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Lecture № 2

METHOD “MOVEMENT – COORDINATION – LEARNING”

DIRECTION I: The “Smart Ball” Method

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Modern education is focused on creating conditions for the harmonious development of the child, which involves the integration of physical, cognitive, and emotional-social aspects of learning. According to the core principle of the preschool development program “*I in the World*”, which is based on an integrated approach to teaching, upbringing, and development, an important task is the formation of complex abilities in children, particularly physical and intellectual skills. One of the effective tools for achieving this goal is the *Smart Ball Method*, which relies on the use of ball-based physical exercises as the main instrument of development.

The relevance of this research is determined by the need to ensure optimal conditions for children’s development in accordance with their age-related and psychophysiological characteristics. Physical activity is a crucial factor in forming sensorimotor, cognitive, and social development, as the interaction between motor and mental activity stimulates memory, attention, thinking, communication skills, and motor coordination.

The material and technical support of the *Smart Ball Method* includes balls of various sizes and textures. The balls come in a wide color range of seven shades corresponding to the colors of the rainbow: red, yellow, green, blue, light blue, pink, and orange.

The surfaces of the balls may contain various illustrations, including:

- Animals – different types of animals such as kittens, puppies, elephants, birds, fish, etc.
- Plants – flowers, trees, leaves, and other natural elements.
- Geometric shapes – circles, squares, triangles, rectangles, and abstract patterns.
- Emojis and emotions – emoji faces expressing joy, sadness, surprise, and other emotions.



- Cartoon characters – characters from popular children’s cartoons and fairy tales.
- Numbers and symbols – letters, numbers, and various symbols for educational purposes.
- Space and nature – stars, planets, the sun, clouds, oceans, and mountains.
- Sports themes – football, basketball, volleyball motifs, or images of sports competitions.
- Marine themes – fish, starfish, coral, ships.
- Transport – cars, trains, airplanes, bicycles, etc.

Such illustrations make the balls bright and attractive to children, stimulating their interest in play and development.

As part of the research, a structural model for the comprehensive development of motor and cognitive abilities in older preschool children was developed. It is implemented through physical exercises with the priority use of balls. This model consists of four functionally interconnected components (Fig. 1):

1. Target Component – defines the goal, objectives, and expected outcomes.
2. Content Component – includes forms of activity organization, tools, and principles of implementing the method.
3. Procedural Component – contains teaching methods, ways of organizing children, and stages of implementation.
4. Result Component – provides for the assessment of the dynamics of physical and cognitive development as well as children’s social competence.

The target component includes the overall goal and key objectives (health-related, educational, developmental, and corrective). The Smart Ball Method aims to ensure the comprehensive development of children by integrating physical activity, cognitive learning, and social interaction. It is focused on strengthening health, developing motor skills, cognitive abilities, communication, and emotional resilience through playful ball-based exercises.



Structural Model of Comprehensive Development of Motor and Cognitive Abilities of Children in Physical Exercise with Priority Use of Balls

