ANNOTATION OF THE SCIENTIFIC PAPERS AND SELF-ASSESSMENT OF THE CONTRIBUTIONS BY
## ASSOCIATE PROFESSOR VLADIMIRA STEFANOVA ANGELOVA, PHD

applicant in the competition for the academic position of **"professor"**
area of higher education: **1. Pedagogical Sciences,**
professional field: **1.3. Pedagogy of Teaching**
(Methodology of Teaching Primary School Mathematics)

The following 44 scientific papers are presented for the participation in the competition: 2 monographs, 1 studio research paper, 15 scientific articles – 10 of which are in Bulgarian language and 5 in English, 1 resource book for university students, 4 methodological handbooks for teachers, 8 mathematics textbooks for primary school students, 13 mathematics activity books for primary school students. All of them are developed and published after acquiring the academic position "associate professor".

The numbering used reflects the sequential number of the relevant scientific work involved in the competition.

MONOGRAPHS

1. ***Angelova, V.*** Pedagogical technology for teaching word problems in primary school. Plovdiv, Plovdiv University "Paisii Hilendarski" Publishing House, 2019, 216 pages, ISBN 978-619-202-416-1
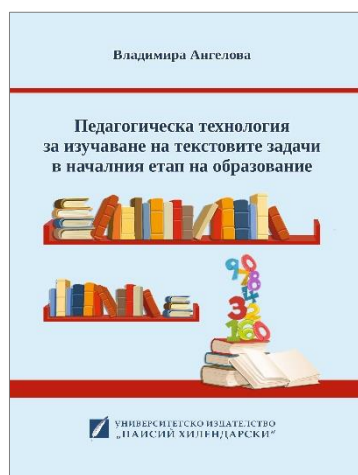
The monograph examines some topics from the area of modelling of word problems designed for primary school students. The theoretical background of word problems are presented as well as an innovative technological variation for teaching them. Some strategies are developed for comprehending, planning and solving word problems and they bridge the connection between theory and practice.

The book is organized in 6 parts.

The components of **the first part** ensure the theoretical background of the methodology of teaching word problems in primary school. The first part presents a brief description of the normative documents that reformed the Bulgarian education. This chapter summarizes some of the theoretical fundamentals which ensure the basics of the methodology of teaching word problems. Here are defined some basic concepts related to the topic. Different scholars' definitions of the concept *problem* and more specifically *mathematical problem* and *practical problem* are presented. The structure of word problems is outlined and that becomes the basis for constructing the typology of the problems. The structure of solving the problems is revealed.

The second part of this scientific book analyzes the views of many researchers on the stages of problem solving when teaching mathematics. This part of the monograph presents different effective strategies for solving word problems. Some of them are based on the methods of solving problems and others on research.

The third part offers the reader a structured and logical technological variation for teaching word problems applicable in the first grade. The presented system of problems is created in accordance with the new educational documents.

The fourth part presents the technology for teaching word problems in the second grade and it builds upon the one developed for the first grade.

The development of the required knowledge and skills from the "Modelling" sphere of competence finds its logical continuation in the third grade.

The fifth part of this book acquaints the reader with the basic components of the technological variation of teaching the system of word problems applicable in the third grade.

The methodological system of problems presented in **the sixth part** of this paper is a technology for acquiring word problems in the fourth grade.

The solving of word problems develops primary school students' cognitive and heuristic thinking by engaging them in intellectual activities. Therefore the developed pedagogical technology for teaching word games in primary school is a useful tool for the learners.

This book is a valuable resource for the teachers who teach mathematics from first to fourth grades because it serves as a guide in the sphere of modelling.

2. ***Angelova, V.*** Diophantine equations and systems of Diophantine equations – theoretical aspects and methodological projection in primary school education. Plovdiv, Plovdiv University "Paisii Hilendarski" Publishing House, 2018, 172 pages, ISBN 978-619-202-394-2
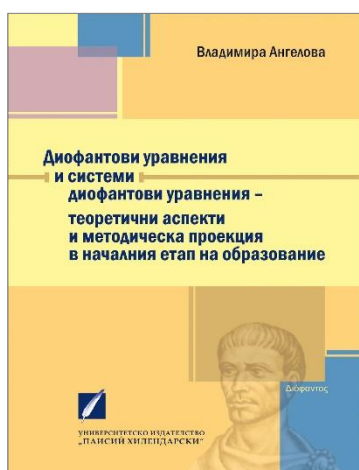
This book is dedicated to the *Diophantine equations* and *the systems of Diophantine equations* and includes the theoretical foundations of this type of problems as well as the methodological options for teaching this topic in mathematical classes.

The creation of this scientific book is provoked by the author's ambitions to create a technological variation for mastering problem solving with *Diophantine equations* or *systems of Diophantine equations* and its implementation in those forms of teaching mathematics that allow its integration: elective classes, facultative classes, school mathematics study groups, etc.

The book is structured in three parts.

The first part acquaints the reader with selected topics from the number theory and the focus is on the theoretical development of the concept of *number*, on the main properties of the arithmetic operations – addition, subtraction, multiplication and division and on their applications as well as on some elements from the divisibility theory. The theoretical background is supported by a large number of examples and

more than 150 problems, accompanied by solutions which ensure the practical implementation of the presented eight topics.

The second part presents to the readers the theory of the *Diophantine equations* and *the systems of Diophantine equations*. The text includes different methods for solving: linear Diophantine equations with two or more unknowns, Diophantine equations of second and higher degree with n ($n \geq 2$) unknowns and systems of Diophantine equations.

The theoretical foundations find application in examples and problems that can be used by the teacher in order to effectively master the techniques for solving *Diophantine equations* and *the systems of Diophantine equations*.

The third part immerses the reader in the methodological system of problems that presents a technological variation for mastering the *Diophantine equations* and *the systems of Diophantine equations*.

The theoretical aspects of the methods for solving, described in the second part of this book are a useful tool for solving the problems (included in the third part) which are *Diophantine equations* and *the systems of Diophantine equations*. The exposition includes mathematical and practical problems which are numerous and various both as content and as a plot. The system of problems included in the third part of this monograph consists of many unconventional and non-routine examples as well as various ideas and techniques for their solution.

The technological variation of teaching offers specific methodology which develops children's skills to solve non-standard type of problems and perform excellently at different national and international mathematical competitions and Olympiads.

STUDIO RESEARCH PAPERS

3. *Angelova, V.* Didactic technology for understanding the concepts area of rectangle and the units of measurement for area in primary school teaching of mathematics. Plovdiv, Plovdiv University "Paisii Hilendarski" Publishing House, 2019, 32 pages, ISBN 978-619-202-446-8

This studio research paper presents the didactic technology for understanding the concept of *area of a rectangle*, *the units of measurement for area* and their application for solving mathematical and practical problems. This technology of education is an innovation in exposing the presented issues for the fourth grade of primary school education.

The didactic technology aims at acquiring solid basic knowledge which is the basis necessary for solving problems of practical and applicable character.

The technology ensures not only knowledge but something more – an opportunity to apply this knowledge in real life situations.

The created education package of resources and the suggested technology for teaching and learning equip the teachers with didactic toolset that can directly be used in the classroom.

The presented geometric concept and the developed mathematical ideas increase students' engagement and improve their results by placing them in a position of active learning.

SCIENTIFIC ARTICLES IN BULGARIAN LANGUAGE

4. ***Angelova, V.*** Didactic technology for understanding the concept of perimeter of a triangle, a rectangle, and a square in primary school mathematics. In: Pedagogy, Sofia, "Az-buki" National Publishing House ISSN 1314-8540 (Online), ISSN 0861-3982 (Print) /letter of assurance, verifying that the article is reviewed and approved for print/

This publication presents a working technology for understanding the concepts *geometric shape* and *perimeter of a triangle, a rectangle,* and *a square*. The article focuses on the methodology of teaching the basic conceptual apparatus as well as the kinds of geometric and practical problems related to it.

