

The background is a solid green color with a subtle gradient. It features several white line-art icons: two open books, two pencils, and various geometric shapes (a circle, a square, a hexagon, and a diamond) arranged around the central text. The text is centered and reads:

**THEORETICAL AND
METHODOLOGICAL
FOUNDATIONS OF CONTINUITY
IN THE EDUCATIONAL PROCESS
OF PRESCHOOL AND PRIMARY
EDUCATION**

**ACADEMY OF APPLIED SCIENCES
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**THEORETICAL AND METHODOLOGICAL
FOUNDATIONS OF CONTINUITY IN THE
EDUCATIONAL PROCESS OF PRESCHOOL AND
PRIMARY EDUCATION**

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successful language development, socialization, and adaptation. Its implementation requires alignment of educational content, methods, forms of work, individualization, and multidisciplinary cooperation among specialists.

Filimonova T.V., Ph.D. in Pedagogy, Associate Professor

2.3. Theoretical and methodological foundations of continuity in the formation of natural science competence in preschool children and first-grade pupils

The development of pedagogical science in contemporary Ukrainian society necessitates the implementation and justification of new methodological foundations of education. The Laws of Ukraine “On Education” and “On Preschool Education” stipulate that the child must become the center of educational influence, with the primary goal being the formation of a socially active, creative, and humanistically oriented personality^{157 158}. In this context, the unity of educational influences throughout the entire period of the child’s personality formation acquires particular importance.

One of the priorities of modern education remains the reorientation of the education system toward human needs. All citizens must be able to learn throughout life and have access to a high-quality education system; these are the objectives toward which the efforts of specialists and officials in the field of education should be directed. Consistent acquisition of education is possible only through adherence to the principles of perspective and continuity between adjacent levels of education, particularly between preschool and primary education.

Continuity between educational levels, such as preschool and primary education, ensures uninterrupted acquisition of education. In the educational process, continuity is essential for creating a unified educational trajectory that extends from kindergarten to school. This process facilitates the child’s holistic personal development.

¹⁵⁷ Law of Ukraine “On Preschool Education” No. 2628-III dated January 1, 2021. Retrieved October 18, 2025, from <http://zakon2.rada.gov.ua/laws/show/2628-14>

¹⁵⁸ Law of Ukraine “On Complete General Secondary Education” No. 463-IX dated May 1, 2021. Retrieved October 18, 2025, from <https://zakon.rada.gov.ua/laws/show/463-20#Text>

In senior preschool age, children begin to actively develop such skills as curiosity, initiative, responsibility, creativity, and communication abilities. Primary school education builds upon these skills and further deepens them.

In the educational space, the term “continuity” implies the preservation of the main types of activity characteristic of preschool children when they enter primary school.

The transition between preschool and primary education levels must be gradual and seamless, as children need to undergo a period of adaptation. Such adaptation is feasible only if, during the first years of primary school, the activities that were central in kindergarten are continued and raised to a higher level. For the child, this makes adaptation significantly easier.

Education under present-day conditions poses an important task for educators: the implementation of a competence-based approach in the processes of teaching and upbringing. In general, natural science competence involves the child’s understanding of the natural environment as a holistic living organism in which all natural components – air, soil, plants, animals, and humans – interact in diversity, unity, movement, and variability.

In Ukraine, the concept of ecological education is regarded as an element of the state’s harmonious development and is currently becoming increasingly relevant as an official state document. Among the tasks of preschool education outlined in the concept is the formation of the foundations of natural-ecological competence, natural-ecological culture, and moral-value orientation of the personality.

Under modern conditions, scientific approaches to ecological education have been developed in the studies of R. Melnychenko, V. Tanska, Z. Plokhii, L. Prysiazhniuk, and S. Rudyshyn, who identified the psychological-pedagogical foundations of ecological education and upbringing^{159 160 161 162}. Conceptual provisions of the ecological direction in pedagogy have been further elaborated by H. Belenka,

¹⁵⁹ Melnychenko, R., & Tanska, V. (2018). Ecological competence of a teacher as a prerequisite for continuous ecological education and upbringing. *Scientific Notes*, (4/2), 271–275.

¹⁶⁰ Plokhii, Z. P. (2014). Forming ecological competence in junior preschool children: Teaching guide. Kyiv: Svitych. 144 p.

¹⁶¹ Prysiazhniuk, L. A. (2015). Familiarizing preschool children with nature: Environmental dimension. In *Current issues of preschool and primary education in the context of European educational strategies* (pp. 191–194). Vinnytsia: Nilan-LTD.

¹⁶² Rudyshyn, S. D. (2016). Ecological competence as a general competence of natural science teachers. *Ukrainian Pedagogical Journal*, (3), 12–17.

T. Naumenko, O. Polovina, L. Zaitseva, L. Ishchenko, and many other scholars^{163 164 165}.

Ecological consciousness shapes the individual's worldview, which is oriented toward preserving the natural environment for future generations while ensuring well-being. Ecological values, encompassing aesthetic, cognitive, practical, and ethical attitudes toward ecology and nature in general, influence the individual's behavior. A value-based attitude toward nature consists in the individual's understanding and awareness of a range of ecological problems and readiness to engage in various practical actions aimed at preserving the natural environment.

When examining the content of the key terms related to the research problem, we turn to the view of M. Holovan, who clearly distinguishes between the adjacent concepts of "competence" and "competency" in the educational process. According to the scholar, competence represents a set of interrelated characteristics of the child (knowledge, skills, abilities, and modes of activity). In contrast, competency is the possession of a corresponding competence, including the personal attitude toward it and the object of activity¹⁶⁶.

Thus, the concepts of competence and competency are more systemic and multicomponent in nature. O. Ovcharuk considers "competence" as a term that, compared to the well-established notions of "skills, knowledge, and abilities," represents a complex structure based on values and experience – both knowledge and personal qualities acquired through formal education and beyond¹⁶⁷.

Competence is realized at different levels and includes various mental operations (analytical, critical, communicative) as well as practical skills and common sense; it has its own classification and hierarchy¹⁶⁸.

¹⁶³ Belenka, H. V., Naumenko, T. S., & Polovina, O. V. (2013). Preschoolers about the world of nature: Methodological guide for educators of preschool children. Kyiv: Borys Grinchenko Kyiv University. 115 p.

¹⁶⁴ Zaitseva, L. I. (2012). Formation of scientific-practical experience in the sphere of natural-object environment in senior preschool children: Theoretical and methodological aspect: Monograph. Melitopol: MMD Publishing House. 381 p.

¹⁶⁵ Ishchenko, L. V. (2016). Pedagogical conditions for ensuring continuity in ecological education of children during the transitional period from preschool to junior primary school age. Scientific Notes of Uman State Pedagogical University, 58–63.

