

# **Experimental activity of children**

## **Middle preschool age (4-7 years)**

For development of the child crucial importance has not abundance of knowledge, but the type of their assimilation determined by type of activity in which knowledge is acquired. In the light of this aspect the special importance is gained by children's experimenting. It acts as a training method if it is applied to transfer of new knowledge to children. It can be considered as a form of the organization of pedagogical process if the last is based on an experimenting method. At the same time, experimenting is one of types of cognitive activity of children and adults.

According to many teachers, experimental activity is one of types of cognitive activity of children, that is that type of practical activities by means of which they learn the world around.

### **The child is a born researcher**

It is important to involve the child in research work – carrying out the elementary experiences and experiments under the leadership of the adult. Experiences by something remind children focuses, they aren't regular, and, above all – children make them.

Sometimes it happens so that the adult just shows this or that experience, and children watch. Of course it is so simpler, but the child needs to do everything. It is very important educational point.

### **Research work helps the child to think, generalize, draw conclusions logically**

The famous teacher Jan Amos Komensky wrote: "It is necessary to learn so that people as far as it perhaps acquired knowledge not from books, but from the sky and the earth, from oaks and beeches, that is knew and studied the things, but not someone else's certificates on things".

### **Adult's task**

The main advantage of this method is that it gives to children real ideas of various parties of the studied object, of its relations with the environment and other objects.

In the course of the experiment there is an enrichment of memory of the child, his thought processes, need to give the account on what was seen, to formulate the found regularities, to stimulate development of the speech become more active.

### **Children very much like to experiment**

This results from the fact that the evident and effective and evident and figurative thinking, and experimenting as any other method is inherent in them corresponds to these age features. At preschool age he is a leader, and in the first three years almost only way of knowledge of the world.

Experimenting passes practically through all kinds of activity.

On charging the child experiments with the body, carrying out exercises.

On occupations, for example, on drawing, gets acquainted with properties of materials (a rastvoryaemost of paints, etc.)

On meals flavoring receptors are involved, the kid learns taste of the prepared dishes.

In skillful hands even the usual plastic bottle can turn into the filter in which it is possible to pour water or to fill sand, and the usual package for garbage can become a trap for air and if to cut him on ribbons and to attach by means of an adhesive tape to a stick, then it will be possible to see the direction of wind on walk or to make wind.

Experiments make a basis of any knowledge, without them any concepts turn into dry abstractions. In preschool education experimenting is that method of training which allows the child to model the world picture based on own observations, experiences, establishment of interdependence, regularities in the consciousness.

To introduction of the term "experimentings" the science is obliged to Ge. Piaget: he has analysed value of this activity for children and teenagers, has proved that the advantage of children's experimenting is that it gives real ideas of various parties of the studied object, of his interrelations with other objects.

Experiments positively influence the emotional sphere of the child, development of its creative capabilities, they give to children real ideas of various parties of the studied object, its relations with other objects and with the habitat, on forming of labor skills.

In the course of the experiment there is an enrichment of memory of the child, his thought processes as constantly there is a need to make transactions of the analysis and synthesis, comparison and classification, generalization and extrapolation become more active. Need to give the account on what was seen, to formulate the found regularities and conclusions stimulates development of the speech. Not only acquaintance of the child with the new facts, but also accumulating of fund of intellectual acceptances and transactions which are considered as intellectual abilities is a consequence.

Children's experimenting is closely connected with other kinds of activity – observation, development of the speech (ability to accurately express the thought facilitates carrying out experience while replenishment of knowledge promotes development of the speech). Doesn't demand the special proof connection of experimenting with formation of elementary mathematical representations. During experience constantly there is a need to consider, to measure, compare, define a form and the sizes. All this gives to mathematical representations the real importance and promotes their understanding. At the same time possession of mathematical operations facilitates experimenting. It is also necessary to

consider features of experimenting in different age groups. Experimental activity of children of middle preschool age.

Children of average group (4 – 5 years) have first attempts to work independently, but visual inspection from the adult is necessary – for safety and for moral support as without fixed encouragement and expression of approval activities of the four-year-old child quickly fade. In this age group it is possible to make experiments on clarification of the reasons of the separate phenomena, children study properties of water and snow, sand.

Structure of holding game experimenting:

- \* statement, problem formulation (informative task);
- \* promotion of assumptions, selection of the methods of check pushed by children;
- \* check of hypotheses;
- \* summing up, conclusion;
- \* fixing of results;
- \* questions of children.

For positive motivation of activity of preschool children various incentives are used:

- \* external incentives (novelty, singularity of an object);
- \* secret, surprise;
- \* motive of the help;
- \* informative motive (why so);
- \* choice situation.

**Purpose of experimental activity:**

To promote development in children of informative activity, inquisitiveness, aspiration to independent knowledge and reflection.

