Specific needs in mathematics Part 3

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Solving word problems

- Reading the word problem task and transcription it into the mathematical language is a problem for many children.
- Children often have difficulties with reading the whole text, understanding it, and with coping with the length of the text.

Barriers in communication when solving word problems

- In solving word problems and application tasks, we encounter situations in which the child solves simple tasks involving the basic operations with natural numbers without problems, but have difficulties with solving complex word problems.
- Children have problems with relations "n more (less)" and "n times more (less)".
- Other problems are with the analysis of the task and a correct mathematization.

Barriers in communication when solving word problems

- **Verbal communication**
- During verbal communication, both teachers and pupils should focus on essential phenomena, on the facts that are important for the given notion or topic.
- Children should understand the notions used.

Barriers in communication when solving word problems

- **Graphic communication**
- Cultivation of written presentation is the most important means of graphic communication.
- This concerns especially mathematical notes (e.g. writing of the numbers, notation for algorithms, written operations). Nevertheless, the layout of the calculation in itself does not guarantee understanding and mastering the topic.

Barriers in communication when solving word problems

- **Communication in symbolic pictures**
- Children can use pictures to model mathematical notions and relations.
- Approaches to the solution should be free of any formalism, so that the pupils have as much space for solving the problem as possible.
- If the pupils have their own insights into the task and solve it without formal notation, we accept their solution.

Barriers in communication when solving word problems

- **Principles of solving word tasks**
- Analysis of the task – pupils clarify for themselves the relationships between the given facts and the ones sought.
- Graphical representation
- Mathematization
- Formal solution
- Interpretation of the results
- False – true test

Barriers in communication when solving word problems

- **Simple word problems**

1. *Patrick had 13 beads, he won 5 beads. How many beads did he have after the game?*

2. *Patrick had 13 beads, Tom had 5 beads more than Patrick. How many beads did Tom have?*

Barriers in communication when solving word problems

- The transition from arithmetics to algebra is for pupils with SLD very complicated.
- We can often help them by drawing picture when solving word problems.
- Pupils start algebra in the 8th grade in the Czech Republic.
- They have problems with expressions „n more / less than", „n times more / less than", with making up the equation, they don't make true-false test.

Barriers in communication when solving word problems

- *Tourists were accommodated in three hotels. In the second hotel there were 10 people more than in the first hotel. In the third hotel there were 5 people more than in the second. Total number of tourists was 85. How many tourists are in single hotels?*

Algebraic solution of the pupil with dyslexia and dysorthographia

Algebraic solution of the pupil with dyslexia and dysorthographia

- **Word problems with distractors**
1. *Roman has 15 cars, and that is three times more than Peter has. How many cars does Peter have?*
2. *Together, Roman and Peter have 20 cars. Peter has three times less cars than Roman. How many cars does each of the boys have?*

Barriers in communication when solving word problems

Unit conversions

- **Frames for transfer between length units**

		km			**m**	dm	cm	mm
0	0	0	0	0	0	0	0	0

Using visual and other aids for working with children with learning difficulties

- **Frame for the transfer of area units**

		km^2		ha		a		**m^2**		dm^2		cm^2		mm^2	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Visual and other aids

- **Frame for the transfer of volume units**

m^3			dm^3			cm^3			mm^3		
			hl		*l*	*dl*	*cl*	*ml*			
0	0	0	0	0	0	0	0	0	0	0	0

Visual and other aids

- It is important that pupils have an idea of the units. This is achieved by manipulative activities. Fixation can be supported by entertaining videos.
- Watch these videos:
- https://www.youtube.com/watch?v=h6vca9PnlyI
- https://www.youtube.com/watch?v=LZxXUb9iAZc

Units conversions