

primary mathematics challenging word problems

Primary Mathematics Challenging Word Problems: Unlocking Critical Thinking Skills

primary mathematics challenging word problems often serve as more than just a test of arithmetic skills—they are gateways to developing critical thinking, problem-solving abilities, and a deeper understanding of math concepts among young learners. For many students, especially those in primary school, word problems can feel like puzzles that require both reading comprehension and mathematical reasoning to solve. Embracing these challenges early on helps build confidence and prepares children for more complex math in later years.

In this article, we'll explore why primary mathematics challenging word problems are so essential, how they can be effectively approached, and share some strategies and examples that make solving them more accessible and enjoyable for students.

Why Are Challenging Word Problems Important in Primary Mathematics?

Word problems bridge the gap between abstract numbers and real-world contexts. Unlike straightforward calculations, these problems demand that students interpret the scenario, identify relevant information, and decide which mathematical operations to apply. This process nurtures multiple skills simultaneously.

Enhancing Comprehension and Reasoning

When children tackle word problems, they must first understand the language of the problem. This improves reading comprehension and develops logical reasoning. For example, understanding terms like “total,” “difference,” or “product” within a story helps students connect language with math operations. By grappling with challenging problems, kids learn to extract key details and filter out irrelevant information.

Building Problem-Solving Skills

Challenging word problems encourage perseverance and creative thinking. Often, there isn't just one straightforward path to the answer, so students learn to try different approaches, check their work, and refine their thinking. This trial-and-error process is vital for nurturing a growth mindset.

Common Types of Primary Mathematics Challenging Word Problems

Word problems come in many forms, each targeting different mathematical concepts and thinking skills. Familiarity with these types helps students feel more prepared and less intimidated.

1. Addition and Subtraction Problems

These are among the first challenging word problems children encounter. They often involve combining groups, finding differences, or comparing quantities.

Example:

“Sarah has 15 apples. She gives 7 to her friend. How many apples does Sarah have left?”

This type encourages understanding of both the action described (giving away) and the operation (subtraction).

2. Multiplication and Division Problems

These problems introduce concepts of repeated addition and equal sharing.

Example:

“There are 4 baskets, each with 6 oranges. How many oranges are there in total?”

Or,

“12 cookies are shared equally among 3 friends. How many cookies does each friend get?”

These problems help students connect grouping and partitioning concepts.

3. Multi-Step Word Problems

These are particularly challenging because they require multiple operations and careful sequencing.

Example:

“Tom has 20 marbles. He buys 10 more and then gives 5 to his sister. How many marbles does Tom have now?”

Students must decide the order of operations and keep track of changing quantities.

4. Time and Money Word Problems

These problems help children relate math to everyday activities.

Example:

“Jane starts her homework at 4:15 PM and finishes at 5:00 PM. How long did she spend on her homework?”

Or,

“If a toy costs \$8 and you have \$20, how much money will you have left after buying the toy?”

Effective Strategies for Solving Challenging Word Problems

Helping students navigate these problems successfully calls for a combination of clear methods and encouragement.

Read the Problem Carefully

Encourage students to read the problem more than once to fully grasp the scenario. Sometimes, underlining or highlighting key numbers and keywords can aid understanding.

Identify What Is Being Asked

Students should pinpoint exactly what the question wants. Are they finding a total, a difference, or the number of groups? Clarifying the goal prevents misinterpretation.

Draw a Diagram or Picture

Visual aids can simplify complex word problems. For example, drawing groups of objects or a number line can help students visualize the problem and organize their thoughts.

Break Down Multi-Step Problems

For multi-step problems, solving each part one at a time and writing down intermediate answers can prevent confusion. This stepwise approach builds confidence.

Estimate Before Calculating

Estimating results before solving helps students check the reasonableness of their answers, fostering number sense.

Practice Regularly with Varied Problems

Exposure to diverse word problems strengthens adaptability. Regular practice also reduces anxiety associated with challenging questions.