Tasks:

1. Expansion of ideas of children of the world around through acquaintance to elementary knowledge from various fields of sciences:

- \* development in children of ideas of chemical properties of substances;
  - \* development in children of elementary ideas of the main physical properties and phenomena (magnetism, reflection and light refraction, sound, warmth, freezing and thawing of water);
  - \* development of ideas of properties of water, sand, clay, air, stone;
  - \* development of elementary mathematical representations (to exercise in the quantitative account).
2. Development in children of abilities to use devices - assistants when holding games – experiments (magnifying glass).
  3. Development in children of mental capacities:
    - \* development of powers of thinking: analysis, classification, comparison;
    - \* formation of ways of knowledge by the touch analysis.
  4. Socially – personal development of each child: development of communicativeness, independence, observation.

## Entertaining experiences and experiments

### WATER

#### 1. Experience "Transparent water"

What color water? On a table at you paper strips lie, with their help we will define color of water. Put and compare color of water and color of each strip. Whether it is possible to tell that water coincides with one of their flowers? (No). What then colors water? (Colourless, transparent). Think as it is possible to check transparency of water? (Look through glass with water at something: text, drawing, neighbor

#### "Water has no form"

Compare a water form in the glass with water at the neighbor, the tutor (the tutor shows that if to pour water in ware of other form, water takes the form of this ware). What it is possible to tell about a water form?

#### "Water liquid, can flow"

Give to children 2 glasses: 1 – with water, 2 – empty. And to suggest them to pour water from one glass in another. Ask a question: "Water flows? Why?". Conclusion: water liquid, flows.

#### "Water has no taste"

Whether you know taste of salt, sugar, a lemon, onions? Taste of apples, potatoes, tomato, bread, cake is well familiar to you. Taste water in a glass. Whether it is possible to call water salty, bitter, sweet, sour? No of familiar tastes can be carried to water. Conclusion: water has no taste.

#### "Water has no smell"

When mother bakes pies and rolls, an appetizing savor you will feel behind apartment doors. Delicate aroma is published by flowers, spirits. And smell water, than it smells? Conclusion: water has no smell.





## 2. "Ice – solid water"

To suggest children to bring icicles, the different sizes. And to track what will quicker thaw.

It is possible to use snow, and also if warm season, to freeze water in the refrigerator. Conclusion: ice, snow – too water.



## 3. "Steam is water too"

To take a thermos with boiled water. To open it and to show to children steam. Over it to deliver a mirror and glass. To show that steam is water too.

May we tell that a snowflake, a droplet and "parinka" sisters? (Yes) Why?



#### 4. "A lung - heavy"

*Purpose:* to acquaint children with the fact that wooden objects easy - don't sink, and iron – heavy – sink in water.

*Equipment:* wooden matches, sticks from ice cream, nails, details from the designer, the container with water.

*Speech material:* easy, heavy, sinks, doesn't sink, floats above, lies below.

Occupation course: To children about 3 wooden subjects and on 3 iron subjects are offered to everyone to choose. To touch them, to remember what they to the touch. Then the tutor asks what will occur if to lower them in water? Children independently make an experiment and come to a conclusion that wooden objects - lungs, they don't sink in water, and iron – heavy, they sink.





## 5. The submarine from egg

Fill one half-liter can with clear water and lower in it crude egg. It will drown.

In the second half-liter can pour strong solution of table salt (2 tablespoons on 0,5 l of water). Lower the second egg there – it will float. This results from the fact that salty water is heavier therefore and it is easier to float in the sea, than in the river.

Put the third egg on a bottom of a one-liter jar. Gradually adding in turn water from half-liter cans. It is possible to receive solution in which egg not will neither emerge, nor to sink. It will keep as suspended, in the middle of solution.

When experiment is made. It is possible to show focus. Adding salty water, you will achieve that egg will emerge. Adding fresh water – that egg will sink. Foreign salty and fresh water doesn't differ from each other, and it will look surprisingly.



## 6. "Bait" for ice



It will be necessary for carrying out experience for you: thread, ice cube, glass of water, salt pinch.

Let's lower ice in water. We will put a thread on edge of a glass so that it one end lay on the ice cube floating on a water surface. Let's fill a little salt on ice and we will wait 5-10 minutes.

Let's take for the free end of a thread and we will pull out an ice cube from a glass.

Salt, having got on ice, slightly waterlogs his small site. Within 5-10 minutes salt is dissolved in water, and clear water on the surface of ice is frozen together with thread.



## 7. Straw pipette

It will be necessary for carrying out experience for you: a straw for cocktail, 2 glasses.

Let's deliver 2 glasses nearby: one - with water, another - empty. Let's lower a straw in water.

Let's clamp a forefinger a straw from above and we will transfer to an empty glass we Will remove a finger from a straw - water will flow out in an empty glass. Having done the same several times, we will be able to transfer all water from one glass to another.

By the same principle the pipette which for certain is in your home first-aid kit works.



## 8. Disappearing coin

Material: a glass jar with a cover in reservoir 1 liters, tap water, a coin

Preparation:

Pour in bank of water and close a cover.

Give to the assistant a coin that he could be convinced that it valid the most regular coin and in it isn't present any dirty trick. Let he will put a coin on a table. Ask it: "You see a coin?" (Of course, he will answer "yes".)