Teaching with this technology aids the development of students' spatial imagination and thinking and becomes a prerequisite for higher-order thinking activation in the educational process.

This technology is useful for all the teachers because it ensures an opportunity to teach students geometric shapes in a systematic way using their life experience and rich imagination.

5. ***Angelova, V***., Nikolova, A. The educational platform mozaBook and its potential for creating electronic educational content in mathematics for the second grade. In: Journal of University Students' Articles from the 7th Scientific Students' Conference, Part I, Plovdiv, Plovdiv University "Paisii Hilendarski" Publishing House, 2018, p. 319 – 328, ISBN 978-619-202-366-9.
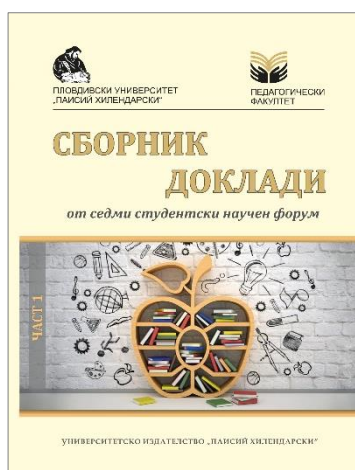
The article is focused on the potential of the educational platform mozaBook for creating electronic educational content in mathematics for the second grade. Here are presented the authors' electronic resources and they are based on this platform. These e-resources include problems from the four spheres of competence: *Numbers, Geometric Shapes and Bodies, Measurement and Modelling.* They are an effective means for organizing the education in a digital environment. With them the teacher can modernize the required knowledge and skills; the resources can also be used for solidification of the new knowledge and for checking learning outcomes.

The created electronic resources for education increase the students' interest and motivation for participation in the educational process in mathematics and increase the teachers' methodological toolset.

6. ***Angelova, V.***, Nikolova, A. Innovative training technology for mastering tabular multiplication and division. In: Perspectives for Creating an Innovative Educational Environment, Plovdiv, Plovdiv University "Paisii Hilendarski" Publishing House, 2017, p. 341 – 356, ISBN 978-619-202-297-6

This article synthesizes the theoretical foundations of the operations multiplication and division. The author presents a structured technological variation for teaching and learning tabular multiplication and division by second grade students. The technology includes methodological system of problems, some of which are created in an electronic version using multimedia presentations, flash cards, animations, etc. Here are presented detailed instructions for using the methodological system of problems.

The created technology changes the model of traditional education and enables the teacher to create and work in an innovative educational environment with ICT.

7. ***Angelova, V.*** Teaching the commutative and associative properties of addition in primary school mathematics education. In: Social and Pedagogical Aspects of Child's Development, Plovdiv, Plovdiv University "Paisii Hilendarski" Publishing House, 2017, p. 269 – 278, ISBN 978-619-202-297-2

This article offers a variation of teaching the commutative and associative properties of addition and presents different options for their application in primary school mathematics education.

After the application of the presented technology for teaching these properties the students will become competent to use them: they will learn how to choose and apply an appropriate rational variation for transformation and calculation of arithmetic expressions; how to solve mathematical and practical problems; how to find the unknown addend in equations and they will develop their skills for mental math calculations. The application of different variations of calculations aids the deliberate mastering of the properties of the operations.

Learning the commutative and associative properties of addition by students in the early years of their education is the starting point for the development of their mathematical thinking as well as the development of knowledge and skills that will set the foundation for establishing their entire secondary education.

8. ***Angelova, V.*** Problem-based education – an alternative for activating students' thinking when studying primary school mathematics. In: Innovations and Competencies in Education, Plovdiv, Plovdiv University "Paisii Hilendarski" Publishing House, 2016, p. 73 – 85, ISBN 978-619-202-178-8

This article presents the theoretical foundations of problem-based education and its application when teaching primary school mathematics.

The methodology of applying the problem-based approach in teaching mathematics involves creating various problem situations and identifying potential solutions. The presented situations are numerous and various. They depend on the ways and means of their creation as well as the size and content of the educational material.

An activation of students' mathematical thinking and developing skills for critical and creative thinking is expected to be observed after using and applying the created problem-based situations in primary school mathematics.

The present study supports the teachers who are motivated to use a teaching approach that is alternative to the traditional ones. The presented problem-based situations do not exhaust the whole range of problem-based situations in teaching mathematics but represent the basic components of the planned educational content in primary school mathematics. Using this foundation all teachers can apply their creative thesis and other variations in their work in accordance with their scientific interests and the learners' potential.

9. *Angelova, V*. Technological options for mastering of the arithmetic operations addition and subtraction with natural numbers up to 100. In: KNOWLEDGE – International Journal Scientific paper Vol. 13.3., 2016, p. 183 – 188, ISSN 1857-92, Global Impact and Quality Factor 1.023

Options for mastering of the arithmetic operations addition and subtraction with natural numbers up to 100 are presented in this article and the focus is on the skills for mental math calculations.

The article offers a wide range of various strategies with different levels of complexity for mental addition and subtraction of natural numbers up to 100 as well as methodological guidelines for their teaching. As a result of teaching these strategies, second grade students are expected to know different approaches for mental calculations and to be able to discuss and explain their use as well as to choose the most efficient strategy for mental calculation.

Mental calculations are in everyday use. If students increase their knowledge, skills and attitude related to the wide range of strategies for mental calculations, they will be able to use them successfully in everyday life. This generates not only progress in the sphere of mathematics but also self-confidence in students' own abilities to cope with different everyday situations.

10. *Angelova, V*. Alternative didactic technology for clarification of the process for solving problems by using set theory models. In: Alternatives in Education, Plovdiv, Plovdiv University "Paisii Hilendarski" Publishing House, 2016, p. 19 – 28, ISBN 978-619-202-159-7

The article presents a methodological system of exercises that practice problem solving skills by using set theory models. This category of problems is solved with models such as Euler-Venn diagrams.

This paper is designed both for teachers and students from primary school level.

Teachers, who play a crucial role in students' development, can use this ready-made product in their work and in this way stimulate students' learning activity and develop key mathematical ideas for solving problems on sets.

Students who are taught with this methodological system will learn how to solve problems on sets; will learn how to use and create schematic models for this type of problems with the help of Euler-Venn diagrams and what is most important they will develop their mathematical skills.

The methodological product is flexible and can be adapted to primary school students' needs, time and acquisition potential. It can be used in elective classes, facultative classes, school mathematics study groups, etc.

11. *Angelova, V*. Alternative models and techniques for introducing the arithmetic operations addition and subtraction with natural numbers. In: Education, Development, Arts, vol. 2, Plovdiv, Plovdiv University "Paisii Hilendarski" Publishing House, 2015, p. 191 – 201, ISBN 978-619-202-076-7

The article presents and analyzes different strategies for introducing the arithmetic operations addition and subtraction with natural numbers up to 20.

The wide range of strategies enables the first graders to compare them and choose the most suitable one and explain their decision.

The expected results are twofold.

On one hand, the presented strategies for calculating numbers up to 20 constitute a complete methodological system which the teachers can use in their work.

On the other hand, it is expected that first graders' logical and mathematical thinking will develop after using and applying these strategies. Later, when the students are to be introduced to arithmetic operations with larger numbers this knowledge can naturally be transferred and summarized.

12. *Angelova, V.* Strategies for non-standard introduction of specific cases of arithmetic operations with natural numbers in the inclusive classroom. In: The Challenges of the Inclusive Education, Plovdiv, Plovdiv University "Paisii Hilendarski" Publishing House, 2015, p. 56 – 69, ISBN 978-954-423-994-7
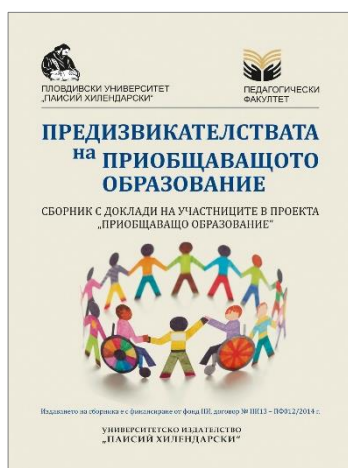
Research proves that at least 75% of the calculations in everyday life are performed mentally. Therefore it is important to stimulate children to think actively, to develop their strengths and talents, to extract and store information and experience.