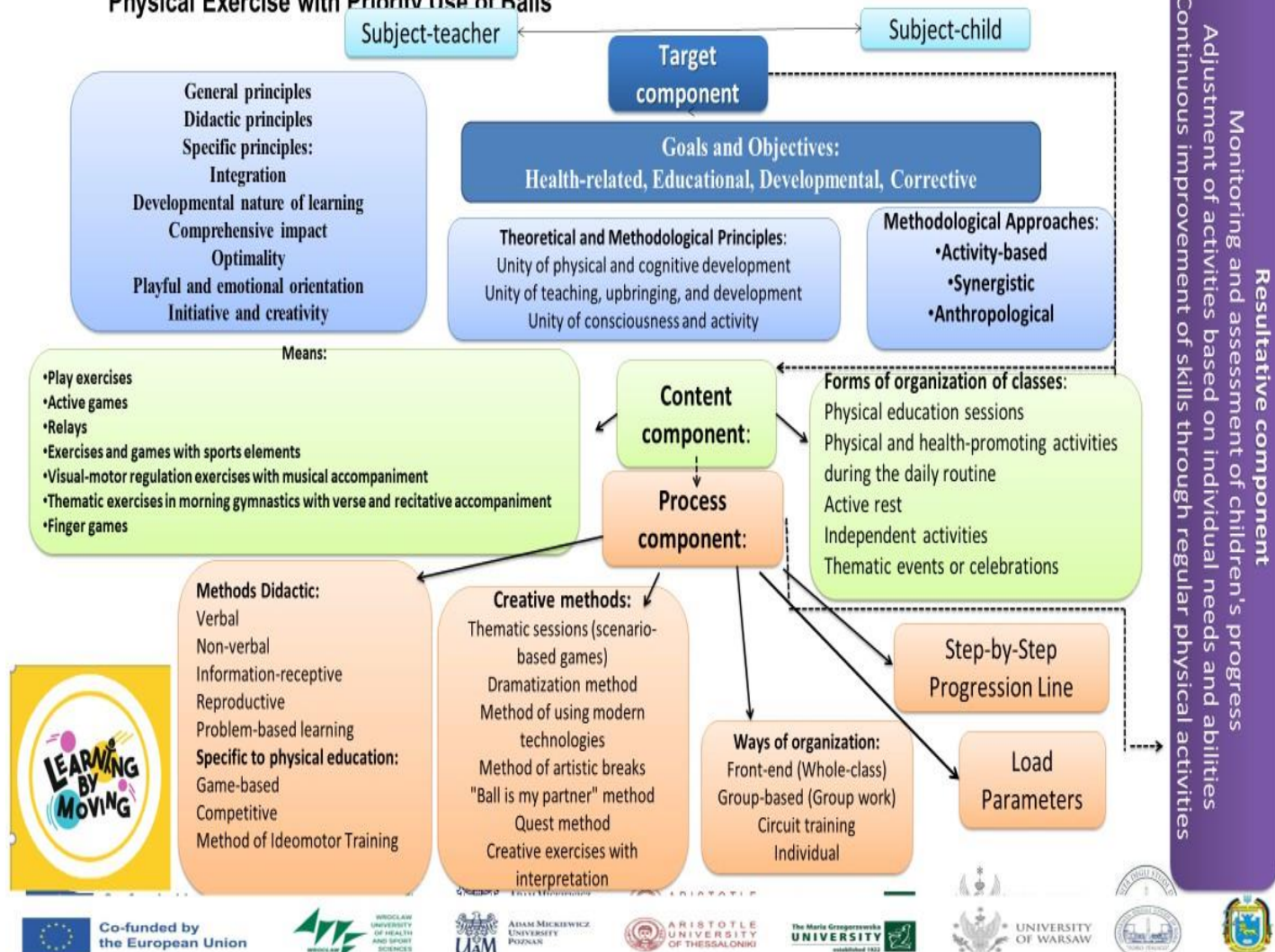


Figure 1. Structural Model of Comprehensive Development of Motor and Cognitive Abilities of Children in Physical Exercise with Priority Use of Balls

The objectives of the method can be divided into several key areas:

Health-Improving Area

- improving children’s physical health through active movement games;
- forming proper posture and strengthening the musculoskeletal system;
- developing coordination, balance, and motor skills;
- increasing endurance, speed, agility, and strength;



- strengthening the cardiovascular and respiratory systems.

Educational Area

- developing attention, memory, thinking, and imagination through interactive ball tasks;
- forming mathematical skills (counting, geometric shapes, spatial awareness);
- enriching vocabulary and developing speech (object description, structured expression);
- building teamwork and interaction skills through group games;
- using playful methods to support learning in natural and humanitarian subjects.

Developmental / Upbringing Area

- fostering discipline, responsibility, and self-organization;
- cultivating a positive attitude toward a healthy lifestyle and physical activity;
- developing social skills, communication, and mutual support in team games;
- developing emotional resilience and self-control;
- encouraging initiative and creativity in task performance.

Corrective Area

- improving fine and gross motor skills in children with developmental delays;
- correcting speech disorders through articulation exercises with the ball;
- developing sensory integration and movement coordination;
- supporting children with special educational needs through adapted exercises;
- reducing anxiety and stress through active games and relaxation techniques.

The content component of the method is based on the use of optimal forms of organizing motor activity (physical education classes, active recreation, independent activity) and specially selected tools that promote a child’s comprehensive development.