¹⁶⁶ Honcharenko, S. U. (1997). Ukrainian pedagogical dictionary. Kyiv: Lybid. p. 23

¹⁶⁷ Plokhii, Z. (2014). Ecological-developmental environment of a preschool educational institution: Innovative approaches. Doshkilne Vychovannia, (7), 6–10. p. 9

¹⁶⁸ Ishchenko, L. V. (2016). Pedagogical conditions for ensuring continuity in ecological education of children during the transitional period from preschool to junior primary school age. Scientific Notes of Uman State Pedagogical University, 58–63. p. 59

Having examined various interpretations of the content of “competence,” it can be asserted that they share a common core: knowledge, skills, and abilities that a person must possess, as well as the range of issues in which the individual is most knowledgeable. Equally important is experience, through which a person can successfully perform tasks in accordance with rules and norms.

Thus, knowledge, skills, abilities, the range of issues, and experience together constitute the factors that collectively define the content of competence. The primary orientation here is on meeting the needs and cultural demands of the individual related to practical activity, spiritual life, and communicative interests.

Most scholars emphasize that the substantive aspect of the term “competence” comprises three components (see Fig. 1).

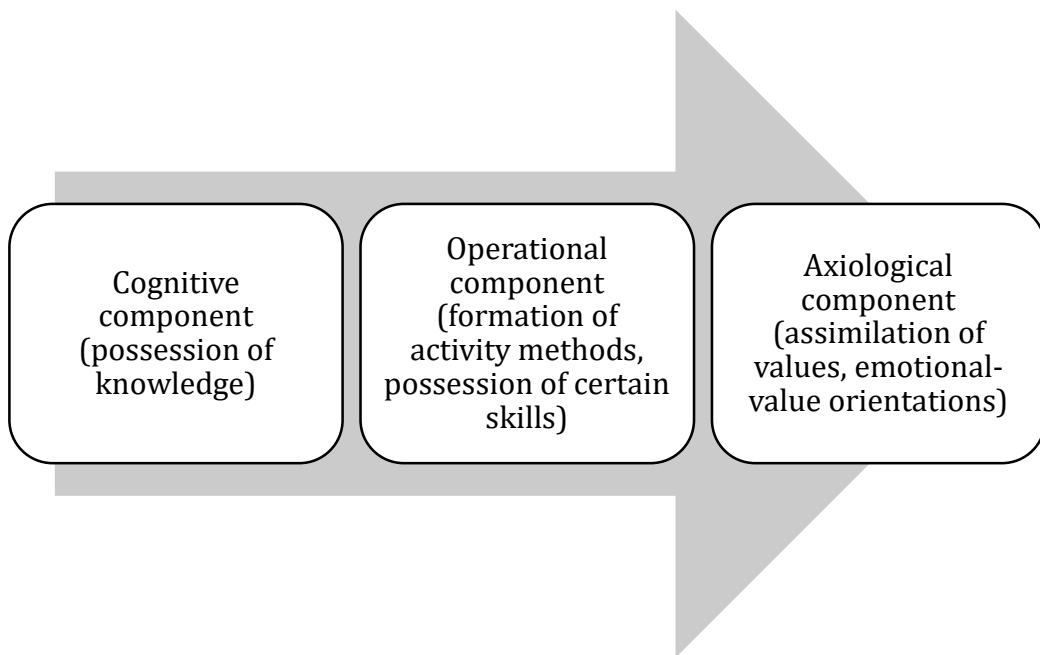


Fig. 1 – Components of the substantive aspect of the term “competence”

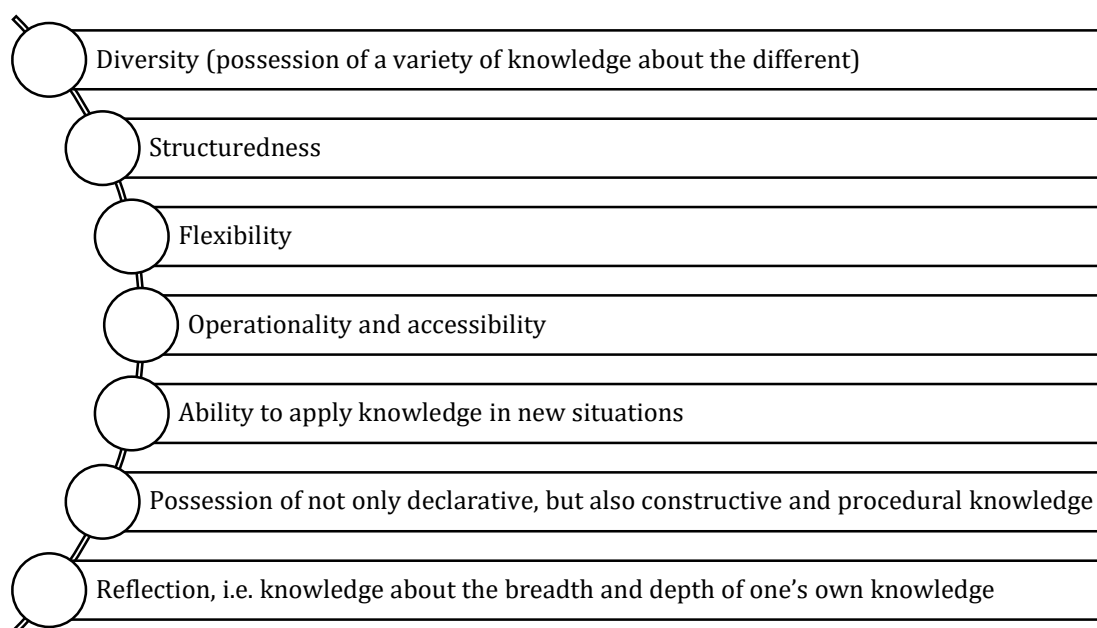
Having considered the content of competence, let us now analyze the next definition – “competency.”

For example, in the Basic Component of Preschool Education, “competency” is defined as a personal acquisition and outcome of preschool education that reflects a

system of interrelated components of the child's physical, social, mental, and spiritual development¹⁶⁹.

In contrast, in the Concept of the New Ukrainian School (NUS), the term "competency" is interpreted as a dynamic combination of knowledge, views, ways of thinking, skills, values, abilities, and other personal qualities that determine the individual's (child's) capacity to successfully carry out professional or further educational activities¹⁷⁰.

Among the interesting interpretations of the content of competency is the definition proposed by N. Oshurkevych, who regards "competency" as a special type of organization of subject-specific knowledge that enables the individual to independently make effective decisions. The scholar also emphasizes that such knowledge must meet certain requirements (see Fig. 2).



**Fig. 2 – Requirements for the content of “competency” according to
N. Oshurkevych**

¹⁶⁹ Implementation of continuity in natural science education: Realities and prospects: Collection of scientific-methodological works / Ed. by R. K. Melnychenko, O. A. Sorochnytska, & V. V. Tanska. (2018). Zhytomyr: O. O. Yevenok Publishing House. 212 p.

¹⁷⁰ Lysenko, N. V. (2015). Eco-eye: A preschooler discovers the world of nature: Teaching-methodological guide. Kyiv: Slovo. p. 10

Thus, the primary and priority task of primary education is the comprehensive development of the child, their talents and abilities, key and cross-curricular competencies and skills in accordance with age-related and individual characteristics and needs; the formation of values; and the development of independence, creativity, and inquisitive curiosity.