This article presents a non-standard and theoretically grounded explanation of some specific cases of arithmetic calculations with natural numbers. The developed didactic technology involves formulation of original and effective rules for quick calculations that enhance students' skills development. A wide range of examples is presented as well as ideas for their teaching.

This publication is a resource, an idea for introduction of rules for quick and non-standard calculations which manages to diversify the educational process in mathematics which is more or less very algorithmic in character. It is a ready-made product for the teacher and it is scientifically, theoretically and methodologically grounded and accompanied with many illustrated examples.

13. *Angelova, V*. Application of some set theory tools in elementary mathematics education. In: Education, Society, Personality, Plovdiv, Plovdiv University "Paisii Hilendarski" Publishing House, 2015, p. 77 – 90, ISBN 978-619-202-032-2

The main motive for exploring the potential of modelling and more specifically the use of Euler-Venn diagrams in modern teaching of mathematics is its importance for the development of primary school students' thinking.

This article presents the system and methodology of applying the Euler-Venn diagrams for introducing and mastering the mathematical knowledge, skills and attitude in primary school.

The paper demonstrates the author's original set theory tools and visual strategies that aid: the mastering of knowledge related to the quantitative meaning of numbers; understanding the meaning of the arithmetic operations – addition, subtraction, multiplication and division; acquiring the algorithm for mental and written calculations.

SCIENTIFIC ARTICLES IN A FOREIGN LANGUAGE

14. ***Angelova, V.*** Technology for teaching first graders word problems containing the word combinations "*more than*" and "*less than*". In: KNOWLEDGE – International Journal Scientific Paper Vol. 20.3., 2017, p. 1193 – 1198, ISSN 1857-923X – for e-version, ISSN 2545-4439 – for printed version Global Impact and Quality Factor 1.023
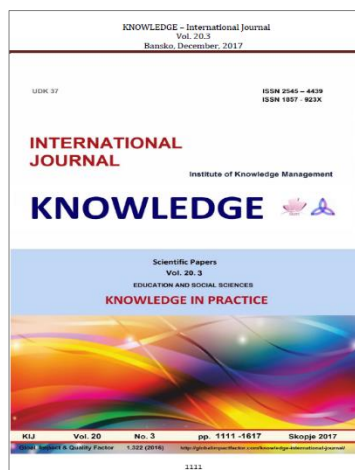
This publication presents the content and technology for teaching word problems with one calculation containing the word combinations "*more than*" and "*less than*". The presented system and methodology include two groups of word problems.

First group. Word problems that aim to find a number that is a definite number of units more than or less than a specific number.

Second group. Word problems for comparing two numbers by their difference.

The author suggests models for explaining and comprehending the meaning of the expressions "*more than*" and "*less than*" and they become the basis for understanding and solving problems of the two presented groups.

The developed system and methodology is compliant with the requirements of the new first grade mathematics curriculum standards.

This system of teaching word problems provides the students with knowledge and skills: to solve word problems of the two presented groups; to describe real and illustrated practical situations with mathematical models; to connect the arithmetic operations with practical solutions and to formulate answers.

15. ***Angelova, V.*** System and technology for studying word problems in the first grade of primary school. In: KNOWLEDGE – International Journal Scientific paper Vol. 14.1., 2016, p. 387 – 392, ISSN 1857-92 Global Impact and Quality Factor 1.023

Solving word problems contributes for acquiring knowledge and skills for modelling real life situations, which are represented by the text models in the word problems. Modelling – this important component of mathematical education – starts in the first grade and the first grade mathematics curriculum standards define it as a main sphere of competence.

This study presents a system and technology for teaching word problems in the first grade and they are compliant with the new educational documents and integrated in the educational environment of Republic of Bulgaria.

The focus of the present study is on the group of word problems, directed towards revealing the meaning of the arithmetic operations – addition and subtraction with the numbers that are studied in the first grade.

The students, taught with the presented system and technology, are expected to develop mathematical thinking and skills for modelling the word problems of the discussed kind with number expressions.

16. *Angelova, V.* Opportunities and alternatives for training students in using mathematical proof in primary school. In: The Future of Education, Florence, Italy, 30 June – 1 July 2016, p. 416 – 420, ISBN 978-88-6292-743-7, ISSN 2384-9509
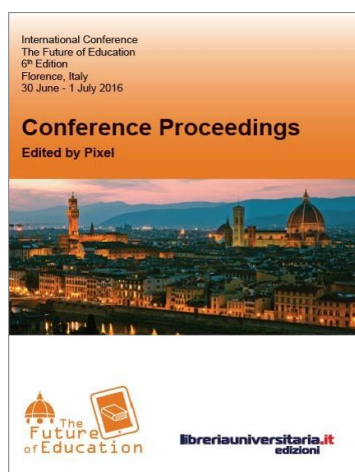
Mastering logical proof in primary school is a necessary condition for developing students' mathematical thinking. They are an important alternative way for mobilizing students' under-used mental capacities. Especially valuable in this respect is the indirect apagogical proof.

This publication presents the research on the theoretical basis of the indirect apagogical proof and the methodological options for teaching this topic in primary school. The research is directed to finding and presenting some opportunities that the educational content in mathematics offers in primary school classes in Bulgaria for propaedeutic teaching of the indirect apagogical proof.

The theoretical aspects in this work reveal the complex logical structure of this kind of proof.

The developed methodology of teaching defines how the education of primary school students to be organized.

As a result of the education and the employment of the created technological variation for teaching this topic, students are expected to have mastered knowledge and skills for problem solving by applying the indirect apagogical proof.

17. *Angelova, V.* Some ideas and methods for solving non-standard problems in mathematics education. In: Social Competences, Creativity and Wellbeing, Plovdiv, Plovdiv University Press „Paisii Hilendarski", 2015, p. 89 – 98, ISBN 978-619-202-023-1
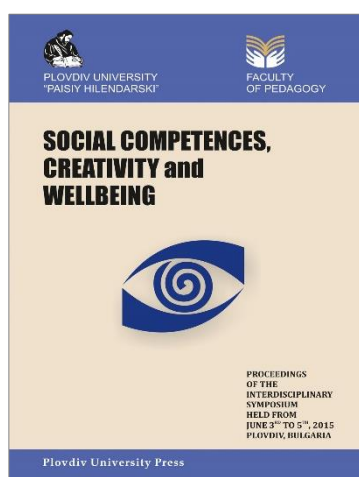
In order to meet the challenges of modern education it is necessary to reveal some new opportunities for student and teachers' development. In mathematics education that is unattainable without solving non-standard problems and integrating them in the process of education.

This article describes some ideas and methods for solving problems which most of the students consider being non-standard in character.

Research related to the theoretical fundamentals of *Diophantine equations* and *the systems of equations (inequalities)* is presented as well as the methodological options for teaching this theme in mathematics education.

The mathematical ideas for solving this class of

problems and the presented technology contribute to organizing the process of solving them. This class of problems is interesting and creativity, logic, intuition and mathematical sensibility are required to solve them.

18. ***Angelova, V.*** Aspects of teaching mathematics to gifted students in the context of inclusive education. In: International Journal on New Trends in Education and their Implications – IJONTE, 2014, volume 5, number 3, p. 104 – 116, ISSN 1309-6249
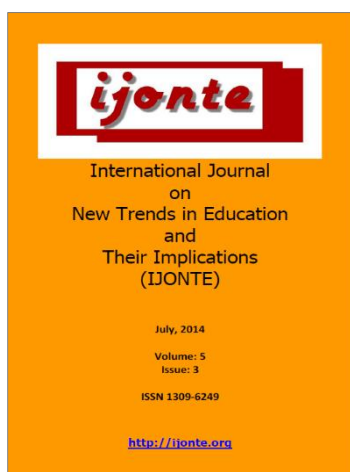
The aim of this article is to reveal some aspects of the work with gifted primary school students in mathematics training in the context of inclusive education.