Means of the Method

Motor activities are adapted to the child’s age capacities and include (Fig. 2):

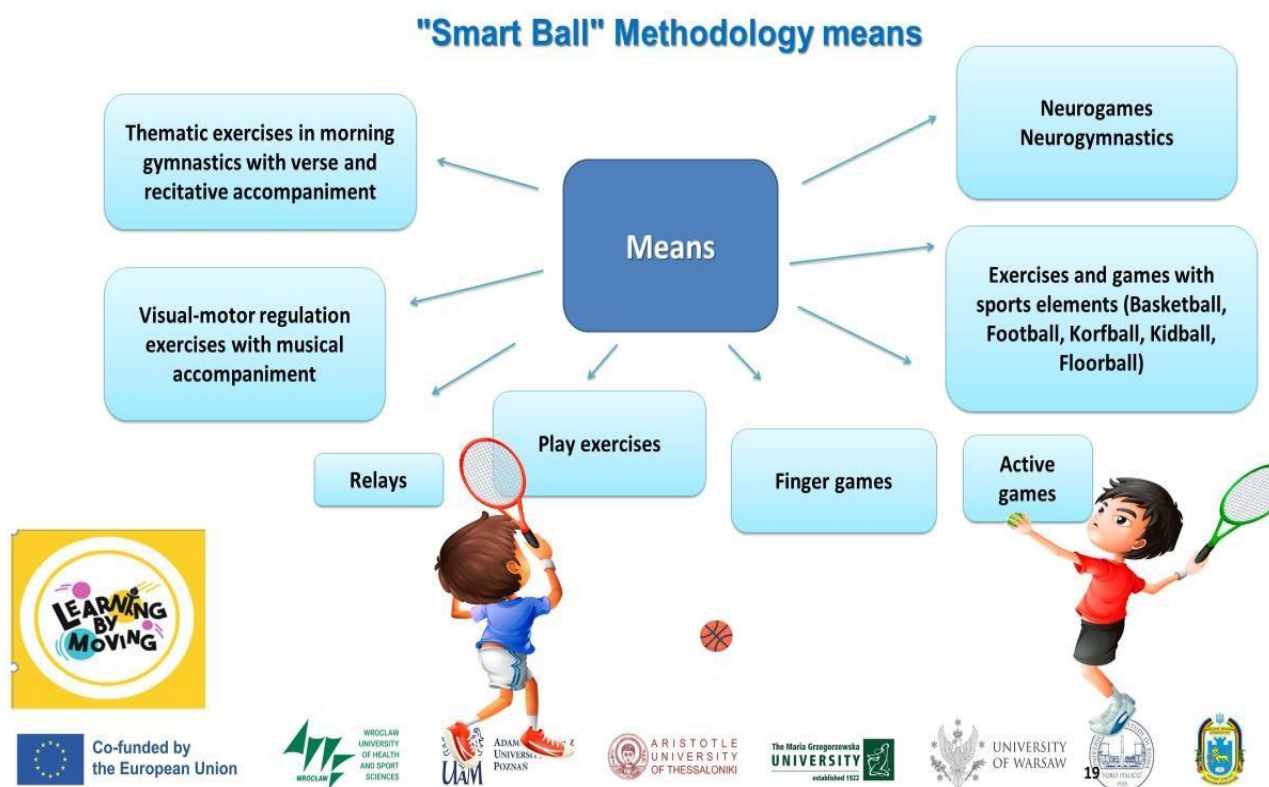


Figure 2. "Smart Ball" Methodology means

- Play-based exercises and movement games – develop motor skills, coordination, attention, and thinking;
- Relays – improve reaction speed, agility, and teamwork ability;
- Exercises and games with sports elements – expand the range of motor skills;
- Visual-motor regulation exercises (VMR) accompanied by music – promote sensory integration;



- Story-based morning gymnastic exercises with rhythmic or poetic accompaniment – stimulate speech activity and improve cognitive processes;
- Finger games with balls – support the development of fine motor skills, coordination, and cognitive abilities.

These games combine finger manipulation with balls, creating interactive playful tasks that enhance hand coordination, dexterity, and spatial awareness. Activities with balls can be performed both in place and in motion, either with direct physical contact or without contact.

The use of integral developmental balls is characterized by multifunctionality:

- Ball as an object (catching, passing, throwing, dribbling, bouncing, rolling, etc.);
- Ball as an obstacle (stepping over, jumping over, climbing over, etc.);
- Ball as a reference point: location of an object in space (up, down, left, right, in front, behind, in the middle), motor actions (run to, jump to, run around, crawl to, roll to, etc.), positional cues (in front of, behind, over, with, on, between, next to, under);
- Ball as support (under the feet, back, abdomen, etc.);
- Ball as a massager.

