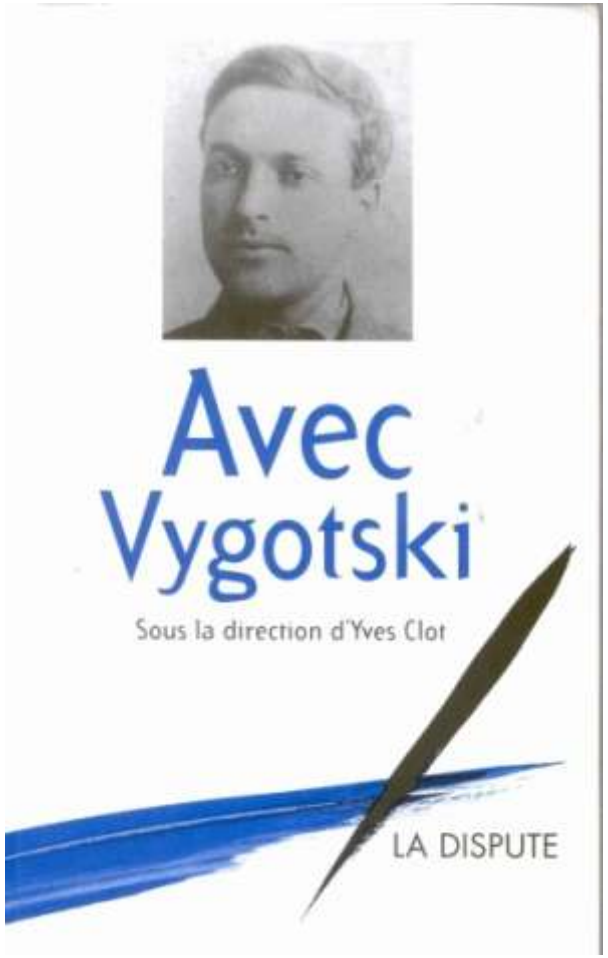
Piotr Gal'perin
Psychologist in Vygotsky's Footsteps



P.Ya. Galperin
1902-1988

Who is he?

Who is he?

What did he do in psychology?

In his theory are presented:

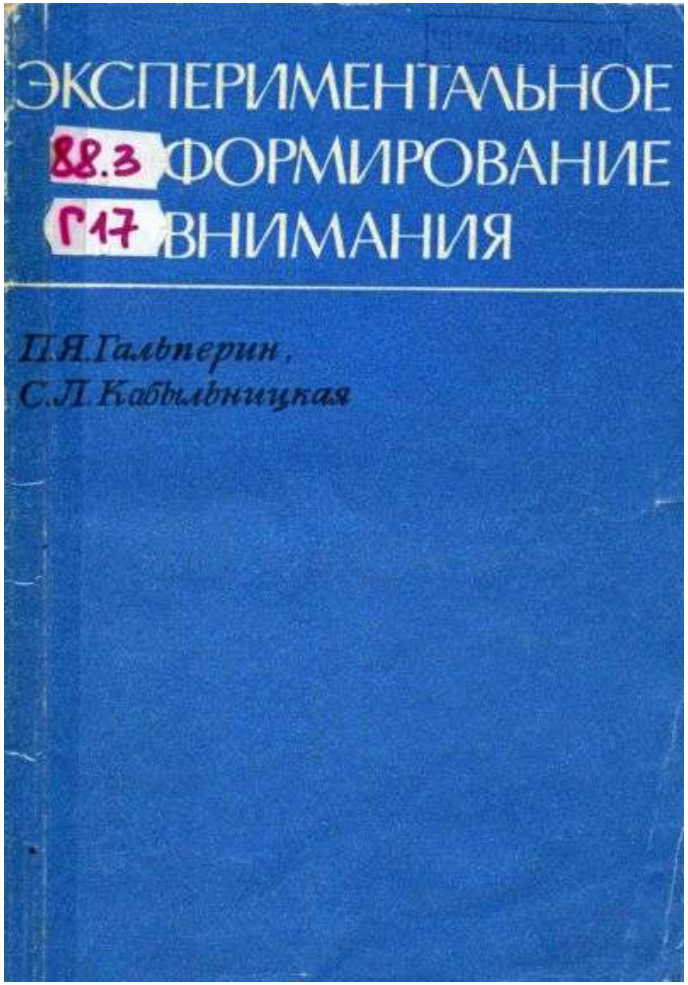
- New understanding of a subject of psychology.
- The objective characteristic of mental life
- Objective necessity of psyche, its vital value

1976

The essence of this book consists in proving that orientation activity is a subject of psychology

In his theory is shown

Possibility of studying mental processes on the basis of stage by stage-systematic formation



What did he do in psychology?

In his theory are analyzed

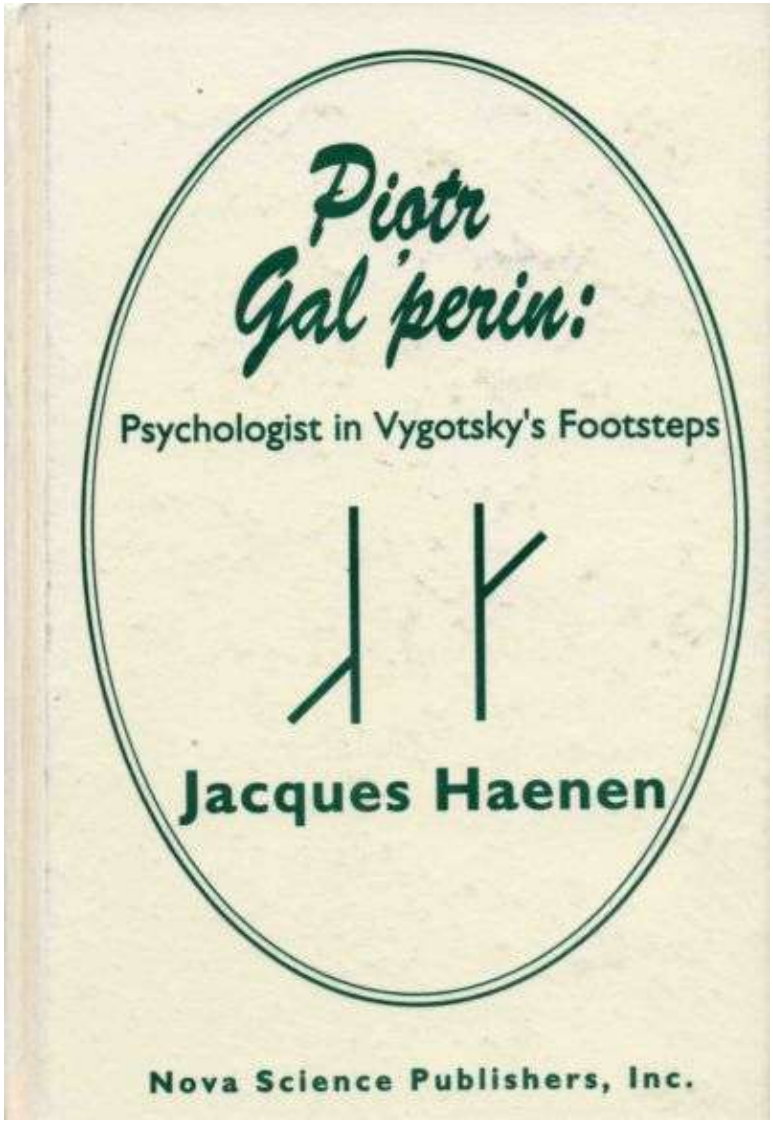
- The evolution of animal psyche
- Results of anthropogenesis and their value for formation of mentality of the human being
- The primitive thinking and the qualitative difference between animal and human mentality

What did he do in psychology?

In his theory the concepts of the biological, organic and social in human being mentality are differentiated

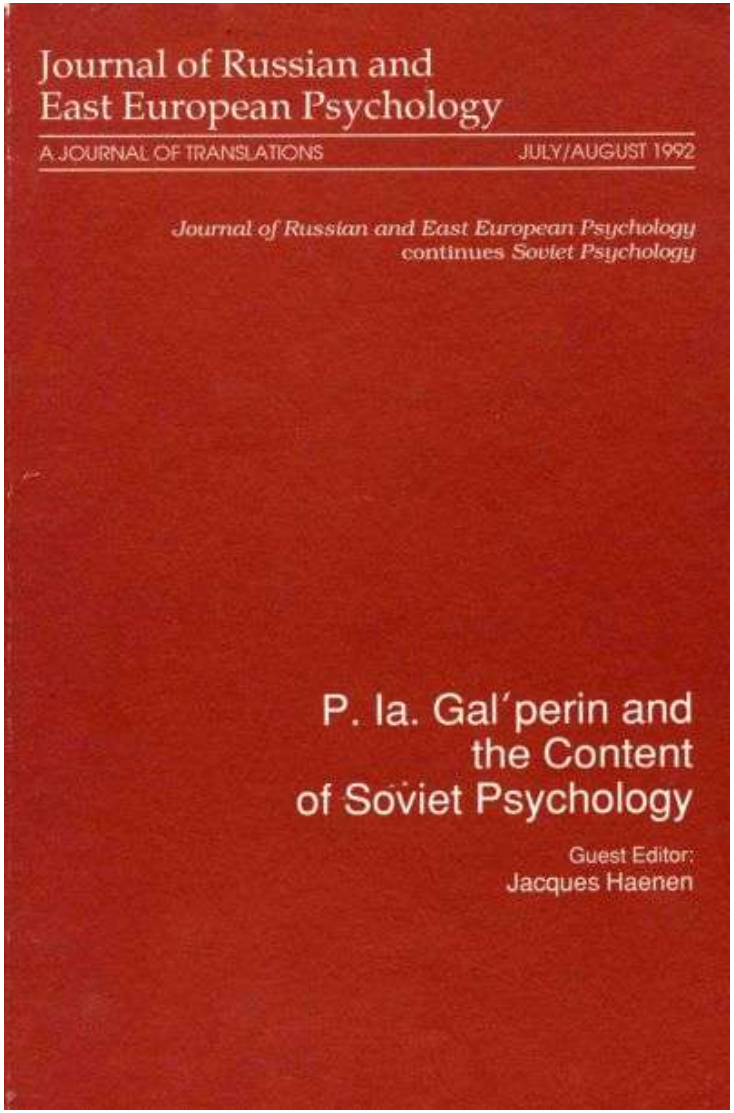
In his theory the mental processes are considered from the point of view of their vital sense

In his theory a new understanding of the research method of investigation mental processes is entered



What did he do in psychology?

He studied psychological processes from the point of view of their origins and development



What did he do in psychology?

- He constructed the method and the theory of step-by-step formation of the mental actions and concepts

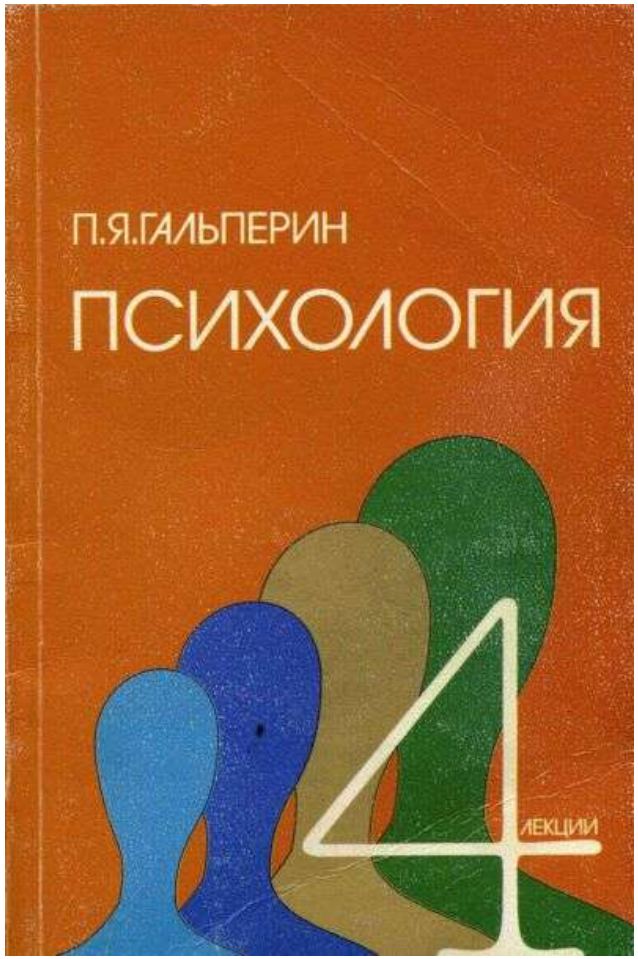
Method

The idea of the forming experiments as method of psychology belongs to Vygotsky

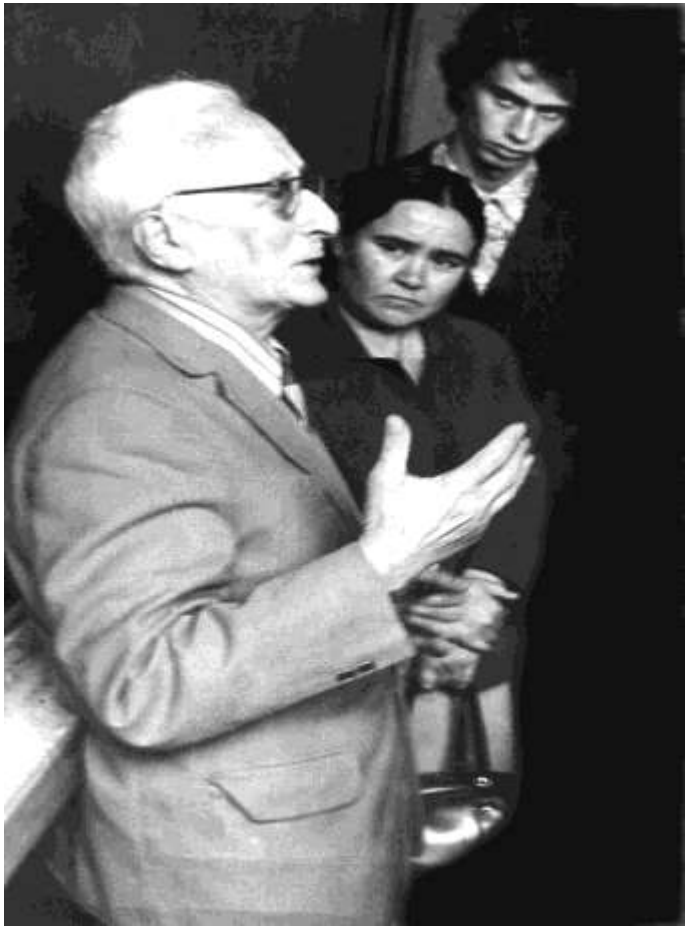
“The method applied by us can be named by experimentally-genetic in the sense that it is artificial causes and creates genetic process of mental development” 1931

Method

- P.J.Galperin has improved this method in details and used it in various experimental settings.



Method



- Every subject's action includes two parts: orientation and execution.
- The orientation of action serves as the psychological mechanism of any action.
- The execution depends on the orientation.
- The orientation may be either full or not.
- If we can find conditions for construction of sufficient (full) orientational basis of action, the pupil will solve the task without mistakes from the very beginning and every time later.

However it is not so easy to find it. It requires a true deep investigation.

Types of investigations

1. The formation of concepts which have complete characteristics: some scientific concepts that are studied at school, the concept of conservation (Piaget), etc.
2. The investigation of productivity of thinking during open tasks solving (Gilford, Torrance)
3. The concept formation which has uncertain characteristics (H. Gardner)

The first type of investigation

The formation of concepts which have complete characteristics:

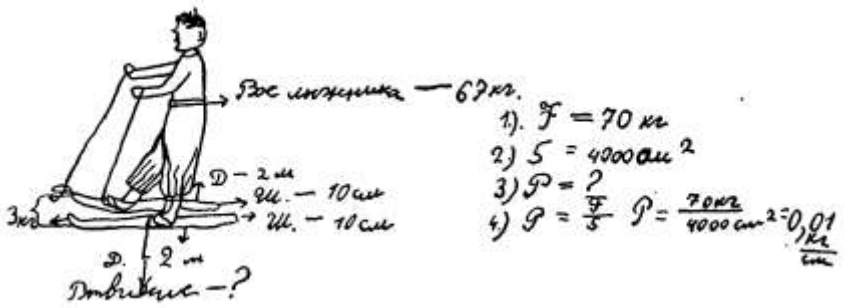
1.1. some scientific concepts that are studied at school,

1.2. the notion of conservation (Piaget)

1.1.Formation of system of concepts «Pressure of solid bodies» with application to the decision of tasks

Aim - to form the ability to solve the tasks without errors from the first and each time further in children with learning difficulties

1.1. The forming of notion “The pressure of solid bodies”.



«The skier is powerful 67 *kg* **/** there were on skis **/** in length of 2 *m* **/** and width 10 *sm* **/** everyone**/**. What pressure is What pressure is rendered by it on snow **/** if both skis **/** weigh 3 *kg***/**?»

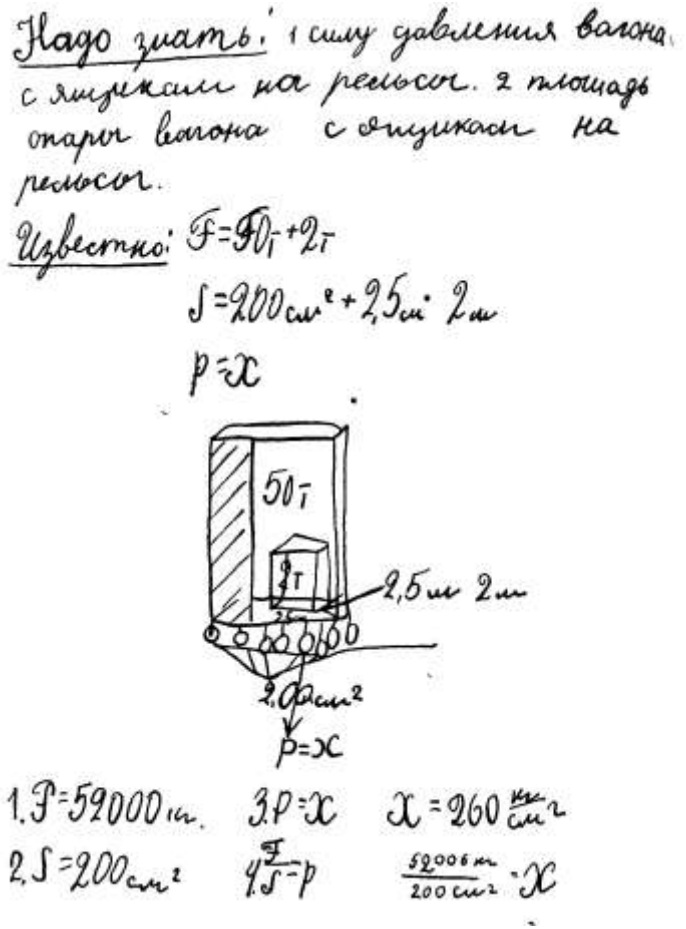
Inclined lines divided the problem text into semantic parts.

- To solve the task it is necessary to present a problem situation in drawing

1.1.The forming of notion “The pressure of solid bodies”

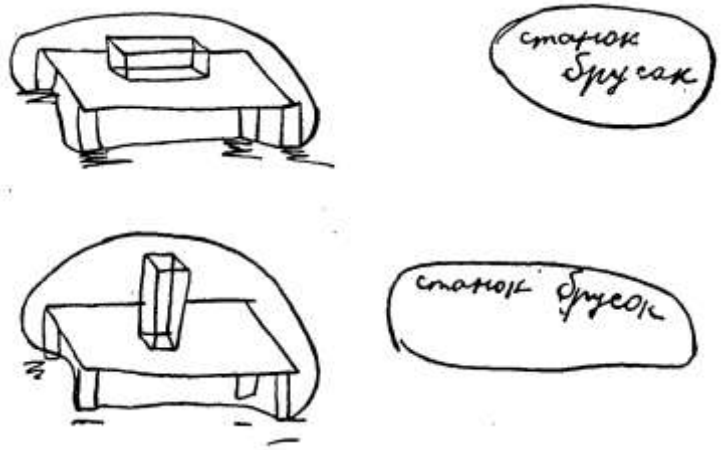
When the pupil represents a problem situation by drawing it - he does not do errors.

But if the problem has to be solved without the image - the pupil came back to errors again.



