

BUNIN YELETS STATE UNIVERSITY

"APPROVED"

Director of the Institute of Psychology
And Pedagogy _____/T.D.Krasova/



THE WORK PROGRAMME OF THE DISCIPLINE **B1.C.05.02 Methods of teaching mathematics at primary school**

Direction of training: 44.03.01 Pedagogical Education

Profile: Primary education

Qualification (degree): bachelor

Mode of study: full-time

Institute of Psychology and Pedagogy

Department: Pedagogy and educational technologies

	full-time form	full-time and part-time form	part-time form
Study course	2-3	-	-
Term	3, 4, 5	-	-
Lectures	52	-	-
laboratory work		-	-
Practical work (seminars)	52	-	-
including practical training	10	-	-
Form of control	Credit test Exam	-	-
Control	9	-	-
Independent work	174,7	-	-

Total number of academic hours: 288

labor intensity: 8 credits

Developer of the work programme:

Candidate of Pedagogical Sciences, Associate Professor S.N. Chislova

I. ORGANIZATIONAL AND METHODOLOGICAL SECTION I

The purpose of studying the discipline: to develop in students universal, general professional, professional competencies necessary for the professional solution of educational and training tasks that arise in the process of teaching mathematics to primary school students.

Objectives of studying the discipline:

- ensure acquisition of knowledge of the main regulatory documents necessary for organizing mathematical education of primary school students, the system of knowledge about the goals, content, methods, means, forms of teaching primary school students mathematics, scientific foundations of studying the main concepts of the initial course of mathematics;
- develop the ability to apply the basics of mathematical and methodological knowledge in the process of teaching mathematics to primary school students;
- ensure mastery of methods for solving professional problems that arise in the practice of teaching mathematics to primary school students.

The place of the discipline in the structure of the BPEP: implemented within the framework of the basic (mandatory) part of block B1. Disciplines (modules)

Planned learning outcomes for the course:

Code of competence	Indicators of competence achievement	Planned learning outcomes for the discipline
UC-2	To know: - methods of designing a solution to a specific project task, determining the optimal ways to solve it, based on current legal regulations and available resources and limitations	Knows: - methods for designing a solution to a specific methodological task of a project, determining optimal methods for solving it, based on current legal norms and available methodological resources.
	To be able to: - formulate a set of interrelated tasks within the framework of the set goal of the work, ensuring its achievement; - qualitatively solve specific tasks (research, project, activity) within the specified time	Is able to: - formulate a set of interrelated tasks within the framework of the set goal of a mathematics lesson, ensuring its achievement; - qualitatively solve specific educational and methodological tasks in a mathematics lesson and in extracurricular activities in mathematics
	To possess: - skills of determining the expected results of solving the set tasks; - skills of publicly presenting the results of solving the tasks of research, project, activity	Possess: - skills of determining the expected results of solving the assigned problems in the lesson and in extracurricular activities in mathematics; - skills of publicly presenting the results of solving the problems obtained in the lesson and in extracurricular activities in mathematics.

