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Didactics: Logical Operation – Seration in Preschool

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Abstract

The paper presents an example of processing a logical operation – SERATION in preschool. The didactic-methodical approach to processing is traditional which is recommended as a rule and the first step in adopting this topic. Examples of e-tasks using ICT can serve only in the second phase – the phase of determining this content.

Keywords: didactics, methodical work, logical operation,seration, preschool

Introduction – logical operation: Seration

Seration represents the editing of a class (set) objects (objects, people) according to their arranged differences. As a more complex logical operation than classification, serial processing follows. In that sense, children are required to pay more attention, concentrate and have an elementary form of analytical thinking. Thus, serialization is a set of similar objects that are grouped by some common feature that is (= transitive), that is, that differences in the degree of presence or absence of that trait should be observed and arranged or arranged in a sequence (= series) that can be ascending (from<to>the element) and falling from (from>to<the element) (Hilcenko, 2012).

The relation R on the set S is transitive if for every three elements x, y and z, which do not need to be different, it holds that if *xRy* and *yRz* then *x* is alo *Rz.* For example, the following relations are transitive:

The relation *R* = "older than" on the set of all people is transitive because if person a is older than person *B*, if person *B* is older than person *c* then person *A* is also older than person *C* this applies to any three people in the set of all people.

The relation R = "less than" on the set of all integers is transitive because if for the numbers *A, B, C* ∈ *Z* it holds that *AB and BC* then it also holds that *AC* it holds for any three integers numbers *A*, *B*, *C*.

1. Seration – application and age groups of children in kindergarten

The seration can be applied to the dimensions of objects, beings … (length, width and height), which is most understandable to children. It is also applicable to the size of objects, beings … (spatial relations: "big-small"); mass (= weight); quantity (= number) of sets; saturation (= color intensity); but also on time relations (= days of the week) or time course of an event, action-operation (= cause--and-effect sequence). The difference in the understanding of the concept of seriation is noticeable in age groups. Younger children form a seration completely differently than older ones. While in the process of already formed seration (eg by length), the new member does not compare with the elements in the series, but disbands it and starts from the beginning, until the older children, the new added member, compare with the existing ones in the series, find a suitable place, without spoiling the existing array (Hilcenko, 2012).

Example: In case the trait by which the class LENGTH of the object (object, being) is arranged, then other elements in the seration can be arranged in two ways: 1) in ascending order: *"long, longer, even longer … and the longest"*, or if the absence of that trait, ie. items are short, we sort them into 2) opadajući niz: *"short, shorter, even shorter … and the shortest"*. Number of elements (objects, beings) with which a series of objects is formed and the degree of their diversity, conditioned by the age of children. Thus, a smaller number of elements (3 –6) is suitable for younger age, while the degree of their mutual difference is higher (easier to notice). In contrast, older children can edit sequences of up to 10 elements, while their mutual difference is smaller (less noticeable), which requires a more careful analysis of the elements (objects, beings), ie, a higher degree of intellectual maturity of the child.

What would it look like on a concrete example in practice with older children?

The educator begins by organizing centers of interest that can be equipped and tailored to specific topics such as holidays, seasons, events, customs – (local or general) that children choose according to their interests or preferences. Of

course, the emphasis is on awakening children's interest in the concept of length and seration length.

Here is an example: *center of customs-weddings* (eg long-short gloves, socks, belts, belts and other clothing items of folk costumes, arranged in series by length); *center-life on the farm* (applications or models of domestic animals are arranged in series along the length of the ears, legs, neck, tail … but also ears of grain, straws, twigs, etc.);

So, regardless of the type of center of interest, children manipulate objects, compare them and name them. The educator supervises, supplements or points out important details (the appearance of the object, the length of certain parts). He directs the activities, focuses the conversation on the length of the subject, encourages the children to name the length of the subject, the relations between the subjects, to name the subjects that are long, that is, short. This awakens the interest of children, preparing them for the development of the concept of seration of objects by length (in directed activities), which he designs himself. That part can be organized in different ways (Hilcenko, 2017).