The ball is a multifunctional tool that can be used in various developmental and educational contexts. Below are some ways it can be used:

1. Play Object

The ball serves as the main attribute for active games and sports activities. It can be used in team games, relays, football, basketball, volleyball, tennis, and many others.

2. Developmental Tool

A ball can be used to develop coordination, motor skills, and balance in children. For example, throwing, rolling, or catching a ball improves motor skills, while balance exercises with a ball strengthen coordination.



1. Corrective Tool

For children with developmental delays, the ball can serve as a corrective instrument. For instance, it is used to improve fine motor skills, correct speech disorders (via articulation exercises), enhance coordination, and develop social skills.

2. Therapeutic Tool

Balls are used in physical therapy to restore mobility and muscle strength. Ball exercises improve physical condition, strengthen muscles, reduce stress, improve blood circulation, and release tension.

3. Educational Tool

A ball can be used as an object for studying physical properties (such as shape, weight, elasticity), and for performing tasks that help develop attention, memory, and thinking. For example, educational ball games enhance cognitive abilities by requiring concentration and quick reactions.

4. Tool for Developing Social Skills

Balls can be used to enhance communication skills in group or team games, teaching children cooperation, interaction, and team spirit.

The procedural component defines the teaching methodology, workload, ways of organizing children, and stages of implementation.

The method is based on the principles of differentiated instruction and progressive task complication, ensuring gradual increases in physical and cognitive demands.

Main Methods Used in the Smart Ball Method

- Play-based method – creates a motivational environment for movement activities;
- Problem-solving method – stimulates thinking, attention, and memory;
- Repetition and variation method – reinforces motor skills;
- Sensory-motor training method – develops coordination and spatial orientation;



- Associative learning method – combines movements with familiar images, enhancing imagination and motor activity;
- Contrast exercise method – alternates fast and slow movements, tension and relaxation exercises to develop coordination.
- Creative Methods Used in the Smart Ball Method

These methods stimulate children’s interest and develop their imagination and creativity:

Interactive storyline games. Children perform exercises within interactive games that make activities fun and engaging. The ball may act as a character, and exercises become “missions” to rescue or help it.

Thematic (scenario-based) lessons. Special thematic stories or fairy tales are created where children take on roles, and the ball becomes a key element. For example, in “Adventures in the Forest,” the ball could represent a magical stone that requires completing various tasks.

Dramatization method. Children perform ball exercises as part of a scene or play. This develops not only physical skills but also acting and communication abilities.

Use of modern technology. Interactive screens, video lessons, or digital programs can be used to help children train with the ball, receiving real-time feedback through mobile apps or computer systems.

Artistic breaks. Lessons incorporate music, dance, or drawing. Children may draw their ball movements on large sheets or create artwork inspired by motion. Movement games to music also develop rhythm and coordination.

“The Ball Is My Partner” method. Children imagine the ball as their partner. Together with the teacher, they may create a story about this “partnership,” encouraging imagination and active involvement.



Quest-based method. Physical activities can take the form of quests, where children complete ball-related tasks to progress to the next stage – for example, overcoming obstacles or collecting elements of a “treasure.”

Creative movement interpretation. Children, together with the teacher, can invent new, original ball exercises – such as creating a “new sport” or unusual ways of passing the ball in a group.

Load Management

Physical load levels are determined based on the children’s age and psychophysiological characteristics. Exercises are structured to maintain an optimal balance between physical and intellectual activity, ensuring high levels of motivation and preventing fatigue.

Considering the interrelation between physical and cognitive development, the primary emphasis was placed on those motor qualities that have the greatest impact on the formation of mental processes. This determined a scientifically grounded selection of optimal types of movements that correspond to the functioning of the nervous system and the psychomotor characteristics of children.

We conducted a study aimed at examining the correlation between motor and cognitive qualities.