In order to meet this objective a task was assigned and it was to design a system of exercises for teaching the theme *Counting possibilities* that can develop students' logical-mathematical thinking and enable them to practice knowledge and skills of combinatorial character.

The components of the system are presented, as well as the requirements for the selection and structuring of the content and the methods of education.

The system of exercises for solving problems from the theme *Counting possibilities* consists of the following components:

1. *Practical problems with combinatorial character* which can be integrated with the educational content from the sphere of competence "Modelling" in mathematics education.
2. *Problems for finding numbers and problems for counting numbers with combinatorial character* that can be integrated with the educational content from the sphere of competence "Numbers" in mathematics education.
3. *Geometry problems with combinatorial character* that can be integrated with the educational content from the sphere of competence "Flat shapes" in mathematics education.

The technological interpretation of the system of exercises for teaching the theme *Counting possibilities* offers a methodology for problem solving and demonstrates the opportunity to integrate it in the educational content in primary school mathematics education.

TEXTBOOKS AND RESOURCE BOOKS FOR UNIVERSITY STUDENTS

19. **Angelova, V.** Teaching the natural numbers up to 100 and arithmetic operations with them. In : State Exam Resource Book on Methodology of Education in the Kindergarten and the Primary School. Scientific editor: assoc. prof. Vladimira Angelova, PhD, Plovdiv, Plovdiv University "Paisii Hilendarski" Publishing House, 2016, p. 117 – 131, ISBN 978-619-202-149-8

This resource book is designed for university students, preparing for state exams on methodology of education in the kindergarten and the primary school. The topics in this resource book strictly follow the questionnaire for the state exam for students from the Master's degree program "Pre-School and Primary School Pedagogy" (non-

specialists – 5 semesters) at the Educational Faculty of Plovdiv University "Paisii Hilendarski".

Assoc. prof. Vladimira Angelova, PhD developed the topic:

"Teaching the natural numbers up to 100 and arithmetic operations with them".

The aim of this paper is to contribute to the better understanding of the natural numbers up to 100, of the options for teaching the operations addition and subtraction of natural numbers up to 100 and tabular multiplication and division.

The paper provides theoretical and methodological accents for teaching the numbers up to 100. Here is presented the practical technology for teaching:

- the operations addition and subtraction of the natural numbers up to 10;
- the operations addition and subtraction of the natural numbers up to 20;
- the algorithms for addition and subtraction of the natural numbers up to 100;
- tabular multiplication and division.

METHODOLOGICAL HANDBOOKS FOR TEACHERS

20. **Angelova, V.** Math teacher's handbook for 4th grade. Sofia, "Prosveta Plus" Publishing House, 2019, 180 pages, ISBN 978-619-222-279-6
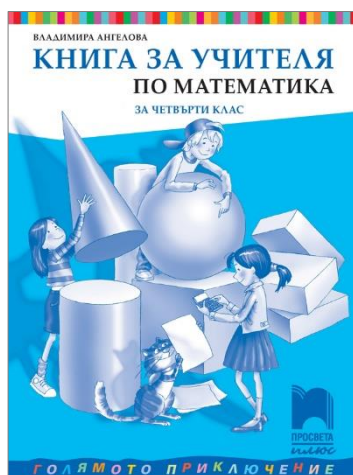
The teacher's handbook is a methodological manual for teachers who teach mathematics in the 4th grade using the mathematics resource pack of "Prosveta Plus" with authors Vladimira Angelova et.al.

The teacher's handbook presents the author's conceptual ideas which if the creative teacher recognizes and combines them with modern teaching approaches and techniques, it can guarantee the creation of one modern, positive and effective classroom.

The current edition provides a short presentation of the fourth grade mathematics curriculum standards. An innovative methodological concept is presented in accordance w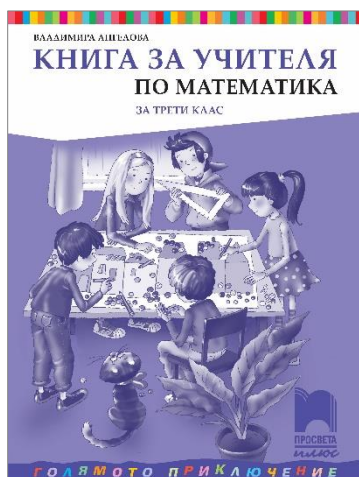ith the specifics of mathematics education in the 4th grade. The handbook presents methodological guidelines for developing certain topics from the educational content included in the textbook. For each lesson the author defined: the objectives, the competencies as expected learning outcomes and the new concepts. Sample lesson descriptions are included as well as ideas for their execution. The handbook provides extra exercises, additional teacher resources as well as answers to some of the questions and problems.

A *Complete 4th grade curriculum and instructional resources division on mathematics* is developed in detail. This curriculum is designed in the context of the methodology presented in the mathematics resources by the same author.

Criteria for assessing students' initial, mid-year and end-of-the-year mathematical competencies are included in the Appendix section of the handbook.

The current teacher's handbook is a tool that helps the pedagogue to create an interactive and entertaining educational environment in which the students can independently develop their ideas, can think and formulate hypothesis, can make free choices and apply their knowledge.

21. **Angelova, V.** Math teacher's handbook for 3th grade. Sofia, "Prosveta Plus" Publishing House, 2018, 167 pages, ISBN 978-619-222-167-6

The teacher's handbook is a methodological manual for teachers who teach mathematics in the 3th grade using the mathematics resource pack of "Prosveta Plus" with authors Vladimira Angelova et.al. The teacher's handbook presents in detail the author's didactic technology for teaching mathematics which helps the third graders develop the competencies defined in the third grade mathematics curriculum standards.

The book contains theoretical explanations that define the specifics of teaching mathematics in the third grade.

The handbook presents methodological guidelines for developing all the topics from the educational content included in the textbook.

For each lesson the author defined: the objectives, the competencies as expected learning outcomes and the new concepts.

Lesson descriptions are included as well as other variations and ideas for their execution.

A *Complete 3rd grade curriculum and instructional resources division on mathematics* is developed in detail.

The Appendix section of the handbook includes not only sample variations for assessment but also assessment criteria of students' mathematical competencies related to:

- the level of students' mathematical competencies at the beginning of the 3rd grade;
- the level of students' mathematical competencies after studying the numbers up to 1000 and the operations addition and subtraction with these numbers;
- the level of students' mathematical competencies after studying the operations multiplication and division with the numbers up to 1000;
- the level of students' mathematical competencies at the end of the 3rd grade.

22. **Angelova, V.** Math teacher's handbook for 2nd Grade. Sofia, "Prosveta Plus" Publishing House, 2017, 176 pages, ISBN 978-619-222-122-5

The teacher's handbook is a methodological manual for teachers who teach mathematics in the 2nd grade using the mathematics resource pack of "Prosveta Plus".

It provides a brief presentation of the second grade mathematics curriculum standards. The teacher's handbook presents the authors' methodological and conceptual ideas and they are compliant with the specifics of mathematics education in the 2nd grade.

The handbook presents methodological guidelines for developing specific topics from the educational content included in the textbook. For each lesson the author specifically defined: the objectives, the competencies as expected learning outcomes and the new concepts. Sample lesson descriptions are included as well as other variations and ideas for their execution; ideas how to work with the workbook. The handbook provides extra exercises, guidelines related to the homework to be assigned, additional teacher resources as well as answers to some of the questions and problems.

A *Complete 2nd grade curriculum and instructional resources division on mathematics* is developed in detail. This curriculum is designed in the context of the methodology presented in the mathematics resources by the same authors.

Criteria for assessing students' initial, mid-year and end-of-the-year mathematical competencies are included in the Appendix section of the handbook.

