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Reasoning and formulating hypothesis

Commentary to the film

"Developing cognitive functions – summary"

The primary task for students on this page is identifying three required (2 squares and 1 triangle) geometric shapes from a model by selecting and linking the respective dots from an amorphous cloud of dots. The students learn how to recognize these shapes without evident cues.

An important part of this lesson is learning to **formulate a hypothesis and deduction** – reasoning. Thinking **"if – then"** is the main characteristic of hypothetical thinking, we have a mental idea about **"what happens if…".** Formulation of hypothesis is followed by deduction – a kind of a conclusion. However, it is important to have strategies for verification of a hypothesis, searching for information that either confirm the hypothesis or disprove it.

Some children have no need to pursue logical evidence for their statements or conclusions and their typical answer to a deductive question "why" is "because". The lack of the need for logical evidence does affect not only the elaboration phase but has impact on communicating in the output phase.

The page brings us to discovering that it is important to respect the shape and the size and that we can control our work by comparing with the model.

At the end of this lesson, although the work on this page is not finished yet at this moment, we can see the activity of building metacognitive strategies. Those children who already completed the task and are ready with connecting the dots are encouraged to think about: 1) how the work went on for me; 2) what procedure, strategy did I use; 3) what can I take from this lesson with myself to life. These questions support children in developing their thinking about how they are thinking.

All phases are visibly involved and we can see the fluid boundaries between them. To succeed in a mental phase the processes in the previous phase is essential. We can identity the following cognitive functions:

Improving cognitive functions – input phase

- Clear perception of shapes and realization of their characteristics + Labeling
- Systematic search
- Conservation of constancies
- Use of two sources of information (shape and size)

Improving cognitive functions – elaboration phase

- Definition of the problem
- Selection of relevant dots
- Planning behavior
- Hypothetical thinking and use of logical evidence
- Spontaneous comparison with the model
- Summative behavior

Improving deficient cognitive functions – output phase

- Need for precision
- Projection of relationship according to rules
- Planning before drawing
- Visual transport
- Ability to describe strategies verbally