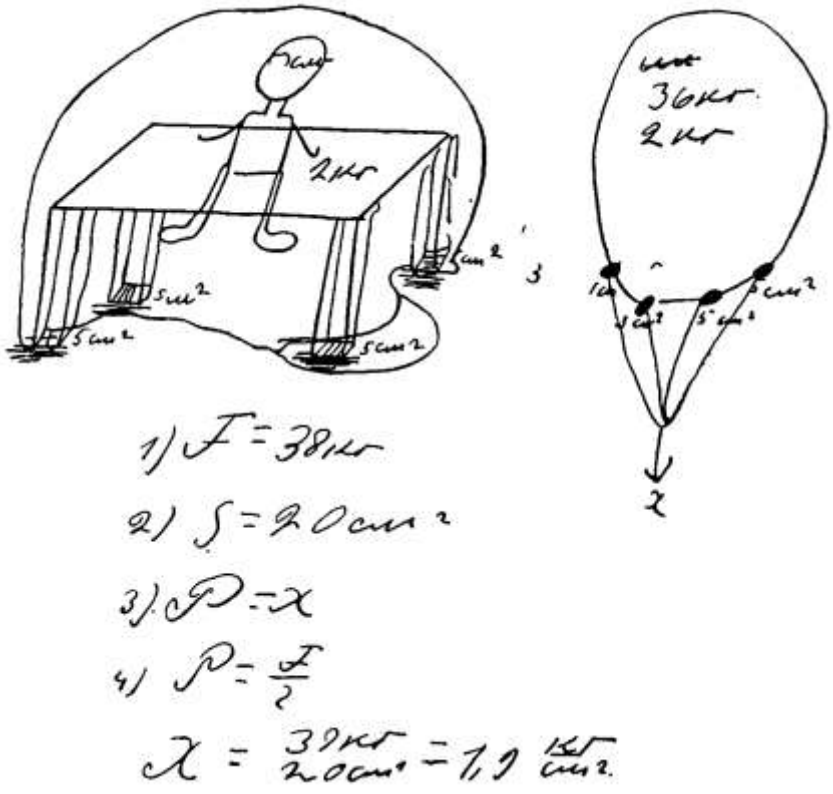
1.1.The forming of notion “The pressure of solid bodies”

«On the heavy machine tool have put a detail-brusok. What the force pressing on a floor? Whether it if this detail on the machine tool to put on an edge will change?»



Before passing to the problem solution in mind it is necessary to pick out from a problem situation presented by means of drawing its essential features

1.The forming of notion “The pressure of solid bodies”.



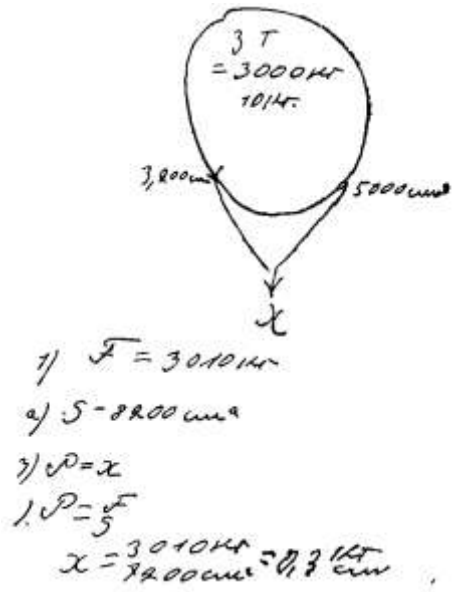
«To define the pressure rendered by a stool, on which you sit, on a floor (36 *kg*, 2 *kg*, 5 *sq. sm)».*

The operative scheme of thinking

1.The forming of notion “The pressure of solid bodies”

«To shop have brought the machine tool. It is powerful 3 tons. He leans against a floor two supports: one - the sizes 40x80 sm and another - 50x100 sm On the machine tool have put a detail. It is powerful 10 kg, leaning against the machine tool a head 200 sq. sm

To define pressure of the machine tool with a detail on a floor»

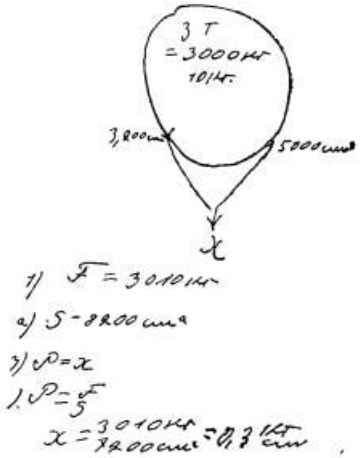


The new finding of this investigation is the concept of “operative scheme of thinking”

1.The forming of notion “The pressure of solid bodies”

The operative scheme fixes the general, essential moments of a situation, corresponding to the formula. It represents the object of the analysis in the transformed form: it pulls together points of support, it unites forces of pressure.

All components of a problem are completely materialized and clearly selected in the scheme

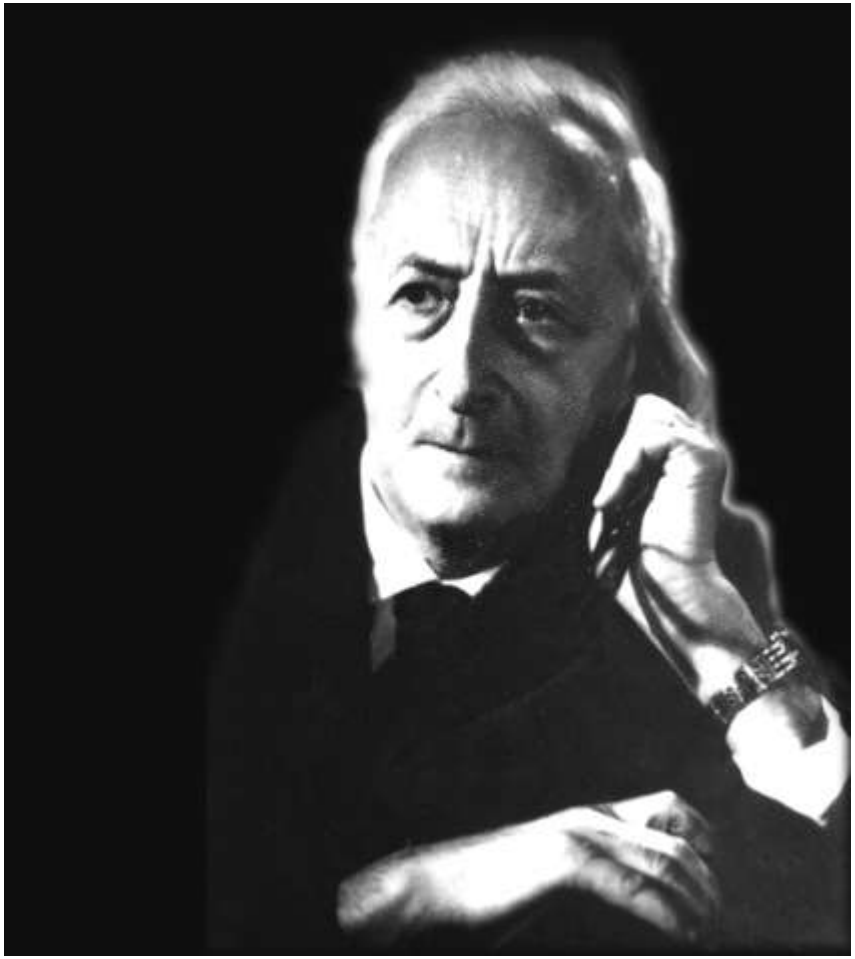


The scheme is the general for all tasks related to the given system of concepts

The first type of investigation:
The formation of concepts which have complete characteristics

1.2.The notion of conservation.
Piaget and Gal'perin

Gal’perin and Piaget



Piaget and Gal’perin

At first we will consider some theoretical positions:

According to Piaget and Galperin, the **subject’s action** is a basis of any mental process.

But the interpretation of the action (its structure, function and genesis) is different.

In Piaget's theory

Thinking is a system of mental operations

Operation is an action that has been transposed to the intellectual level, been schemed, reversible and coordinated with the others to form integrated system.

Action in Piaget's theory

Piaget defines *the action* in terms of

- *the level* (internal, external)
- *mobility* (irreversible, reversible)
- *degree of comp*letion (it may be reduced, executed symbolically, or developed, realized through real objects).

Approach of Piaget

Piaget does not analyze either the **psychological mechanism** of action

or its **psychological structure**,

but merely emphasizes its physical and logical aspects.

Approach of Piaget

Piaget treats the subject action globally, without distinguishing between the psychological and concrete content.

Piaget does not see any possible interpretation of the development of action other than its conformity to formal logical structures

Approach of Galperin

In each concrete action of subject Galperin distinguishes two basic components: **orientation and execution**;

the subject's action is characterized by a complex interaction of orientation and execution;

the orientation is the psychological mechanism of the action and its content determinate the success and general quality of action.

According to Galperin

The success of the action and quality of the mental process formed on its basis depends on the orientation completeness.

According to Galperin

The orientation is a complex phenomenon which includes in itself the follows:

- the image of the action situation,
- the image of the initial subject action,
- the image of the final result,
- the image of the action itself and its key points,
- the quality of the means or tools to fulfill the action
- operative scheme of thinking.

The transition from pre-scientific thought to the first truly scientific thought of the child

Experimental study

The transition from pre-scientific thought to the initial truly scientific thought in the child

Piaget

principle of conservation is the psychological criterion of transition to new "cognitive stage“ (the stage of **the concrete-operations)**

Galperin

it is the necessary condition for the child to form scientific ideas.

Piaget’s fenomena

The liquid conservation

goal

We want to learn children to solve tasks of Piaget without any mistakes, **what we should do?**

In accordance of Galperin's theory we should orientate child (= create orientation base of their action)

This means that we should give him a psychological tool.

For the Piagetian exercises this tool is measure and measurement

- **Scholars of many countries have tried to develop the notion of quantitative invariance (conservation) in the preschool child.**
- **The method of the development of mental actions developed by Galperin enables us to formulate a new hypothesis on the characteristics of this transition.**
- We constructed our experiments in accordance with Gal'perins's method of the systematic formation of mental actions and concepts.

First attempts

Attempts to introduce measurement in Piagetian exercises ended in failure.

The child succeeded in making the measurement, but failed in final decision because of influence of visual image.

The child made a judgment that was immediate and undifferentiated.

Role of measurement

- Measurement has to be a psychological tool not a technical tool

- Measurement plays a role of objective criterion and have to allow the child to focus on objective parameters of an object

Operative scheme of thinking

Clearly, what was needed to create a new mediated mode of thought

Firstly at the external

Secondly at the internal level

Fix it

Only, after doing all this we could ask child to solve the Piagetian exercise

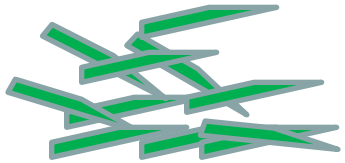
The act of learning of how to carry out mediate evaluation of the various parameters of an object had several steps.

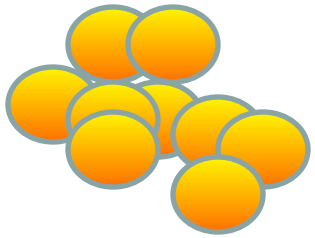
The sequence of actions

1. Comparing quantity of two groups of objects (one to one correspondence) – discret objects, directly
2. Comparing quantity of two group of objects (mediated by marks) - discret objects, mediated
3. Comparing of length two objects directly – continual, directly
4. Comparing of length two objects by means of the third one – continual, mediated
5. Usage of real measurement (by dividing object into the parts)

First step

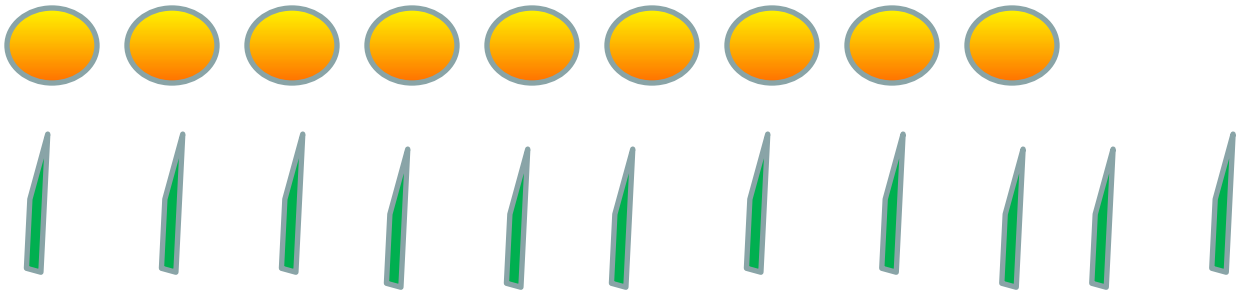
- Comparing quantity of two groups of objects (one to one correspondence) – discret objects, directly





First step

- Comparing quantity of two groups of objects (one to one correspondence) – discret objects, directly



Second step

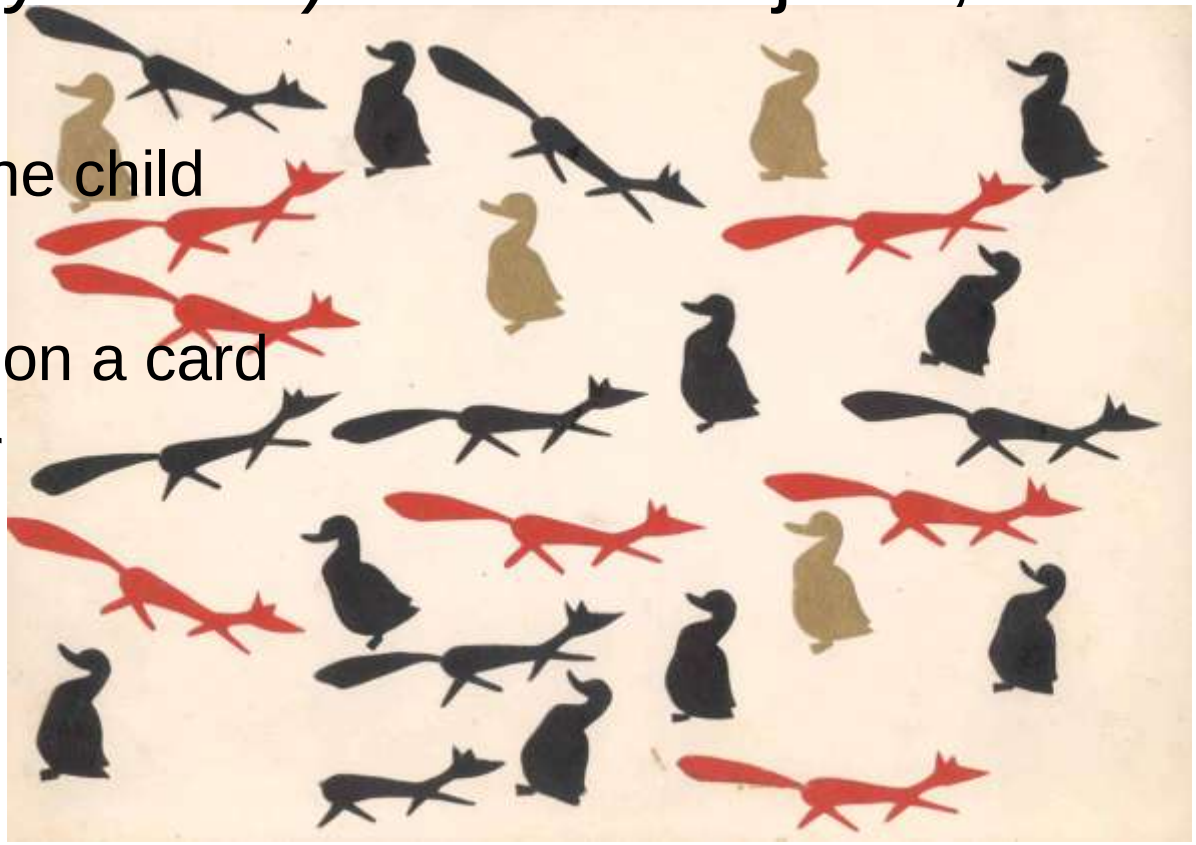
Comparing quantity of two group of objects (mediated by marks) - discret objects, mediated

We presented to the child

some cards

with cutouts stuck on a card

in a random order



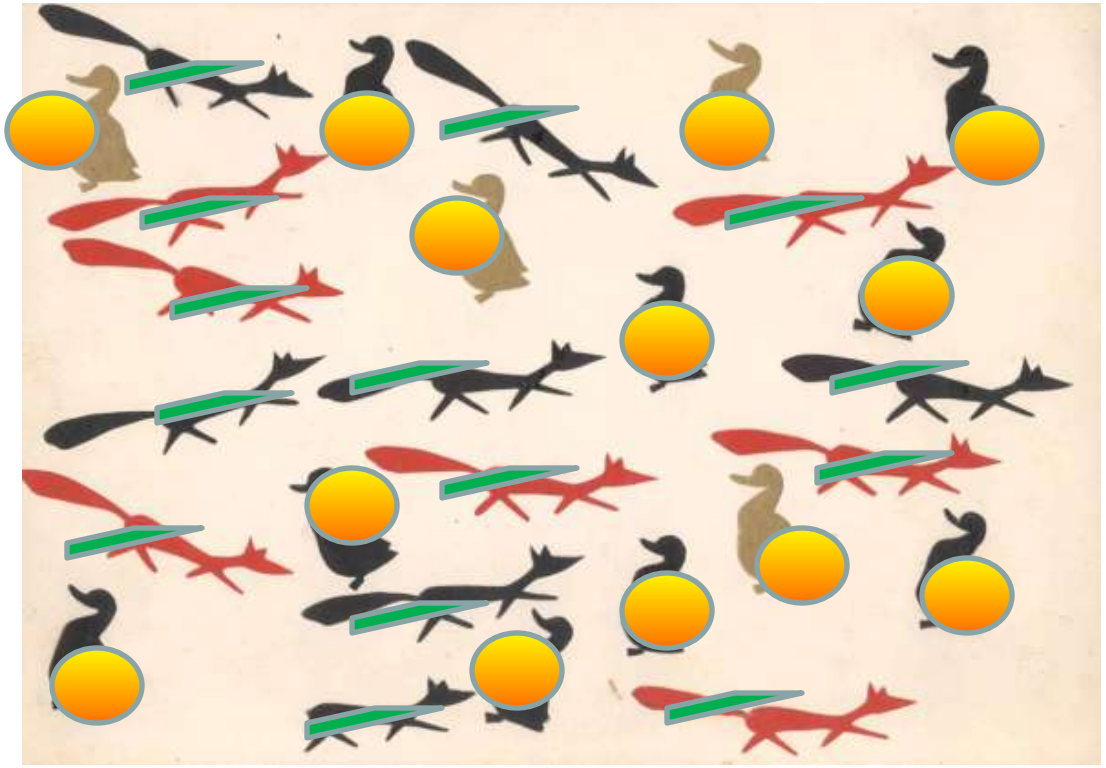
Second step – with marks

Comparing quantity of two group of objects (mediated by marks) - discret objects, mediated

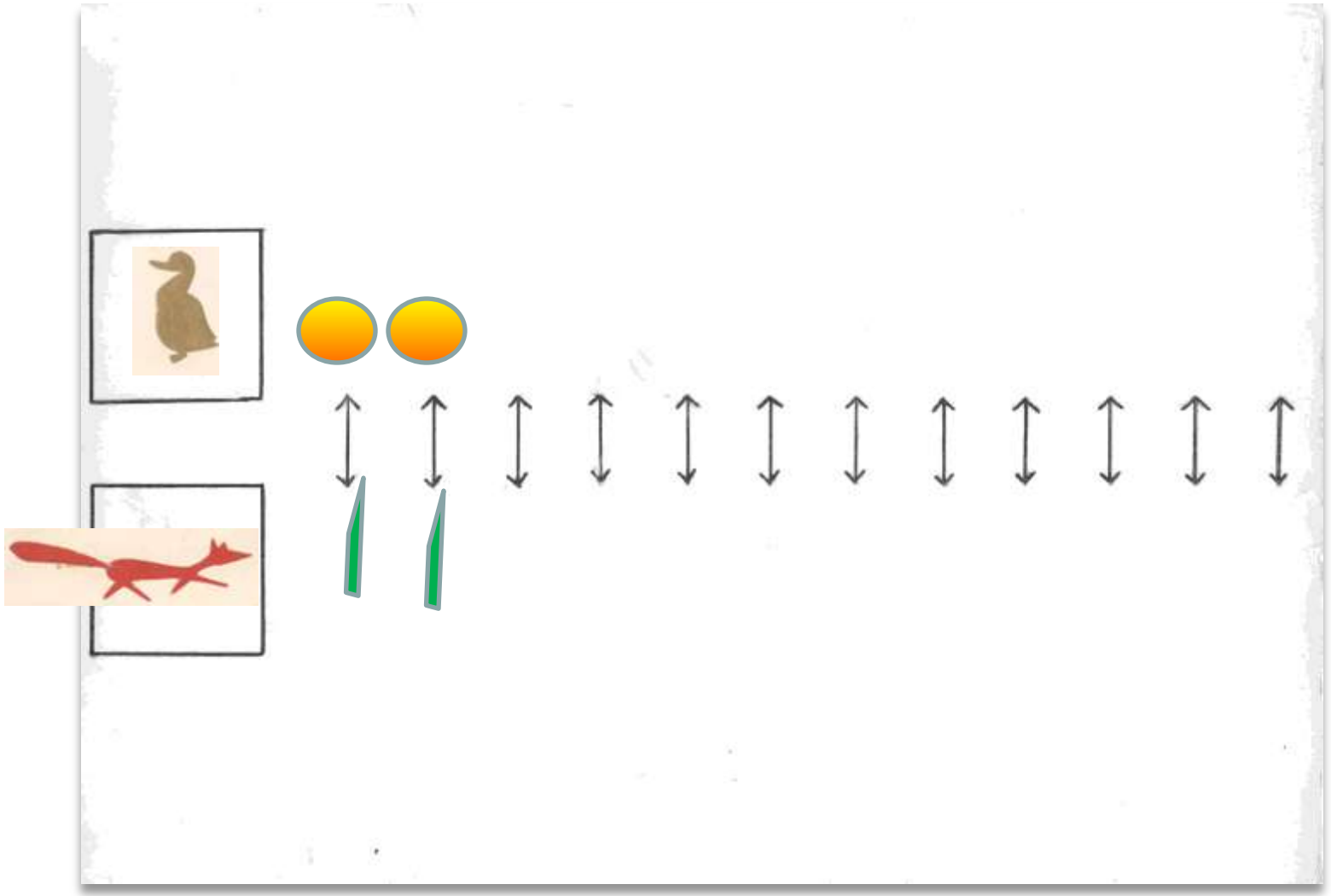
The child had to say which were the most numerous.

