

## RELATIONSHIP: SIGNS – OBJECT – CONCEPT IN THE PROCESS OF THE CREATION OF THE CONCEPT OF SIMILAR FIGURES (CASE STUDY)

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During my research lasting 3 years I analysed the process of forming of the concept of similar figures. One of the aims was connected with the problem of selecting a set of standard representations for the similarity. I tried to check the following criteria (in the frame of the “epistemological triangle”):

- Does the reference context and object capture the fundamental mathematical ideas underlying the given domain?
- Does the given sign (word, name, expression) is connected in the right way with the mathematical concept?

During the first stage of my research I used different tools for learning the meaning of the statement: “the same shape”. Among others there were the transparent sheet with the picture of a car. We have manipulated those sheet on the overhead projector and observed the picture on the screen. We used the expressions: “figure have the same shape”, or “figure has a changing shape”.

After three years I used the same tools during the investigation. This situation caused bringing up new associations. The tools were recognised, but the reference context was interpreted not in direction of ideas of similar figures. The representation, which give the possibilities of the action on the object does not open the way to the domain of similarity. They allow two different interpretations:

1. in the direction of non-proportional change of the figure (deformations);
2. in the direction of isometries.

Both of those domains are different. Similarity is not connected with any of them. The used object and reference context does not satisfy my expectations. Also the expression: “the same shape”, connected with such context does not help is creating the right intuitions – it has completely different meaning. Going after the children though – preservation of shape is connected with such action of the object which does not change the object as the whole.

It seems that the procedural change the one figure into the other one is not a basic root for that mathematical concept.

### References:

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