

ORGANIZATION OF THE MATERIAL BASE OF NATURAL SCIENCES OF PRIMARY EDUCATION

Elmuratova Nilufar Maxmudovna

**Senior lecturer of the Department of "Humanities and Natural Sciences" of
the ISFT Institute**

Abstract: The organization of the material base for natural sciences in primary education is crucial for fostering hands-on, inquiry-based learning. Essential resources such as tools, visual aids, outdoor spaces, mini-laboratories, and digital technologies create an engaging environment where students can explore scientific concepts. Well-organized materials promote critical thinking, curiosity, and environmental awareness by linking theory to real-world experiences. Proper planning, maintenance, and teacher integration ensure effective use of resources, enhancing scientific literacy and problem-solving skills.

Keywords: Material base, natural sciences, primary education, inquiry-based learning, hands-on activities, scientific literacy, educational resources.

The organization of the material base for natural sciences in primary education plays a critical role in fostering an effective learning environment and ensuring that students grasp foundational scientific concepts. Natural sciences, encompassing biology, physics, ecology, and chemistry, require not only theoretical instruction but also practical, hands-on experiences to make learning meaningful. A well-organized material base serves as a foundation for developing scientific skills, sparking curiosity, and facilitating the exploration of natural phenomena. It includes educational tools, equipment, visual aids, laboratories, outdoor facilities, and digital resources—all of which need to be carefully planned, maintained, and integrated into the curriculum to achieve learning objectives. A well-structured material base

begins with the provision of essential physical resources. For primary education, classrooms must be equipped with age-appropriate tools, such as microscopes, magnifying glasses, thermometers, and measuring instruments. These tools enable students to observe and experiment with real-life objects and processes. For instance, magnifying glasses can allow students to examine the details of a leaf's structure or the texture of soil, while thermometers can help them learn to measure temperature variations. Hands-on activities that rely on such tools are more effective in teaching scientific skills than mere theoretical instruction. At this stage, the tools and equipment should be designed with safety, simplicity, and durability in mind so that young learners can use them with confidence and under supervision.

In addition to tools, classrooms must include visual aids to support the teaching of natural sciences. Visual aids such as posters, models, charts, and diagrams provide students with a clearer understanding of scientific concepts. For example, three-dimensional models of the human body, solar system, or the life cycle of a butterfly can help students visualize abstract ideas. Such resources serve as powerful teaching tools, allowing students to understand complex phenomena in a simple and interactive way. Teachers can use these materials to explain topics more effectively, making lessons more engaging and comprehensible for young learners. Moreover, visual aids are particularly beneficial for visual learners, helping them connect theoretical knowledge to real-world applications.

Outdoor spaces are another crucial component of the material base for natural sciences in primary education. Nature is an open classroom that provides endless opportunities for exploration and discovery. Schools should organize gardens, small ecosystems, or even greenhouses where students can engage in observation and experimentation. For instance, a school garden can serve as a living laboratory where children learn about plant growth, ecosystems, and sustainability. Observing the germination process, measuring plant growth, and identifying parts of a plant in a hands-on manner foster critical thinking and problem-solving skills. Similarly, small

ponds or compost areas can provide opportunities for students to learn about water ecosystems and decomposition processes, linking theoretical lessons to tangible, real-life experiences. These spaces also promote environmental awareness, encouraging students to respect and protect the natural world.

Equally important to the material base is the inclusion of resources that promote inquiry-based learning. Inquiry-based methods encourage students to ask questions, investigate problems, and develop solutions through experimentation and observation. For this approach to be successful, schools must provide materials such as science kits, specimen collections, and experiment-based learning tools. For instance, science kits containing seeds, soil samples, and measuring instruments can help students study plant growth, while specimen collections of insects or rocks allow them to explore biodiversity and geology. Encouraging curiosity and scientific inquiry through accessible resources helps students develop essential skills such as critical thinking, problem-solving, and communication.

In conclusion, the organization of the material base for natural sciences in primary education is essential for creating a stimulating and effective learning environment. A well-organized material base includes physical tools, visual aids, outdoor spaces, digital resources, and inquiry-based learning materials, all of which complement theoretical instruction. These resources allow students to explore, observe, and interact with the natural world, fostering a deeper understanding of scientific concepts. Proper planning, maintenance, and integration of these materials are vital for maximizing their impact on learning outcomes. By prioritizing the material base, schools can lay a strong foundation for scientific literacy, curiosity, and problem-solving skills, preparing students for lifelong engagement with science and the natural world.

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