The only way to solve the problem was by using indicators (marks**).**

The child put, for example, a rod on each "fox" and a counter on each " duck".

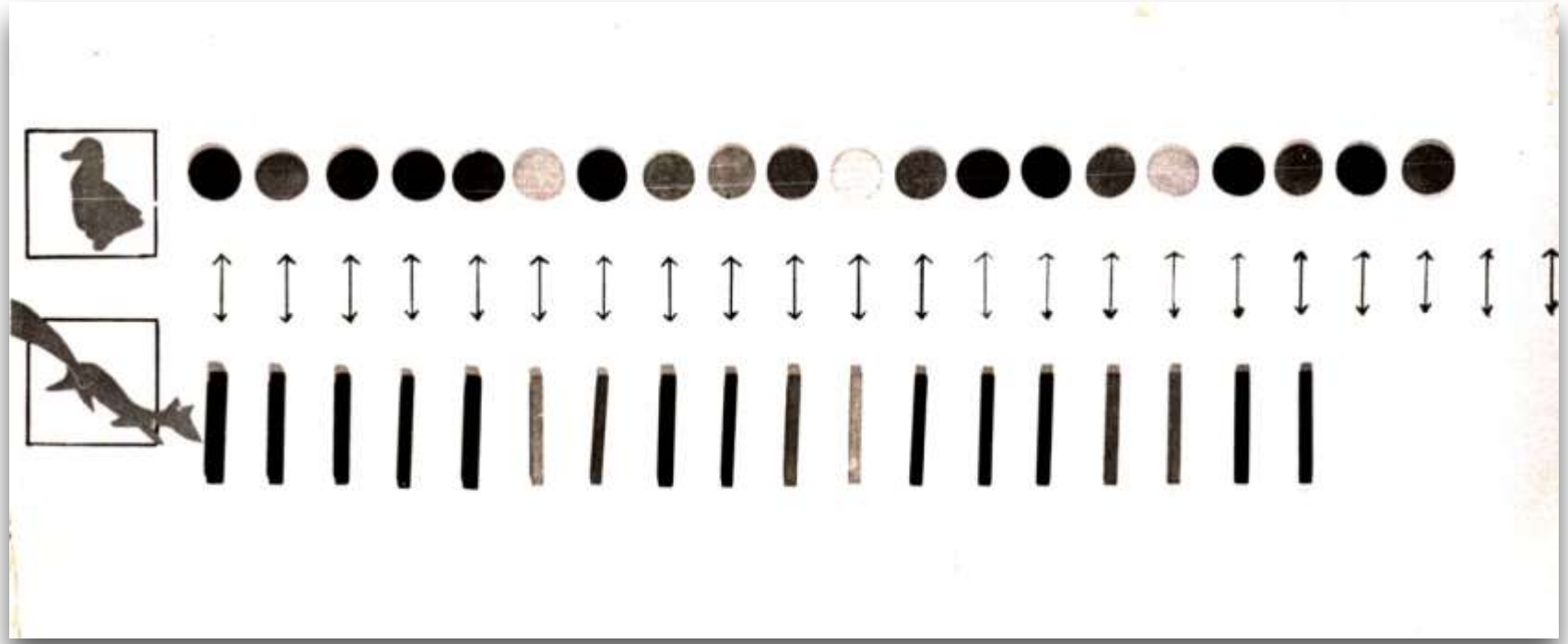


Orientation card: The experimenter presented to the child a card- scheme on which were two square boxes and a long row of double arrows



Fulfilled card (real photo)

Having established a one-to-one correspondence, the child was able to give the right answer to the question



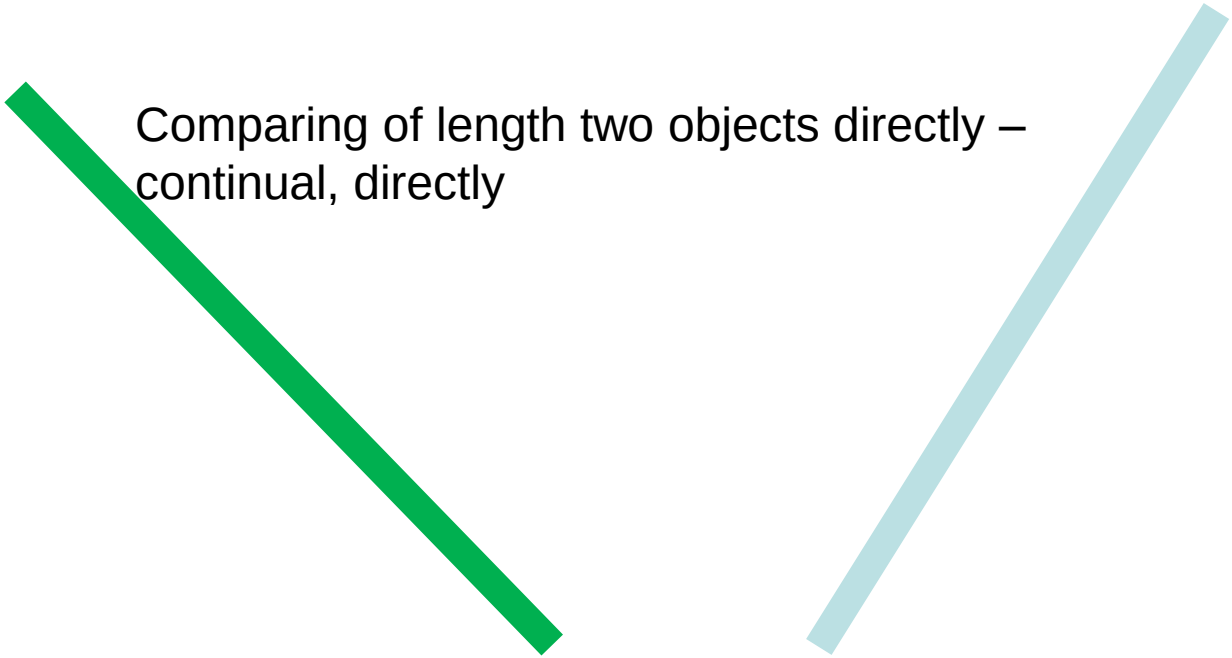
Example of tasks

Example of tasks

Example of tasks

.

Comparing of length two objects directly – continual, directly

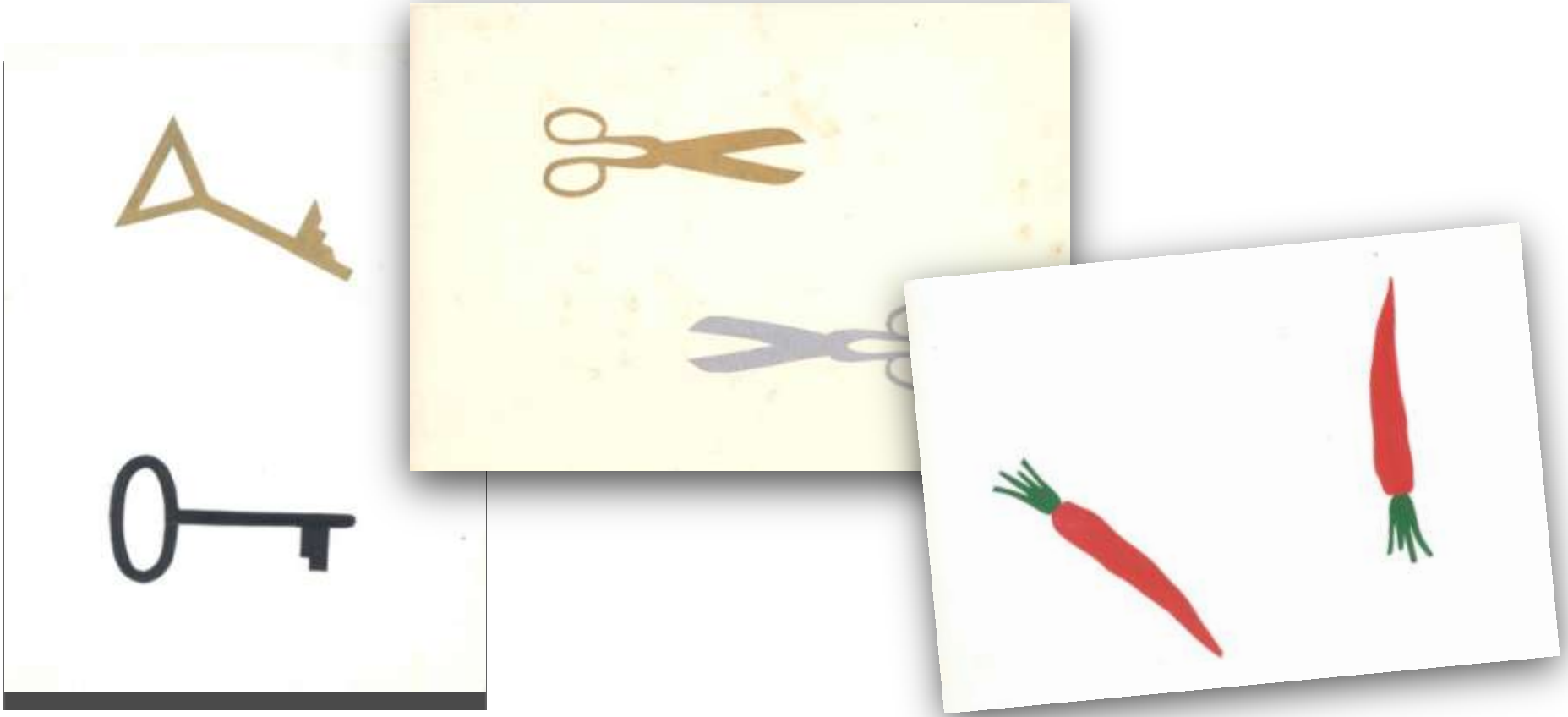


Third step

Comparing of length two objects directly – continual, directly

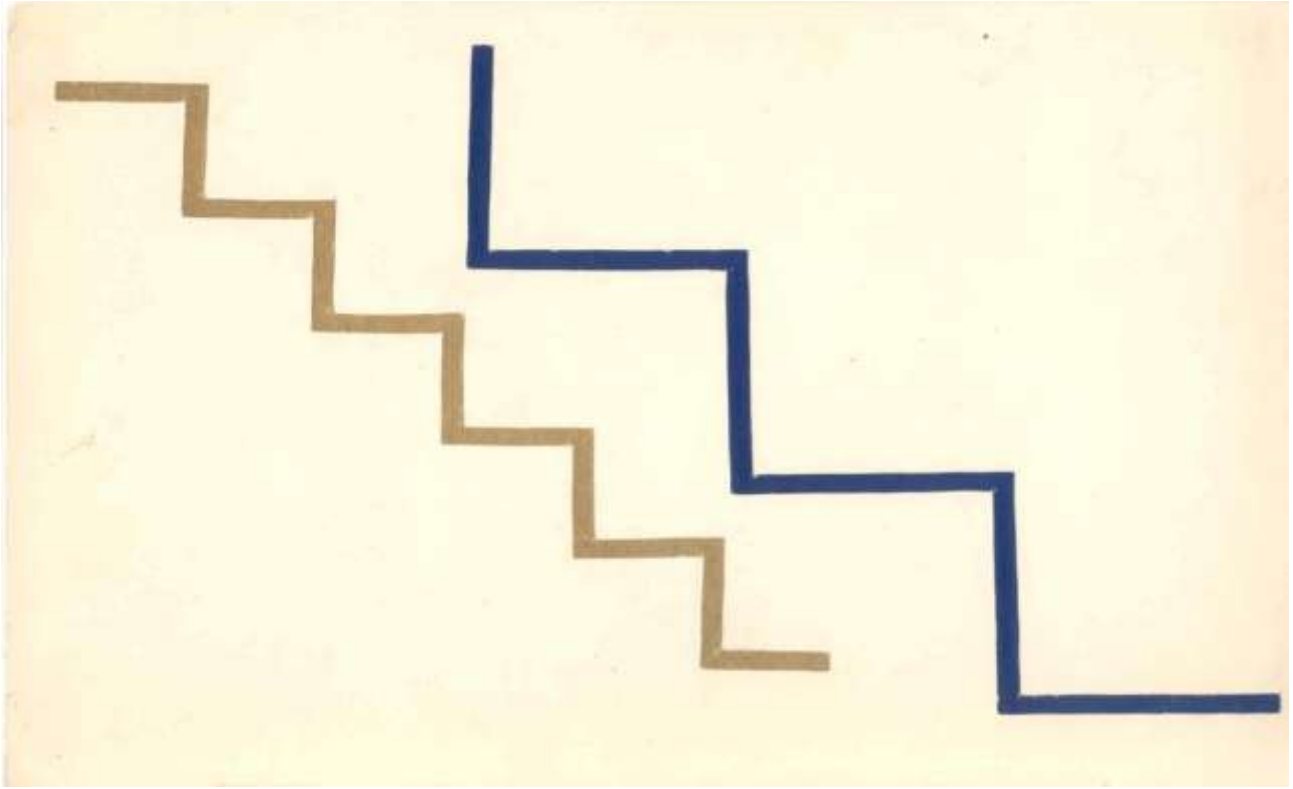
The child had to cut a length of the strip that was exactly the length of one of the cutouts and then place it on the other to see whether it was larger or smaller

Comparing of length two objects by means of the third one – continual, mediated



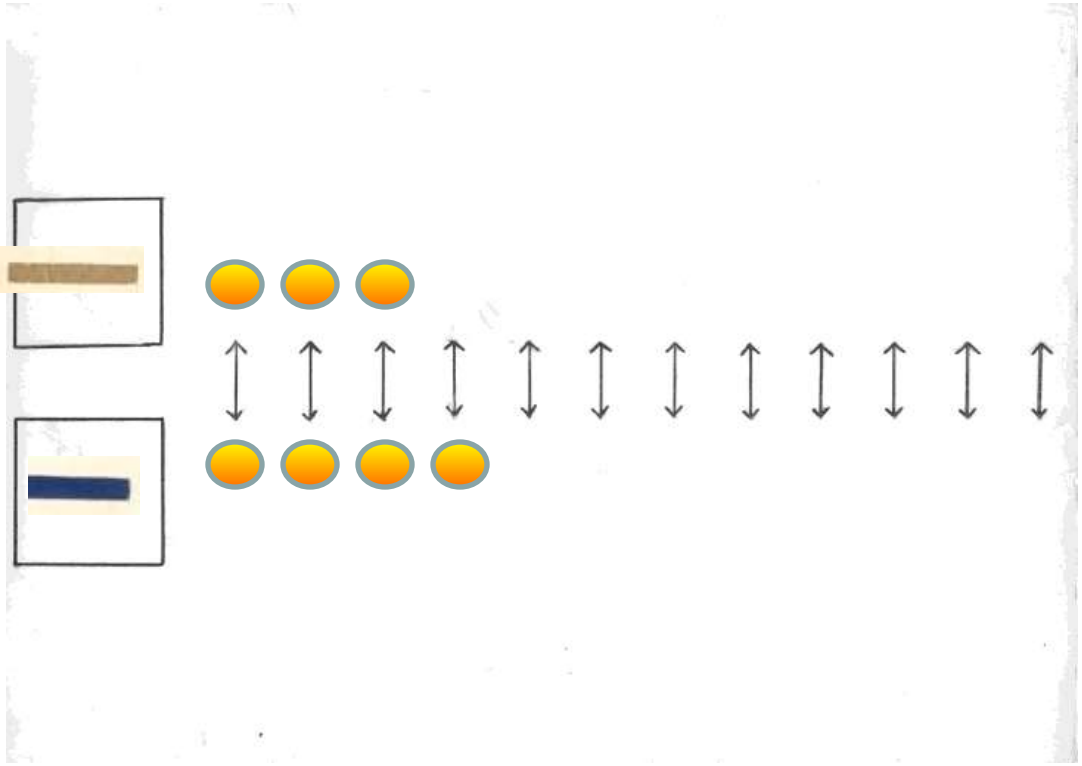
This step consisted of learning how to compare two objects by means of the third one.
We setting up an exercise in which direct comparison of the dimensions of the figurines was impossible. The third object had to be used.
The child have to cut the strip of paper and use it to compare the lengths of two objects.
But the comparison through the third element is not a real measurement. It isolates the parameter , and indicates it value, but it itself is an independent, concrete object.
Third element is not an instrument that transforms the measured size into a quantity.

Usage of real measurement (by dividing object to the parts) What the child have to do is to compare, for example, the length of two 'stepped' lines or two 'paths', using a small strip of paper.

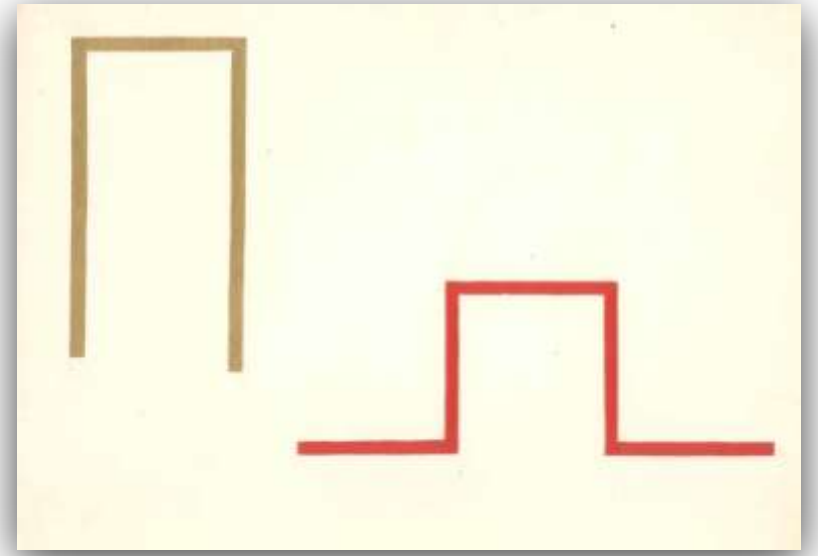


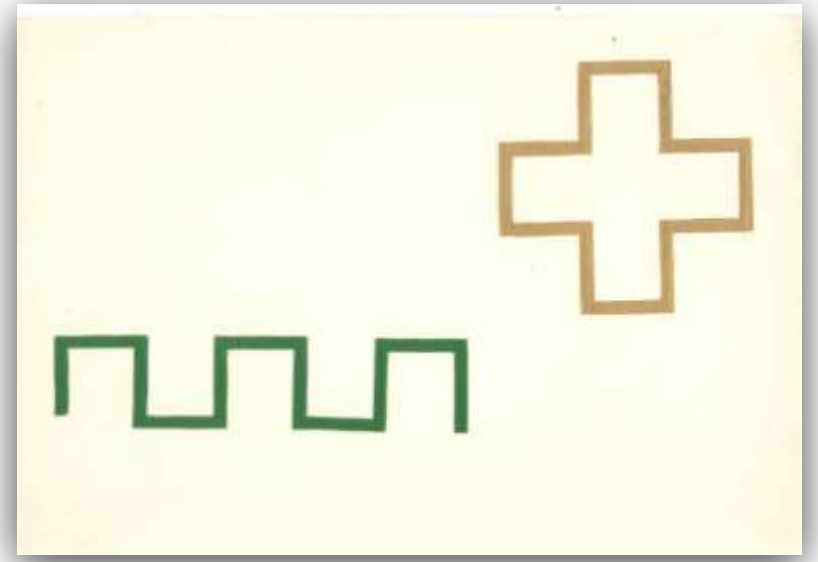
Fifth step – usage of orientation card

The length was measured and compared using the marks. And all this information the child wrote in the card-scheme.