Here's a suggestion: Projection of dramatized-animated-story "Hunters". (The story can also be performed by costumed educators or students).

Fable*: "The hunters went hunting and brought a pot in which they will prepare a delicious soup from venison that they will catch !? In the forest, they met various wild animals that they wanted to compare in LENGTH with a pot. However, as no animal wanted to enter the pot, and thus be outwitted, they remained hungry …"*

Picture 1

Before (and during the story), the educator gives the task to deter the animals from the evil intentions of the hunters and to explain why they could not fit in the pot. After watching the cartoon, there is a conversation about the characters and their characteristics (body length and their parts), picture 1 (Hilcenko, 2008).

As it is about the older age group, didactic material in the form of pictures, applications … can be represented to a greater extent (but we will also list examples of working with specific material). Thus, for the central part of the activity, the educator prepared a game board: with 3 subtasks:

1) Make an ascending seration (lengthwise) from top to bottom of 4 elements, to which should be added another felt-tip pen to be placed in the appropriate place.

2) Make a descending seration of elements (according to length) from right to left of 4 hammers, to which you need to add 2 more and put them in the appropriate places.

3) Make a series of descending arrays of "Lego" cubes of 10 elements (which are scrambled) and add 2 missing elements (Picture 2).
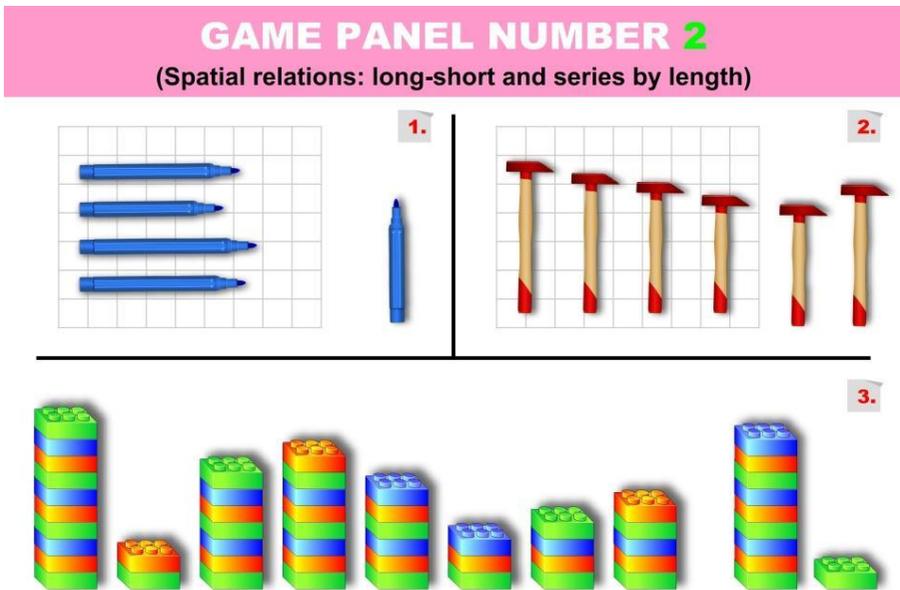
Picture 2

We give an example of the same but complicated task (puzzle!) Encouraging all children to solve it in as many numbers as possible. The task is: *"From two sets of (LENGTH) 7 cubes and (LENGTH) 3 cubes, make 4 sets (LENGTH) of 4, 3, 2 and 1 "Lego" cubes!"* (Picture 3 with problem solving) (Hilcenko, 2009).