Examples of Primary Mathematics Challenging Word Problems with Solutions

Let's look at a few examples that illustrate how to approach and solve these problems effectively.

Example 1: Sharing and Multiplication

Problem:

"There are 24 candies to be shared equally among 6 children. How many candies does each child get?"

Solution Approach:

- Identify that this is a division problem (equal sharing).
- Divide 24 by 6.
- $24 \div 6 = 4$ candies per child.

Example 2: Multi-Step Problem Involving Addition and Subtraction

Problem:

“Lucy had 30 balloons. She gave 8 to her friend and then bought 12 more. How many balloons does she have now?”

Solution Approach:

- First, subtract the balloons Lucy gave away: $30 - 8 = 22$.
- Next, add the balloons she bought: $22 + 12 = 34$.
- Lucy now has 34 balloons.

Example 3: Time Calculation

Problem:

“Mark started reading at 3:45 PM and finished at 4:30 PM. How long did he read?”

Solution Approach:

- Calculate the difference between 3:45 PM and 4:30 PM.
- $4:30 \text{ PM} - 3:45 \text{ PM} = 45 \text{ minutes}$.
- Mark read for 45 minutes.

Tips for Teachers and Parents Supporting Students With Challenging Word Problems

Helping children master challenging word problems isn't just about drilling; it requires patience, encouragement, and smart strategies.

- **Encourage questions:** Let students ask for clarification and think aloud while solving.
- **Use real-life contexts:** Incorporate problems related to everyday experiences to make learning relevant.
- **Promote collaborative learning:** Group work can expose students to different problem-solving methods.
- **Celebrate effort:** Praise persistence even if the solution isn't immediately correct.
- **Introduce puzzles and games:** Math games that involve word problems can make learning fun and engaging.

The Role of Digital Tools in Tackling Primary Mathematics Challenging Word Problems

With technology becoming an integral part of education, various apps and online platforms now offer interactive word problems tailored to primary students. These tools often provide instant feedback, hints, and step-by-step guides, making it easier for learners to independently practice and refine their skills. Additionally, adaptive learning platforms adjust the difficulty level according to the student's progress, ensuring they remain challenged without feeling overwhelmed.

Using digital resources alongside traditional teaching methods can enhance engagement and provide personalized learning experiences, which are especially beneficial for mastering complex word problems.

Primary mathematics challenging word problems are more than just academic exercises—they are building blocks for logical thinking and real-world problem solving. By approaching these problems with effective strategies, patience, and the right resources, children can develop a confident and positive relationship with mathematics that will serve them well throughout their education and beyond.

Frequently Asked Questions

What are primary mathematics challenging word problems?

Primary mathematics challenging word problems are complex math questions designed for young learners that require critical thinking and problem-solving skills, often involving multi-step calculations and real-life scenarios.

How can teachers effectively introduce challenging word problems in primary math classes?

Teachers can introduce challenging word problems by starting with relatable contexts, using visual aids, breaking down problems into smaller steps, encouraging group discussions, and gradually increasing difficulty to build confidence and skills.

What strategies help primary students solve challenging word problems?

Effective strategies include reading the problem carefully, identifying key information, drawing diagrams or pictures, estimating answers, breaking problems into smaller parts, and practicing regularly to improve comprehension and problem-solving abilities.

Why are challenging word problems important in primary mathematics education?

Challenging word problems enhance critical thinking, improve comprehension, develop problem-solving skills, and help students apply mathematical concepts to real-world situations, preparing them for advanced math and everyday decision-making.

Can using technology aid in solving primary mathematics challenging word problems?

Yes, technology such as educational apps, interactive whiteboards, and online games can provide engaging practice, instant feedback, and visual representations that help primary students understand and solve challenging word problems more effectively.