Example of exercises





Measurement of the ordinary objects

- We teach the children to use a measuring instrument and marks in different situations.
- We gave the child real objects (two rods, two books, some cottons and a stone, a nail and a pencil, etc.) and asked the child to measure and compare objects by different parameters - dimensions (length, breadth, height, area, weight).

The mode of reasoning thus formed was then transposed to Piagetian (and similar) exercises including the parameters of length, area, distance, weight and volume.

Solving the Piagetian exercise

Conservation of length, area, distance, weight and volume

Different either in structure (discrete and continuous quantities) or in material (modeling clay, liquids, etc.)

All exercises were made correctly and children always could justify their answers

Results - child begins to make a distinction between what seems to be and what actually exists

- The child passes beyond the limits of his or her immediate experience and sees for the first time the possibility of truly scientific understanding of the world.
- When we teach a child how to use an objective criterion to isolate parameters, and how to convert them into mathematical quantities and establish a one-to-one correspondence between them, the child's initial idea about things is thereby modified.

The highly important effect

The transition to scientific thought is *modification of the picture of the world*. As a rule, things appear to the child, as they immediately seems to him. Even if there should be something behind the external aspect of the object, it remains mysterious and hidden from the child.

Before our teaching, the children always took the appearance as reality, after our teaching children begins to make a distinction between what seems to be and what actually exists

Results - development of a new intellectual instrument

The use of measurement became for the child a new method of exploring of the environment
We taught the children to use a spatial scheme to represent the structure of the essential properties of the object.

This schematic representation of the essential relations between the objects is the outward manifestation of what will subsequently be the inner framework of the child's reasoning.

Results - ***the change in the child's attitude***

- At the pre-scientific level of thought the child arrives at a judgment that is immediate and "egocentric".
- In our experiments we taught the children to assess objects by measurement, which serves to give material expression to an objective attitude to things.

The transition from pre-scientific thought to the first truly scientific thought in the child

In conclusion repeat again:

We constructed our experiment in accordance to Galperin's method of the systematic formation of mental actions. This method enabled us to instill new knowledge into the subjects, but it also revealed something else to us, namely, how the elements of scientific thought take shape.

The first type of investigation:

the notion of conservation

The new result in this investigation is the construction of **“operative scheme of thinking”** on the basis of measure.

NB: As the result of such kind of teaching “le décalage” was absent

The second type of investigation

The solving of the open tasks
(Gilford, Torrance)

goal

The goal of this investigation - to create a system of conditions which will allow to receive many decisions of a problem “Drawing pictures“ (P.Torrance)

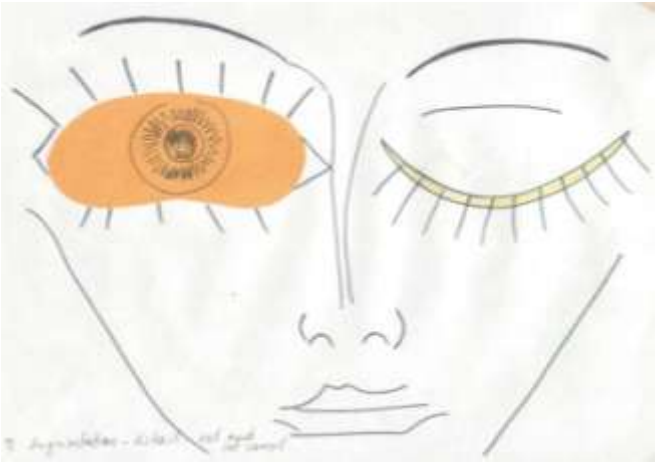
The ideal form

“Let's agree to name … the developed form which should appear in the end of children's development … a final, or ideal, - ideal in the sense that is the sample of that should appear in the end of development.”

Л.С.Выготский «Лекции по педологии», 1933-1934 г.

The drawings of adults

The ideal form - drawings of adults – opens the possibility to find the qualitative criteria of success in the decision of divergent problems



New variant of a technique of double stimulation

Designing of means of orientation
- «magic windows»

"ВОЛШЕБНЫЕ ОКОШКИ"

Устройство "окошек"

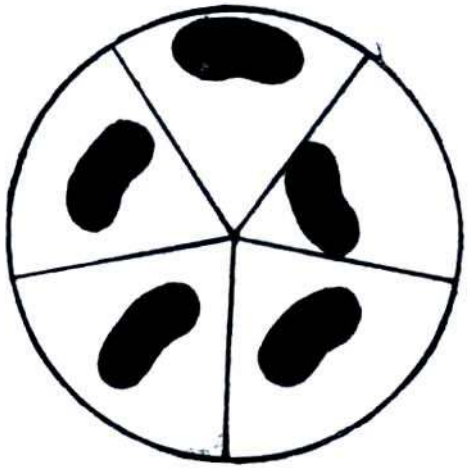


Рис. 9.
(пространственный опыт)

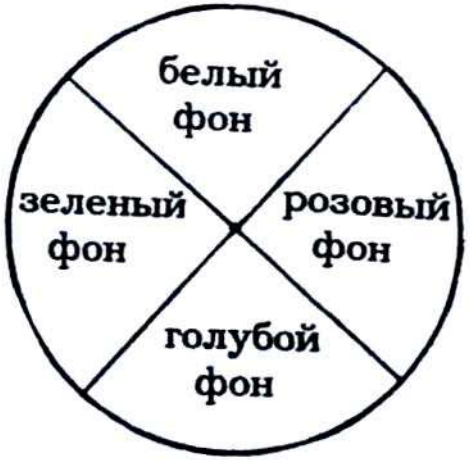


Рис.10.
(визуальный опыт; цветовой фон)

Рис. 11.
(перцептивный опыт)

Рис. 12.
(эмоциональный опыт)

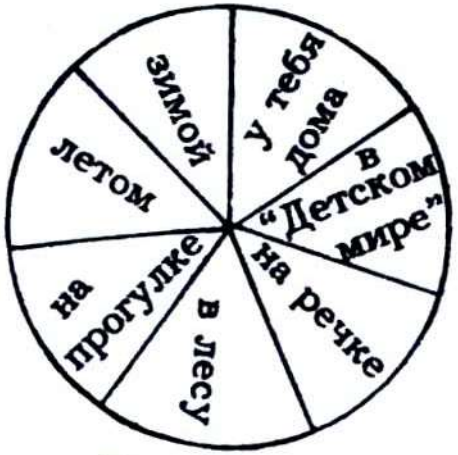


Рис. 13.
(ситуационный опыт)

Рис. 14.
(сказочный опыт)

Рис. 15.
(игровой опыт)

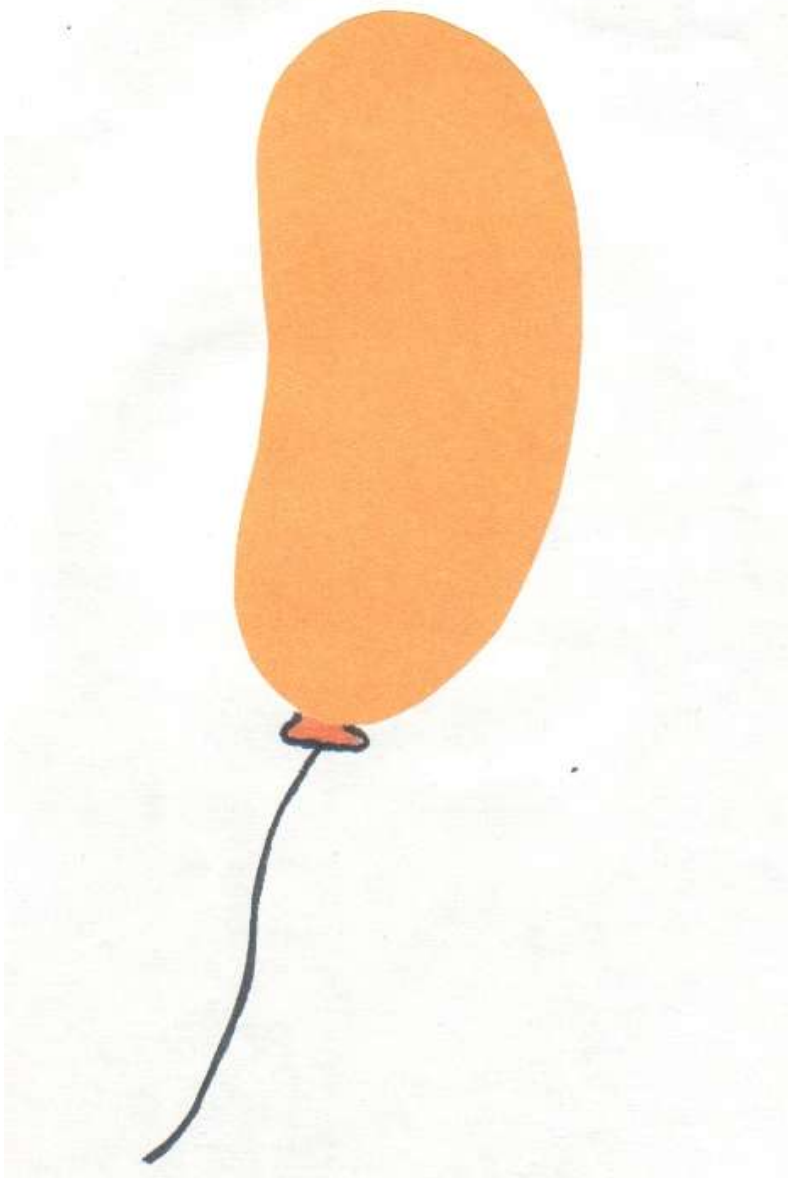
The magic windows

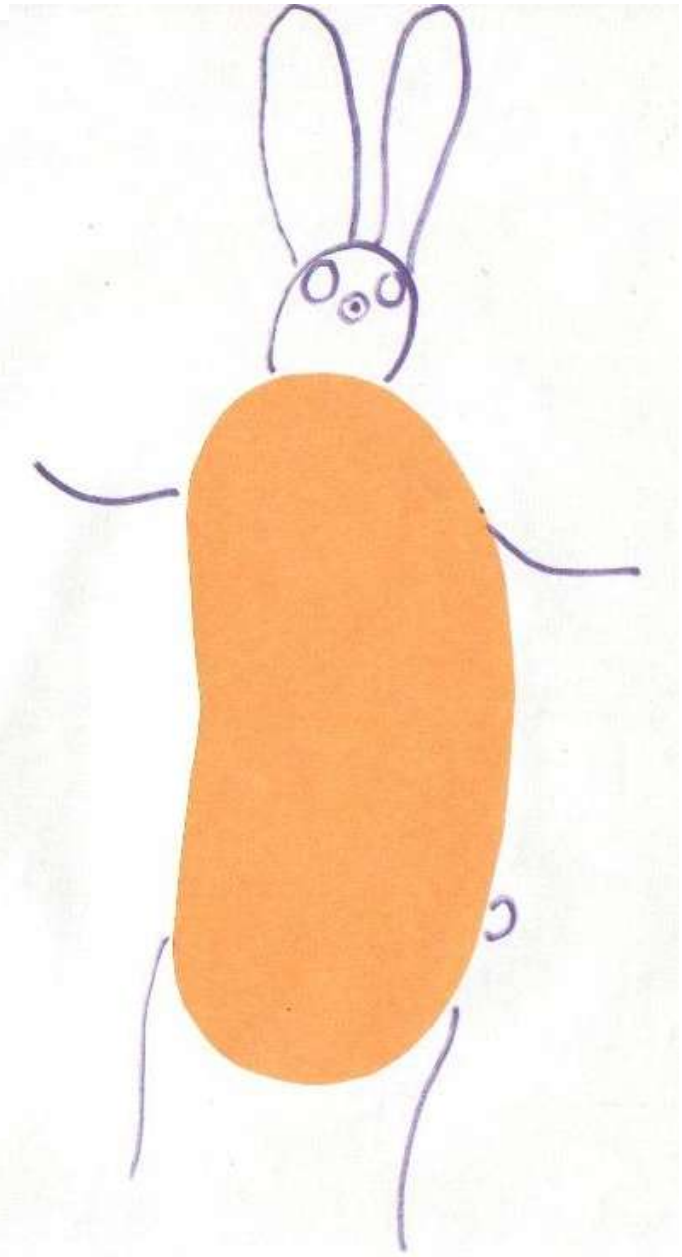
Magic windows helped the child to find the decision.

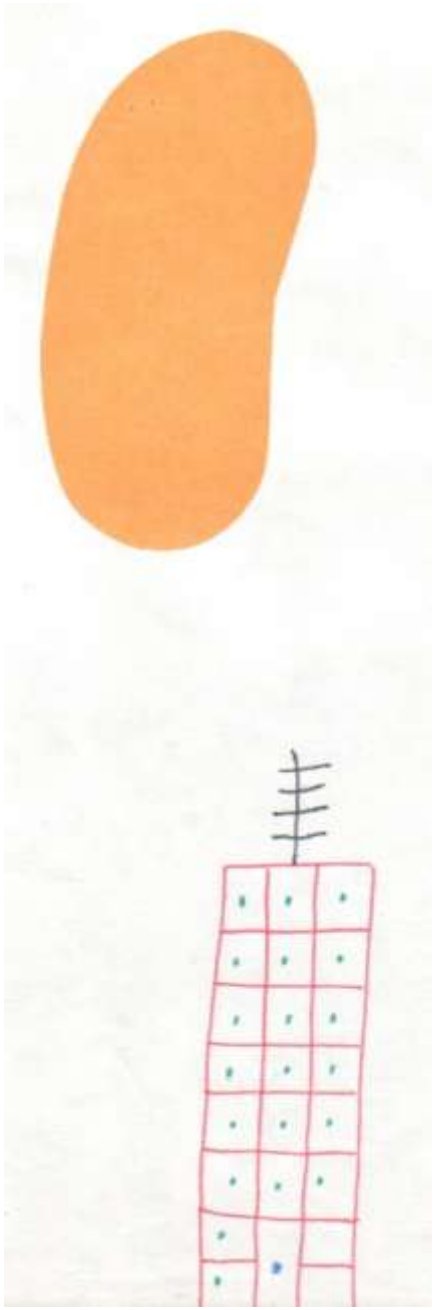
They reminded the child familiar situations, fairy tales, fantastic charachters, etc.