The results of the factor analysis made it possible to determine the optimal proportions of means influencing the development of physical abilities. Based on these findings, the distribution of time for developing physical abilities during physical education classes was established as follows (Fig. 3):

Physical Ability Component	Percentage of Total Time
Coordination component	35%
Speed component	25%
Speed–strength component	20%
Strength component	10%
Endurance	5%
Flexibility	5%

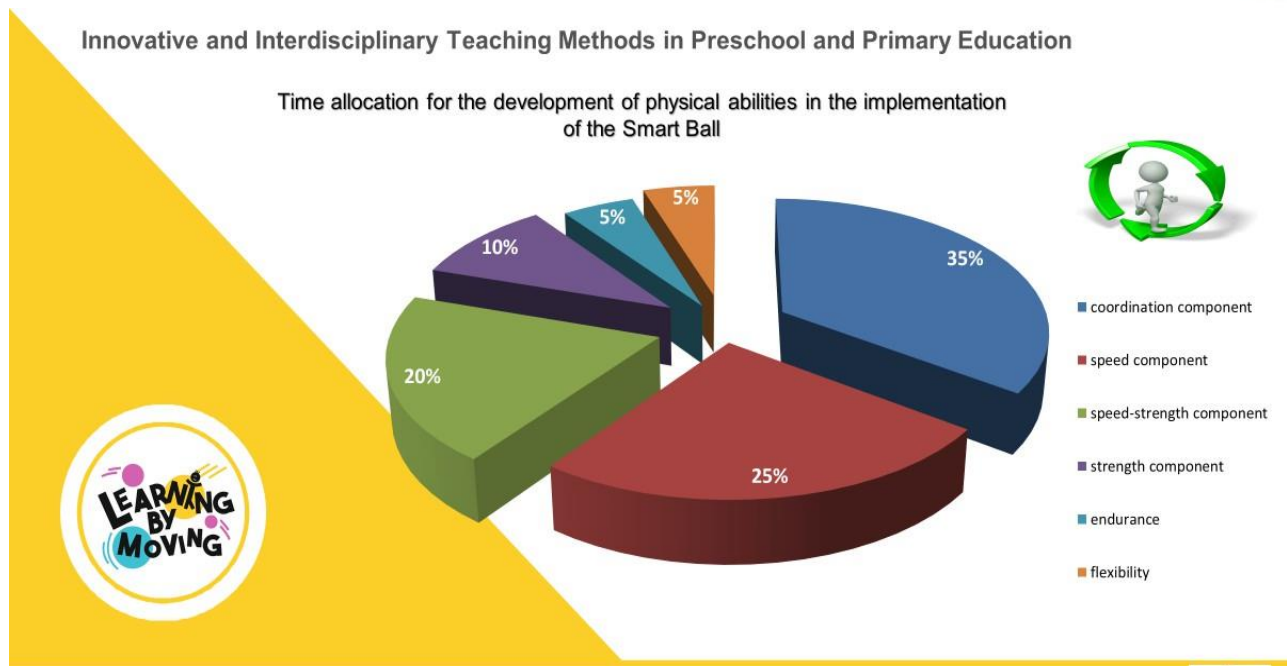


Figure 3. Time allocation for the development of physical abilities in the implementation of the Smart Ball

In the development of physical abilities, we placed special emphasis on those most closely related to the development of children’s cognitive processes. Thus, an evidence-based selection of the most appropriate types of movements was carried out — those that best correspond to the mechanisms of mental functioning.

Considering the psychophysiological characteristics of older preschool children, the most effective for development are:

- Coordination abilities – promote the development of spatial orientation, balance, and sensorimotor integration;
- Speed abilities – enhance the reactivity of the nervous system, positively influencing attention and operational thinking;
- Speed–strength abilities – develop accuracy and control of motor reactions, which is important for visual-motor coordination;



- Strength abilities – support overall physical development, increase resistance to fatigue, and improve the ability to maintain long-term concentration.

The development of these abilities is achieved through an optimal combination of physical activity and mental tasks, implemented via a specially designed mechanism integrating motor actions with cognitive challenges.

To ensure maximum effectiveness of the learning process, two main approaches to integrating physical and intellectual activity were identified:

1. Synchronous integration. Motor actions are performed simultaneously with didactic tasks. This approach is recommended for low-intensity exercises, as it allows the simultaneous engagement of cognitive processes (attention, memory, speech) without overloading the nervous system. *Example:* during slow walking, children may name the colors of the balls or count their steps.

