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METHODS OF CONDUCTING EXPERIMENTS AND EXPERIMENTS IN ORGANIZING STEAM ACTIVITIES IN PRESCHOOL EDUCATION

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ABSTRACT

This article describes the methods and advantages of conducting experiments in STEAM events organized for preschool education specialists in order to develop the creative abilities and logical thinking of preschoolers.

Keyword: creativity, imagination, curiosity, activity, emotions, initiative, mobility and flexibility of the child; formation of logical thinking, integrated education, STEAM technology, cognitive research activities

INTRODUCTION

In preschool children, there is a tendency to research, to conduct new experiments, curiosity, a desire to constantly experiment. The child seeks to know and has a lot to master knowledge "why?", "How?"questions. Research activity develops and strengthens the child's cognitive attitude to the world around him. Through free research and experiments, the child is formed as a creative person with an active life position, his own logical thinking. It is important for children to know. Cognitive research activities, first of all, allow the child to find answers to the following questions: How does this happen? Why exactly so? Why only take such actions? What will be the result of the action? Why is it so, not otherwise? [1]

How is the experiment carried out? When conducting experiments with children, it is necessary to adhere to the following plan: the goal is determined; a task is set; during the experiment, children are introduced to safety rules; a plan is drawn up for how to carry out the experiment; the choice of tools for solving the problem - the necessary tools and equipment for the experiment are selected. If the work is teamwork, it is necessary to separate the children and choose a responsible one. The formation of conclusions is the final stage of the experiment - drawing conclusions. The experiments are compared; the results are summarized and analyzed. Children learn to draw conclusions and analyze. Preparation for conducting planned experiments begins with setting current didactic tasks. The teacher invites the children to conduct an experiment, telling them the task in such a way that the children themselves determine what to do. Time is given to meditate, and then the teacher will attract children to discuss the process of the experiment. In the process of work, it is necessary to encourage children who are looking for specific ways to solve the problem, changing experience and experimental actions. At the same time, do not leave out of sight even those who work slowly, somehow lag behind and lose the main idea. Interestingly, children experiment without knowing the result of their work and thus gain new knowledge. The duration of the experiment is determined by many factors: the characteristics of the phenomenon under study; having free time; the state of children, their attitude to this type of activity. If the children are tired,

the experimental activity should be stopped before a predetermined time, on the contrary, if interest in the work is large, it can be continued beyond the specified time. [2]

In order to organize cognitive research activities in children, it is advisable to establish a separate small laboratory in the group and equip it. When conducting research activities in children 6-7 years old, the following experimental materials can be used: salt and sugar used in everyday life, flour, tea, chocolate; hygiene products; natural materials; plant seeds, nut shell, spikes; clay, soil; tree branches; colored paper; various fabrics, fur; cotton, threads; various containers, plastic containers; measuring instruments-scales, spoons, tape measure, ruler, hourglass, thermometer; sieve; sticks; colored glasses, rubber gloves.

When conducting an experiment, children should be warned about the need to comply with safety rules so as not to harm themselves and others. [3] It is necessary to conduct experiments only with the participation of the teacher and with his permission, to explain during the experiment that children do not touch their eyes, face with their hands, to leave the substances and objects being experimented on, not to be put in the mouth. The educator will first need to plan and equip cognitive research activities. Research activities are organized on the basis of the following topics:

Jonsiz jismlar va tirik organizmlarni, shuningdek, ularning xususiyatlarini o‘rganish.

- Review of physical phenomena (magnetic, light, electrical, sound properties).
- To study what a person creates with his own hands, for example, paper, fabric, etc.
- Checking your body (eyes, ears, nose, arms, legs, skin).

Simple experiments carried out during a trip to nature are carried out through collective observations. One of the most common methods for collective observation is to propose to compare the properties of objects - this is snow, water and ice. Invite children to look closely at water, snow and ice and ask them to tell how they are similar and how they are different; offer to compare which is heavier (water or ice, water or snow, snow or ice); their similarities (snow and ice melt); water and ice (water becomes clear, colder, increases in volume as ice melts); water and snow (water loses transparency, becomes colder, its volume increases, snow changes volume); snow and ice (do not affect each other, do not lose their properties when combined). [1]

It is important for the educator to develop various ways to carry out the cognitive research activities of the child. Children carry out the identification and solution of the problem through research. Research activity is natural for a child - he strives for knowledge, performs actions and looks at the result, experiments with objects, studies the causes of phenomena. Search and research activities are the main source of information about the objects around the child, therefore, the main task of parents and educators is to help conduct such research.[4] it is very important to help children choose the right topic for research and how to study it, as well as

collect data and present results. Preschool children will have an interest, a desire for constant experience, a desire to independently find a solution to a problem situation. The role of the educator is to organize and assist in these activities. When we talk about cognitive research activities, we understand the activities of the child directly aimed at understanding the structure of things, the connections between the phenomena of the surrounding world, their regulation and systematization. This activity begins in early childhood, initially representing a simple, as if aimless (procedural) experiment with things, in which perception is differentiated, the simplest categorization of objects by color, shape, purpose occurs, sensory norms, simple instrumental actions are mastered.[7] cognitive research activity in preschool childhood is to test the potential of any new material. Cognitive research activity at the age of 6-7 is characterized by the child's specific cognitive motives, understanding how things work, learning something new about the world, conscious intention to regulate his ideas about any area of life. The main methods of developing cognitive interest and research desire in preschool children are ICT; search and research work; project work; Game technologies.