23. **Angelova, V.** Math teacher's handbook for 1st grade. Sofia, "Prosveta Plus" Publishing House, 2016, 180 pages, ISBN 978-619-222-017-4
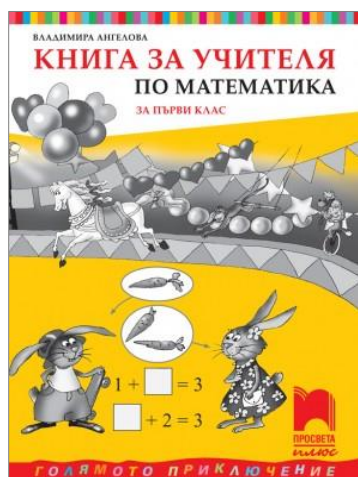
This handbook meets the demand for specialized methodological literature compliant with the current *State educational standard for comprehensive education* and the *first grade mathematics curriculum standards* from 2015.

The teacher's handbook is a methodological manual for teachers who teach mathematics in the 1st grade using the mathematics resource pack, consisting of a textbook, workbooks and electronic textbook with authors Vladimira Angelova et.al. It is part of the complete resource pack of publishing house "Prosveta Plus" for the 1st grade called *The Great Adventure*.

This methodological manual provides unit-by-unit definitions of: the objectives, the competencies as expected learning outcomes and the new concepts. Sample lesson descriptions are included as well as other variations and ideas for their execution; ideas how to work with the workbook. The handbook provides extra exercises, guidelines related to the homework to be assigned, additional teacher resources as well as answers to some of the questions and problems.

A *Complete 1st grade curriculum and instructional resources division on mathematics* is developed in detail. This curriculum is designed in the context of the methodology presented in the mathematics resources by the same authors.

TEXTBOOKS FOR SCHOOL STUDENTS

The textbooks numbered as [24], [25], [26], [27], [28], [29], [30] and [31] are published by "Prosveta Plus" and compliant with the new normative documents, reforming the Bulgarian education. At the current stage (2019) these textbooks are relevant and the primary school students are taught by them.

24. ***Angelova, V.*** and Koleva, J. 4th Grade Mathematics Textbook. Sofia, "Prosveta Plus" Publishing House, 2019, 144 pages, ISBN 978-619-222-276-5

The 4th grade mathematics textbook is developed on the basis of the authors' methodological ideas that guarantee detailed and systematic approach to developing the competencies defined in the fourth grade mathematics curriculum standards.

It contains a rich collection of attractive teaching instruments which enable the teachers to create a modern, positive and effective classroom where the now grown-up children are encouraged to develop as confident mathematicians possessing problem solving skills.

The textbook aids the complete understanding of the concepts because the authors use real life situations and problems which help students see the role of mathematics in everyday life.

Algorithms for written calculations and different approaches and techniques for mental calculations are presented which enable the children to make choices how to calculate.

Different exercises are developed in a systematic way and they ensure the acquisition of knowledge and skills from the following spheres of competencies: *"Geometric shapes and bodies"* and *"Measurements"*.

The advantage of this textbook is the accurately developed system of word problems which are the key to understanding mathematics. The activities employed for solving the word problems require students to explore and examine their ideas, to think and develop hypothesis and to learn how to learn.

The textbook meets the demands of the students with different learning styles and gives opportunity for both group and individual teaching. It provokes interest in mathematics and is a means for immersion in a modern education in which adventure and experience become main components of learning.

25. ***Angelova, V.,*** Koleva, J. and Nikolova, A. 4th Grade Mathematics – electronic textbook. Sofia, "Prosveta Plus" Publishing House, 2019, 144 pages, ISBN 978-619-222-275-8

The electronic textbook (e-textbook) 4th Grade Mathematics is an innovative digital technology. It is an electronic version of the paper textbook in which electronic educational resources are developed for each lesson. These resources include single- and multiple-choice problems, chains, tables, games, animations, etc. They are diverse, fun and with different levels of complexity. They help teachers to enrich their methodological

toolset. Once these resources are integrated in the lesson, the textbook becomes interactive and easier both for teaching and learning.

Animations are included in the electronic textbook and they demonstrate the algorithms for written and mental calculations.

This electronic textbook is a universal device for organizing the technological education in a new information era. The multimedia tools in it stimulate students' creativity and increase their motivation.

26. ***Angelova, V.*** and Koleva, J. 3rd Grade Mathematics Textbook. Sofia, "Prosveta Plus" Publishing House, 2018, 124 pages, ISBN 978-619-222-164-5
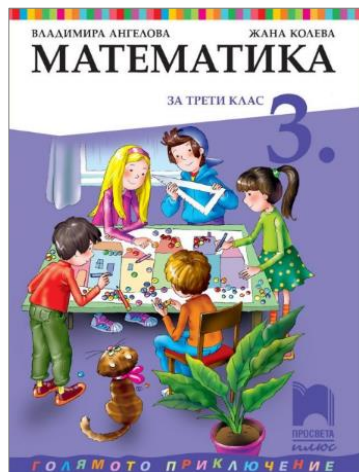
The 3rd grade mathematics textbook reflects the authors' methodological ideas that provide students' mastering of the competencies defined in the third grade mathematics curriculum standards.

It contains a whole range of teaching tools that help the teacher in creating an effective classroom in which the third graders are encouraged to develop problem solving skills.

The textbook offers real life examples and problems which help children understand the application of mathematics in real life.

Algorithms for written calculations of the numbers up to 1000 are presented in a systematic way as well as different strategies for mental calculations. In this way the third graders are equipped with a choice how to calculate.

The entire development of the educational content from the spheres of competencies *"Geometric shapes and bodies"* and *"Measurements"* helps students develop their spatial visualization, imagination and thinking.

The word problems included in the textbook directly and indirectly develop students' modelling skills.

Teaching by this textbook ensures effective acquisition and application of fundamental mathematical knowledge, stimulates students' exploration skills, activates their thinking and develops critical thinking and creative skills and abilities.

27. ***Angelova, V.,*** Koleva, J. and Nikolova, A. 3rd Grade Mathematics – electronic textbook. Sofia, "Prosveta Plus" Publishing House, 2018, 124 pages, ISBN 978-619-222-168-3

The electronic textbook (e-textbook) 3rd Grade Mathematics is an electronic version of the paper textbook in which electronic educational resources are developed for each lesson.

These resources include audio recordings, single- and multiple-choice test problems, flash cards, games, animations, etc. The electronic resources that enrich the educational content of the lessons are diverse, fun and with different levels of complexity.

The animations that demonstrate the algorithms for written calculations are part of the content of the 3rd grade mathematics electronic textbook.

Using the electronic textbook in the educational process changes traditional teaching and creates an innovative educational environment which is a prerequisite for high-quality mastering of the educational content.

28. *Angelova, V.* and Doichinova, S. 2nd Grade Mathematics Textbook. Sofia, "Prosveta Plus" Publishing House, 2017, 124 pages, ISBN 978-619-222-125-6
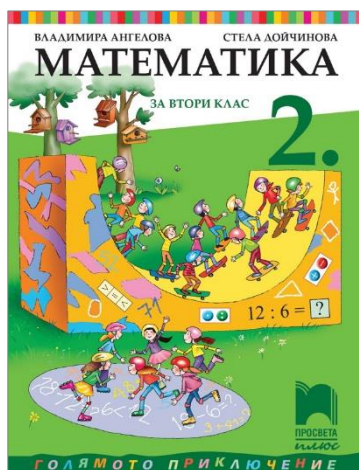
The content of the textbook follows the logical structure of the current second grade mathematics curriculum standards. It integrates knowledge from different areas of mathematics which are taught in unity. The curriculum requirements are specified and presented in detail. The interconnectedness among the diversity of problems aids the formation of knowledge and skills in a systematic way.

The textbook offers a didactic system for mastering the operations addition and subtraction of numbers up to 100 as well as tabular multiplication and division.