Additional Resources

Primary Mathematics Challenging Word Problems: Navigating Complexity in Early Math Education

Primary mathematics challenging word problems represent a critical component in the development of young learners' numerical comprehension and problem-solving abilities. These problems extend beyond simple arithmetic to engage students in deeper reasoning, interpretation, and application of mathematical concepts. As educators and curriculum developers strive to balance foundational skills with complex thinking, understanding the role and design of challenging word problems becomes essential in primary math education.

The Role of Challenging Word Problems in Primary Mathematics

Word problems in primary mathematics are more than just exercises in calculation; they serve as a bridge between abstract numbers and real-world contexts. Challenging word problems push students to analyze information, identify relevant data, and select appropriate mathematical operations. This fosters critical thinking and helps learners develop the ability to approach unfamiliar problems systematically.

These problems often incorporate multiple steps, require logical sequencing, or involve multi-faceted reasoning, which distinguishes them from routine math questions. For example, a primary-level problem might ask a student to determine how many apples remain after a series of transactions or to calculate the total cost of mixed items with varying prices and quantities. The complexity lies in the need to comprehend the scenario fully and apply a combination of addition, subtraction, multiplication, or division accordingly.

Enhancing Cognitive Skills Through Complex Word Problems

Introducing challenging word problems at the primary level encourages several cognitive skills essential for academic growth:

- **Reading comprehension:** Understanding the problem statement requires careful reading and interpretation of information.
- **Logical reasoning:** Deciding which operations to use and in what sequence promotes logical thought processes.
- **Attention to detail:** Identifying key data points amidst irrelevant information sharpens focus and precision.
- **Problem-solving strategies:** Applying various methods such as drawing diagrams, making lists, or working backward helps develop versatile approaches.

By integrating these skills, challenging word problems prepare students not only for higher-level mathematics but also for real-life situations where problem-solving is essential.

Key Features of Primary Mathematics Challenging Word Problems

Several characteristics distinguish challenging word problems from simpler exercises in primary mathematics:

1. Multi-Step Processes

Rather than a single calculation, these problems require multiple steps to reach the solution. For example, a problem may involve finding the total number of objects first and then determining the difference after some are removed.

2. Integration of Different Mathematical Concepts

Challenging problems often combine various operations or concepts, such as measurement, time, or money, alongside basic arithmetic. This multi-concept integration tests students' ability to synthesize knowledge

across topics.

3. Real-Life Contexts

Embedding word problems in familiar scenarios, such as shopping, cooking, or traveling, enhances engagement and helps students understand the practical relevance of mathematics.

4. Ambiguity and Open-Endedness

Some problems may not have a straightforward answer or may allow multiple solution paths, encouraging creative thinking and justification of methods.

Challenges in Teaching and Learning Primary Mathematics Word Problems

Despite their benefits, challenging word problems present several obstacles for both educators and students. Young learners may struggle with language barriers or limited vocabulary, making it difficult to grasp the problem's requirements. Additionally, the cognitive load of interpreting and solving multi-step problems can be overwhelming without sufficient scaffolding.

Teachers face the task of balancing difficulty levels to maintain motivation while ensuring progress. Presenting problems that are too complex may lead to frustration, whereas overly simple tasks fail to stimulate critical thinking. Effective strategies often include modeling problem-solving approaches, encouraging group discussions, and providing visual aids.

Strategies to Overcome Difficulties

- **Explicit vocabulary instruction:** Teaching key mathematical terms helps reduce confusion.
- **Stepwise breakdown:** Guiding students to dissect problems into manageable components.
- **Use of manipulatives and visuals:** Objects, diagrams, and charts can clarify abstract concepts.
- **Encouraging metacognition:** Prompting learners to reflect on their thinking processes enhances understanding.

Comparative Insights: Traditional vs. Challenging Word Problems

Traditional word problems in primary mathematics tend to focus on straightforward arithmetic tasks with clear instructions and singular operations. In contrast, challenging word problems demand a higher level of reasoning and flexibility. Research indicates that exposure to complex problems leads to improved mathematical proficiency and conceptual understanding over time.

