**методика развития скоростно-силовых способностей у школьников**

**METHODS OF DEVELOPING SPEED AND STRENGTH ABILITIES IN SCHOOLCHILDREN**

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**Аннотация**

В статье рассказывается о том, как правильно развивать физические качества у школьников, особенно их силу и скорость. Подробно разбираются основные правила тренировок: почему важно заниматься регулярно, как правильно чередовать нагрузку с отдыхом, как постепенно усложнять упражнения и учитывать возраст детей. Отдельно говорится о том, что тренировки должны быть сбалансированными и подходить каждому ученику индивидуально. В материале описаны разные способы развития силы – от работы с максимальными весами до статических упражнений. Рассказывается про упражнения для развития скорости, включая прыжки, метания и работу с отягощениями. Также приводится классификация разных видов упражнений – от простых до сложных, от тех, что развивают выносливость, до тех, что помогают улучшить координацию. Объясняется, как правильно включать силовые и скоростные упражнения в обычные уроки физкультуры и как они влияют на другие физические качества. Эта информация будет полезна учителям физкультуры, тренерам и всем, кто работает с детьми. Она поможет им грамотно организовать тренировки, учитывая возраст и возможности каждого ученика.

**Annotation**

The article describes how to properly develop physical qualities in schoolchildren, especially their strength and speed. The basic rules of training are discussed in detail: why it is important to practice regularly, how to properly alternate exercise with rest, how to gradually complicate exercises and take into account the age of children. It is also said that the training should be balanced and suitable for each student individually. The material describes different ways to develop strength – from working with maximum weights to static exercises. It tells about exercises for developing speed, including jumping, throwing and weight lifting. There is also a classification of different types of exercises, from simple to complex, from those that develop endurance to those that help improve coordination. It explains how to properly include strength and speed exercises in regular physical education classes and how they affect other physical qualities. This information will be useful for physical education teachers.

**Ключевые слова:** физическое воспитание, скоростно-силовые способности, принципы тренировки, методы воспитания, силовые упражнения, развитие быстроты, физические качества, классификация упражнений, физическая подготовка.

**Keywords:** physical education, speed and strength abilities, principles of training, methods of education, strength exercises, speed development, physical qualities, classification of exercises, physical fitness.

In recent years, the problem of improving physical fitness has increasingly been associated with the search for new ways of teaching and training the most important physical and mental qualities, and increasing the effectiveness of pedagogical control.

Physical qualities are of great importance for the health of a child, his ability to master movements and coordination, increase the emotional positive state of the child's psyche, physical improvement and are the key to long-term working capacity. Most experts believe that "learning motor actions is difficult with insufficient development of motor qualities, and in some cases it is practically impossible" [4, p. 82]. The basis for high working capacity in all types of student activities is a good level of physical fitness.

A positive solution to this problem is most evident in working with school-age children, since school age is an effective period for managing the development of motor skills. A number of researchers believe that, based on the sensitive periods in the development of schoolchildren during natural growth and development, it is possible to achieve the best growth and positive changes in the education of each physical quality.

At school age, you can practice any kind of sport, but special attention should be paid to speed and strength exercises that help develop strength, improve posture, speed up metabolism, strengthen the cardiovascular system and boost immunity. School age is the most favorable period for the formation of motor qualities and the development of speed and strength abilities.

**1. Means and methods of physical education.**

Physical education helps to improve the physical fitness of schoolchildren, strengthen their health and develop their physique. The physical qualities developed in sports are transferred to everyday activities, improving mental and physical performance.

The process of education and upbringing depends on a system of principles that determine the methods of training and physical education. When educating students' speed and strength abilities, the teacher should take into account the following principles::

The principle of continuity. Classes should be regular, with minimal interruptions, so that students accumulate skills based on previous lessons. Violation of this principle reduces the level of development of physical qualities.

The principle of systematic alternation of loads and rest. It is important to properly allocate classes so that the rest between them is optimal, which contributes to more effective physical training of schoolchildren and achieving good results.

The principle of gradual increase of loads. The teacher should gradually increase the requirements for students, increasing the complexity of the exercises and the workload. The optimal load is one that exceeds the natural tension of the muscles, but without overexertion.