The classical algorithms for written calculations are supported with techniques for mental calculations and in this way the child is placed in a situation to understand, analyze and make a deliberate choice how to calculate.

A didactic device illustrating the tabular multiplication is included in the Appendix section of the 2nd grade mathematics workbook.

The geometry knowledge integrated in the textbook is taught in a visualized and practical manner: on one hand, in unity with arithmetic knowledge and on the other hand – in its own independent system.

The developed system of word problems in this textbook is a good basis for development of mathematical thinking and problem solving skills.

The textbook is structured in such a way as to provoke curiosity and interest, to stimulate students' exploration skills, activate their thinking and develop their creativity.

29. *Angelova, V.,* Nikolova, A. and Kadeva, V. 2nd Grade Mathematics – electronic textbook. Sofia, "Prosveta Plus" Publishing House, 2017, 124 pages, ISBN 978-619-222-126-3

The electronic textbook (e-textbook) 2nd Grade Mathematics is a next generation digital technology. It includes an electronic version of the paper textbook and many interactive resources that become a valuable source of additional materials for the teachers. This electronic edition contains more than 500 educational resources. These resources are with different levels of complexity and include audio recordings, single- and multiple-choice problems, games, etc.

The e-textbook contains animations which demonstrate the perimeters of the geometric shapes – rectangle, square and triangle.

This textbook makes teaching easier and guarantees permanent mastering of the competencies defined in the second grade mathematics curriculum standards.

30. *Angelova, V.* and Topalska, R. 1st Grade Mathematics Textbook. Sofia, "Prosveta Plus" Publishing House, 2016, 142 pages, ISBN 978-619-222-020-4
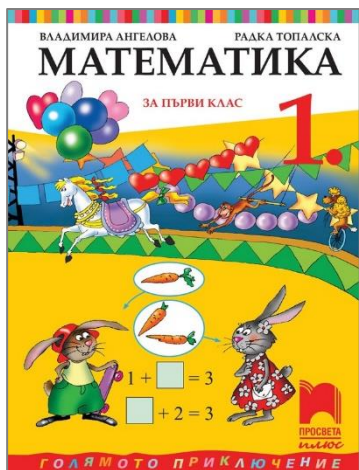
The content of the textbook follows the current first grade mathematics curriculum standards. It integrates knowledge from different areas of mathematics which are taught in unity. The algorithms for performing the mathematical operations are visualized and presented in comprehensible manner and that aids their application in solving practical problems. The geometry content is developed in such a manner as to fully develop students' visualization and thinking skills and imagination.

The presentation of the measurement units is planned successively and it is coordinated with the curriculum standards and the competencies are gradually developed.

The textbook offers a system for developing knowledge and skills for solving word problems with one calculation which is consistent with students' age abilities. To achieve this goal the symbol "hand" is utilized and it serves as an orientation in the methodology for solving word problems and builds five props. The problems included in the textbook are a good basis for developing mathematical thinking and problem solving skills.

Non-standard problems are situated at the right bottom side on all right pages and they develop students' spatial orientation, imagination and logical and combinatorial thinking.

The textbook 1st Grade Mathematics is part of the complete resource pack of publishing house "Prosveta Plus" for the 1st grade called *The Great Adventure".*

This resource pack took part in the competition for best teaching resource - BELMA (Best European Learning Material), which is held every year during the International Book Fair in Frankfurt and won a bronze medal in the 6- to 11- year-olds category. Bulgarian first graders have been taught by it since 2016.

31. *Angelova, V.,* Topalska, R., Kadeva, V. and Nikolova, A. 1st Grade Mathematics – electronic textbook. Sofia, "Prosveta Plus" Publishing House, 2016, 142 pages, ISBN 978-619-222-036-5

The electronic textbook (e-textbook) 1st Grade Mathematics is a digital product that includes the electronic version of the paper textbook and many multimedia educational materials which are an additional resource for all the teachers. The current electronic edition contains more than 500 resources, which include audio recordings, flash cards, animations, games, test problems for knowledge assessment, etc. The e-textbook is a next generation textbook. Using the electronic textbook makes the educational process interactive and

fun and guarantees permanent mastering of the competencies defined in the first grade mathematics curriculum standards.

ACTIVITY BOOKS FOR PRIMARY SCHOOL STUDENTS

32. *Angelova, V.,* and Nikolova, A. 4th Grade Mathematics Workbook № 1. Sofia, "Prosveta Plus" Publishing House, 2019, 52 pages, ISBN 978-619-222-277-2
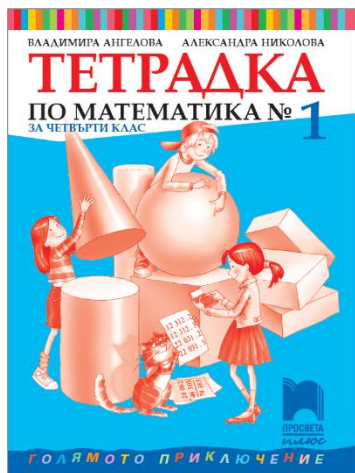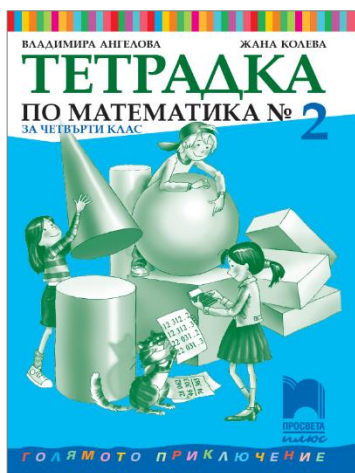
The *4th grade mathematics workbook № 1* includes problems and activities from the following topics from the 4th grade mathematics textbook*: Initial Revision, The Numbers above 1000, Addition and Subtraction of Multi-Digit Numbers*.

The problems in this workbook are compliant with the objectives of the specific lesson and guarantee consolidation and application of the educational content. They are designed for independent task completion.

The workbook contains tests for independent work that:

- assess students' mathematical competencies at the beginning of the 4th grade;
- assess students' mathematical competencies after studying the numbers above 1000 and the operations addition and subtraction with them.

33. *Angelova, V.,* and Nikolova, A. 4th Grade Mathematics Workbook № 2. Sofia, "Prosveta Plus" Publishing House, 2019, 52 pages, ISBN 978-619-222-278-9

The *4th grade mathematics workbook № 2* includes problems and activities compliant with the next three topics from the content of the 4th grade mathematics textbook*: Multiplication and Division of a Multi-Digit Number by One-Digit Number, Multiplication and Division of a Multi-Digit Number by a Two-Digit Number* and an *End-of-Year Revision.*

The problems in this workbook are selected in the context of the lesson objectives and serve for consolidation and application of the educational content. They are designed mainly for independent task completion.

Part of the content of this workbook contains tests for independent work that:

- assess students' mathematical competencies after studying the operations multiplication and division of a multi-digit number by a one-digit number;
- assess students' mathematical competencies after studying the operations multiplication and division of a multi-digit number by a two-digit number;
- assess students' mathematical competencies at the end of the 4th grade.

The game "Tantram" is included as an additional appendix in this workbook. The game helps children develop their logical, spatial and constructive thinking.

34. *Angelova, V.,* and Nikolova, A. 4ᵗʰ Grade Mathematics with Matt and Emma. Sofia, "Prosveta Plus" Publishing House, 2019, 80 pages, ISBN 978-619-222-323-6

The activity book *Mathematics with Matt and Emma 4* is designed for the elective classes and is compliant with the content and pace of teaching mathematics in the 4ᵗʰ grade. It includes 34 topics and contains problems distributed in three levels of complexity: for knowledge and skills consolidation; for knowledge and skills practical application; for improvement and development of logical thinking, observation skills and creative imagination.