A 2021 study by the National Council of Teachers of Mathematics found that students regularly engaging with multi-step word problems demonstrated greater resilience and adaptability when faced with novel mathematical tasks. However, the study also highlighted the need for teacher support and differentiated instruction to accommodate diverse learning styles.

Pros and Cons of Incorporating Challenging Word Problems

1. Pros:

- Enhances critical thinking and analytical skills.
- Prepares students for standardized testing and future academic challenges.
- Encourages application of mathematics in real-world contexts.
- Supports development of perseverance and problem-solving resilience.

2. Cons:

- May cause anxiety or frustration if not properly scaffolded.
- Requires additional instructional time and resources.
- Potentially difficult for students with language or learning difficulties.

Designing Effective Primary Mathematics Challenging Word Problems

Crafting word problems that strike the right balance between difficulty and accessibility involves several considerations:

- **Clarity of language:** Problems should use age-appropriate vocabulary and sentence structures.
- **Relevance:** Scenarios should connect with students' experiences to maintain interest.
- **Progressive complexity:** Gradually increasing problem difficulty allows students to build confidence.
- **Inclusion of visual elements:** Pictures, charts, or manipulatives aid comprehension.
- **Encouragement of multiple solution methods:** Allowing different approaches fosters creativity and deeper understanding.

These design principles contribute to more engaging and effective problem-solving exercises that support a wide range of learners.

The Impact on Curriculum and Assessment

Incorporating challenging word problems into the primary mathematics curriculum aligns with modern educational standards emphasizing critical thinking and application. Assessments increasingly feature multi-step problems to evaluate not only computational skills but also reasoning and interpretation abilities.

This shift necessitates training for educators to design and implement effective word problems and to assess student responses holistically. It also encourages integration of cross-curricular skills, such as literacy and logical reasoning, within math instruction.

Educators report that students exposed to a variety of challenging word problems tend to develop stronger mathematical fluency and flexibility. Moreover, these problems cultivate perseverance and a growth mindset, qualities that extend beyond the classroom.

The integration of primary mathematics challenging word problems into early education represents a vital

step toward nurturing mathematically competent and confident learners. While these problems introduce complexity that can be daunting, thoughtful design and instructional strategies can transform challenges into opportunities for profound learning and skill development. As education evolves, the emphasis on such problems reflects a broader commitment to preparing students for the diverse demands of the 21st century.

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to convey the message that mathematics needn't be drill-and-kill exercises—it can be fun, yet challenging for students to be exposed to the beauty and joy of mathematics.

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primary mathematics challenging word problems: Implementation Research on Problem Solving in School Settings Inga Gebel, 2019 Content of the Book The University of Potsdam hosted the 25th ProMath and the 5th WG Problem Solving conference. Both groups met for the second time in this constellation which contributed to profound discussions on problem solving in each country taking cultural particularities into account. The joint conference took place from 29th to 31st August 2018, with participants from Finland, Germany, Greece, Hungary, Israel, Sweden, and Turkey. The conference revolved around the theme "Implementation research on problem solving in school settings". These proceedings contain 14 peer-reviewed research and practical articles including a plenary paper from our distinguished colleague Anu Laine. In addition, the proceedings include three workshop reports which likewise focused on the conference theme. As such, these proceedings

provide an overview of different research approaches and methods in implementation research on problem solving in school settings which may help close the gap between research and practice, and consequently make a step forward toward making problem solving an integral part of school mathematics on a large-scale. Content PLENARY REPORT Anu Laine: How to promote learning in problem-solving? pp 3 – 18 This article is based on my plenary talk at the joint conference of ProMath and the GDM working group on problem-solving in 2018. The aim of this article is to consider teaching and learning problem-solving from different perspectives taking into account the connection between 1) teacher's actions and pupils' solutions and 2) teacher's actions and pupils' affective reactions. Safe and supportive emotional atmosphere is base for students' learning and attitudes towards mathematics. Teacher has a central role both in constructing emotional atmosphere and in offering cognitive support that pupils need in order to reach higher-level solutions. Teachers need to use activating guidance, i.e., ask good questions based on pupils' solutions. Balancing between too much and too little guidance is not easy.

