that our experimental work on the effectiveness of the methodology of teaching natural sciences to pupils on the basis of a competency-based approach in the lessons "The world around us" and "Natural sciences" is effective.

Conclusion/Recommendations

1. Improving the methods of teaching science to primary school pupils on the basis of a competency-based approach is an urgent methodological problem. It serves to form practical activities for students to have a conscious attitude towards nature, to enjoy its beauty, to appreciate natural resources, to help stabilize the relationship between nature and man, as well as to care for the environment.

2. As a result of the introduction of a competent approach to the process of studying natural sciences, the acquisition of knowledge and information about natural phenomena by primary school students expands the opportunities for practical mastery of practical actions related to them. It is based on certain principles in the organization of the process of teaching natural sciences to primary school students on the basis of a competent approach.

3. The process of teaching natural sciences to primary school students on the basis of a competency approach has its own pedagogical and psychological features, stages and structure, requires a clear definition of educational goals, systematization of tools and methods leading to the end result.

4. The content of primary education consists of 4 important components as learning materials that develop students' cognitive activity - knowledge; activities that allow you to perform activities - exercises; assignments that help to implement the experience of creative activity; emotions, the results of creative activity that allow the expression of values. These components of the content of education serve to realize in students the ability to "know", "implement", "aspire", and "create".

5. The introduction of a competency-based approach in the lessons "The world around us" and "Natural science" ensures the successful development of learners. In this process, students acquire theoretical knowledge and competencies related to science, as well as the ability to use them in real-life situations. Scientific competencies make it easier for them to apply the knowledge, skills and abilities acquired in the lessons "The world around us" and "Natural science" in familiar and unfamiliar situations.

6. Problem-solving tasks organized in the lessons "The world around us"

and "Natural sciences" play an important role in the teaching of natural sciences on the basis of a competent approach. In the process of solving such tasks, students should gain experience in solving problems. The main purpose of this is to apply the acquired knowledge in their personal experience and incorporate it into their practical activities.

7. In designing and organizing the lessons "The world around us" and "Natural science", it is necessary to systematize a certain number of educational tasks, taking into account the creative activity of students.

8. In the lessons "The world around us" and " Natural science" a wide range of problem-based tasks is given on the basis of the organization of learning situations that allow students to explore creatively. As a result of teaching natural sciences in primary school on the basis of a competent approach, the practical significance of the lesson increases. As a result, students' inner potential and new sides are opened. At the same time, they develop the skills of independent work, increase self-confidence, interest in the study of science, develop creative thinking skills, motivate them to prepare for future life.

9. The pedagogical activity and professional competencies of the teacher play an important role in providing students with natural sciences on the basis of a competent approach in the lessons "The world around us" and "Natural sciences". First of all, the teacher should have a good knowledge of natural phenomena, to arouse students' interest in it, to give them the opportunity to perform practical actions based on the knowledge acquired in the lessons of nature, to engage in creative collaboration with students. The teacher should make effective use of project technology when performing practical activities with students in nature, because this technology helps students to research, create herbariums, express their creative attitude towards birds and wildlife.

10. There are certain ways to apply a competency-based approach to the lessons "The world around us" and "Natural science". The methodological knowledge of teachers is important in the presentation of natural-scientific knowledge with the help of teaching materials.

11. The results of experimental work have shown that the improvement of methods of teaching science to students on the basis of a competent approach in the lessons "The world around us" and "Natural science" serves to increase the effectiveness of the pedagogical process in this area. As a result of teaching primary school students natural sciences based on a competency-based approach, they are rapidly developing practical creative activity experience. The results of experimental work aimed at the organization of the lessons "The world around us" and "Natural science" on the basis of a competent approach allowed to confirm the validity of the scientific hypothesis put forward in the study.

Based on the results of the study, the following recommendations are issued:

1. Development of recommendations and developments aimed at teaching pupils natural sciences on the basis of a competent approach in the lessons "The world around us" and "Natural sciences";

2. Organization of seminars, trainings, round tables for primary school teachers to improve their methodological skills in the organization of lessons "The world around us" and "Natural science" on the basis of a competent approach;

3. Creation of a set of tasks, texts in order to improve the system of teaching science to learners on the basis of a competent approach in the lessons "The world around us" and "Natural Science";

4. Development of a program of extracurricular activities in order to improve the methodological system aimed at teaching primary school pupils natural sciences on the basis of a competent approach;

5. It is expedient to include in the program of professional development courses for primary school teachers topics aimed at improving the methodology of teaching science to the learners on the basis of a competency-based approach.

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