Existing scientific definitions highlight the following essential characteristics of competency. First, competency enables effective decision-making based on formed knowledge, skills, and abilities. Second, a child with well-developed competencies is friendly and more advanced in their own abilities. Third, such a combination of knowledge and attitudes helps perform tasks with a high degree of self-regulation, self-assessment, and self-reflection while adapting to various circumstances.

Consequently, when the concept of “competency” is analyzed, the emphasis is on the effectiveness of mastering knowledge, skills, and experience, with particular attention to the qualities these knowledge, skills, and experience should possess. When competencies are examined as personal neo-formations, the structure, constituent components, and interrelationships among them become important objects of analysis. When the focus is on competences, a specific list of them is distinguished.

Scholars have developed a certain hierarchy of competencies that a preschool child should possess. For instance, according to I. Zimnia, the competency structure includes the following components: a) readiness to demonstrate competency (motivational aspect); b) possession of knowledge of the competency content (cognitive aspect); c) experience in demonstrating competency in diverse standard and non-standard situations (behavioral aspect); d) attitude toward the content of the competency and the object of its application (value-meaning aspect); e) emotional-volitional regulation of the process and result of competency manifestation¹⁷¹.

The system of competencies in education has a hierarchical structure, the levels of which are presented in Fig. 3.

¹⁷¹ Ishchenko, L. V. (2016). Pedagogical conditions for ensuring continuity in ecological education of children during the transitional period from preschool to junior primary school age. *Scientific Notes of Uman State Pedagogical University*, 58–63. p. 60

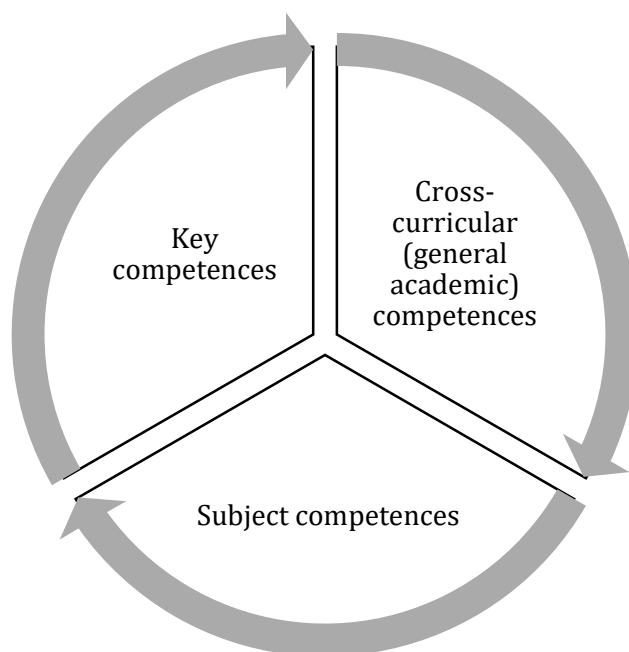


Fig. 3 – Hierarchical structure of competencies

Thus, key competencies also include cross-curricular and supra-curricular competencies. They are primarily manifested in the child's ability to perform functional and subject-specific types of activity. General subject-area competencies encompass the knowledge, skills, and abilities formed during the assimilation of the content of a particular educational domain from preschool through primary, secondary, and senior school; the child understands the role of a given domain in society and can practically apply the relevant skills within culturally appropriate activities to solve individual and social problems. Finally, subject-specific competencies constitute a component of general subject-area competencies and relate to a specific subject or discipline.

It should be noted that, drawing on the work of domestic psychologists, researcher I. Zimnia identified three groups of competencies. The first group comprises personal competencies – knowledge, skills, and abilities concerning the individual as a subject of life activity. The second group includes communicative competencies – the establishment of relationships and interaction with peers, adults, educators, teachers, and parents. The third group consists of activity-based competencies related to various types of the individual's activity¹⁷².

¹⁷² Ibid., p. 58

For example, H. Tarasenko distinguished three levels of competencies: key, general subject-area, and subject-specific¹⁷³.

Thus, based on the hierarchical systems examined, it is possible to trace the system of key competencies determined by the social system. This system varies across countries and depends on the values and worldview of each society. However, one of the clearly formed competencies in senior preschool children is natural-ecological competence.

According to the Basic Component of Preschool Education, “natural-ecological competence” is the child’s ability to behave appropriately in various life situations; it is based on an emotional-value attitude toward the natural environment and knowledge of the laws of nature and is formed through cognitive, exploratory, play, and labor activities¹⁷⁴.

Children with well-developed natural-ecological competence show curiosity about understanding the surrounding environment and their Motherland, are interested in phenomena and objects of planet Earth and visible objects of the vast Cosmos, respond emotionally to the natural environment while demonstrating respect for various forms of life, react positively to situations of interaction with different natural objects, and exhibit interest and activity in activities that ensure the cognition of nature and the formation of skills for appropriate behavior.

In other words, as S. Rudyshyn notes, preschool children already possess a well-formed foundation of knowledge, skills, and abilities¹⁷⁵.

Regarding natural science competence in preschool children, H. Chorna considers it essential that children have ideas about the nature of planet Earth and the Universe, understand that Earth is part of the vast Cosmos, and that its objects (stars, planets, comets, meteorites, etc.) are located very far away. Children of this age possess elementary notions about human exploration of space and know that Earth contains both non-living and living natural objects.

Meanwhile, L. Prysiashniuk points out that natural-ecological competence in senior preschool children includes awareness of the relationships between plants and animals and their functions in nature. The scholar believes that children at this age

¹⁷³ Tsytysura, S. M. (2018). Key competencies of the New Ukrainian School: Workshop-seminar. *Pochatkove Navchannia ta Vychovannia*, (25/26), 14–32. p. 23

¹⁷⁴ Implementation of continuity in natural science education: Realities and prospects: Collection of scientific-methodological works / Ed. by R. K. Melnychenko, O. A. Sorochynska, & V. V. Tanska. (2018). Zhytomyr: O. O. Yevenok Publishing House. p. 21

¹⁷⁵ Modern trends and priorities of the competency-based approach in training future specialists in preschool and primary education: Collection of scientific-methodological works / Ministry of Education and Science of Ukraine, National Academy of Pedagogical Sciences of Ukraine, Ivan Franko Zhytomyr State University. (2016). Zhytomyr: Polissia. Part 2. p. 13.

can establish the dependence of natural objects on ecological factors and understand the characteristics and conditions of plant development. Among these elements are knowledge of developmental phases, ecological factors, soil fertility, and care¹⁷⁶.

At the same time, natural-ecological competence includes numerous subcomponents, such as understanding the existence of animals (stages of development, dependence on habitat, reactions to natural changes). Children are aware of the classification of plants and animals into groups, distinguish between wild and cultivated plants, wild and domestic animals, and know the rules of behavior toward them.