<https://doi.org/10.37626/GA9783959871167.0.01> RESEARCH REPORTS AND ORAL

COMMUNICATIONS Lukas Baumanns and Benjamin Rott: Is problem posing about posing "problems"? A terminological framework for researching problem posing and problem solving pp 21 – 31 In this literature review, we critically compare different problem-posing situations used in research studies. This review reveals that the term "problem posing" is used for many different situations that differ substantially from each other. For some situations, it is debatable whether they provoke a posing activity at all. For other situations, we propose a terminological differentiation between posing routine tasks and posing non-routine problems. To reinforce our terminological specification and to empirically verify our theoretical considerations, we conducted some task-based interviews with students. <https://doi.org/10.37626/GA9783959871167.0.02> Kerstin Bräuning:

Long-term study on the development of approaches for a combinatorial task pp 33 – 50 In a longitudinal research project over two years, we interviewed children up to 6 times individually to trace their developmental trajectories when they solve several times the same tasks from different mathematical areas. As a case study, I will present the combinatorial task and analyze how two children, a girl and a boy, over two years approached it. As a result of the case studies we can see that the analysis of the data product-oriented or process-oriented provides different results. It is also observable that the developmental trajectory of the girl is a more continuous learning process, which we cannot identify for the boy. <https://doi.org/10.37626/GA9783959871167.0.03> Lars Burman:

Developing students' problem-solving skills using problem sequences: Student perspectives on collaborative work pp 51 – 59 Using problem solving in mathematics classrooms has been the object of research for several decades. However, it is still necessary to focus on the development of problem-solving skills, and in line with the recent PISA assessment, more attention is given to collaborative problem solving. This article addresses students' collaborative work with problem sequences as a means to systematically develop students' problem-solving skills. The article offers student perspectives on challenges concerning the social atmosphere, differentiation on teaching, and learning in cooperation. In spite of the challenges, the students' experiences indicate that the use of problem sequences and group problem solving can be fruitful in mathematics education.

<https://doi.org/10.37626/GA9783959871167.0.04> Alex Friedlander: Learning algebraic procedures through problem solving pp 61 – 69 In this paper, I attempt to present several examples of tasks and some relevant findings that investigate the possibility of basing a part of the practice-oriented tasks on higher-level thinking skills, that are usually associated with processes of problem solving. The tasks presented and analysed here integrate problem solving-components – namely, reversed thinking, expressing and analysing patterns, and employing multiple solution methods, into the learning and practicing of algebraic procedures – such as creating equivalent expressions and solving equations. <https://doi.org/10.37626/GA9783959871167.0.05> Thomas Gawlick and Gerrit Welzel: Backwards or forwards? Direction of working and success in problem solving pp 71 – 89 We pose ourselves the question: What can one infer from the direction of working when solvers work on the same task for a second time? This is discussed on the basis of 44 problem solving processes of

the TIMSS task K10. A natural hypothesis is that working forwards can be taken as evidence that the task is recognized and a solution path is recalled. This can be confirmed by our analysis. A surprising observation is that when working backwards, pivotal for success is (in case of K10) to change to working forwards soon after reaching the barrier.

<https://doi.org/10.37626/GA9783959871167.0.06> Inga Gebel: Challenges in teaching problem solving: Presentation of a project in progress by using an extended tetrahedron model pp 91 - 109 In order to implement mathematical problem solving in class, it is necessary to consider many different dimensions: the students, the teacher, the theoretical demands and adequate methods and materials. In this paper, an implementation process is presented that considers the above dimensions as well as the research perspective by using an extended tetrahedron model as a structural framework. In concrete terms, the development and initial evaluation of a task format and a new teaching concept are presented that focus on differentiated problem-solving learning in primary school. The pilot results show initial tendencies towards possible core aspects that enable differentiated problem solving in mathematics teaching.