Three physical education lessons per week are enough for physical improvement, after which the load becomes habitual and progress slows down. Progress in the development of speed and strength abilities is possible only with a systematic increase in workload, but a sharp increase in its intensity can lead to overexertion and deterioration of students' results.

The principle of adapted load balancing. Training loads should not negatively affect the health of schoolchildren, their increase should correspond to the level of physical fitness of students, and strength and intensive loads should be temporarily reduced depending on the state of health and performance of students.

The principle of cyclical construction of classes. The training process is divided into cycles of different duration: microcycles (up to 2 weeks), mesocycles (2 weeks - several months), macrocycles (more than a year). Each cycle involves a gradual increase in the load, but without exceeding the permissible limits.

The principle of age adequacy. The workload should correspond to the age, gender, health, and level of education of the students. In high school age, the load should be moderate, aimed at strengthening the muscular system and improving overall performance.

Together with the principles of physical education of schoolchildren, the following training principles can be additionally used in the process of developing speed and strength abilities:

The principle of unity of general and special training. General and special training should be conducted in parallel, which will contribute to improving the level of physical development and health of students through the development of theoretical knowledge and practical skills. The development of one part of the body's system contributes to the improvement of its other parts, which improves overall physical progress.

The principle of undulation of load dynamics. High performance of students cannot be permanent due to many factors (health, fatigue, motivation, external conditions). To prevent overwork, it is necessary to regulate the loads, alternating them with rest periods and changing the dynamics of the loads — ascending stepwise or undulating, which will contribute to a faster and more effective recovery of the body and improve physical fitness.

The principle of individualization requires taking into account the individual characteristics of each child (motivation, physical and mental abilities, physiological differences). This principle is based on a differentiated approach to the duration of rest, intensity of exercise, form of exercise, frequency of body weight control, nutrition and other factors.

The principles considered determine the methods and means of physical education, their rational use.

The means of developing strength are gymnastic exercises with weights, jumping, strength exercises with small and large weights (dumbbells, kettlebells, barbell).

Methods of strength education:

The method of maximum effort. "Exercises are performed with extreme or near-extreme weights (90% of the maximum), 1-3 repetitions per series, 5-6 series, rest 4-8 min. The method of maximum effort promotes the development of maximum dynamic force" [2, p.34].

The method of repeated efforts: "weights 30-70% of the maximum, 4-12 repetitions, 3-6 sets, rest 2-4 minutes" [2, p.42]. It is most effective for building muscle mass.

"The dynamic effort method uses exercises with low and medium weights (up to 30%), 15-20 repetitions at maximum tempo, 3-6 sets, rest 2-4 minutes" [2, p.51].

The isometric method is "maximum static muscle tension of 4-6 seconds, 3-5 repetitions with rest of 30-60 seconds" [2, p.55]. Develops strength in static work.

Strength exercises should be combined with exercises to develop flexibility and muscle relaxation.

The education of quickness of movement is characterized by reaction time, maximum speed and frequency of movements. For this purpose, physical exercises with maximum speed, speed and strength exercises (jumping, throwing), outdoor games are used.

The main methods of speed education are: "Repetition of exercises at maximum speed (overcoming distance segments, running at an angle, throwing projectiles); Performing exercises in difficult conditions (lengthening the distance, running uphill, throwing heavy projectiles).

To improve speed performance, it is important to use exercises with near-maximum or maximum intensity, short duration and rest until breathing is restored" [2, p.61].

**2. Physical exercise is the main means of developing speed and strength abilities.**

At school age, various exercises are used to develop speed and strength abilities: jumping (athletics, gymnastics), throwing, pushing, high-speed movement and actions in outdoor games and martial arts. To increase the performance of speed and strength abilities, it is important to use exercises with the highest speed, while maintaining the correct technique, while the weight of the load should be no more than 30-40% of the maximum for each student.

For schoolchildren, it is necessary to use light weights or perform exercises without them (throwing a ball, jumping with a medical ball up to 1 kg). The number of repetitions in one series is 6-12, series 2-6, rest between them is 2-5 minutes. Exercises for developing speed and strength abilities should be applied regularly (2-3 times a week) throughout the school year. The amount of weight can be gradually increased as students grow up (from 1-2 kg in elementary school to 3-5 kg in secondary school).