Important knowledge, skills, and abilities at this age also include understanding the main characteristics of non-living natural objects – water, air, clay, sand, and stones – which the child can identify during elementary experiments in preschool institutions or primary school.

Children with well-developed natural-ecological competencies are aware of the role and characteristics of individual objects and properties, comprehend physical phenomena of the surrounding world (softness, hardness, flowability, viscosity, solubility; buoyancy, speed, direction), and confidently name artificial materials produced by humans from natural raw materials (rubber, metal, fabric, paper, plastic, etc.).

Most importantly, preschool children must know the signs of the seasons and natural phenomena.

Drawing on the Concept of Ecological Education of Ukraine, attention should be paid to the fact that one of the tasks of educational-upbringing activity in preschool institutions is the formation of the foundations of natural-ecological competence and moral-value orientations of the personality, which constitute the basis for understanding the essence of nature and one's own re-evaluated behavior within humanistic value guidelines toward nature¹⁷⁷.

Examining the Basic Component of Preschool Education, it is evident that key competencies play a significant role in preschool children's acquisition of new knowledge, skills, and abilities.

¹⁷⁶ On the Concept of Ecological Education in Ukraine: Resolution of the Collegium of the Ministry of Education and Science of Ukraine No. 13/6-19 dated December 20, 2001. Retrieved October 18, 2025, from <https://zakon.rada.gov.ua/rada/show/v6-19290-01#Text>. p. 2

¹⁷⁷ Rudyshyn, S. D. (2016). Ecological competence as a general competence of natural science teachers. *Ukrainian Pedagogical Journal*, (3), 12–17.

Key competencies are those required by every individual for personal fulfillment and development, active citizenship, social inclusion, and employment – competencies capable of ensuring lifelong success¹⁷⁸.

Therefore, it can be stated that the goal of the natural science educational domain in primary school is to form competencies based on the study of natural and ecological sciences. By mastering new knowledge, skills, and abilities, children will be able to successfully interact with nature in later life, thereby developing the foundations of critical thinking, safe behavior, and nature-conserving conduct.

In primary school, pupils can immerse themselves in the world of nature, gaining experience in its exploration, seeking answers to questions, observing the surrounding world, conducting experiments, creating learning models, demonstrating curiosity, and deriving joy from discovering nature. Building on the knowledge acquired in preschool institutions, the child in school systematizes natural science information, recognizes the diversity of nature and the interconnections among its objects and phenomena, explains the role of natural sciences and technology in human life, and behaves responsibly in the surrounding world.

Children with well-developed natural science competencies are able to critically evaluate facts, combine new experience with previously acquired knowledge, and creatively apply it to solve problems of a natural science nature¹⁷⁹.

Thus, based on the analysis of the literature, a unified definition has been formulated: “competency” is an integrative personal formation that closely combines skills, abilities, knowledge, personal qualities, and experience that characterize the capacity and readiness to solve tasks and problems arising in real-life situations while being aware of the significance of the activity, its object, and its result. Natural science competence, in turn, strengthens natural-ecological values, motivation for appropriate ecological activity, ecological awareness, and personal experience of active engagement in diverse situations.

Under present-day conditions, it is necessary to form natural-ecological consciousness, which encompasses convictions, values, views, respectful attitude toward the natural-ecological world, love for nature, responsibility, etc. Natural science competence implies the child’s possession of a system of ecological knowledge about nature and rules of interaction with it, as well as the formation of experience in ecological activity.

¹⁷⁸ Lysenko, N. V. (2015). *Eco-eye: A preschooler discovers the world of nature: Teaching-methodological guide*. Kyiv: Slovo. p. 10

¹⁷⁹ Zhyvirikhina, L. A. (2014). *Formation of ecological competence in preschool children*. *Tavriiskyi Visnyk Osvity*, (4/48), 69–75. p. 69

Analysis of pedagogical literature reveals that the term “continuity” presupposes a certain gradualness and consistency in the knowledge, skills, abilities, and modes of activity that a preschool child must possess “vertically” throughout the learning process¹⁸⁰.

For instance, in the Ukrainian Pedagogical Dictionary, S. Honcharenko interprets continuity in learning as consistency and systematic arrangement of instructional material, connection, and coordination of stages and levels of the educational-upbringing process, realized during the transition from one lesson to the next (within a system of lessons) or from one year of study to the next. A. Bohush holds a somewhat different view, asserting that continuity in the educational-upbringing environment enables class teachers to be better acquainted with preschool education and upbringing programs and to take into account the achieved levels of children’s development, learning, and upbringing across all program sections, incorporating them into further primary school work¹⁸¹.

In H. Hodina’s study aimed at ensuring continuity between the two educational levels, the following pedagogical conditions were identified:

- harmony of interconnection and transition in the tasks and content of program material (gradual expansion, complication, and deepening of knowledge, skills, and abilities acquired at the previous stage, with a prospective orientation toward the requirements of systematic learning in primary school);
- ensuring interconnection between play and learning activities;
- coordination of forms, means, and methods of organizing educational-upbringing work in preschool institutions and primary school;
- methodological unity regarding different types of children’s activity in senior preschool groups and first grade – creation of a unified educational-developmental environment for children;
- development of a unified targeted cooperation between preschool institutions, primary school, the community, and the family;
- enhancement of the professional-pedagogical competence of educators in both educational levels (preschool and school)¹⁸².

¹⁸⁰ Zaitseva, L. I. (2012). Formation of scientific-practical experience in the sphere of natural-object environment in senior preschool children: Theoretical and methodological aspect: Monograph. Melitopol: MMD Publishing House. p. 4

¹⁸¹ Bohush, A. (2006). Continuity between preschool and primary education levels as a pedagogical problem. Scientific Notes of Volodymyr Hnatiuk Ternopil National Pedagogical University. Series: Pedagogy, (2), 58–61. p. 58

¹⁸² Holovan, M. S. (2008). Competence and competency: Theory experience, experience of theory. Higher Education of Ukraine, (3), 23–30. p. 25

The pedagogical aspect of the problem of continuity determines its goal, content, methods, and forms, as well as the implementation of educational-upbringing tasks in preschool and primary education. O. Chepka states that continuity in learning activity is a concept characterized by interconnection and coordination of content, stages, and levels of the learning process, methods, techniques, and forms of its organization, whereby knowledge, skills, and abilities are formed in a specific order: each subsequent element of instructional material, being linked to and building upon the previous one, prepares the ground for mastering new material.

It should be noted that one of the ways to address the problem of continuity in the learning activity of senior preschool and junior primary school children is the search for the most appropriate means, methods, and forms of instruction, among which play-based methods are the most effective. Continuity in preschool and school education, as the author asserts, is characterized by the interconnection of the leading types of activity of senior preschool and junior primary school children, as well as by the coordinated work of educators aimed at forming the knowledge, skills, and abilities of senior preschoolers and first-graders on the basis of connection and coordination of content, methods, means, and forms of instruction in these two educational levels.