<https://doi.org/10.37626/GA9783959871167.0.07> Heike Hagelgans: Why does problem-oriented mathematics education not succeed in an eighth grade? An insight in an empirical study pp 111 - 119 Based on current research findings on the possibilities of integration of problem solving into mathematics teaching, the difficulties of pupils with problem solving tasks and of teachers to get started in problem solving, this article would like to show which concrete difficulties delayed the start of the implementation of a generally problem-oriented mathematics lesson in an eighth grade of a grammar school. The article briefly describes the research method of this qualitative study and identifies and discusses the difficulties of problem solving in the examined school class. In a next step, the results of this study are used to conceive a precise teaching concept for this specific class for the introduction into problem-oriented mathematics teaching.

<https://doi.org/10.37626/GA9783959871167.0.08> Zoltán Kovács and Eszter Kónya: Implementing problem solving in mathematics classes pp 121 - 128 There is little evidence of teachers are using challenging problems in their mathematics classes in Hungary. At the University of Debrecen and University of Nyíregyháza, we elaborated a professional development program for inservice teachers in order to help them implementing problem solving in their classes. The basis of our program is the teacher and researcher collaboration in the lessonplanning and evaluation. In this paper we report some preliminary findings concerning this program.

<https://doi.org/10.37626/GA9783959871167.0.09> Ana Kuzle: Campus school project as an example of cooperation between the University of Potsdam and schools pp 129 - 141 The "Campus School Project" is a part of the "Qualitätsoffensive Lehrerbildung" project, whose aim is to improve and implement new structures in the university teacher training by bringing all the essential protagonists, namely university stuff, preservice teachers, and in-service teachers - together, and having them work jointly on a common goal. The department of primary mathematics education at the University of Potsdam has been a part of the Campus School Project since 2017. Thus far several cooperations emerged focusing on different aspects of problem solving in primary education. Here, I give an overview of selected cooperations, and the first results with respect to problem-solving research in different school settings. <https://doi.org/10.37626/GA9783959871167.0.10>

Ioannis Papadopoulos and Aikaterini Diakidou: Does collaborative problem-solving matter in primary school? The issue of control actions pp 143 - 157 In this paper we follow three Grade 6 students trying to solve (at first individually, and then in a group) arithmetical and geometrical problems. The focus of the study is to identify and compare the various types of control actions taken during individual and collaborative problem-solving to show how the collective work enhances the range of the available control actions. At the same time the analysis of the findings give evidence about the impact of the collaborative problemsolving on the way the students can benefit in terms of aspects of social metacognition. <https://doi.org/10.37626/GA9783959871167.0.11> Sarina Scharnberg: Adaptive teaching interventions in collaborative problem-solving processes pp 159 - 171 Even though there exists limited knowledge on how exactly students acquire problem-solving competences, researchers

agree that adaptive teaching interventions have the potential to support students' autonomous problem-solving processes. However, most recent research aims at analyzing the characteristics of teaching interventions rather than the interventions' effects on the students' problem-solving process. The study in this paper addresses this research gap by focusing not only on the teaching interventions themselves, but also on the students' collaborative problem-solving processes just before and just after the interventions. The aim of the study is to analyze the interventions' effect on the learners' integrated problem-solving processes. <https://doi.org/10.37626/GA9783959871167.0.12>