Matt and Emma will help their friends – the 4ᵗʰ graders to become more confident in addition and subtraction of natural numbers, to master techniques for multiplication and division of multi-digit numbers by one- and two-digit numbers, to broaden their knowledge on geometric shapes and bodies and the standard measurement units for length, weight, time, area and angle, to solve word problems and improve their skills for description of real life situations with mathematical models.

This activity book is compliant with the *4ᵗʰ grade curriculum on mathematics for the elective classes.* It is developed by me and includes:

- Presentation of the 4ᵗʰ grade curriculum on mathematics;
- Expected learning outcomes for the following spheres of competence: *Numbers, Geometric shapes and bodies, Measurement,* and *Modelling;*
- Educational content for the elective mathematics classes in the 4ᵗʰ grade;
- Specific methods and forms for assessing students' achievements;
- Methodological guidelines;
- 4ᵗʰ grade instructional resources division on mathematics for the elective classes.

35. *Angelova, V.,* and Koleva, J. 3ʳᵈ Grade Mathematics Practice Book. Sofia, "Prosveta Plus" Publishing House, 2018, 132 pages, ISBN 978-619-222-255-0
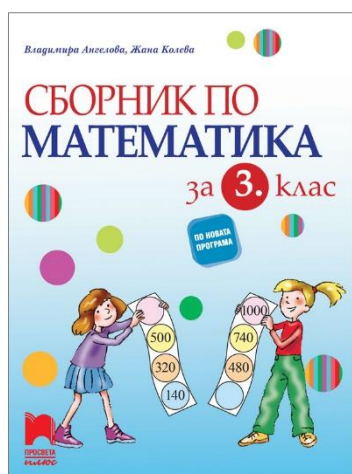
The 3ʳᵈ Grade Mathematics Practice Book is developed as part of the complete resource pack of publishing house "Prosveta Plus" called "*The Great Adventure"* and it is designed for additional work in mathematics classes, for homework and assessment of students' knowledge and skills.

The problems in it consolidate the acquired knowledge and skills and practice their application. They help students to achieve:

- acquisition and application of written and mental addition and subtraction of the numbers up to 1000;
- acquisition and application of written and

mental multiplication and division of the numbers up to 1000 by a one-digit number;

- broadening knowledge on flat geometric shapes;
- deepening and broadening knowledge on the standard measurement units for length, weight and time;
- improving students' skills for solving word problems formulated in different ways;
- improving students' skills for description of real life situations with mathematical models.

The educational technology in this practice book is personalized. It aids the formation of mathematical literacy and the key competencies outlined in the curriculum. It also develops students' creative thinking.

36. *Angelova, V.,* and Nikolova, A. 3rd Grade Mathematics with Matt and Emma. Sofia, "Prosveta Plus" Publishing House, 2018, 72 pages, ISBN 978-619-222-254-3

This activity book is designed for the elective mathematics classes in the 3rd grade.

The topics included in it contain problems and exercises distributed in three levels of complexity: for knowledge and skills consolidation; for knowledge and skills practical application; for improvement and development of logical thinking, observation skills and creative imagination.

The answers and solutions to some of the logical problems are presented at the end of the activity book.

Matt and Emma will help their friends – the 3rd graders to become more confident in addition, subtraction, multiplication and division of the numbers up to 1000, to broaden their knowledge on flat geometric shapes and the standard measurement units for length, weight and time. And not only this – they will solve word problems and improve their skills for description of real life situations with mathematical models.

The problems and exercises included in the activity book involve the following types of tasks: compare, find and correct the mistakes, fill-in the gaps, match, draw, extract and interpret the information from the text, table, scheme or diagram.

The teacher can use the book as a reliable source for diverse and effective work.

This activity book is compliant with the *3rd grade curriculum on mathematics for the elective classes.* It is developed by me and includes:

- Presentation of the 3rd grade curriculum on mathematics;
- Expected learning outcomes for the following spheres of competence: *Numbers, Geometric shapes and bodies, Measurement,* and *Modelling;*
- Educational content for the elective mathematics classes in the 3rd grade;
- Specific methods and forms for assessing students' achievements;
- Methodological guidelines;

- 3rd grade instructional resources division on mathematics for the elective classes.

37. ***Angelova, V.,*** and Doichinova, S. 2nd Grade Mathematics Workbook № 1. Sofia, "Prosveta Plus" Publishing House, 2017, 40 pages, ISBN 978-619-222-123-2
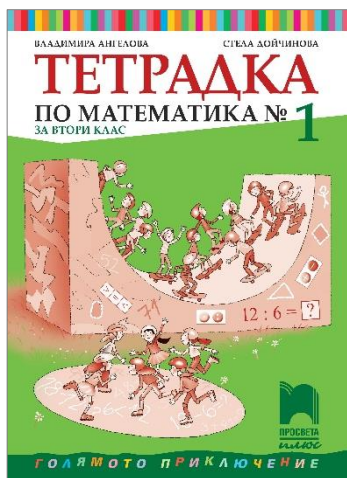
The 2nd grade mathematics workbook № 1 includes problems and activities from the following three topics from the 2nd grade mathematics textbook:

- *The numbers 21, 22, 23, …, 99, 100;*
- *Addition and subtraction of the numbers up to 100 without regrouping;*
- *Addition and subtraction of the numbers up to 100 with regrouping;*

The problems in this workbook are selected in the context of the lesson objectives and serve for consolidation and application of the educational content. They are designed mainly for indepen dent work by the students.

Part of the content of this workbook is the assessment toolset in the form of tests for independent work that:

- assess students' mathematical competencies at the beginning of the 2nd grade;
- assess second grade students' mathematical competencies after studying the numbers up to 100 and the operations addition and subtraction with them.

The workbook includes summaries of the basic knowledge from the first three topics from the textbook.

38. ***Angelova, V.,*** and Doichinova, S. 2nd Grade Mathematics Workbook № 2. Sofia, "Prosveta Plus" Publishing House, 2017, 44 pages, ISBN 978-619-222-124-9
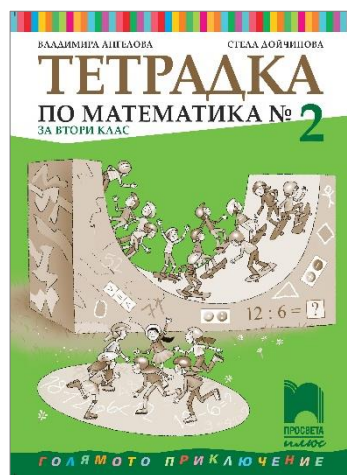
The 2nd grade mathematics workbook № 2 includes problems and activities from the fourth and fifth topics from the 2nd grade mathematics textbook*:*

- *Tabular multiplication and division;*
- *End-of-year revision.*

The problems in this workbook serve for consolidation and application of the educational content and can be solved independently by the students.

A test for assessing students' mathematical competencies at the end of 4th grade is designed and included at the end of this book.

The appendix of this book contains a didactic tool for quick multiplication and a model of a clock.

The workbook includes summaries of the basic knowledge from the topic: *Tabular multiplication and division.*

39. ***Angelova, V.,*** Georgieva, K., Koleva, J., Tonev T., Doichinova, S. 2nd Grade Mathematics Practice Book. Sofia, "Prosveta Plus" Publishing House, 2017, 116 pages, ISBN 978-619-222-148-5

The 2nd Grade Mathematics Practice Book is developed as part of the complete resource pack of publishing house "Prosveta Plus" called "The Great Adventure" and it is designed for additional work in mathematics classes, for homework and assessment of students' knowledge and skills.

The problems in it consolidate the acquired knowledge and skills and practice their application. They help students to achieve:

- acquisition and application of the algorithms for addition and subtraction of the numbers up to 100;
- mastering the tabular multiplication and division;
- broadening knowledge on flat geometric shapes;
- broadening knowledge on the standard measurement units for length and time;
- developing a system for solving word problems, formulated in different ways;
- improving skills for describing real life situations with mathematical models.

The practice book is a valuable resource in teachers' everyday work because it provides additional materials for each topic and is completely synchronized with the textbook.