Drawings of children of 5 years

A forming series

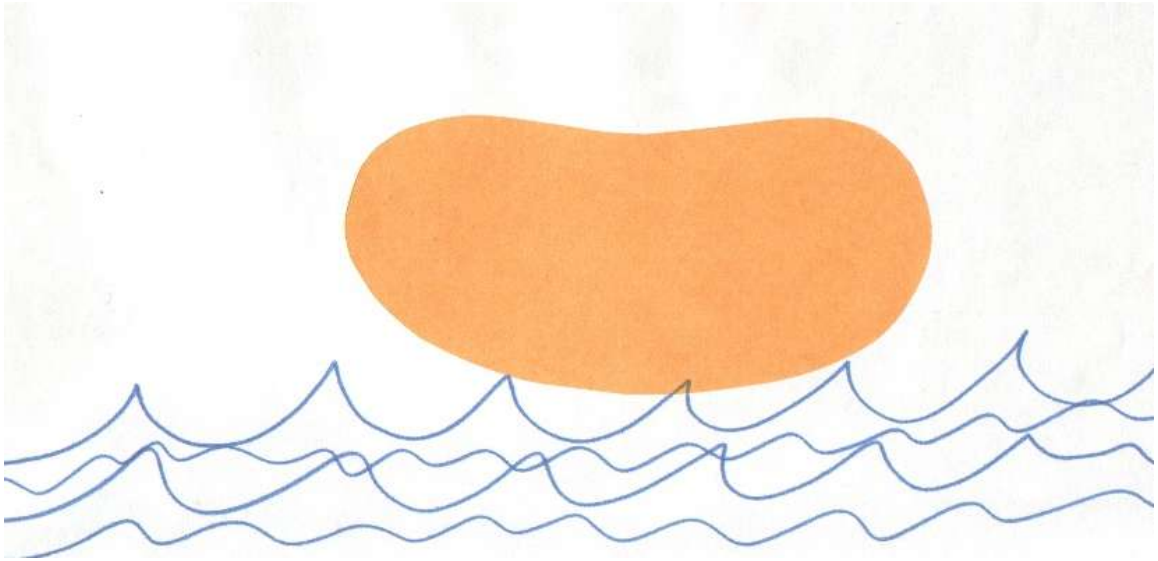


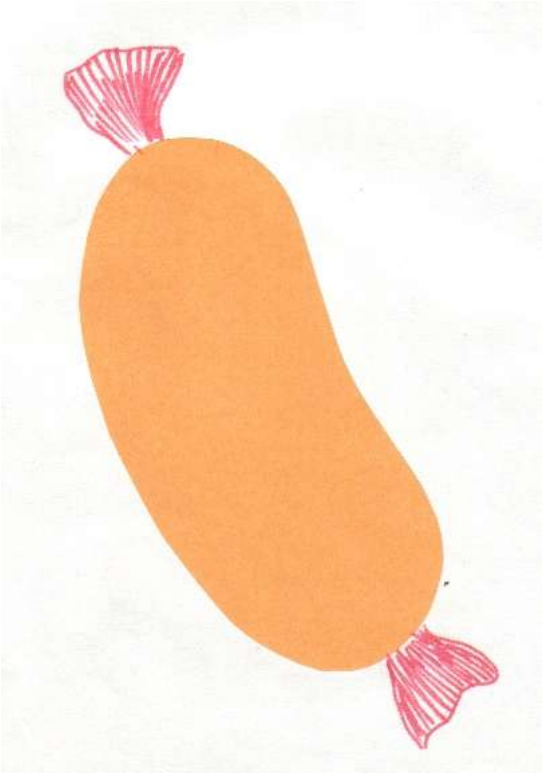




Drawings of children of 6 years

A forming series





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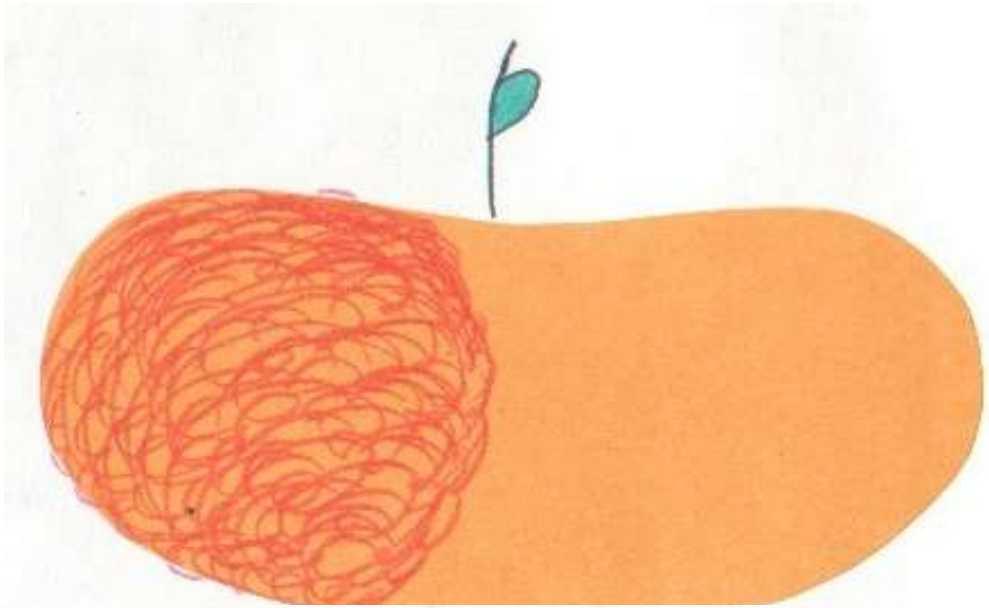
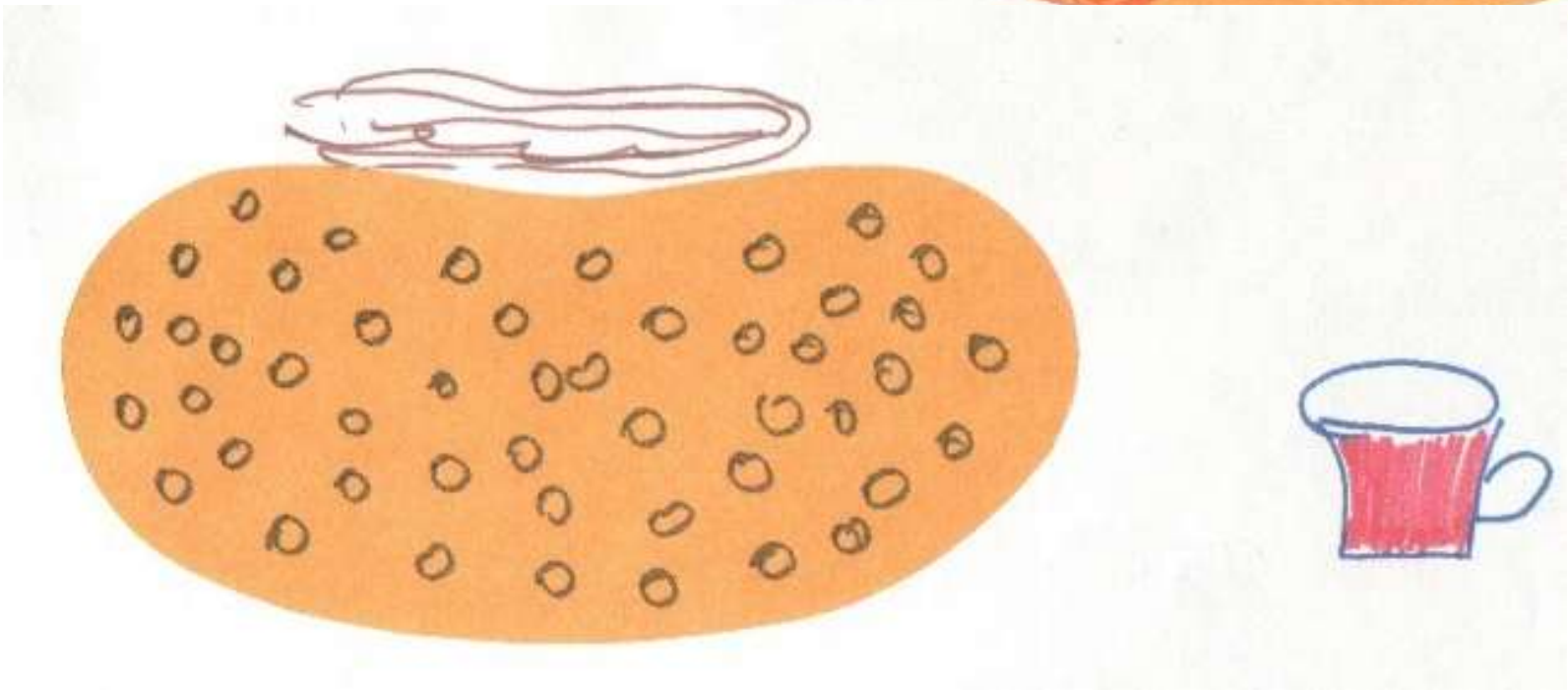
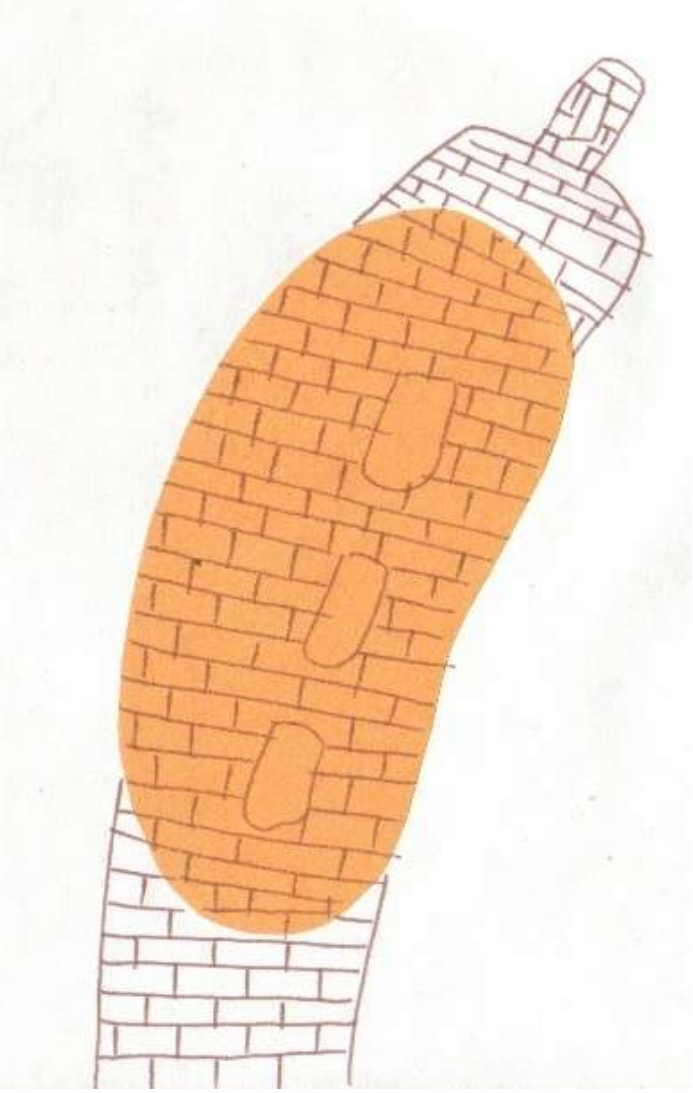
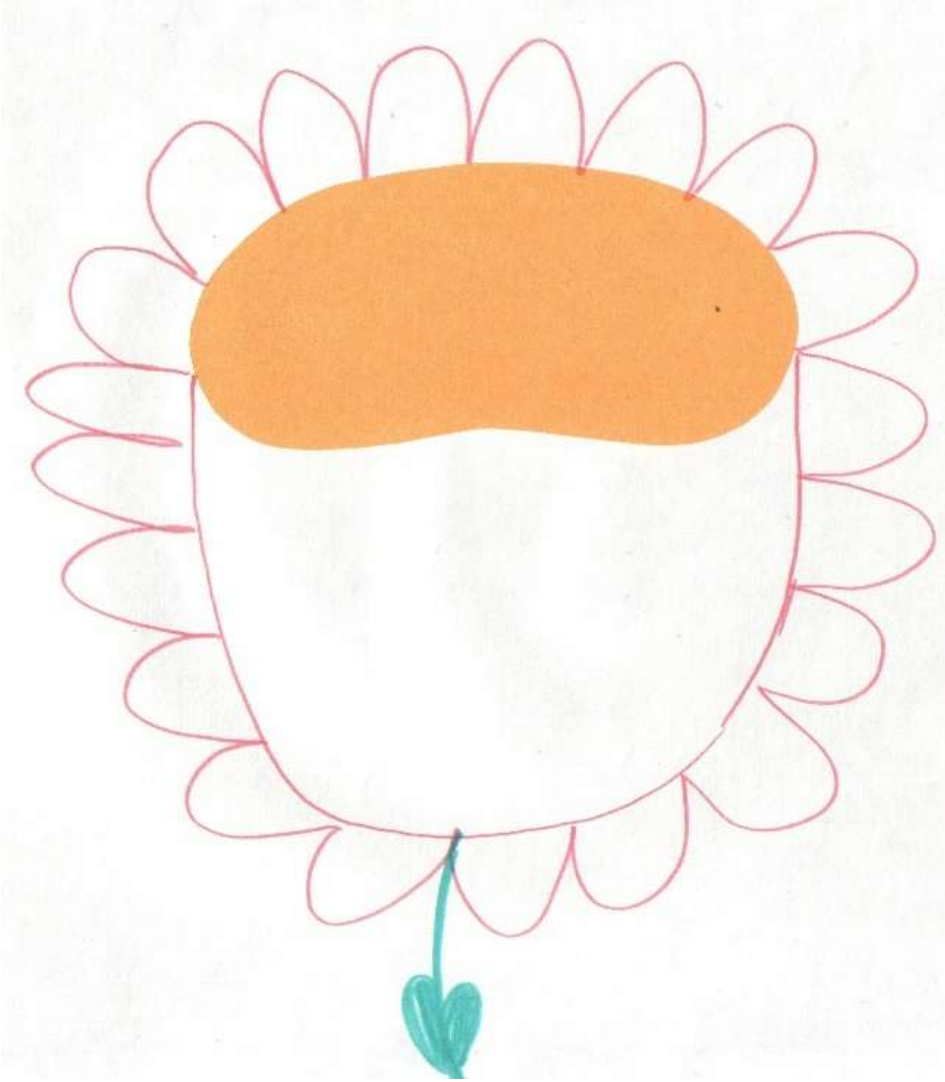


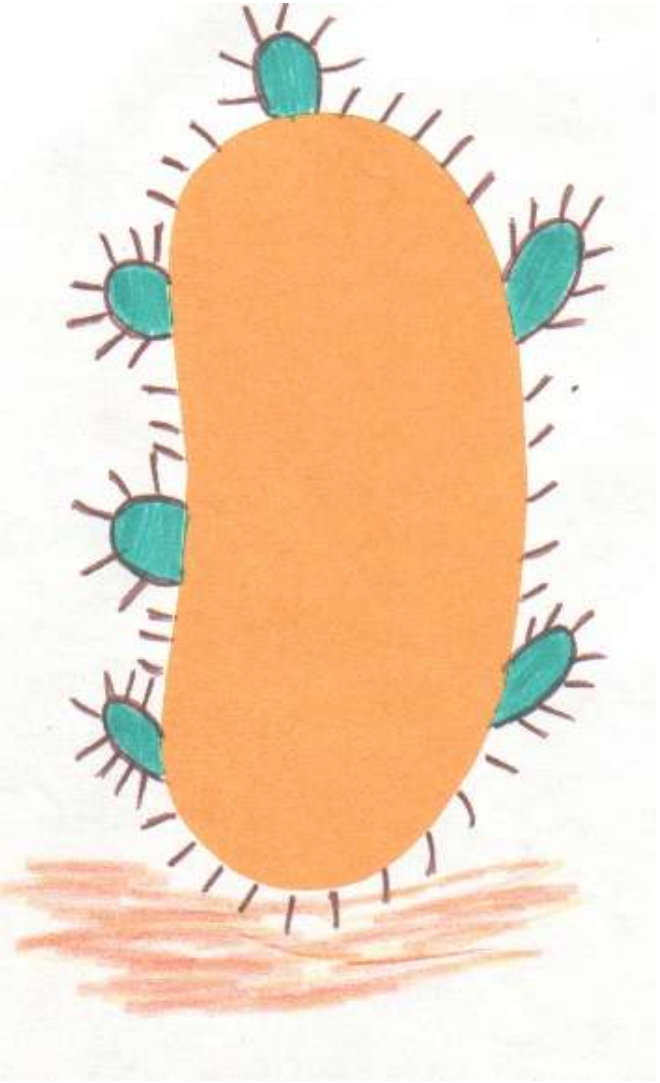


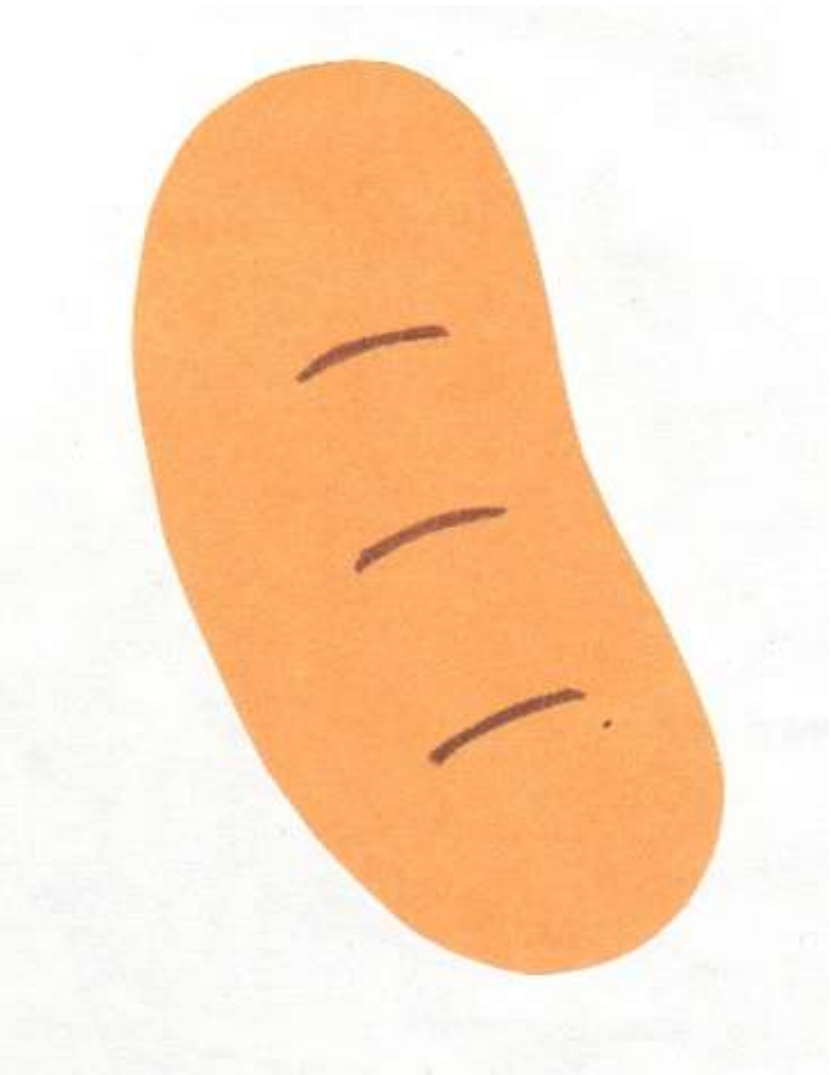


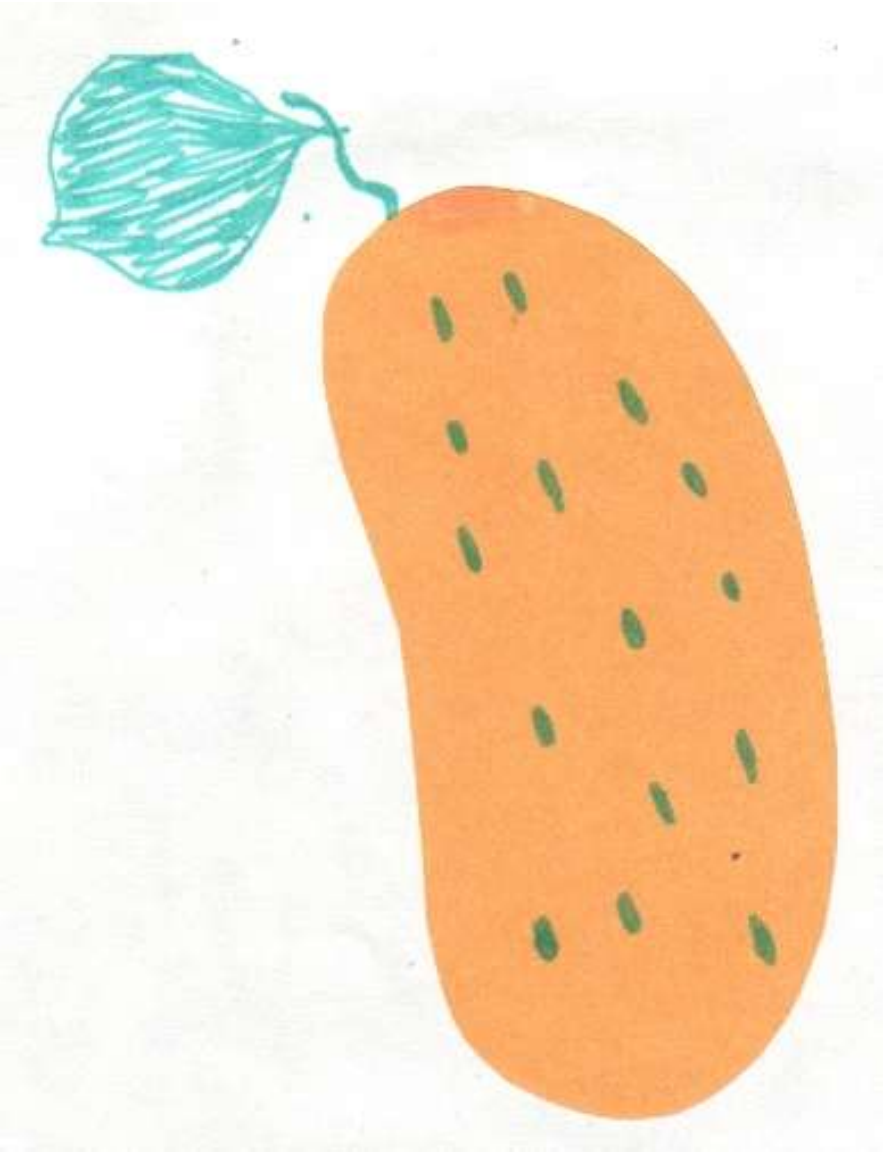


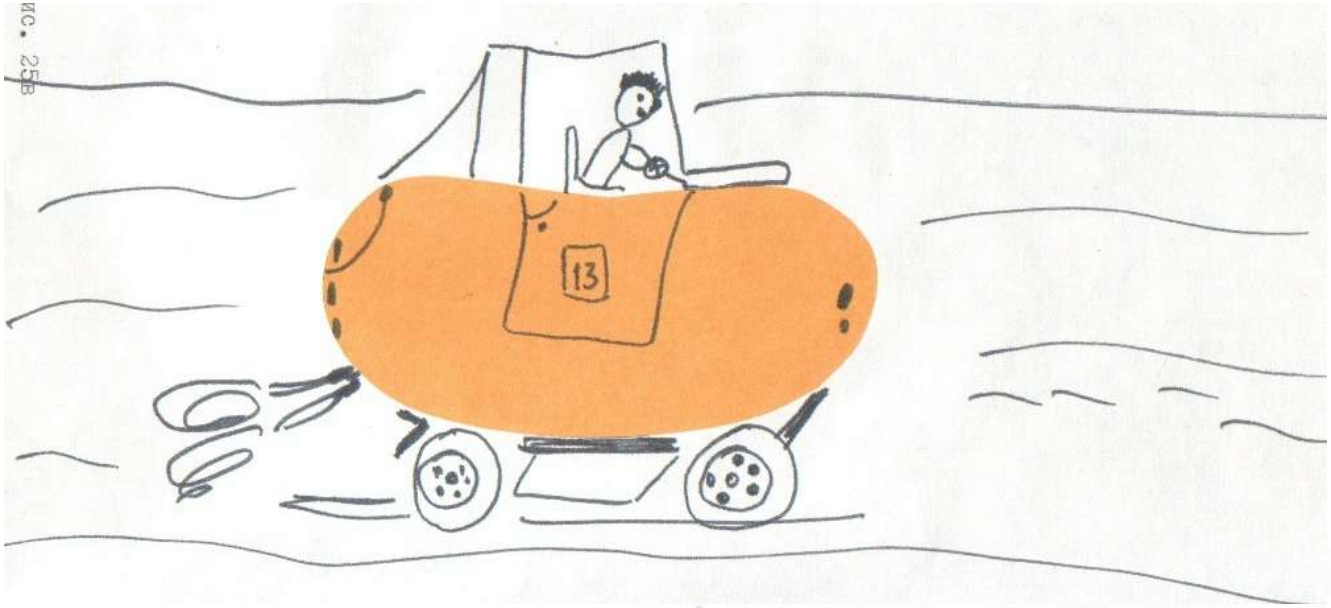
Drawings of children of 7 years

A forming series





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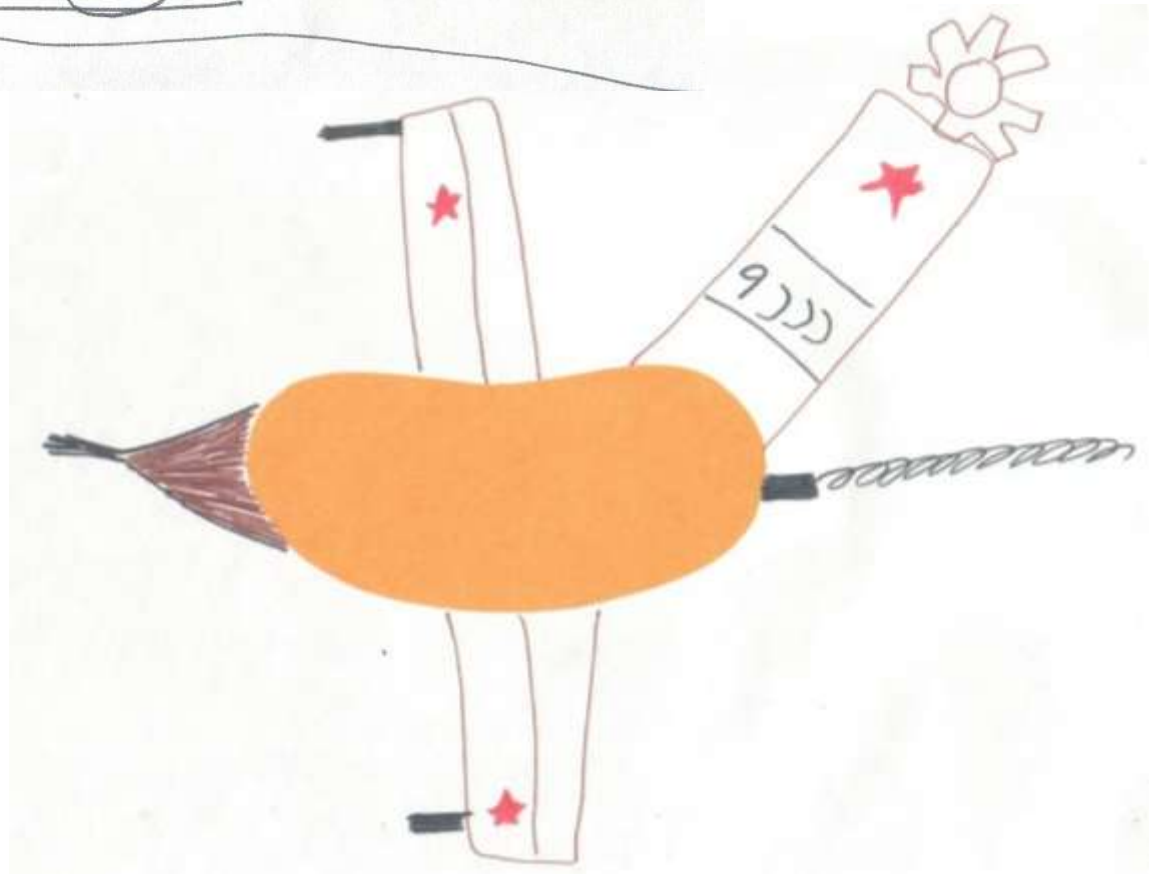