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GAME PANEL NUMBER 3
(Spatial relations: long-short and series by length and number)
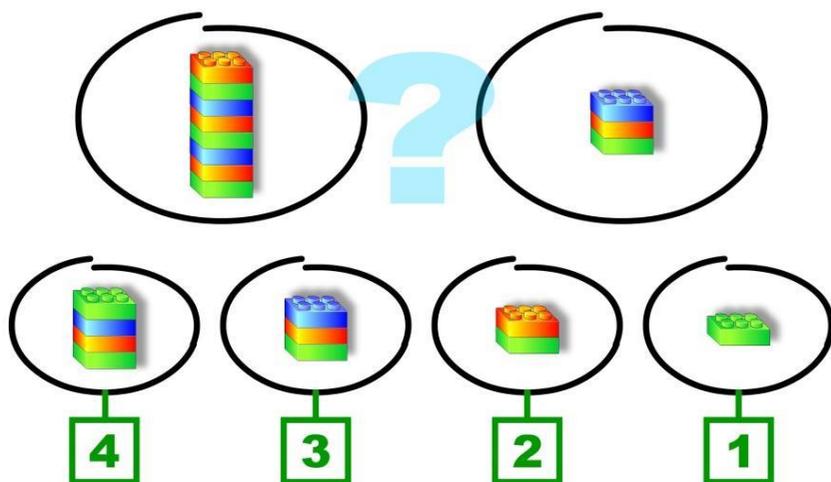
Picture 3

The work can be organized with specific didactic material. Thus e.g. all children receive 2 sticks (pencils, crayons …) of different lengths – long and short. Named children compare them "loudly" (in length, ratio and color). Working with sticks provides task development. Thus, sticks can be "compared without looking – by palpation", in which individual characteristics are emphasized again. Furthermore, at the request of the educator, the children raise a long or short stick – again only on the basis of palpation. Similarly, the educator forms a series of short (5–7) sticks or long (8–10) sticks, which he takes from the children and "chores" them! (Rajović, 2009). Work can also be organized in groups. Thus, the number of groups depends on the ideas of the educator and the topic of the task. In this case, these are two groups of spatial relations LONG-SHORT in which series of sticks are formed – in the set "LONG" (ascending = from LESS LONG to LONGEST or in the set "SHORT" descending = from short to SHORT). Whether the game will be organized as a competition or not, it depends on the educator, but preference should be given to the correct task and verbalization of the same *("long, longer, even longer … and the longest" or "short, shorter, even shorter … and the shortest")* over speed. The following are similar tasks that improve the children's experience (ribbons, ropes, scarves, scarves of various lengths, colors and numbers). Tasks must be interesting and stimulating in which longitudinal seration is practiced. If the educator, after a series of tasks, assesses that the children have largely adopted the concepts of long-short and long seration with the help of different didactic material, the ex-

perience is deepened on objects from the immediate environment (study room), the external environment (yard, playground), close ones and those further away. This is practiced by giving each child a sample of LONG or SHORT arranged in (ascending or descending) sequence (eg house, school and stadium fence; for short, eg boulevard, street, alley). An important note is that everything that children do on a manipulative-motor level should be verbalized.

TO SAY: e.g. *"I'm making a descending sequence ..."*

Conclusion

PLAY SHEET NUMBER 1
SPATIAL RELATIONS:
LONG-SHORT AND SERIES BY LENGTH

Fun math:
find and circle the longest and shortest object.

Picture 4

In the final part of the activity, the children receive a play sheet (next to: Picture 4). The play sheet can contain several tasks, four types (*differentiated according to the age, interest and abilities of children, so that each child can successfully solve it, and thus gain greater self-confidence, faith in their abilities and self-esteem*).

Of course, this topic can also be done in correlation with Physical Education, which is a common example in practice and literature (*where the lengths of children's landings, steps, etc. can be compared which is measured with a rope, in the end it is compared with each other – it forms a series by length and chooses the winner!*). In a similar way, the educator can prepare activities on the topic (classification) of the series according to other spatial relations: difficult--easy, high-low, deep-shallow, wide-narrow… Once the topic of SERATION has been adopted in the traditional way, even more abstract examples of activities can follow, using ICT tools. These e-tasks, the educator can find at numerous addresses (eg: https://www.education.com/games/) or if he has the knowledge to create them himself (Hilcenko, 2003).

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