Speed and strength exercises in the lessons are performed after exercises for developing coordination and learning motor actions. They are divided into three groups: speed (exercises with overcoming one's own weight and light conditions, as well as methods that promote the development of reaction speed); speed-strength (aimed at developing strength and speed at the same time, using weights and resistance of the external environment); force directions.

In general, the development of speed and strength abilities occurs due to an increase in muscle strength or speed, with the greatest increase achieved through strength.

The main means of physical education of schoolchildren are physical exercises, natural and hygienic factors.

Physical exercises are motor actions organized to solve the tasks of physical education.

There are several classifications of physical exercises. One of the most common is based on their effect on physical qualities: "Speed and strength (sprinting, jumping, lifting the barbell); Endurance (long-distance running, cross-country skiing); Coordination and other abilities (acrobatics, gymnastics); Complex (wrestling, sports games)" [3, p.137].

There are particular classifications of physical exercises in individual disciplines. In biomechanics, exercises are divided into: static; dynamic; cyclic; acyclic.

In physiology, exercises of maximum, submaximal, high and moderate power.

Cyclic movements consist of elements that are repeated in the same sequence (walking, running, swimming). Acyclic movements do not repeat in a fixed order and have completed phases (jumps, somersaults).

Non-standard movements depend on the conditions in which they are performed, and are divided into: Martial arts, where the choice of movements depends on the actions of the opponent; Sports games where the difficulty is determined by the number of participants, the size of the field, the speed and duration of the game.

Physical exercises are also divided into basic and additional ones.

Main: Exercises with the weight of external objects: barbells, dumbbells, kettlebells, stuffed balls, partner's weight; Exercises with the weight of your own body; Creating tension due to body weight (pull-ups, push-ups, balancing); Adding external weight (belts, cuffs); Weight reduction using support; Impact exercises with weight gain due to inertia (jumping from an elevation); Exercises with simulators (power benches, station Wagon); Jerk-braking exercises, with a rapid change of muscle tension-synergists and antagonists" [1, p. 82].

Additional: Exercises using the external environment (running and jumping uphill, on the sand, against the wind); Resistance exercises with other objects (resistance bands, rubber bands, balls); Exercises with the partner's opposition" " [1, p.84].

To develop students' speed and strength abilities in physical education classes, the following exercises can be used: "running with a high hip lift in the sand (15-30 m), jumping on soft ground (20-40 m), running uphill (15-25 m), jumping on two legs with a forward tilt (10-30 jumps), jumping out of a deep squat (16-20 jumps), jumping on one leg with forward movement (15-30 m), multiple jumps over obstacles (30-40 jumps), throwing and catching a stuffed ball (6-8 times), as well as bending and unbending the arms while lying down (5-7 times at a time)" [1, p.84].

It is important to perform all exercises in the zones of maximum and submaximal power, in combination with natural hardening factors, they help to increase the body's resistance to adverse environmental influences.

Speed-strength abilities are the ability to overcome resistance with a high rate of contractions, they manifest themselves in actions where not only strength is required, but also speed of movement. The development of other abilities largely depends on the development of this ability, as a rule, speed and strength exercises are used at all stages of age development of schoolchildren. Having analyzed scientific, methodological and special literary sources, we can state that speed-strength abilities are a kind of combination of speed and strength abilities. They are based on the functional features of the muscular and other systems, allowing them to be carried out along with significant mechanical force, which also requires significant speed of movement.

Speed and strength training cause certain biochemical changes in the trained muscles. From an energy point of view, speed-strength exercises are anaerobic and they are characterized by anaerobic power and maximum the most significant age-related changes in the body, including in the development of physical qualities. The development of speed and strength qualities occurs from the age of 9 to 18, with the highest growth rates at the age of 14-16.

To develop speed and strength qualities, the following methods are used: maximum effort, unintentional effort, dynamic effort, "shock" method, static effort, statodynamic method, circuit training and game method. Effective means for developing speed and strength abilities are: exercises with external weights, with their own weight, with simulators, jerk-braking exercises, with the opposition of a partner, using the environment and the resistance of other objects.

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