Deliver on a coin to bank with water.

Tell magic words, for example: "There is a magic coin, here was, here isn't present".

Let your assistant will look through water sideways at banks and will tell whether he sees a coin now? What will he answer?

When you put on a coin to bank with water, apparently, that the coin disappeared. Your assistant won't see it.

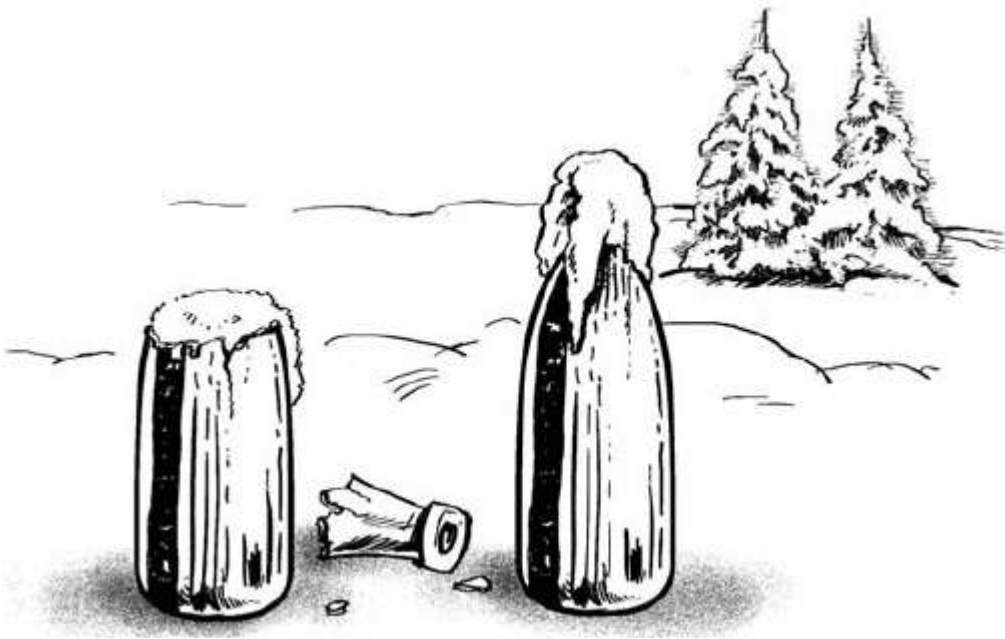
This focus works well thanks to reflection of light from a wall banks. Reflection is a rejection of light from a surface back.



## 9. Ice requires space

Fill a bottle to the brim with water and make a leaky cover of a foil. Deliver a bottle in the refrigerator and wait until water properly freezes.

Look, ice raised a cover. Ice occupies bigger amount, than water from which it turns out. For this reason water pipes can burst in the winter. Water in them extends when freezing and breaks off junctions or pipes.



## 10. Cause a cloud

For experience are necessary: transparent glass bottle; hot water; ice cube; dark blue or black paper.



1. Carefully fill a bottle with hot water.
2. In 3 minutes pour out water, having left a little in the very bottom.
3. Put from above on a neck of an open bottle an ice cube.

4. Deliver the sheet of dark paper behind a bottle. Where the hot air rising from a bottom adjoins to the cooled air at a neck, the white cloudlet is formed. The water vapor containing in air is condensed, forming a cloud of the smallest water drops.

### 11. "Without hands"

Prepare a balloon better (for safety) plastic glass with water. Having filled it approximately on a quarter of amount.

How you think whether it is possible to transfer this glass with water by means of a ball to other table edge, without touching it hands? Experiment. If nothing turns out, read the hint as to make it.

Enclose a ball in a glass and inflate it so. That it densely adjoined to internal walls of a glass. Clamp a ball opening that it didn't come out air, and ... transfer it to other place. It won't fall.



### 12. Dance of peas

Purposes: to acquaint with the concept "movement force"; to develop observation, inquisitiveness, sharpness.

Material: water, peas.

Equipment: a jar, a tubule, a napkin, the sheet of paper, pencils (for each child).

Experimenting course:

Statement of a research task.

The tutor suggests children to teach peas to float and carry out manipulations with peas, as in circus.

Accomplishment of an experiment

Tutor. Accurately handle all materials.

Children under the leadership of the tutor lower in a jar with water four peas and a tubule. Blow in a jar through a tubule. At first it is weak, then with a bigger force.

Why peas move quicker, more slowly? (When air through a tubule arrived slowly, peas moved slowly; force of air increased - and the speed of movement of peas increased.) Means, force of movement of objects depends at most impacts on them.



### 13. Warm air of easier cold

We take a basin, we put in it a glass bottle, on a bottom it is possible to put a pebble or a piece of a platilin, for ballast, and that at the children showing this experiment, the flask strove to departure all the time. On a neck of a bottle we pull a balloon. And then we pour boiled water in a basin. Respectively air in a bottle heats up and inflates a ball. For purity of an experiment it is possible to deliver a basin with cold water nearby and to rearrange a bottle from one reservoir in another visually to show to the child several times as it occurs.

