

Tackling Word Problems

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WHY ARE WORD PROBLEMS IMPORTANT?

- Word problems are important because they exercise students' skills in problem-solving.
- "Problem solving is central to learning mathematics" (OME, 2005, p.11).
- Problem solving skills allow students to develop conceptual understanding by connecting mathematical ideas.
- Word problems encourage students to think flexibly and employ their mathematical knowledge to real-world situations.

"Difficulties in solving word problems can be a major impediment for students' future success in any math-related discipline" (Pfannenstiel et al., 2015, p. 291).

CONCEPTUAL SKILLS

Conceptual skills relate to problem-solving skills. When children have strong conceptual skills, they are able to think flexibly, reason, and apply their math knowledge to real-life situations. In order for children to be able to effectively understand and solve word problems, their conceptual skills need to be increased.

OPEN APPROACH

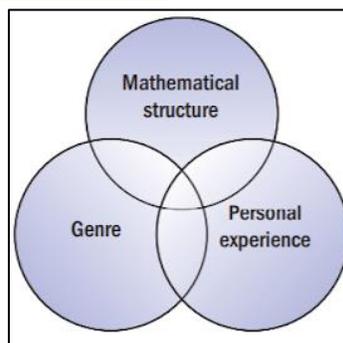
An open approach involves the use of conceptual skills. Students are encouraged to really understand the context, or genre, of the word problem by drawing on several sources of information. They are encouraged to use personal experiences to make sense of the problem (OME, 2011).

PROCEDURAL SKILLS

Procedural skills relate to computational fluency and fact retrieval. For example, a student's ability to know what 6×5 is.

CLOSED APPROACH

Students who use a closed approach to solving word problems rely too heavily on procedural skills. They simply translate the words of a problem into a mathematical equation, often leading to a "suspension of sense-making" (OME, 2011, p.2).



(OME, 2011)

Strategies

REVERSE WORD PROBLEMS

Reverse word problems encourage students to think about word problems in an “open” way. Using these problems, students consider the mathematical structure, the genre or context of the problem, and their own personal experiences, which in turn increases conceptual understanding.

Example:

- Ask students to create a word problem for a given mathematical equation, such as $30/5=6$. Ask students to compare their problems and the various ways they represented the mathematical structure in words.

FERMI PROBLEMS

Fermi problems are open-ended questions grounded in developing mathematical reasoning through real-world, relatable questions. The questions contain no numbers, encouraging estimation and reasoning. Fermi problems are posed orally followed with discussion, allowing ELL students and students with reading difficulties to participate without being overwhelmed by a literacy element. Fermi problems contain no exact answer, helping to reduce math anxiety.

Example:

- How many text messages will you send in one year?
- How much water do you use in one week?

YOU, WE, I MODEL

The YOU, WE, I model is an effective teaching strategy that increases problem solving abilities and encourages children to apply their conceptual understanding to word problems (Seeley, 2016).

Procedure:

YOU – Students consider the question on their own or with a peer.

WE – Students (and the teacher) engage in think alouds and metacognitive strategies to discuss their thoughts regarding the word problem.

I – The educator names the specific learning and strategies that were used, as well as the intended math outcomes of the lesson.

References

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