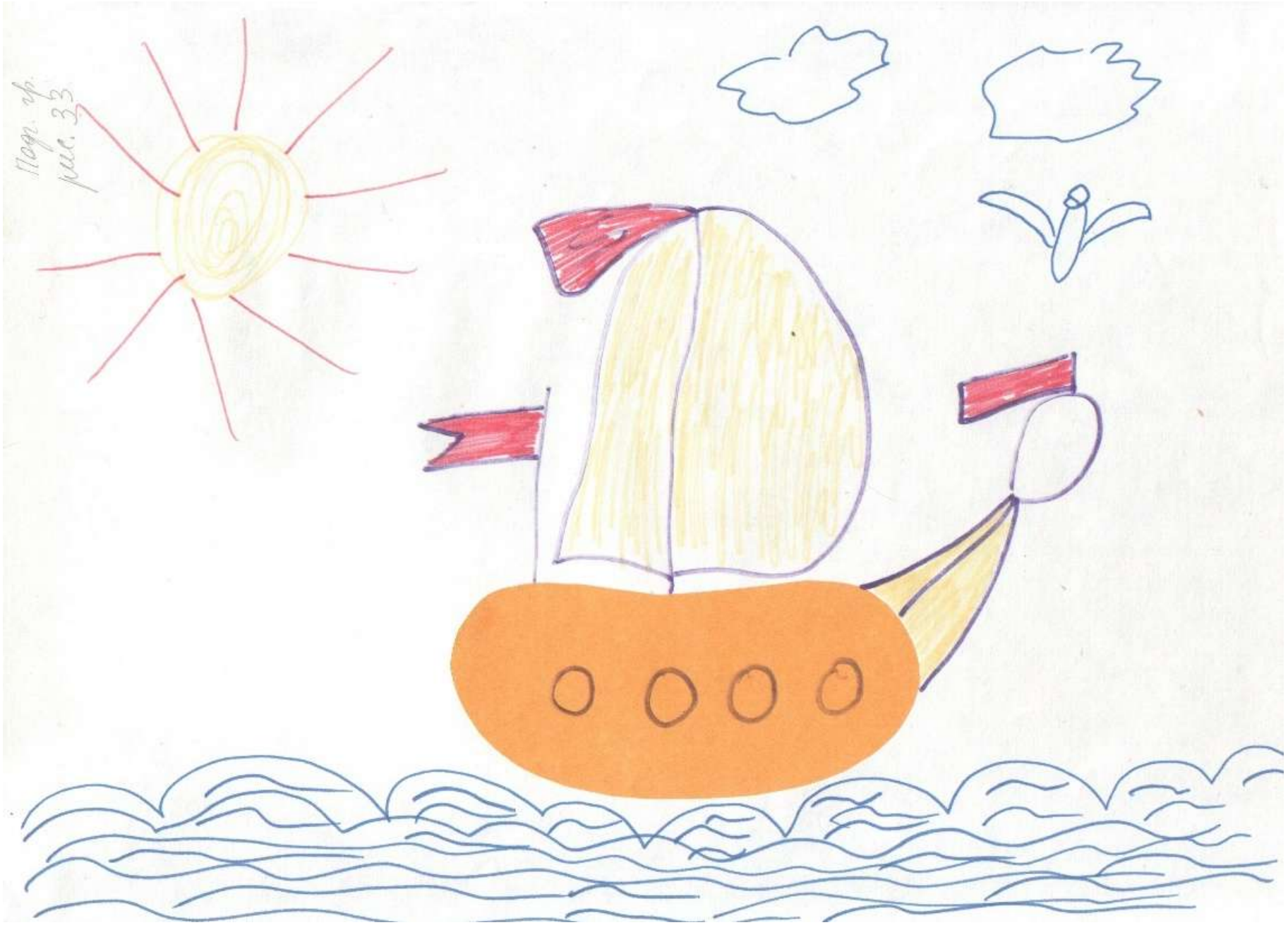
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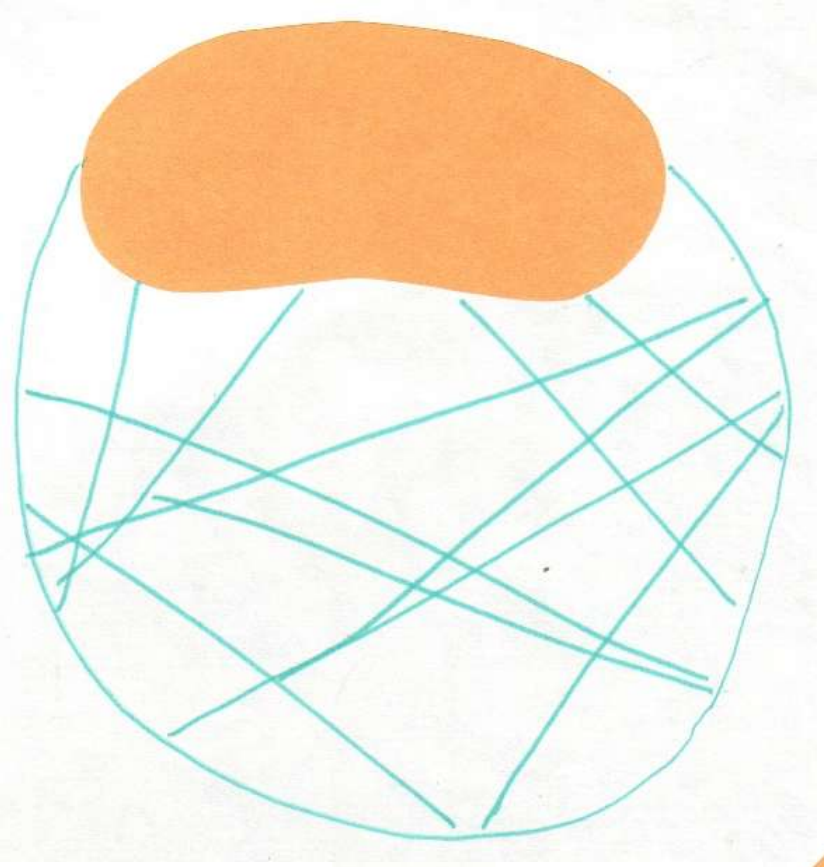