2. Sequential integration. Didactic tasks are performed before or after physical load, which is optimal during moderate or high-intensity exercises. This approach helps maintain balance between physical and intellectual workload. *Example:* after active running, children complete a logical thinking task or perform speech exercises.

When selecting intellectual tasks, the key principles of the methodology aimed at the comprehensive development of preschool children were taken into account. Therefore, the content of the physical education program was supplemented with educational components in three main areas (Fig. 4).

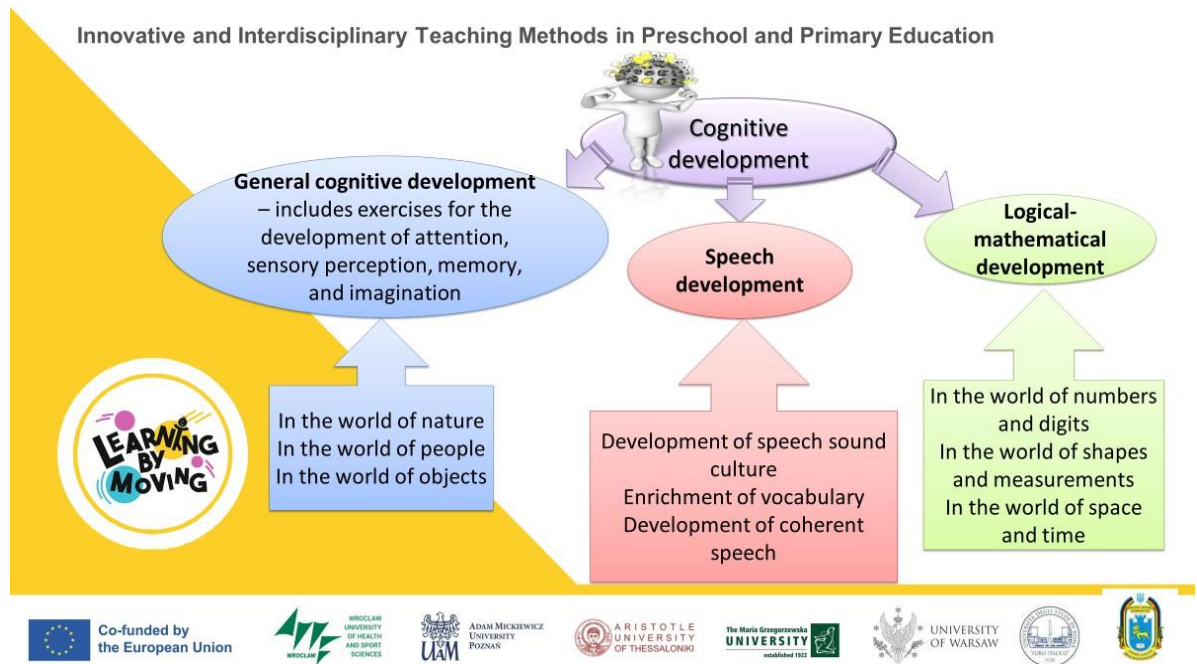


Figure 4. Main areas of cognitive development

1. General Cognitive Development

Includes tasks aimed at developing attention, sensory perception, memory, and imagination.

2. Logical–Mathematical Development

Integrates basic numerical and spatial concepts into physical activity (counting during movement, identifying directions, sorting by size or shape, etc.).

3. Speech Development

Provides the use of verbal accompaniment during physical exercises:

- rhymed instructions,
- speech rhythmization during movements,
- verbal reflections on actions performed,
- articulation and phonological tasks combined with movement



Short Summary of the Lecture

The Smart Ball Method is designed to support the harmonious development of children aged 5–10 by combining physical exercises with cognitive, speech, and social tasks. The ball serves as a multifunctional tool: a play object, obstacle, spatial reference, support, and means of sensory stimulation. The methodology is based on scientifically proven connections between motor and mental processes, which allows for an optimal distribution of physical training: coordination – 35%, speed – 25%, speed-strength – 20%, strength – 10%, endurance and flexibility – 5% each. Integration of physical and cognitive tasks is performed either synchronously or sequentially, depending on exercise intensity. The educational process is enriched with general cognitive, logical-mathematical, and speech development tasks. This method creates an engaging, creative, and effective learning environment that promotes the comprehensive development of the child.

Thank you for your attention!



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