Experiments are another form of research activity, the purpose of which is to change things and processes-that is, an example of an experiment can be made. These practices are cognitive activities of preschool children. The leading type of activity in preschool education is gaming, but according to STEAM technology researchers, the leading type of activity for children is experience. Experience-some actions can be performed for the clarity and practice of knowledge. The experiment is carried out with a predetermined result. Experience means discovering something new. [2]

The purpose of the experiment: development of cognitive abilities in children (analysis, synthesis, classification, comparison, generalization); acquaintance with various properties of substances (hardness, softness, fluidity, etc.); with the main types and characteristics of movement (speed, direction); with physical phenomena (magnetic and terrestrial attraction, electricity, reflection and refraction of light); formation of elementary geographical visions in children; development of an emotional and valuable; formation of aspirations for the implementation of safety rules when conducting experiments and experiments. The knowledge gained during the experiments will be remembered for a long time. It is important not only to conduct experiments, but also to associate the results of this work with observations made in everyday life, at home and on the street. In a group, an experimental angle is created, and this organized angle is called a “small laboratory”. This is the basis for the specific play activity of a preschool child. Playing, children become "scientists", which dramatically increases children's interest in conducting research. They behave more seriously than usual, looking forward to the next study. In the corner of the experiment, a cartoon of experiments with various objects of a lively and inanimate nature settles. For research, it is equipped with various materials, tools, measuring instruments, such as: measuring cups, ruler, paraffin candles, Lantern,

various containers, glass cones, wooden sticks, mirror, balloons, etc. Seeds, a pile of stones, shells, grains, dry leaves, paper samples and fabrics of various textures. The angle of experience will have to be constantly supplemented and enriched with new materials in accordance with the age and interests of children. In STEAM activities, children-inventiveness, ingenuity, creativity, analytical thinking-are brought to the surface through play. How is the experiment carried out? When experimenting with children, the following plan should be followed:

- ✓ Set a task or create a problem situation.
- ✓ Do not forget to introduce children to safety rules during the experiment.
- ✓ Consider the plan of the next steps.
- ✓ Choose the tools and equipment you want to experiment with.
- ✓ If the work is collective work, it is necessary to separate the children and choose a responsible one.
- ✓ Summarize and analyze the results.

It is important for children to know. Cognitive research activities, first of all, allow the child to find answers to the following questions: how does this happen? Why exactly so? Why only take such actions? What will be the result of the action? Why is it so, not otherwise?

When conducting an experiment, children should be warned about the need to follow safety precautions so as not to harm themselves and others. These rules look like this:

- Conduct experiments only with the participation of the educator and with his permission.
- Do not touch your eyes, face with your hands during the experiment.
- It is impossible to leave, put in the mouth the substances and things that are being experimented on.

The stages of the implementation of the experiment: determine the goal, select tools for solving the problem, form the experimental process, correction of observations, the formation of conclusions, comparison of experiments, the ability to determine cause-and-effect relationships. Children learn to draw conclusions and analyze.

Experiment: color chemistry! The course of the experiment: To do this, you will need glasses and colors (gouache), paper napkins. Fill the cups with water for about half. Add colors i.e. red to the water in each glass, blue to the other, and yellow to the third. Place a glass of clean water in the center of each colored glass. Take a paper napkin and place one end in a colored glass and the other end in a colorless glass to form a bridge between the glasses. Now wait. Watch with pleasure the water walks from glass to glass, the formation of secondary colors from primary colors and find out the appearance of the rainbow. In empty cups, the colors on both sides are mixed. It doesn't take much time, but it will take some time for the water to pass from the glass to another container. After a while, you will see a new color crop.

Purpose of the experiment: Formation of the child's initial skills about the science of chemistry.

Experience: properties of water! The course of the experiment: Not all people in everyday life often use water and think that it is completely magical and has amazing properties. Meanwhile, with this liquid, it is possible to conduct the following experiments, which are incredibly interesting with children.

Purpose of the experiment: Introducing children to the properties of water (lack of color, taste, color and taste, water solvent, water leak); formation of laboratory experiments skills: teaching to work with transparent glass bottles: glass cups, tubes; strengthening work with unfamiliar solvents, while following the necessary safety rules; forming initial visions of the transition of water from solid state to liquid state and liquid state to solid state; to gain interest in conducting experiments, to increase observability, to develop visual-moving thinking; to increase curiosity.

Experiment:"water is liquid, it can flow." The purpose of the experiment. Expanding children's data on the flow of water, bringing to the conclusion.
Structure of experience. Give the children two cups: one juicy and the other empty. Offer them to pour water from one glass to another. Is water flowing? For what reason? Because, it is liquid. If the water was not liquid, it could not flow in numbers, in the river, it would not flow out of the tap either. In order for children to better understand the concept of "liquid", remind them of milk. If the milk is liquid, it is poured from one container to another, and we call it ... (children clarify) liquid. If we cannot pour milk from one container to another, the reason is that it falls in pieces, it is ... (children clarify) dark. So we call it liquid, so that the water is also liquid.
Preschool children will have an interest, a desire for constant experience, a desire to independently find a solution to a problem situation. The task of the teacher is not to stop this activity, but, on the contrary, to actively help. When we talk about cognitive research activities, we understand the activities of the child directly aimed at understanding the structure of things, the connections between the phenomena of the surrounding world, their regulation and systematization. This activity begins in early childhood, initially representing a simple, as if aimless (procedural) experiment with things, in which perception is differentiated, the simplest categorization of objects by color, shape, purpose occurs, sensory norms, simple instrumental actions are mastered. The "island" of cognitive research activity in preschool childhood is accompanied by a test of the capabilities of any new material, a game woven in the form of indicative actions, effective activity. Cognitive research activity in

preschool age is characterized by the child's specific cognitive motives, a conscious intention to understand how things work, learn something new about the world, regulate his ideas about any area of life. There are many ways to develop an individual's potential, but real research activity is undoubtedly one of the most effective.

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