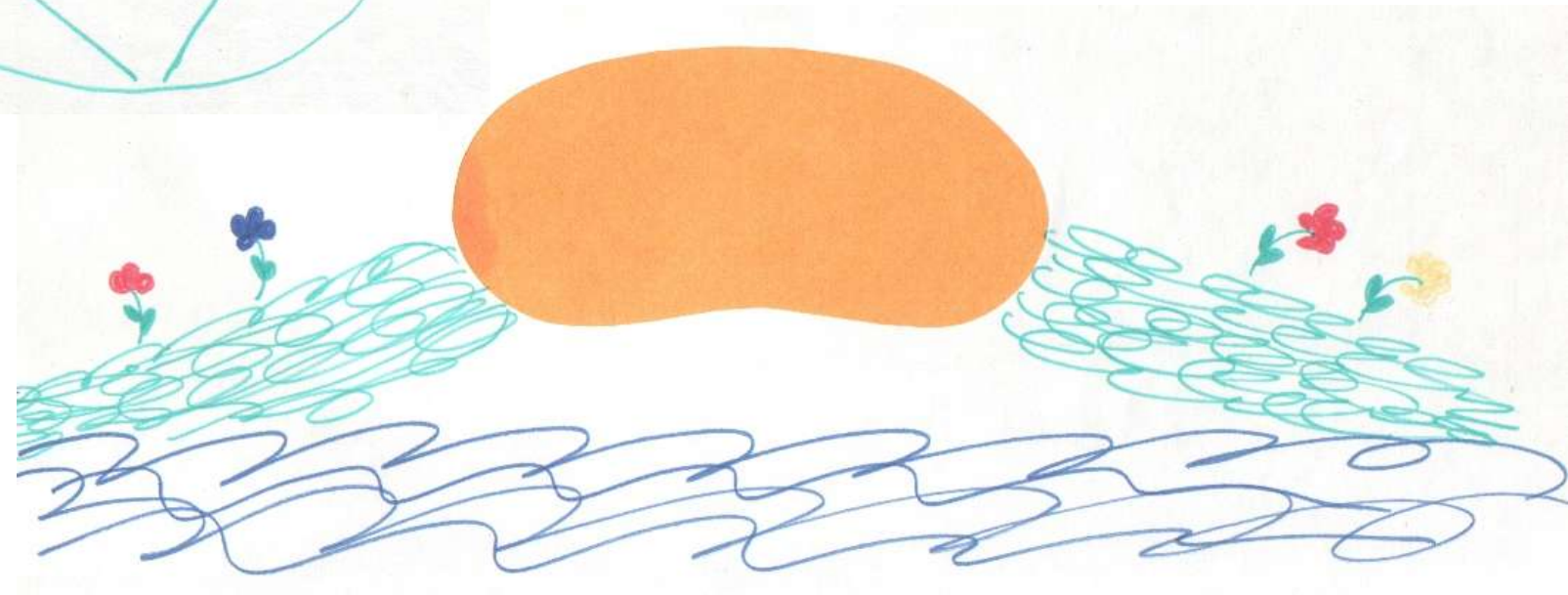

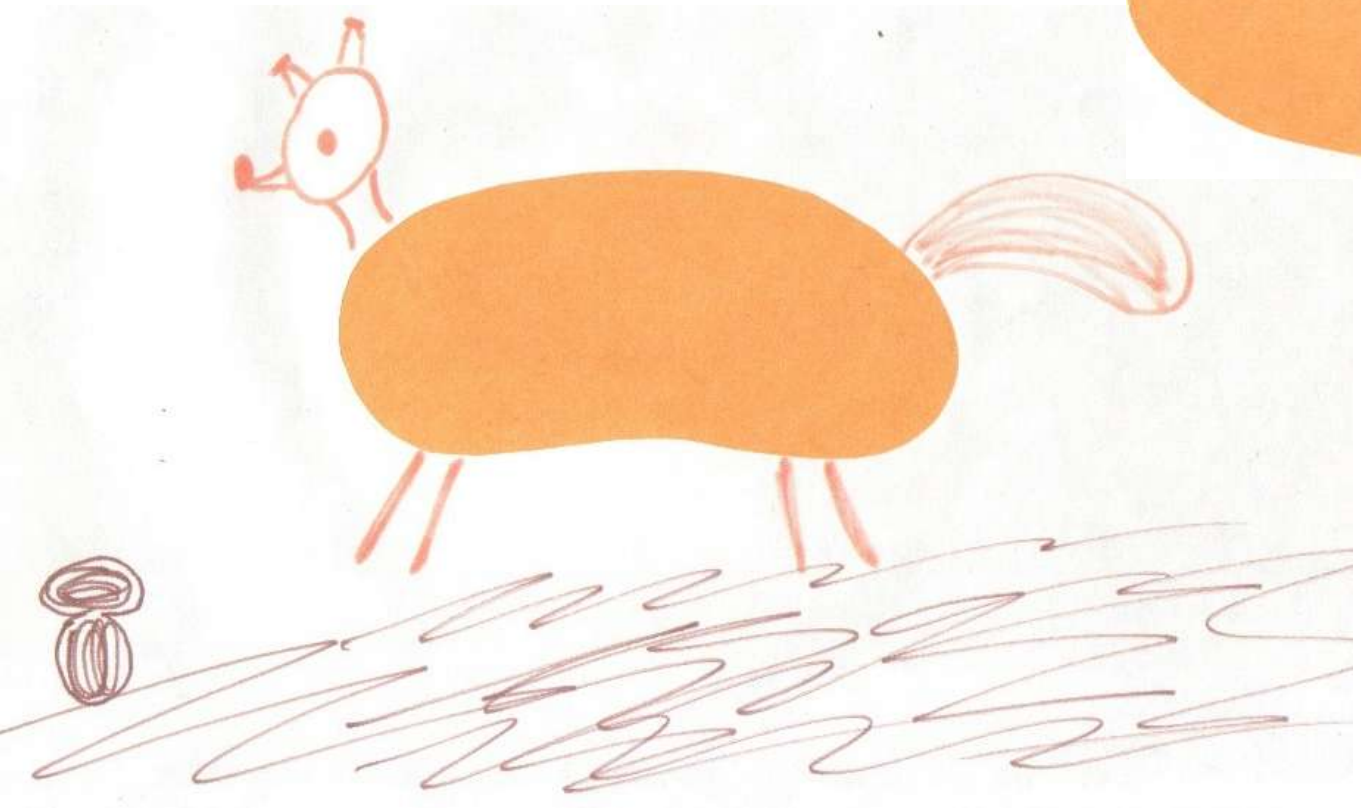

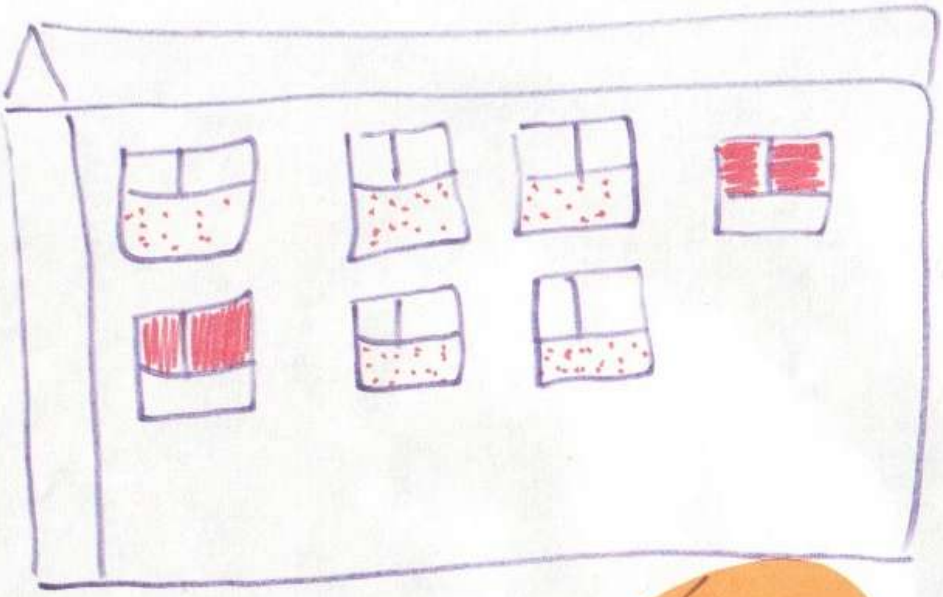

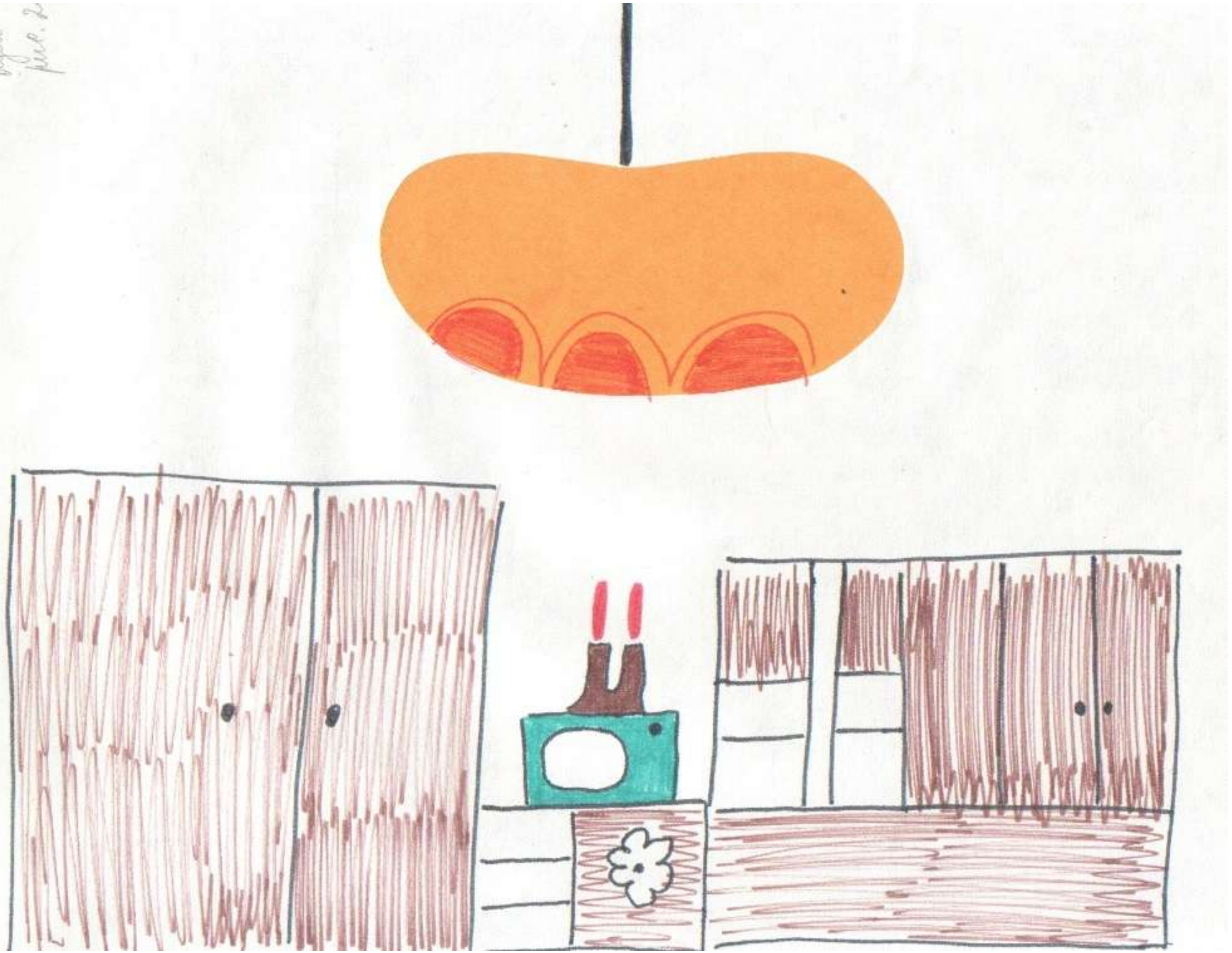

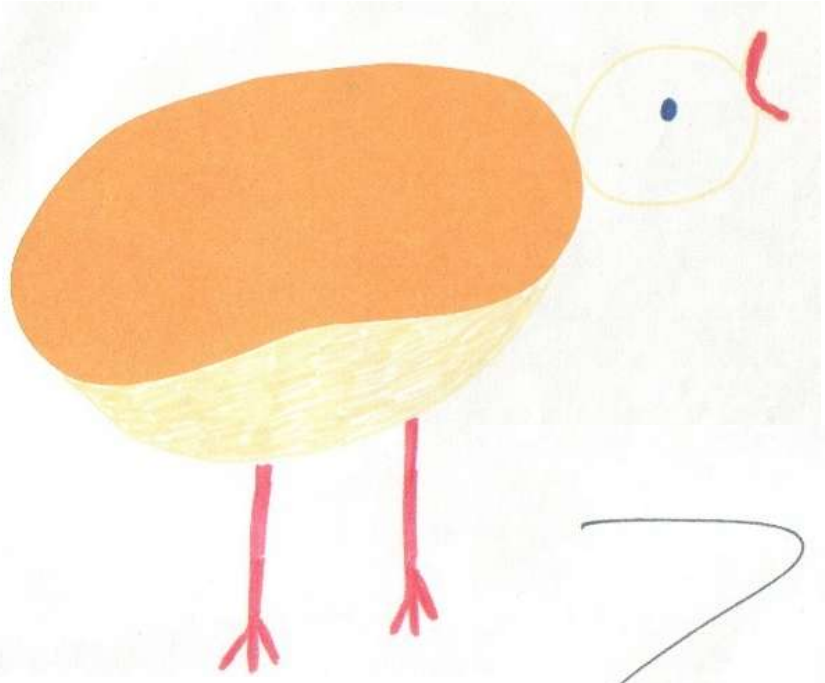

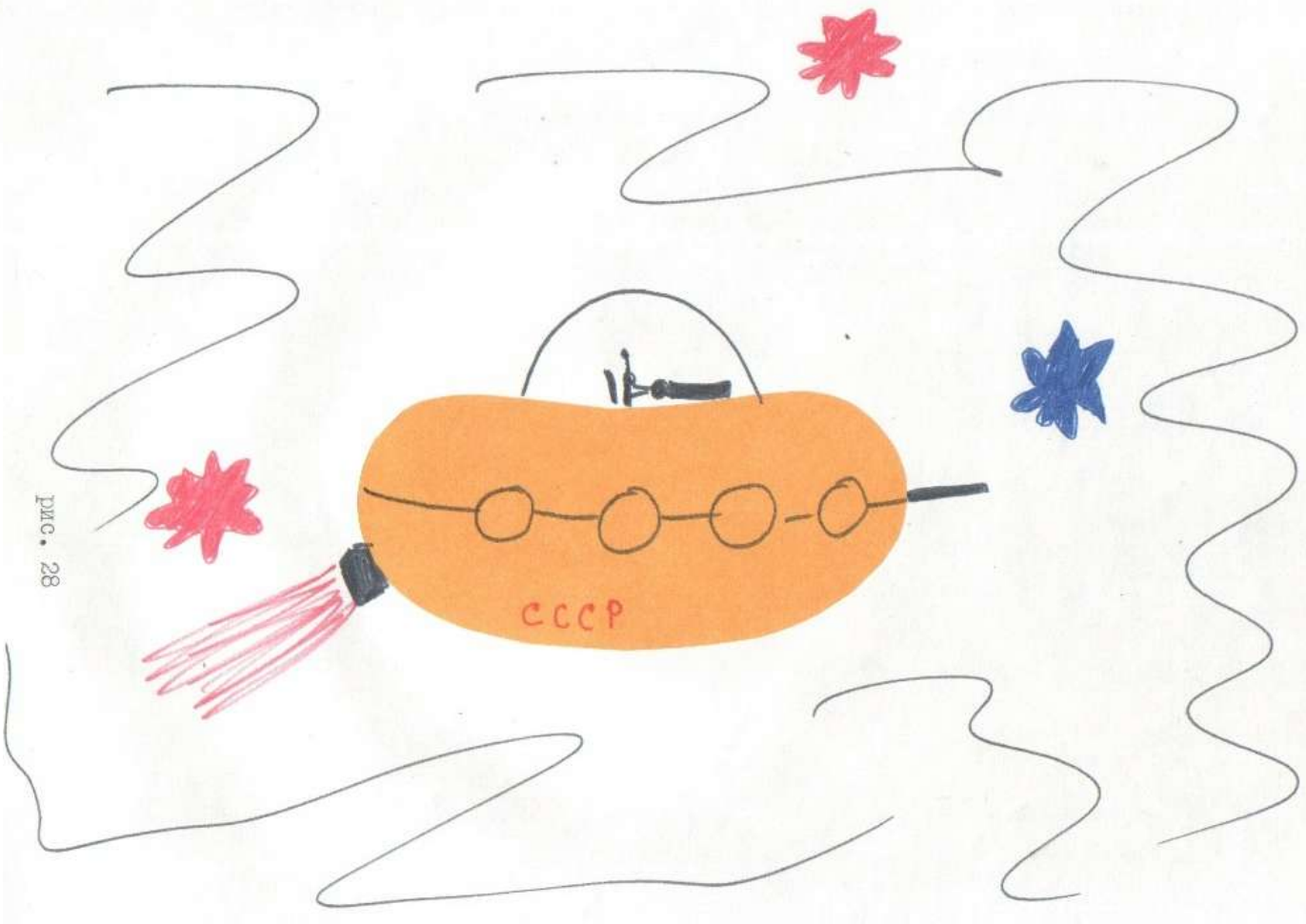

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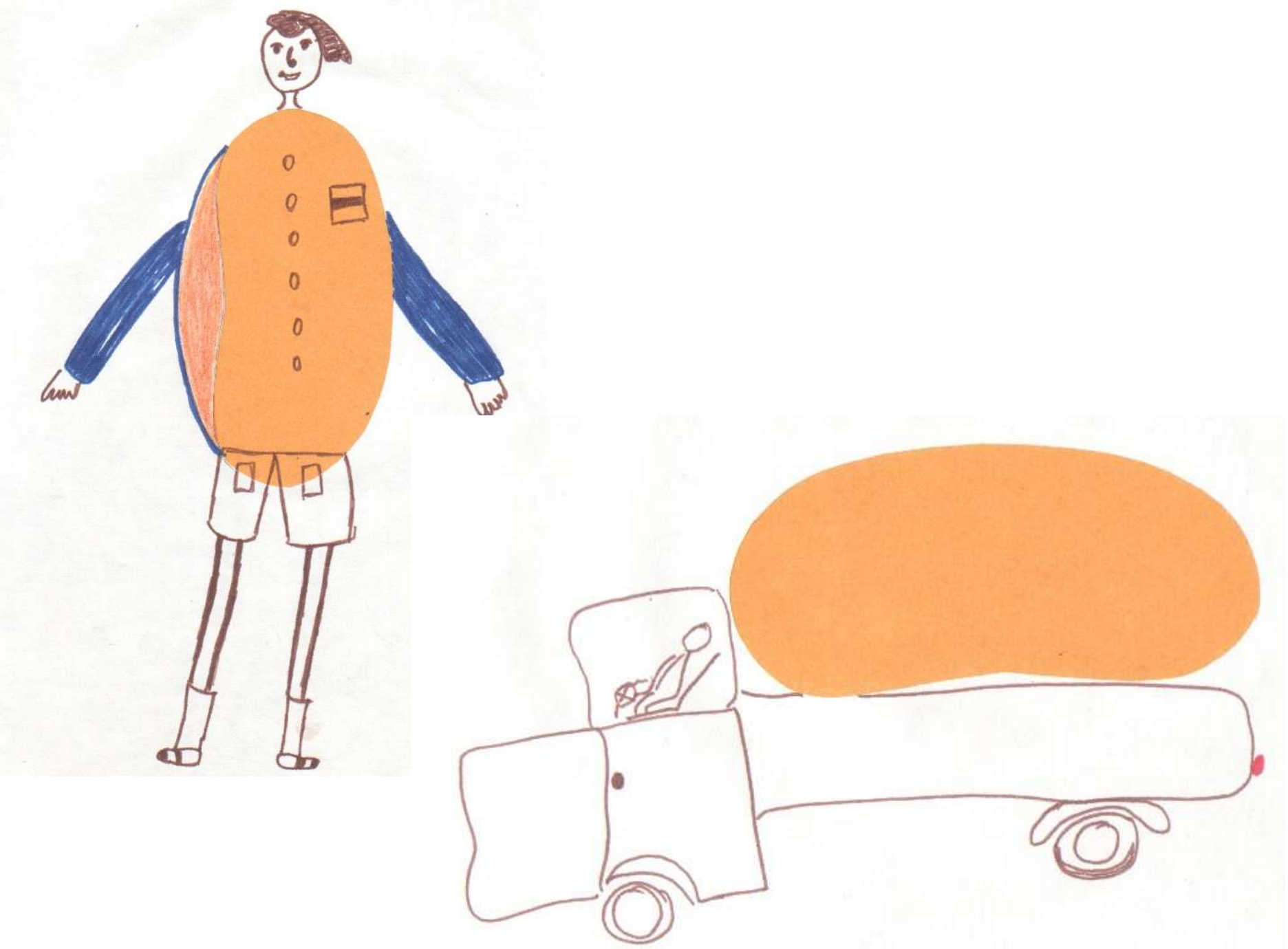
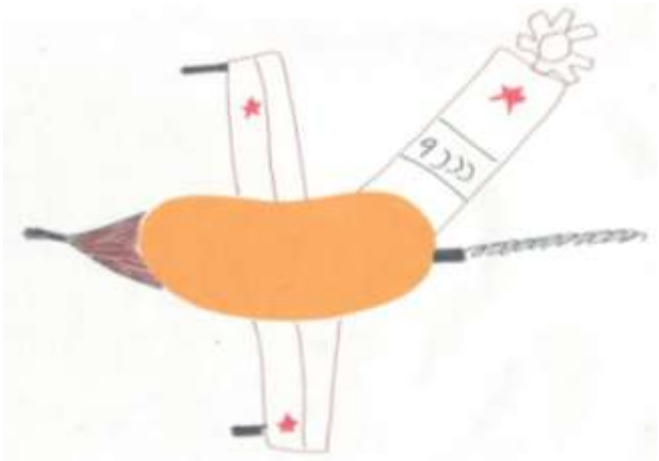


At the result of such teaching preschool children could make many different pictures



The third type of investigation

The formation of concepts with incomplete characteristics (H. Gardner)

- H.Gardner's article "Feeling of style at children“ was the source of this research

goal

The aim is to construct the system of conditions for the understanding the style of painting by children 10-12 years old who start visiting museums, choose clubs and studios, some of them are taught at art school.

The style of painting

The style of painting is very complicated notion because it has many uncertain characteristics (H.Gardner)

The artistic style combines content and formal elements typical for a certain historical period

Hypothesis

The comprehension

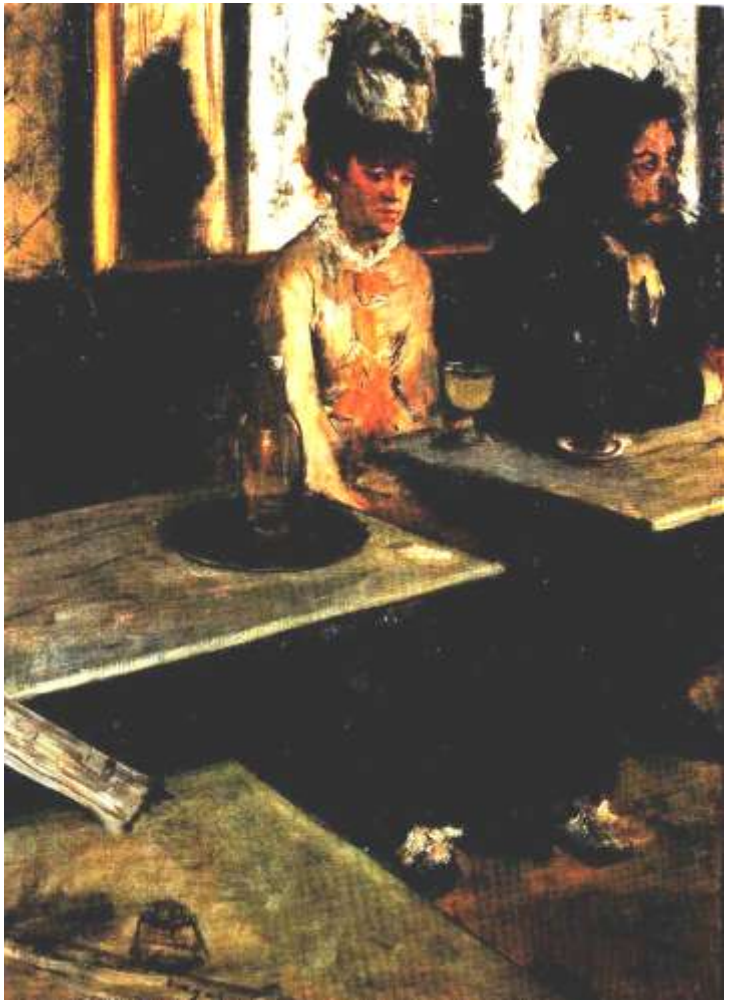
- of artistic image structure,
- of painting means,
- of artwork style

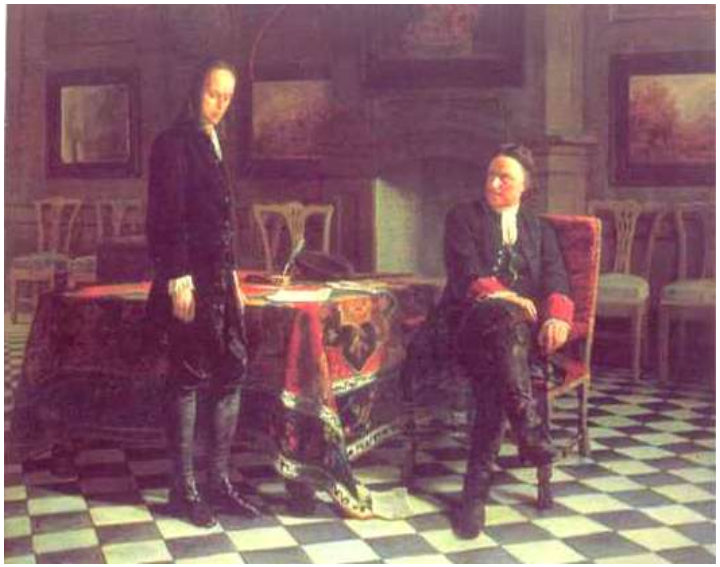
by children of 10-12 years is also possible on the basis of Galperin's theory and method.

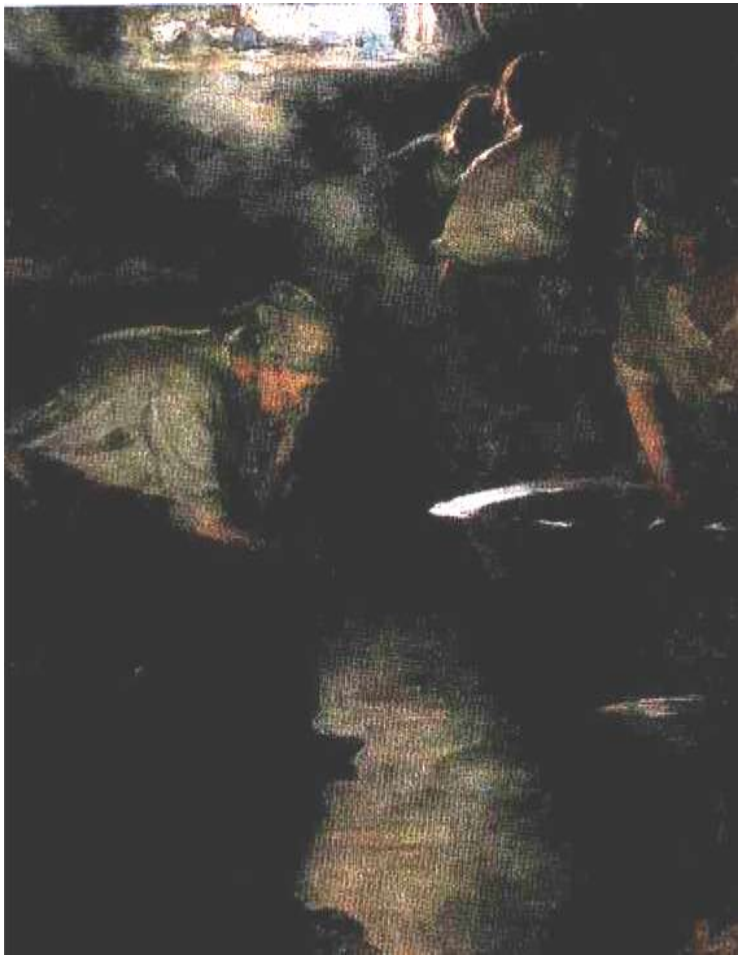
This method includes the solving of several tasks:

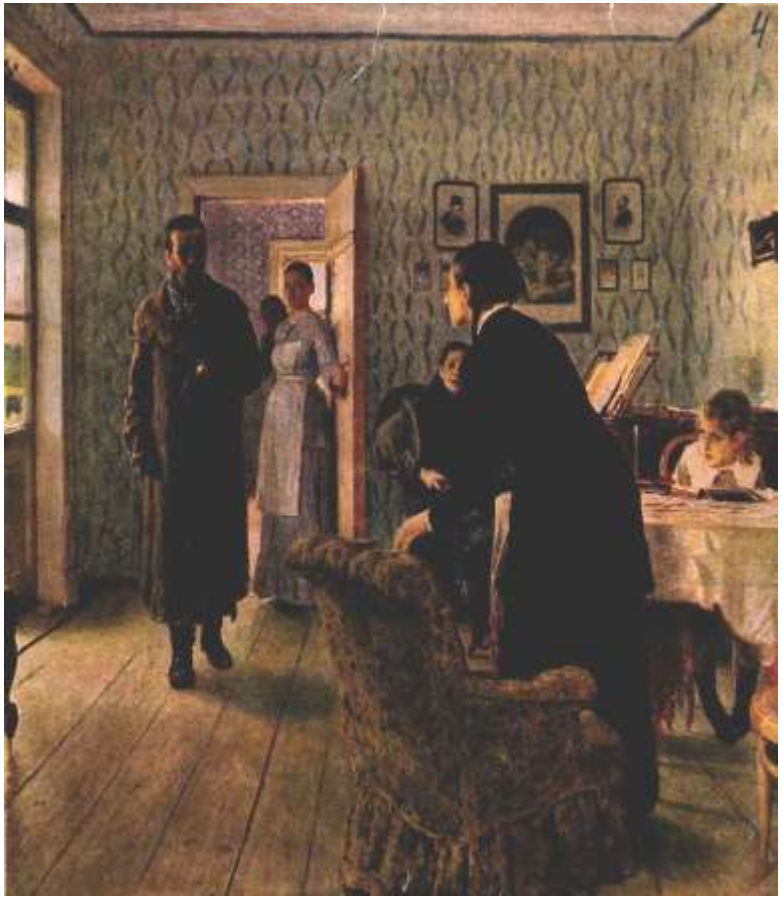
Task 1

- To discover the initial level estimation of painting perception and comprehension by children.
- To analyze the reasoning about paintings of different epochs by experts, ordinary and art schoolchildren
- To define the zone of proximal development for our subjects
- To choose material for analysis









Three levels of perception and comprehension

- Low – the *object* level. There is the enumeration of images without understanding language of painting art. This level predominates among schoolchildren.
- Middle – the *emotionally evaluating* level. There is the elementary aesthetical estimation of work emerge. This level appears among the children from art school.
- High – the *sense* level. It is the level of experts.