40. ***Angelova, V.,*** and Nikolova, A. 2nd Grade Mathematics with Matt and Emma. Sofia, "Prosveta Plus" Publishing House, 2017, 68 pages, ISBN 978-619-222-150-8

This activity book is designed for the elective mathematics classes in the 2nd grade. It contains 32 topics and problems distributed in three levels of complexity: for knowledge and skills consolidation; for knowledge and skills practical application; for improvement and development of logical thinking, observation skills and creative imagination.

Matt and Emma are main characters in each topic of this resource book as well as in the whole collection designed for the elective classes. With their help the second graders will become more confident in adding and subtracting the numbers up to 100, will easily master tabular multiplication and division and will broaden their knowledge on the standard measurement units for length and time. And not only this – they will solve word problems and improve their skills for description of real life situations with mathematical models.

The problems and exercises in this book enable the students to take part in different activities that will help them improve and broaden their mathematical knowledge.

This activity book is compliant with the *2nd grade curriculum on mathematics for the elective classes.* It is developed by me and includes:

- Brief presentation of the 2nd grade curriculum on mathematics;
- Expected learning outcomes for the following spheres of competence: *Numbers, Geometric shapes and bodies, Measurement,* and *Modelling;*
- Educational content for the elective mathematics classes in the 2nd grade;
- Specific methods and forms for assessing students' achievements;
- Methodological guidelines;
- 2nd grade instructional resources division on mathematics for the elective classes.

41. *Angelova, V.,* Hadjieva, S. and Topalska, R. 1st Grade Mathematics Workbook № 1. Sofia, "Prosveta Plus" Publishing House, 2016, 44 pages, ISBN 978-619-222-018-1
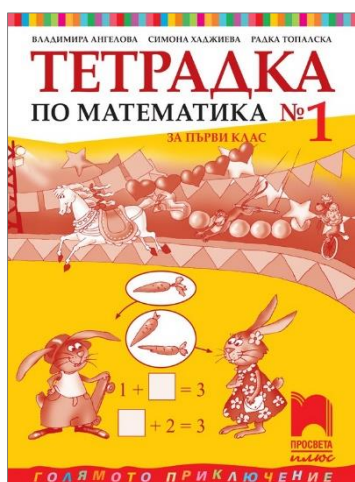
The 1st grade mathematics workbook № 1 includes problems and activities from the following two topics from the 1st grade mathematics textbook*:*

- *The natural numbers from 1 to 5 and zero. Addition and subtraction of the numbers up to 5.*
- *The numbers from 6 to 10. Addition and subtraction of the numbers up to 10.*

The content of the workbook complements the lesson in the textbook. The design of the problems allows students to solve them independently. Answers are provided for some of the problems which cannot be seen with the naked eye but only with the help of a magnifying glass that is part of the resource pack. This allows student who work with this workbook to check their knowledge and skills and self-assess their competencies.

The workbook contains problems and exercises for independent work that:

- assess students' mathematical competencies at the beginning of the 1st grade;
- assess first grade students' mathematical competencies after studying the numbers up to 10 and the operations addition and subtraction.

42. *Angelova, V.,* Alexandrova, D. and Topalska, R. 1st Grade Mathematics Workbook № 2. Sofia, "Prosveta Plus" Publishing House, 2016, 52 pages, ISBN 978-619-222-019-8

The 1st grade mathematics workbook № 2 includes problems and activities from the following four topics from the 1st grade mathematics textbook:

- *Addition and subtraction of the numbers up to 20 without regrouping;*
- *Addition and subtraction of the numbers up to 20 with regrouping;*
- *The numbers 10, 20, 30,…, 90, 100. Addition and subtraction with them;*

- *End-of-year revision*
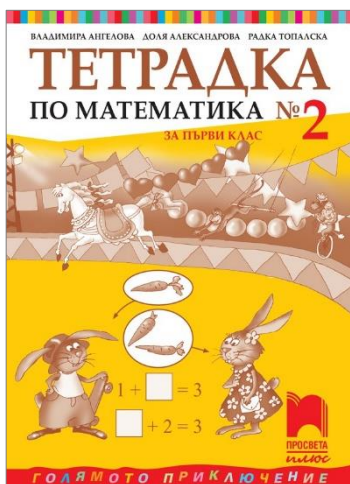
The content of the workbook is a natural continuation of the lesson in the textbook. The problems in it help students consolidate the educational content and can be solved independently by them. Answers are provided for some of the problems which cannot be seen with the naked eye but only with the help of a magnifying glass that is part of the resource pack. This allows student who work with this workbook to check their knowledge and skills and self-assess their competencies.

The workbook contains a test for independent work designed to assess students' mathematical competencies at the end of the 1st grade.

43. **Angelova, V.,** Georgieva, K., Koleva, J., 1st Grade Mathematics Practice Book. Sofia, "Prosveta Plus" Publishing House, 2017, 132 pages, ISBN 978-619-222-147-8

The 1st Grade Mathematics Practice Book is developed as part of the complete resource pack of publishing house "Prosveta Plus" called "The Great Adventure". It is designed for additional work in mathematics classes, for homework and assessment of students' knowledge and skills. The problems in it allow students both to consolidate the acquired knowledge and skills and practice their application. They help students to:

- add and subtract the numbers up to 20 and the tens up to 100;
- solve word problems, formulated in different ways;
- identify and draw geometric shapes;
- understand the standard measurement units for length, weight and time;
- identify the Bulgarian banknotes and coins;
- extract information from illustrations, schemes and diagrams.

The practice book offers a test for independent work that assesses students' initial, mid-year and end-of-the-year mathematical competencies.

44. **Angelova, V.,** Koleva, J. 1st Grade Mathematics with Matt and Emma. Sofia, "Prosveta Plus" Publishing House, 2017, 68 pages, ISBN 978-619-222-149-2

This activity book is designed for the elective mathematics classes in the 1st grade. The topics in it contain problems and exercises distributed in three levels of complexity: for knowledge and skills consolidation; for knowledge and skills practical application; for improvement and development of logical thinking, observation skills and creative imagination.
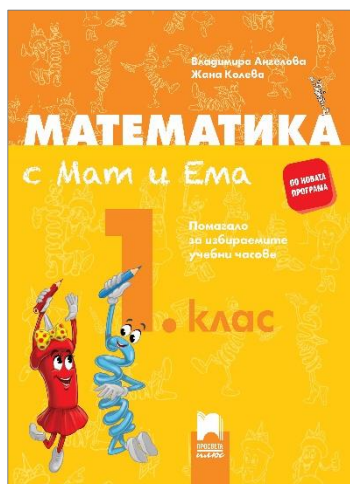
The entertaining characters Matt and Emma take the children towards the "Great Adventure" in the world of mathematics.

Together with Matt and Emma the first graders will easily become more confident in addition and subtraction of the numbers up to 20 and the tens up to 100, they will quickly identify and draw geometric shapes, will competently use the measurement units – kilogram, centimeter and hour.

The problems and exercises stimulate students' exploration skills, activate their thinking and develop critical thinking and creative skills and abilities. The problems and exercises included in it are diverse and involve the following types of tasks: orientate, fill-in the gaps, match, complete the drawing, colour, find and correct the mistakes, extract and interpret information from different sources as text, tables and schemes.

This activity book is compliant with the *1ˢᵗ grade curriculum on mathematics for the elective classes.* It is developed by me and includes:

- Brief presentation of the 1ˢᵗ grade curriculum on mathematics;
- Expected learning outcomes for the following spheres of competence: *Numbers, Geometric shapes and bodies, Measurement,* and *Modelling;*
- Educational content for the elective mathematics classes in the 1ˢᵗ grade;
- Specific methods and forms for assessing students' achievements;
- Methodological guidelines;
- 1ˢᵗ grade instructional resources division on mathematics for the elective classes.

01.06.2019   **SIGNATURE:**
Plovdiv   **/Assoc. Prof. Vladimira Angelova, PHD/**