N. Manzheliy summarizes pedagogical approaches to the concept of “continuity” in the following provisions: broad interconnections in the content and methods of instruction; reliance on and development of prior knowledge and children’s skills; presentation of requirements that are feasible for pupils (in terms of methods and content, taking into account changes in the child’s personality development). We would add that the scholar interprets the term continuity from two interrelated perspectives: (1) from the standpoint of the dynamics of children’s development and (2) from the standpoint of the organization and implementation of the pedagogical process itself¹⁸³.

According to O. Kovshar, only through continuity is the integrity and ascending character of lifelong education achieved. In learning, continuity implies consistency and systematic arrangement of instructional material, connection and coordination of stages and levels of the educational-upbringing process, realized during the transition from one lesson to the next or from one year of study to the next.

Achieving continuity in school practice, as O. Kovshar notes, is ensured by methodically and psychologically substantiated construction of integrated programs and textbooks, adherence to the sequence from simple to complex in instruction and organization of pupils’ independent work, and the entire system of methodological

¹⁸³ Onishchenko, I. V. (2018). *New Ukrainian School – new content of education: Training. Pochatkove Navchannia ta Vychovannia*, (22/24), 24–27. p. 25

means necessary for establishing connections and correct correlations between parts of a subject at different stages of its study; these are the requirements placed on the knowledge and skills of learners at each stage, on the forms, techniques, and methods of explaining new material, and on all subsequent work aimed at its assimilation¹⁸⁴.

The scholar believes that “continuity in the system of continuous education is understood as the interconnection between its adjacent levels that ensures the possibility of holistic personality development at all stages of its formation”¹⁸⁵.

The New Basic Component of Preschool Education states that continuity and perspective in children’s development in preschool and primary education institutions are ensured by several factors:

- coordination and targeted unity in child development at the preschool and primary education stages;
- identification of principles, intentions, and approaches common to preschool and primary education that are adequate to age-related patterns and leading types of activity guiding child development;
- use of forms and methods of pedagogical work corresponding to children’s age;
- consistent enrichment of educational outcomes reflected in the formation of competencies in preschool and junior primary school children¹⁸⁶.

Thus, interpretations of the term “continuity” are quite diverse; nevertheless, most authors agree that “continuity” comprises three interrelated elements (see Fig. 4).

¹⁸⁴ Concept of the New Ukrainian School. (2016). Retrieved October 18, 2025, from https://mon.gov.ua/storage/app/media/zagalna%20serednya/nova-ukrainska_shkola-compressed.pdf. p. 2

¹⁸⁵ Ibid., p. 3

¹⁸⁶ Implementation of continuity in natural science education: Realities and prospects: Collection of scientific-methodological works / Ed. by R. K. Melnychenko, O. A. Sorochynska, & V. V. Tanska. (2018). Zhytomir: O. O. Yevenok Publishing House. pp. 34–35

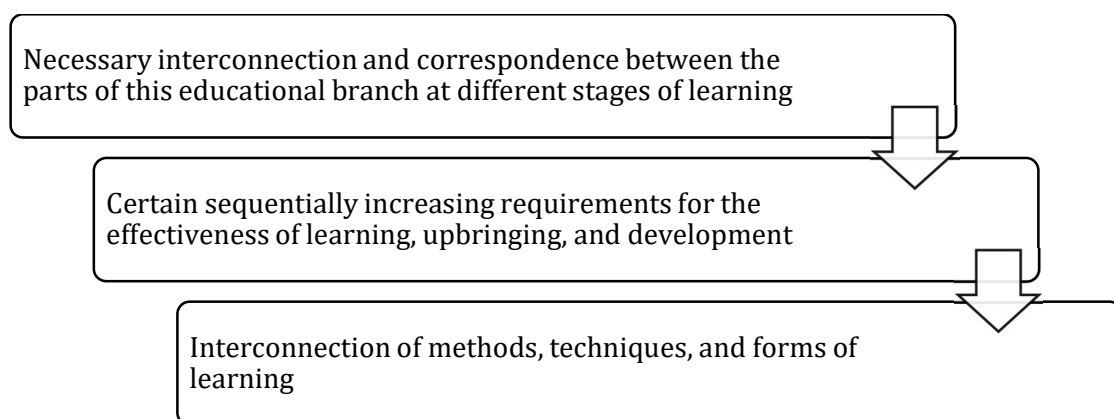


Fig. 4 – **Hierarchical structure of competencies**

Therefore, the implementation of the principle of continuity today contributes to successful preparation of the child for school, which can be achieved in various ways: through the system of preschool education or through organized classes for children not covered by public preschool education.

According to L. Ishchenko, preserving the child's subculture during the preschool period requires the use of play as the leading activity and the enrichment of the individual experience that the child has gained through all specifically child-oriented types of activity, including speech, communication, household, health-preserving, artistic-creative, and cognitive-exploratory activities¹⁸⁷.

It is precisely during the preschool years that the foundation is laid for the development of basic competencies and skills that a person needs throughout life. This involves the mutually complementary development of intellectual, emotional, and volitional qualities and processes, as well as the achievement of age-appropriate psychophysiological, physical, and psychological maturity. Such maturity enables the child to master a new social situation of development – the transition to systematic school education – and to acquire the new social role of a pupil together with the corresponding functions and actions that contribute to the formation of learning activity.

Thus, the maturity of personal qualities and mental processes ensures the successful development of learning skills at subsequent stages of school life. In junior primary school age, learning activity unfolds, building upon the age-related

¹⁸⁷ Kolomiets, L. I. (2012). The problem of ensuring continuity in teaching preschool and junior primary school children in the scientific heritage of L. S. Vygotsky. *Scientific Notes of Mykhailo Kotsiubynsky Vinnytsia State Pedagogical University. Series: Pedagogy and Psychology*, (3), 18–20. p. 19

achievements of the preschool period and requiring appropriate pedagogical methods and forms of work.

The principle of continuity in the content of natural science education between preschool institutions (ZDO) and primary school can be analyzed by comparing the preschool education program with the first-grade curriculum.

In preschool institutions, according to the program, children become familiar with objects of inanimate nature, learning, in particular, about the role of the Sun for living organisms and the importance of water and soil¹⁸⁸. Continuity in the study of inanimate nature is observed in Grade 1, where, building on the knowledge acquired, first-graders explore certain properties of water and soil and deepen their understanding of the significance of these natural objects. When studying the topic "Plants," preschool children realize that plants belong to living nature and learn to recognize plants of their local area. Upon entering school, they become acquainted with plant structure and learn to distinguish between trees, shrubs, and herbaceous plants as well as deciduous and coniferous trees. In preschool institutions, children are also introduced to the external characteristics of animals and taught to recognize and name domestic and wild animals, which serves as the basic foundation for further familiarization with the specific features of the life of domestic and wild animals.

The outstanding scholar A. Bohush believes that the criterion of continuity between preschool and primary education should include the school's inheritance of the system of relationships "educator-child" and "child-educator" as well as the activity-based and communicative aspects of the child's life at the preschool stage¹⁸⁹.