Task 2 - the mastering of “reading rules” of painting

For solving this task the orienting card has been development

Orienting card № 1

№	Steps		
1	**Initial examining of picture**		
2	**Gathering of information**	WHO? WHAT?	WHICH ONE? WHAT S/HE DOES? WHOM INTERACTS WITH?
	About main heroes		
	About second plan heroes		
3	**What the painter wanted to say us**		
4	**General conclusion**		

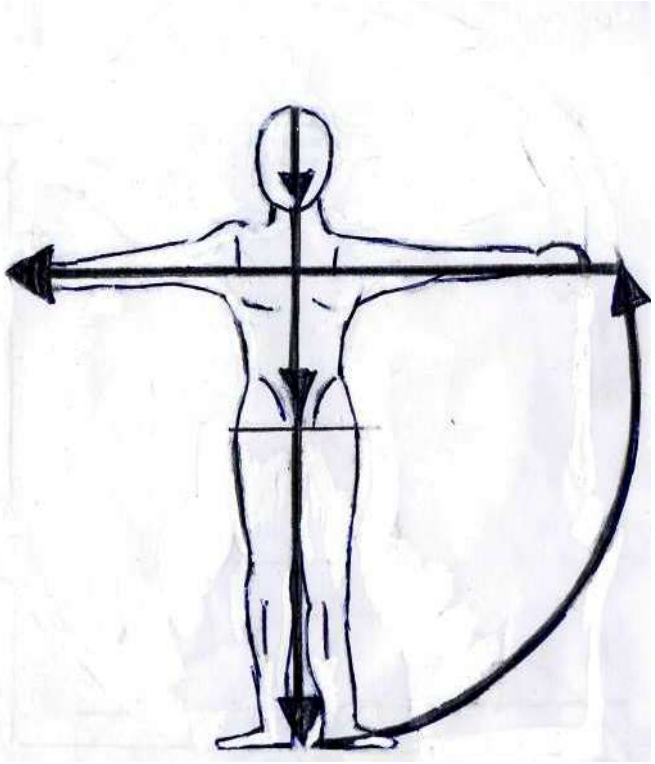
Plan of the work with this card

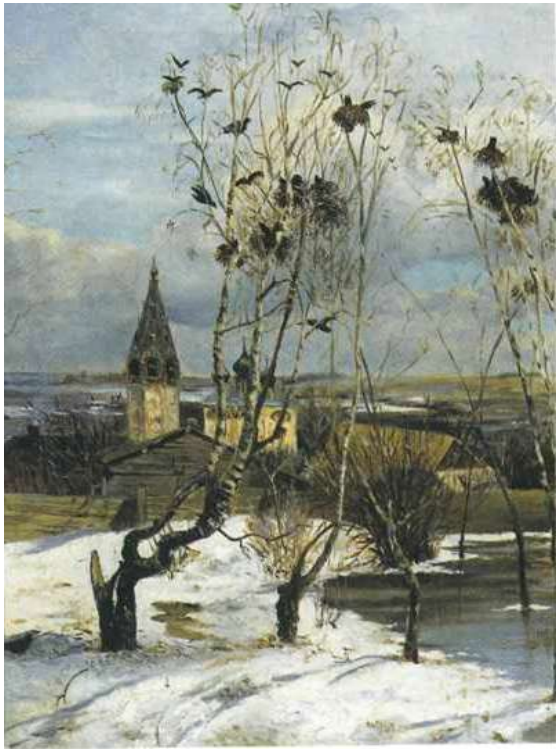
- The initial examining of picture: the transition from the general point to the detailed analysis
- Search of heroes in the picture dimension
- Gathering of information about each hero
- Formulating the idea, included by painter in a picture
- General conclusion

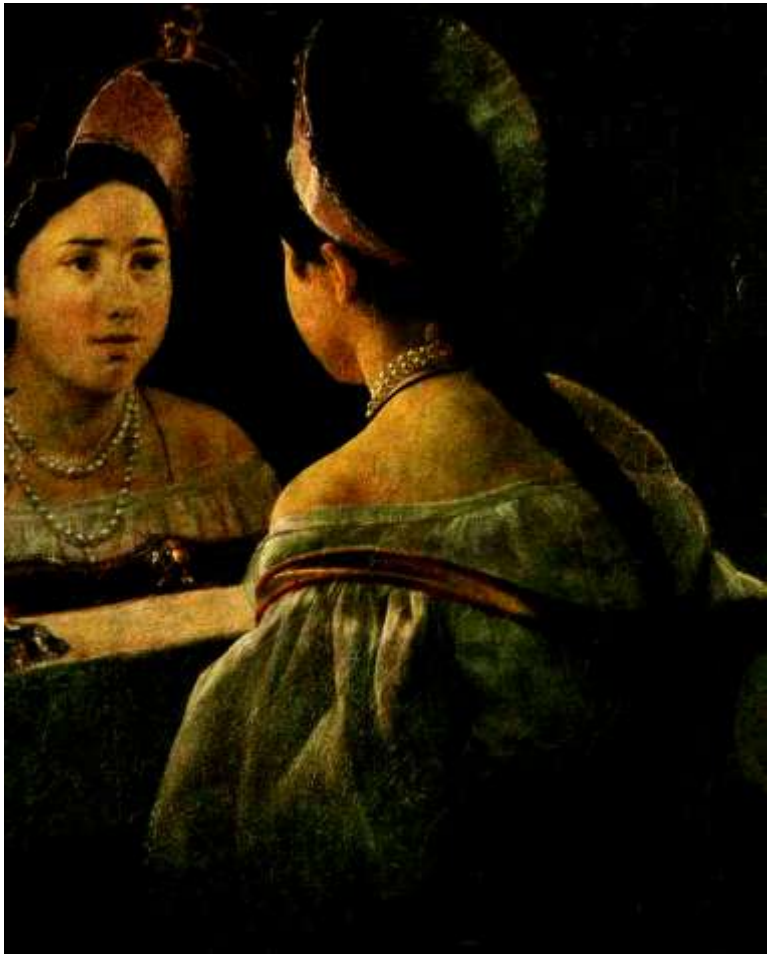
Results

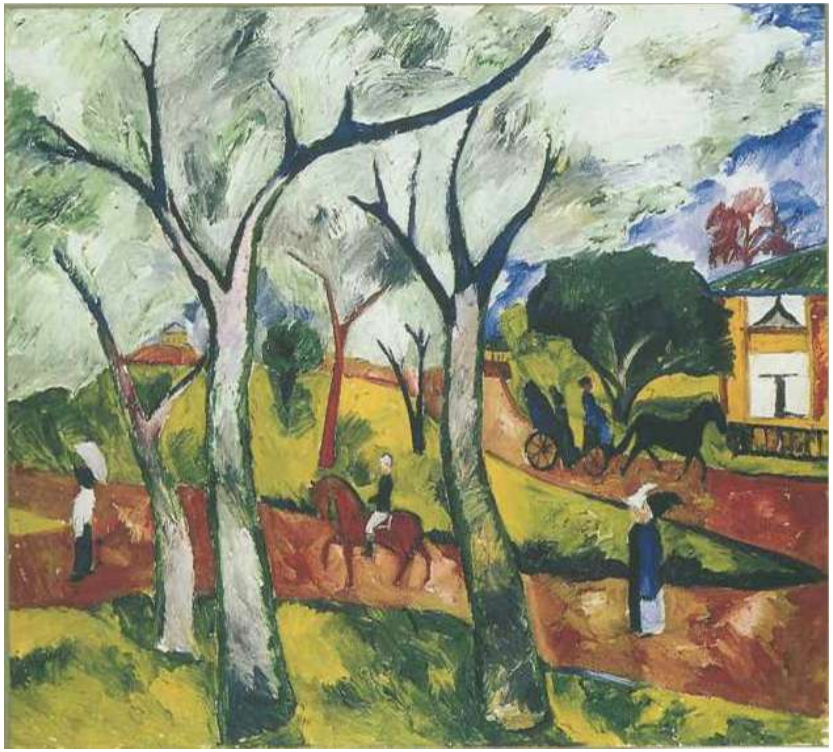
- The gathering of information about each hero, the students made the superfluous movement of eyes.
- That is why, the initial examining of picture was further made with help of an operating scheme which directed the children eyes movement when analyzing the picture

The fragment of the “Golden section” was used as an operating scheme









- The analysis of picture on the basis of operating scheme was accompanied by verbalization. The speech helped a child to understand a content of picture and its basic meanings.
- All the characteristics, found the children, they wrote on the orienting card in the corresponding step section.
- This activity was trained step by step, first with help of orienting card, then without it.

Task 3 –
the forming of a skill for distinguishing
the art-style of painting

Choosing material:

- the Renaissance,
- the baroque,
- the Classicism
- the separate style trends: the Romanism, The Realism and the Impressionism

  in the foreign and Russian art

"great styles"

- Children acquaintance to painting started with Renaissance and baroque repeating the way scientific studying of art style began with the comparative analysis of the differences between art of Revival and art culture of the XVII century.

Distinguishing the constant and various features of artistic style

On the basis of researches of Swiss art-scientist G. Wellflin and Austrian scientist A. Regale the differences among styles were reduced to the following feature pairs of a formal variant style:

- Linearity – Picturesque
- Plane – Background
- Closed form – Disclosed form
- Multitudeness – Unity
- Absolute clearness – Relative clearness of object sphere

The constant features of an art style

- The genre (type) of the piece of art,
- The content characteristic of the image,
- The characteristic graphic-expressive means:

  form,

  composition,

  colour,

  contour line,

  the texture of the canvas,

  contrast

Step by step forming of mental actions:

1. **Motivation stage** is based on explaining to children the role of art in the life of people and society
2. **Building orienting basis of action.**

The constructing of orienting card was made

while analysing the picture of the Renaissance epoch in the joint activity of an art-scientist, a child and an experimenter

Orienting card № 2

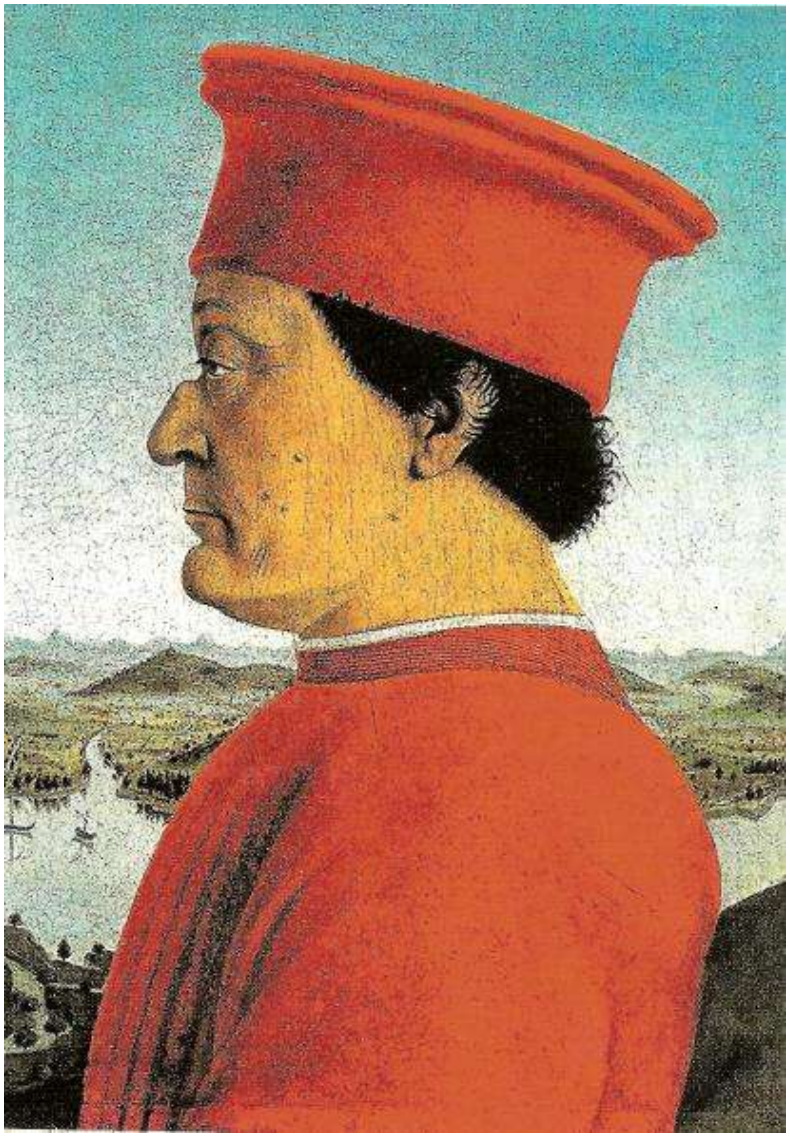
	Constant features	*Various features*
1	**Genre:**	
	Historical, everyday	*Historical* (religious, mythological plots)
	Portrait	«chamber»
2	**Form characteristic**	1. Linearity 2. Plane 3. Closed form 4. Multitudeness 5. Clearness
3	**Colour**	Restrained, local
4	**Contour line**	Sharp
5	**Canvas material**	Closed
6	**Contrast**	Soft, coloured
	Conclusion about style	**The Renaissance**

Step by step forming of mental actions

3. The stage of materialised fulfilment of action.

The experimenter acquainted children with the epoch of the Renaissance, stressing its particularities and explaining that each epoch has a special art style.

The reproduction of picture 'Portrait of Federigo da Montefeltro' (the Renaissance)

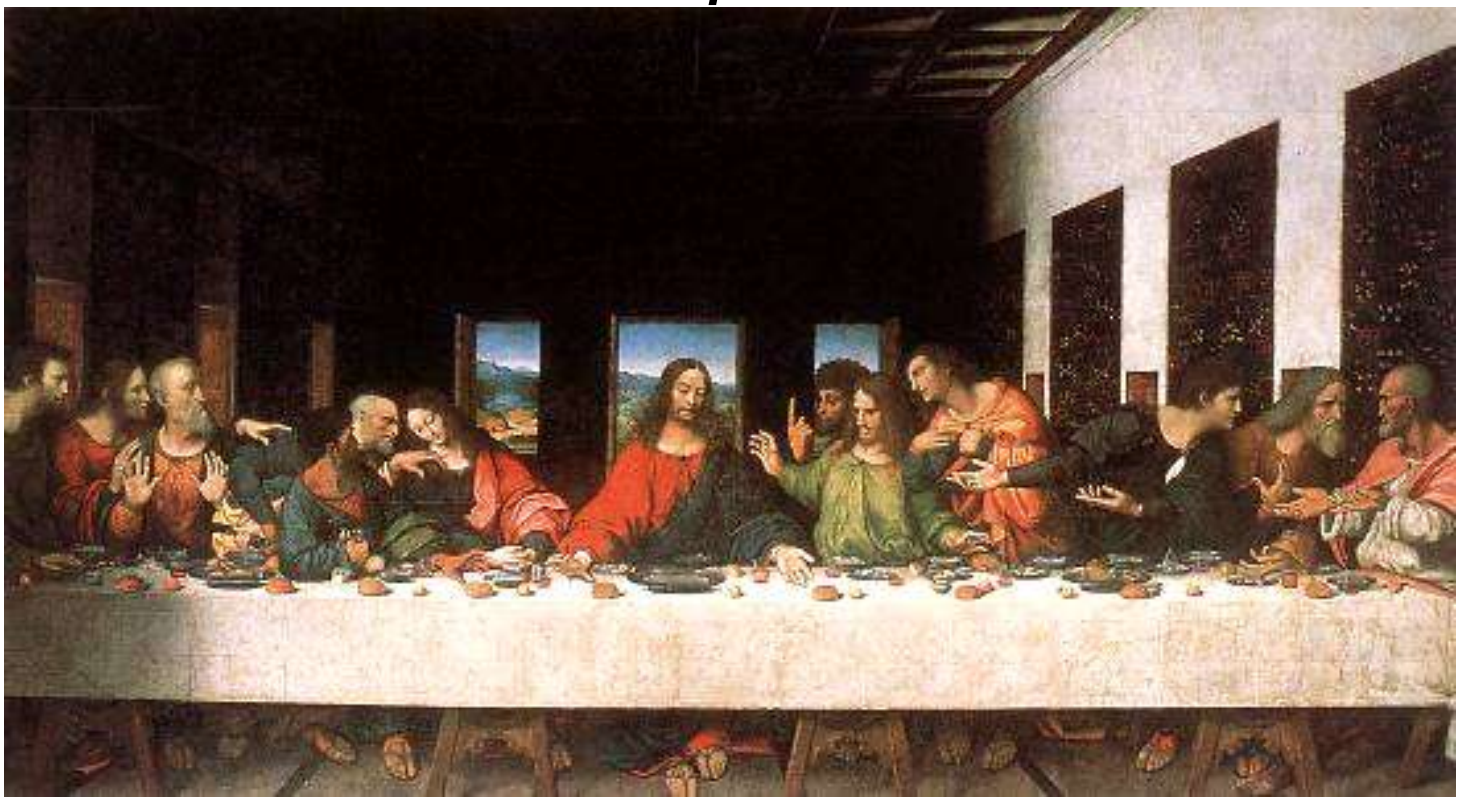


Q: "What can be said about this man?"

The students give their suggestions.

The experimenter explain details of that image, children fix various features on the orienting card

‘The Secret meal’ is represented on the screen



- The experimenter explains the content of the picture. The various features are fixed again on the orienting card. The students analyse the picture with a great interest and assert that a personage in a black is a traitor: ‘His heart is black, because treachery is a black indeed’.

Two portrait: ‘Federigo da Montefeltro’ (the Renaissance) and The portrait of Charles I’ (the baroque) are represented on the screen.

- The experimenter stresses the outward pathos, splendid costume, abundant attribute of power, magnificence of posture etc. The same theme but with a different content makes a child analyse actively the content form of picture

‘The Crucifixion’ and ‘Persey and Andromeda’ are represented on the screen

- E. Which picture ‘feels constrained’ in its frame?
- Discussing this question the students find the various features of the baroque art style and fill in the orienting card. Here is the completely filled in orienting card № 3:

Orienting card №3

	Constant features	*Various features*
1	**Genre:**	
	Historical, everyday	Religious, mythological, historical plots
	Portrait	Chamber, worldly
	Landscape	
2	**Form characteristic** *Historical*	Overloading Splendid, round forms Unstable posture
	Portrait	Splendid furniture Magnificent posture Features of power and wealth «idealising image»
	Landscape	Wild, fantastic nature Insignificance of people in comparison with nature
3	**Composition**	Dynamic, open
4	**Form**	Picturesque, darkened
5	**Colour**	Local
6	**Contour line**	Not sharp
7	**Canvas material**	Open
8	**Contrast**	Very harsh, light
9	**Conclusion about style**	**the baroque**

Orientation card

- All conceptual characteristic of an art style have been fixed on the orientation card in strictly constant order that allowed to supervise the sequence of the analysis of painting.
- The stage of materialized action based on a card was finished when a student defined the art style of two different epochs without mistakes. To achieve this it was necessary to fulfil up to 5-7 tasks.

Step by step forming of mental actions

4. The stage of making action in form of loud speech.

There are no various features on the card № 4. A student himself has now to write them analysing independently a picture. The correctness of work was controlled by a teacher. Sometimes the students carried out the same task and then discussed the results obtained.

Orienting card №4

	Constant features	*Various features*
1	**Genre:**	
	Historical, everyday	
	Portrait	
	Landscape	
2	**Form characteristic** *Historical*	
	Portrait	
	Landscape	
3	**Composition**	
4	**Form**	
5	**Colour**	
6	**Contour line**	
7	**Canvas material**	
8	**Contrast**	
9	**Conclusion about style**	

Step by step forming of mental actions

5. **The stage of making action in form of inner speech.** A child fulfils all the operations mentally uttering only the result.

“The baker and his wife” on the screen

- A few seconds after the exposition of the work, a student-girl noticed: «Oh! That is the style of the Renaissance. Figures are quite obviously situated along the main horizontal line, the picture has a closed character, the figures are lineal, clear and somehow awkward; the figures are situated in order to create the impression of plane».

Results

- The action for recognising art style was trained until it was fulfilled without any error on the materialized and loud speech stage and on the stage of inner speech – until instant recognising the artwork style. Forming the concept ‘art style’ on the basis of the orienting card helped students to control the process of their reasoning, compare styles to each other, find similarity and difference among them.

The developing effect of the training is caused by several factors:

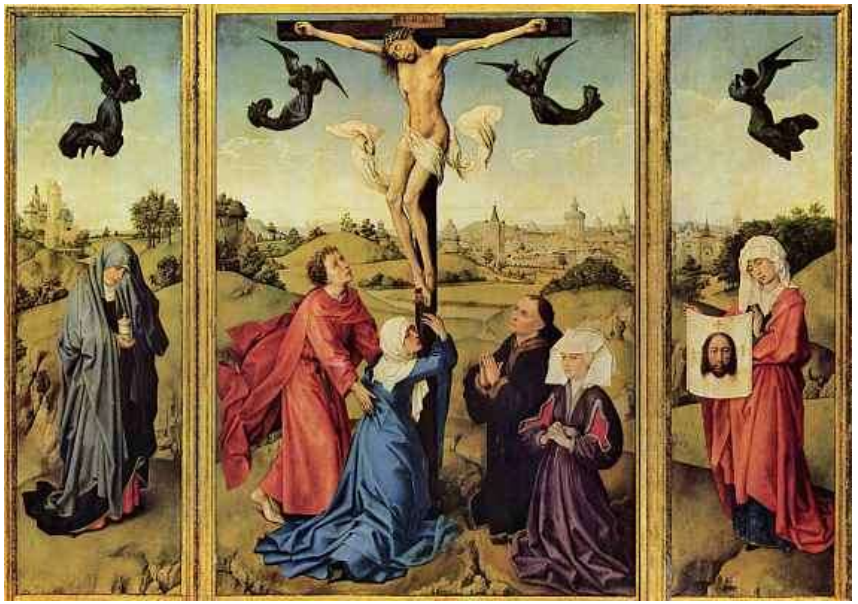
- creation of a full orientation basis of the action constructed specifically for painting analysis;
- organization of active search actions of the students during the analysis;
- introduction of the operative scheme of perception of a piece of art;
- usage of the materialized means and forms of control of the student actions.

- **Finally** the research undertaken has proved general hypothesis according to which, specially developed conditions, aimed at mastering principles of art culture and obtaining special means of painting analysis, form in a child of 10-12 years old the ability for integral perception and comprehension of painters' works from the different historical epochs.

P.S. **The Renaissance**

The Renaissance

The Renaissance



The Renaissance

the baroque

the baroque

the baroque

Classicism

Classicism

Classicism

Romantism

Romantism

Romantism

Romantism

Conclusion

“Mental activity needs to be understood absolutely prosaically. It is the same work, as well as any other work. We should learn to conduct this work. It is necessary to arm this work with adequate means and if you do not make it, it will be bad”

P.Ya. Gal’perin

Thank you for your attention!

L.F.Oboukhova

MGPPU, Sretenka
29, Moscow,
Russia

E-mail: mila-38@mail.ru