UC-9	<p>To know:</p> <ul style="list-style-type: none"> - the conceptual apparatus of economic science and the basic principles of economic functioning; - the goals and mechanisms of the main types of social economic policy. 	<p>Knows:</p> <ul style="list-style-type: none"> - economic concepts: -family budget, - price, quantity, cost and the relationship between these quantities. .
	<p>To be able to:</p> <ul style="list-style-type: none"> - use methods of economic and financial planning to achieve the set goal; - use financial instruments to manage personal finances (personal budget). 	<p>Is able to:</p> <ul style="list-style-type: none"> - use knowledge about the family budget, price, quantity, cost and the relationship between these quantities in the process of teaching primary school students to solve practice-oriented tasks.
	<p>To possess:</p> <ul style="list-style-type: none"> - the skills of using economic instruments to manage finances, taking into account economic and financial risks in various areas of life. 	<p>Possess:</p> <ul style="list-style-type: none"> - skills in applying economic knowledge in the process of teaching primary school students to solve practice-oriented tasks.
GPC-2	<p>To know:</p> <ul style="list-style-type: none"> - federal state educational standards; - history, patterns and principles of construction and functioning of educational systems; - basics of didactics; - modern educational technologies, including ICT 	<p>Knows:</p> <ul style="list-style-type: none"> - federal state educational standard of primary general education; - principles of constructing a basic course of mathematics; - basics of teaching mathematics to primary school students; - modern educational technologies.
	<p>To be able to:</p> <ul style="list-style-type: none"> - develop individual components of basic and additional educational programs; - use ICT in developing educational programs; - plan educational sessions 	<p>Is able to:</p> <ul style="list-style-type: none"> -develop individual components of the educational program in mathematics using ICT; -plan educational lessons in mathematics for primary school students.
	<p>To possess:</p> <ul style="list-style-type: none"> - techniques for developing programs of academic disciplines within the framework of the basic general educational program; - skills in applying modern educational technologies in a real and virtual educational environment; - ICT: at the user level; at the general pedagogical level; at the subject-pedagogical level 	<p>Possess:</p> <ul style="list-style-type: none"> - develop individual components of the educational program in mathematics using ICT; - plan educational lessons in mathematics for primary school students;
GPC-3	<p>To know:</p> <ul style="list-style-type: none"> - the essence, forms and methods of organizing educational and upbringing activities; 	<p>Knows:</p> <ul style="list-style-type: none"> - the essence, forms and methods of organizing educational and upbringing activities in the process of teaching math-

	<ul style="list-style-type: none"> - modern technologies for organizing joint and individual educational and upbringing activities, including in the context of an inclusive educational process; - the basics of psychodiagnostics and the main signs of deviations in the development of children 	<p>ematics to primary school students;</p>
	<p>To be able to:</p> <ul style="list-style-type: none"> - correlate the requirements of federal educational standards with the individual educational needs of students; - organize joint educational and upbringing activities; - develop and implement individual educational routes, individual development programs and individually oriented educational programs taking into account the personal and age characteristics of students 	<p>Is able to:</p> <ul style="list-style-type: none"> - organize joint educational and upbringing activities in the study of mathematics by primary school students;
	<p>To possess:</p> <ul style="list-style-type: none"> - methods of organizing joint and individual educational and upbringing activities; - methods of identifying children with special educational needs 	<p>Possess:</p> <ul style="list-style-type: none"> - methods of organizing joint and individual educational and upbringing activities in the process of teaching mathematics;
GPC-5	<p>To know:</p> <ul style="list-style-type: none"> - principles of organizing monitoring and evaluation of students' educational results; - technologies and methods of monitoring and evaluation of educational results; - special technologies and methods that allow identifying and correcting learning difficulties 	<p>Knows:</p> <ul style="list-style-type: none"> - principles of organizing monitoring and evaluation of educational results of primary school students in the subject area "Mathematics"; - methods of monitoring and evaluation of educational results in the subject area "Mathematics";
	<p>To be able to:</p> <ul style="list-style-type: none"> - apply tools, methods of diagnostics and evaluation of indicators of the level and dynamics of students' development; - conduct pedagogical diagnostics and correction of learning difficulties 	<p>Is able to:</p> <ul style="list-style-type: none"> - conduct pedagogical diagnostics and correction of difficulties in teaching mathematics to primary school students
	<p>To possess:</p> <ul style="list-style-type: none"> - methods of monitoring and evaluation of students' educational results (personal, subject, meta-subject); - special methods that allow identi- 	<p>Possess:</p> <ul style="list-style-type: none"> - methods of monitoring and assessing the educational results (personal, subject, meta-subject) of students in the subject area "Mathematics";