To clarify the state of implementation of the continuity principle in teaching natural science disciplines in preschool institutions and primary school, a comparative analysis was conducted of the preschool education program "I Am in the World" and the integrated course "I Explore the World" in order to identify the core natural science knowledge.

Thus, senior preschool children explore the topic "The Plant World." Colorful flowers, flowering bushes, and spreading trees attract children's attention. They approach them, gently touch the petals at the adult's request, smell them, run their hands over green leaves, imitate adults by watering the flowers, and memorize the names of some plants in their region. During this topic, they also become acquainted with various vegetables and understand that some vegetables grow underground

¹⁸⁸ Dudik, H., & Shablykina, V. (2007). Formation of ecological consciousness in children starts from early childhood. *Primary School*, (6), 19–24.

¹⁸⁹ Bohush, A. (2006). Continuity between preschool and primary education levels as a pedagogical problem. *Scientific Notes of Volodymyr Hnatiuk Ternopil National Pedagogical University. Series: Pedagogy*, (2), 58–61. p. 59

(potatoes, beets, onions) and perform different manipulations with the studied objects. When studying the topic “The Animal World,” the child spends a long time observing animals during walks, imitates their sounds, understands that some animals and birds can pose danger, and distinguishes animal movements. Finally, the topic “Natural Phenomena.” With the help of adults, the preschooler observes various weather conditions and phenomena. Children are able to establish cause-and-effect relationships, orient themselves in the properties of inanimate natural objects, distinguish the seasons, know their names and some characteristic features, and independently notice changes in nature.

Continuity in the educational process between preschool institutions and primary school is observed not only in content but also in the methods of teaching natural science. Thus, continuity in the learning process makes it possible to gradually increase the amount of knowledge, form a holistic idea of scientific knowledge in pupils, enables the teacher to apply productive teaching methods, and gradually increase the workload on pupils. To ensure continuity in the formation of natural science knowledge in first-graders, the following pedagogical conditions have been identified: taking into account the natural-ecological competence acquired by children in preschool institutions, using verbal and practical teaching methods and visual aids in lessons, and applying a variety of tasks for recognizing and distinguishing natural objects.

In the process of forming natural science competence in preschool children, educators primarily adhere to the following tasks: fostering a humane attitude toward nature, forming a system of natural-ecological ideas and knowledge about nature, and developing the ability to see and feel the beauty of the surrounding environment¹⁹⁰.

At a certain age stage, preschool children develop specific types of knowledge, skills, abilities, and natural-ecological competencies. For example, senior preschool children study plants, animals, and phenomena of inanimate nature; learn to identify them in space; and practice imitating the movements of plants and animals. At this age, analyzers such as visual and auditory ones are improved; the development of interest and attention to what is seen is important, as is the formation of a positive attitude toward them.

Thus, children have formed concepts about objects and natural phenomena that they encounter in everyday life. Educators in preschool institutions establish connections in children that they can cognize during classes, games, and object-sensory activity and reflect in the form of concrete ideas.

¹⁹⁰ Sukhorukova, H. (2013). Lessons of thinking amidst nature: Aesthetic complexes according to V. O. Sukhomlynskyi. *Doshkilne Vychovannia*, (9), 7–9. p. 7

For instance, when mastering new knowledge, children's cognitive activity is activated. They are taught to observe, identify individual features of plants and animals, compare objects, and group them according to external characteristics. Already at this age, children can begin to establish cause-and-effect relationships.

By the age of five, children have developed a higher form of visual-figurative thinking, which enables them to better assimilate generalized knowledge. By the time they enter school, children are taught the needs of animals and plants and their dependence on living conditions. Curiosity, love and caring attitude toward nature, observation skills, the ability to find beauty in nature, and interest in agricultural work are also developed¹⁹¹.

Senior preschool children develop richer and more diverse ideas about the plant world of Ukraine. They independently seek to become acquainted with garden plants that overwinter in the soil (narcissus, tulip, lily, iris) and can confidently identify and name early spring flowers (primrose, violet, anemone, snowdrop). Expanding knowledge about indoor plants and the specifics of caring for them is equally important, as is familiarization with medicinal plants (mint, wild strawberry, viburnum, cornflower, chamomile).

Drawing on the New Basic Component of Preschool Education, specifically the educational domain "The Child in the Natural Environment," it should be noted that senior preschool children are expected to have developed the following knowledge: general ideas about the nature of planet Earth and the Universe; understanding that their native Earth is part of the vast infinite Cosmos and that all its objects (stars, planets, comets, meteorites, etc.) are located very far away; elementary ideas about human exploration of infinite space; knowledge that on the blue-green planet Earth there are inanimate and living natural objects; awareness of the relationships between the plant and animal worlds and their functions in the natural environment; establishment of the dependence of all natural objects on ecological factors; understanding of the characteristics and conditions of plant development (developmental phases, ecological factors, soil fertility, care) and animal existence (developmental stages, dependence on habitat, reactions to seasonal changes); awareness of the classification of plants and animals into groups; knowledge that there are wild and cultivated plants as well as wild and domestic animals and the rules of behavior toward them; knowledge of the main properties of inanimate natural objects (air, water, sand, clay, stone) that can be identified during elementary experiments; awareness of the meaning of names and characteristics of individual

¹⁹¹ Belenka, H. V., Naumenko, T. S., & Polovina, O. V. (2013). Preschoolers about the world of nature: Methodological guide for educators of preschool children. Kyiv: Borys Grinchenko Kyiv University. p. 19

properties of objects and physical phenomena of the surrounding world (hardness, softness, flowability, viscosity, buoyancy, solubility; speed, direction, etc.); possession of the names of artificial materials produced by humans from natural raw materials (metal, rubber, fabric, plastic, paper, etc.); knowledge of the signs of the seasons and natural phenomena.

They realize that human life is impossible without nature; are aware of the negative and positive impact of humans on the natural environment, environmental problems (especially climate change), and the need to conserve energy and water, sort waste, etc., in everyday life and possess initial skills of such behavior; consciously use knowledge about nature in various types of activity and life situations; and are oriented toward human activities aimed at preserving, restoring, and protecting nature¹⁹².

However, based on this knowledge, according to the New Basic Component, children of this age should have developed the following skills: the ability to observe natural objects and phenomena of planet Earth and visible objects of the Cosmos; the ability to compare and group natural objects of the plant and animal worlds according to characteristic features; the ability, independently or with minimal adult help, to conduct simple experiments to explore the properties of natural objects, observe natural phenomena, notice changes in the state of nature and weather, and evaluate meteorological phenomena (air temperature, wind, precipitation, etc.); the ability to behave appropriately based on the assessment of natural phenomena and weather conditions.

With adult help, they are able to grow plants, care for pets, and look after them; demonstrate adherence to the rules of nature-appropriate behavior and skills of careful attitude toward resources; and respond to an adult's suggestions to preserve and improve the natural environment or provide assistance to living natural objects¹⁹³.

In the process of forming natural-ecological competence in preschool and junior primary school children, the principles of accessibility and scientific accuracy are primarily taken into account.