Nina Sturm: Self-generated representations as heuristic tools for solving word problems pp 173 - 192 Solving non-routine word problems is a challenge for many primary school students. A training program was therefore developed to help third-grade students to find solutions to word problems by constructing external representations (e.g., sketches, tables) and to specifically use them. The objective was to find out whether the program positively influences students' problemsolving success and problem-solving skills. The findings revealed significant differences between trained and untrained classes. Therefore, it can be assumed that self-generated representations are heuristic tools that help students solve word problems. This paper presents the results on the impact of the training program on the learning outcome of students. <https://doi.org/10.37626/GA9783959871167.0.13>

Kinga Szűcs: Problem solving teaching with hearing and hearing-impaired students pp 193 - 203 In the last decade the concept of inclusion has become more and more prevalent in mathematics education, especially in Germany. Accordingly, teachers in mathematics classrooms have to face a wide range of heterogeneity, which includes physical, sensory and mental disabilities. At the Friedrich-Schiller-University of Jena, within the framework of the project "Media in mathematics education" it is examined how new technologies can support teaching in inclusive mathematics classrooms. In the academic year 2017/18, the heterogeneity regarding hearing impairment was mainly focussed on. Based on a small case study with hearing and hearing-impaired students a problem-solving unit about tangent lines was worked out according to Pólya, which is presented in the paper. <https://doi.org/10.37626/GA9783959871167.0.14>

WORKSHOP REPORTS Ana Kuzle and Inga Gebel: Implementation research on problem solving in school settings: A workshop report 207 On the last day of the conference, we organized a 90-minute workshop. The workshop focused on the conference theme "Implementation research on problem solving in school settings". Throughout the conference, the participants were invited to write down their questions and/or comments as a response to held presentations. <https://doi.org/10.37626/GA9783959871167.0.15>

Ana Kuzle, Inga Gebel and Anu Laine: Methodology in implementation research on problem solving in school settings pp 209 - 211 In this report, a summary is given on the contents of the workshop. In particular, the methodology and some ethical questions in implementation research on problem solving in school settings are discussed. The discussion showed how complex this theme is so that many additional questions emerged. <https://doi.org/10.37626/GA9783959871167.0.16>

Lukas Baumanns and Sarina Scharnberg: The role of protagonists in implementing research on problem solving in school practice pp 213 - 214 Based on seminal works of Pólya (1945) and Schoenfeld (1985), problem solving has become a major focus of mathematics education research. Even though there exists a variety of recent research on problem solving in schools, the research results do not have a direct impact on problem solving in school practice. Instead, a dissemination of research results by integrating different protagonists is necessary. Within our working group, the roles of three different protagonists involved in implementing research on problem solving in school practice were discussed, namely researchers, pre-service, and in-service teachers, by examining the following discussion question: To what extent do the different protagonists enable implementation of research findings on problem solving in school practice? <https://doi.org/10.37626/GA9783959871167.0.17>

Benjamin Rott and Ioannis Papadopoulos: The role of problem solving in school mathematics pp 215 - 217 In this report of a workshop held at the 2018 ProMath conference, a summary is given of the contents of the workshop. In particular, the role of problem solving in regular mathematics teaching was discussed (problem solving as a goal vs. as a method of teaching), with implications regarding

the selection of problems, its implementation into (written) exams as well as teacher proficiency that is needed for implementing problem solving into mathematics teaching.

<https://doi.org/10.37626/GA9783959871167.0.18>

primary mathematics challenging word problems: Understanding and Enriching Problem Solving in Primary Mathematics Patrick Barmby, David Bolden, Lynn Thompson, 2025-02-28 This up to date book is essential reading for all those teaching or training to teach primary mathematics. Problem solving is a key aspect of teaching and learning mathematics, but also an area where teachers and pupils often struggle. Set within the context of the new primary curriculum and drawing on research and practice, the book identifies the key knowledge and skills required in teaching and learning problem solving in mathematics, and examines how these can be applied in the classroom. It explores the issues in depth while remaining straightforward and relevant, emphasises the enrichment of maths through problem-solving, and provides opportunities for teachers to reflect on and further develop their classroom practice.

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