¹⁹² Implementation of continuity in natural science education: Realities and prospects: Collection of scientific-methodological works / Ed. by R. K. Melnychenko, O. A. Sorochynska, & V. V. Tanska. (2018). Zhytomyr: O. O. Yevenok Publishing House. p. 12

¹⁹³ Ibid., p. 13

For example, V. Harkushevskiy believes that scientific cognition of the world occurs when correct ideas are provided, children's sensory experience is involved, and relationships and connections between objects and phenomena are analyzed¹⁹⁴.

The principle of encyclopedicity should not be forgotten – that is, the use of material from different branches of natural science.

The local lore (*kraieznavchyi*) principle is also significant: it involves studying nature using local material and becoming acquainted with objects that are not present in the given area through visual aids¹⁹⁵.

The effectiveness of developing natural science competence also depends on properly selected methods. Visual methods include observation, examination of pictures, and demonstration of films. Practical methods include experiments, play-based methods, and labor. Verbal methods – educator's stories, reading of literary works, and conversations – are no less effective.

In scientific literature, observation is defined as planned, purposeful perception of phenomena and objects under the guidance of an adult or educator¹⁹⁶.

There are several types of observation according to the form of organization (individual, group, and collective), duration (short-term and long-term), and didactic purpose (introductory, repeated, and final).

L. Ishchenko emphasizes that the formation of natural science competencies occurs more effectively through observation during walks, excursions, games, and labor. Considerable attention is given to the educator's stories and conversations using demonstration pictures and films as well as reading literary works¹⁹⁷.

N. Kot draws attention to the fact that natural-ecological competencies are best developed during structured classes, which are the main form of organizing children's familiarization with nature. Classes are held at set times according to the program and a prepared plan. They are structured to develop children's speech and cognitive abilities in the process of becoming acquainted with nature and to foster interest in and love for nature.

¹⁹⁴ Harkushevskiy, V. S. (2016). Pedagogical conditions of continuity in the content of natural science-mathematical and special training of labor education teachers. *Psychological and Pedagogical Problems of Rural Schools*, (18), 30–37. p. 30

¹⁹⁵ Derkach, V. (2015). Current issues of continuity in the organization and content of preschool and primary education. *Primary School*, (10), 6–8. p. 6

¹⁹⁶ Hushlevska, I. (2014). The concept of competency in domestic and foreign pedagogy. *Path of Education*, (3), 22–24. p. 23

¹⁹⁷ Kolomiets, L. I. (2012). The problem of ensuring continuity in teaching preschool and junior primary school children in the scientific heritage of L. S. Vygotsky. *Scientific Notes of Mykhailo Kotsiubynsky Vinnytsia State Pedagogical University. Series: Pedagogy and Psychology*, (3), 18–20. p. 18

Therefore, as the scholar asserts, the main goal during a class is for all children to master the program material¹⁹⁸.

O. Maksymova's view is interesting: he believes that during excursions, preschool children can better understand the essence of certain natural phenomena and processes, which contributes to the better development of natural-ecological competence. An excursion, according to the scholar, allows children to communicate freely with nature in natural settings – in a garden, field, forest, or grove. Nature walks, which can be conducted with children of different ages, are also effective¹⁹⁹.

Familiarizing children with nature in kindergarten requires constant direct contact with it. One of the important conditions ensuring this process is the organization of a nature corner in the kindergarten. Children's observation of plants and animals and labor in the nature corner are organized throughout the entire school year. Labor in the nature corner is carried out every day. Children observe plants, gradually learn to treat them with care, acquire elementary labor skills, and are taught to work together – first with each other and then independently with adults.

The preschool institution has its own plot where children spend most of their time, especially in warm seasons. In general, the plot is a place for diverse interaction with the environment: walks, games, observations of plants and animals, and classes throughout the year.

Together with the educator, children grow and care for plants and gain concrete ideas about their development. In the process of caring for plants, preschool children develop the ability to correctly use tools for soil cultivation and plant care and cultivate a caring attitude toward nature.

An important component of forming natural-ecological competence is the constant familiarization of children with artistic words and literary works.

Deep interest in the surrounding natural space is fostered by information carefully selected by adults from ecologically oriented works – both artistic and popular science (e.g., by V. Sukhomlynskyi, D. Pavlychko, L. Kostenko, etc.) – as well as the adult's own stories based on personal experience of communicating with living nature. Children are especially fascinated when the topic concerns the animal world. Folk tales come to the foreground here. Young children listen spellbound to tales

¹⁹⁸ Melnychenko, R., & Tanska, V. (2018). Ecological competence of a teacher as a prerequisite for continuous ecological education and upbringing. *Scientific Notes*, (4/2), 271–275. p. 274

¹⁹⁹ Onyshkiv, Z. M. (n.d.). Continuity in educational-upbringing work with preschoolers and junior primary school pupils in the "preschool institution – primary school" complex. *Girska Shkola*, (1), 25–27. p. 26

about “Cunning Little Fox-Sister” and “Swift Wolf-Brother,” “Speckled Hen” and the turnip that was pulled from the ground with the help of the little mouse, and so on²⁰⁰.

Generations of children have grown up with these stories, which nurture love for plants and animals. A child deprived of fairy tales in childhood grows up harsh and cruel toward living beings. Such a person feels no pity, can easily throw a dog or cat out into the street when it is no longer needed, or even raise a hand against a loved one.

Natural-ecological games and their tasks enable the child to feel part of nature, respond to problems, and arouse the desire to help and protect nature from danger. Examples include “The Tale of a Little Cloud,” “From a Pure, Transparent Droplet,” “Why Does the Bird Sing So Merrily?” and others²⁰¹.

According to Z. Plokhii, plot-based games with natural-ecological content are no less effective; they help children become acquainted with human activities that protect and study the state of nature. Play performs an important role in the emotional-value formation and development of a responsible attitude toward the natural environment²⁰².

The most important result of a child’s play activity is a high level of emotional satisfaction with the process, which best corresponds to the needs and possibilities of cognizing the surrounding world and building harmonious relationships with nature.

When selecting natural objects and phenomena for play tasks and trainings, the child’s overall attitude toward the environment should be taken into account, as it shapes their attitude toward the objects of their immediate surroundings. Preschool children are particularly interested in search-oriented didactic games such as “Possible – Impossible,” “Who Prepares for Spring and How?,” “Snow in the Fairy-Tale Forest,” etc., as well as meditation games: “I Am a Little Cloud,” “I Am a Swift Rain,” “I Am a Strong Wind,” and others²⁰³.

To further expand preschool children’s natural-ecological knowledge today, it is recommended to conduct observation-based conversations such as “Rain and a

²⁰⁰ Plokhii, Z. (2014). Ecological-developmental environment of a preschool educational institution: Innovative approaches. *Doshkilne Vykhovannia*, (7), 6–10. p. 6

²⁰¹ Prysiashniuk, L. (2014). Ecological fairy tale in work with senior preschool children. *Doshkilne Vykhovannia*, (9), 20–24. p. 22

²⁰² Prysiashniuk, L. A. (2015). Familiarizing preschool children with nature: Environmental dimension. In *Current issues of preschool and primary education in the context of European educational strategies* (pp. 191–194). Vinnytsia: Nilan-LTD. p. 192

²⁰³ Prysiashniuk, L. A. (2016). Organization of active-effective cognition of nature by preschool children in the context of empowerment pedagogy. In *Current issues of preschool and primary education in the context of European educational strategies* (pp. 44–48). Vinnytsia: Nilan-LTD. p. 45

Bright Rainbow,” “Strong Wind, or How Air Moves,” “The Sun, Air, and Water Are Our Best Friends,” and others. Research-search activity occupies an important place in ecological education²⁰⁴.

Here, answers should not be given immediately but gradually; children should be encouraged to find the answers themselves. Children immediately become interested in solving problem-based and logical tasks on natural-ecological topics. This arouses cognitive activity and genuine interest in the environment. Examples include: “Who Runs Faster – the Rooster or the Sparrow?,” “Why Are Trees Bare in Autumn?,” “When Does This Phenomenon Occur?” Educators’ experience shows that rather complex nature-conservation topics can be introduced into the content of natural-ecological education of preschool children, such as “Let There Be Cleanliness on Earth,” “Rules of Behavior on the Street,” “The Famous Red Data Book of Ukraine,” “If Only Trees Could Speak.” To form natural-ecological competence in children, it is recommended to conduct a series of classes on topics such as “Medicinal Plants for Health and Strength,” “Vitamins for Health,” “The Danger of Waste,” “Healing Treasures of Mother Earth,” “Drinking Water of the Planet,” etc., during which children can become acquainted with the properties of natural materials and resources²⁰⁵.

An important goal of such classes is to help children realize that all natural resources are components of the living environment of various living creatures. The cultural criteria of senior preschool children’s interaction with the environment include natural-ecological ideas, the ability to establish causal relationships in nature, interest in natural objects and phenomena, emotional reactions to violations of their use, and the desire to observe norms and rules of behavior in the environment.

Using various methods, the educator must ensure that children, while performing a certain type of activity, are aware of its purpose and evaluate the results achieved. Increasing attention to the formation of natural-ecological competence in preschool children requires the search for diverse forms of familiarizing them with the environment.

One such form, which is still insufficiently used by educators in pedagogical practice, is the targeted nature walk – a convenient and useful form of organizing children’s leisure that involves pedestrian movement and enables familiarization with the immediate natural surroundings.

Thus, targeted walks bring variety to children’s lives, enrich their ideas, and allow them to better understand the natural environment of the area where they live:

²⁰⁴ Prysiazhniuk, L. (2014). Ecological fairy tale in work with senior preschool children. *Doshkilne Vykhovannia*, (9), 20–24. p. 24

²⁰⁵ Tarasenko, H. (2014). Ecology of childhood: Polylogue of scientific-pedagogical approaches. *Doshkilne Vykhovannia*, (5), 3–6. p. 5

forest, meadow, park, field, square, pond, or river. Such walks can be conducted not only for cognitive purposes but also for cognitive-practical ones – collecting berries or seeds of wild herbs to feed birds in winter. The difference between targeted walks and daily ones is that they take place outside the preschool institution. The volume of program tasks to be implemented during a targeted walk is significantly smaller than that of an excursion, yet the value of such walks lies in the fact that, thanks to their regularity, changes in natural objects can be traced and their causes identified.

A preschool child already possesses certain formed knowledge, skills, and abilities that they can use independently in life. Thus, children at this age are able to realize that human life is impossible without nature; are aware of the negative and positive impact of humans on the natural environment, environmental problems (especially climate change), and the need to conserve energy and water, sort waste, etc., in everyday life and possess initial skills of such behavior; consciously use knowledge about nature in various types of activity and life situations; and are oriented toward human activities aimed at preserving, restoring, and protecting nature.

The Concept of the New Ukrainian School notes that among the main natural-ecological skills formed in preschool children are the ability to observe natural objects and phenomena of planet Earth and visible objects of the Cosmos; the ability to classify and group natural objects of the animal and plant worlds according to characteristic features; the ability, independently or with minimal adult help, to conduct simple experiments to explore the properties of natural objects, observe natural phenomena, notice changes in the state of nature and weather, and evaluate meteorological phenomena (air temperature, wind, precipitation, etc.). Children at this age are capable of appropriate behavior based on the assessment of natural phenomena and weather conditions. With adult help, they are able to grow plants, care for pets, and look after them, demonstrating adherence to the rules of nature-appropriate behavior and skills of careful attitude toward resources, and they respond to an adult's suggestions to preserve and improve the natural environment or provide assistance to living natural objects²⁰⁶.

Thus, continuity in the educational process consists in the formation of natural-ecological competence in senior preschool children. Starting from the first grade, pupils, building on the knowledge acquired, develop research activity skills. Pupils learn to define the purpose of research, formulate hypotheses, choose and explain actions for studying natural objects, and determine possible results of observations and experiments. At this age, pupils plan research by suggesting a

²⁰⁶ Lysenko, N. V. (2015). *Eco-eye: A preschooler discovers the world of nature: Teaching-methodological guide*. Kyiv: Slovo. p. 13

sequence of steps during observation and modeling of selected natural phenomena and objects using the provided instruments and models. Pupils learn to analyze and substantiate research results, formulate conclusions, describe, and observe.

The final stage in using acquired natural competencies is pupils' self-analysis of their research activity, on the basis of which they describe and explain what they have learned, rejoicing in the discovery of something new and understanding that mistakes are an integral part of cognition.

Thus, the foundation of natural science competencies is ecological knowledge. It is through the assimilation of ecological knowledge that preschool children are informed about ecological problems and helped to become aware of ecological norms and values.

Modern natural-ecological knowledge includes key ecological ideas: the integrity of nature in the biosphere and the interconnection of all its components as well as the need to protect nature and its diversity. Therefore, the formation of ecological consciousness generates a personal attitude toward preserving the natural environment as a condition for the well-being of future generations.

Ecological values, which lie in aesthetic, ethical, cognitive, and practical attitudes toward nature, influence the individual's behavior. The individual's awareness of ecological problems and readiness to engage in various practical actions aimed at conserving and preserving the natural environment signifies a value-based attitude toward nature.

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2.4. Theoretical and methodological foundations of continuity in the formation of computer literacy in preschool and early primary school children

At the current stage of societal development, the issue of continuity between preschool and primary education remains one of the most pressing and complex challenges in the general education system. While preserving continuity with the preschool period, which is aimed at the comprehensive development of the child, the formation of moral norms, and the acquisition of social experience, primary school ensures the further formation of the child's personality and their physical, intellectual, and social development. It fosters a value-based attitude toward the state, native land,

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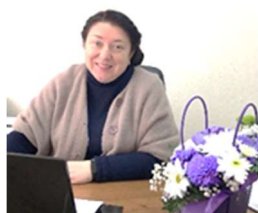
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