	<p>ifying and correcting learning difficulties</p>	<p>- methods that allow identifying and correcting learning difficulties;</p>
GPC-9	<p>To know:</p> <ul style="list-style-type: none"> – principles of operation of modern information technologies and methods of their use to solve problems of professional activity 	<p>Knows:</p> <ul style="list-style-type: none"> - principles of operation of modern information technologies and ways of using them to solve problems of professional activity in the process of teaching mathematics to primary school students
	<p>To be able to:</p> <ul style="list-style-type: none"> – reasonably choose modern information technologies and use them to solve problems of professional activity 	<p>Is able to:</p> <ul style="list-style-type: none"> – to reasonably choose modern information technologies and use them to solve problems of professional activity in the process of teaching mathematics to primary school students.
	<p>To possess:</p> <ul style="list-style-type: none"> – skills of working with modern information technologies, methods of their use to solve problems of professional activity 	<p>Possess:</p> <ul style="list-style-type: none"> – skills in working with modern information technologies, ways of using them to solve problems of professional activity in the process of teaching mathematics to primary school students.
PCS-1	<p>To know:</p> <ul style="list-style-type: none"> - fundamentals of specific teaching methods(techniques) in the subject area; - characteristics of students' personal, meta-subject and subject results in the context of teaching in the subject area (according to the Federal State Educational Standard and the model curriculum); - modern educational technologies and methodological patterns of their selection; - methods of monitoring, assessing and correcting learning results in the subject area 	<p>Knows:</p> <ul style="list-style-type: none"> - fundamentals of methods of teaching mathematics to primary school students; - modern educational technologies and methodological patterns of their selection, taking into account the peculiarities of teaching mathematics to primary school students; - methods of monitoring, assessing and correcting the results of learning in the discipline "Mathematics".
	<p>To be able to:</p> <ul style="list-style-type: none"> - design a work program in the subject area; - design and implement various forms of training and organization of extracurricular activities of students in the subject area (profiles ensuring the achievement of meta-subject, subject and personal results 	<p>Is able to:</p> <ul style="list-style-type: none"> - design and implement various forms of training in the discipline "Mathematics", ensuring the achievement of meta-subject, subject and personal results
	<p>To possess:</p> <ul style="list-style-type: none"> - teaching methods in the subject ar- 	<p>Possess:</p> <ul style="list-style-type: none"> - methods of teaching in the discipline

	<p>ea and the methodology for their selection taking into account the specifics of the content of the educational material, age and educational needs of students;</p> <ul style="list-style-type: none"> - modern educational technologies ensuring the achievement of students' meta-subject, subject and personal results; - methods of monitoring, assessing and correcting learning results in the subject area 	<p>"Mathematics" and the methodology of their selection taking into account the features of the content of the educational material, age and educational needs of students;</p> <ul style="list-style-type: none"> - modern educational technologies ensuring the achievement of meta-subject, subject and personal results of students; - methods of monitoring, assessing and correcting the results of learning in the discipline "Mathematics"
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II. CONTENT AND SCOPE OF THE DISCIPLINE

indicating the number of hours allocated for contact work of students with the teacher (by type of classes) and for independent work

Full-time education

№	Name of sections and topics	Total	Classroom lessons			Indep. work
			Lec.	Sem.	Lab.work	
Section 1. General questions of methods of teaching mathematics in primary grades		46	8	6		32
1.	Topic 1.1. Methods of teaching mathematics as a science. Initial course of mathematics as a subject	10	2			8
2.	Topic 1.2. Means and methods of teaching mathematics to primary school students	12	2	2		8
3.	Topic 1.3. Organization of teaching mathematics to primary school students	12	2	2		8
4.	Topic 1.4. Verification and assessment of learning outcomes	12	2	2		8
Section 2. Methods of studying the numbering of non-negative integers in elementary grades		62	10	12		40
5.	Topic 2.1. General questions of the methodology of studying the numeration of numbers	10	2			8
6.	Topic 2.2. Methods of	14	2	4		8

	studying numeration in the preparatory period and in the topic "Numbers from 1 to 10"					
7.	Topic 2.3. Methodology for studying the numbering of numbers in the topic "Numbers from 1 to 100"	14	2	4		8
8.	Topic 2.4. Methodology for studying the numbering of numbers in the topic "Numbers from 1 to 1000"	12	2	2		8
9.	Topic 2.5. Methodology for studying the numbering of numbers in the topic "Numbers that are greater than 1000"	12	2	2		8
	<i>Test</i>					
<i>Total for the 3th semester</i>		<i>108</i>	<i>18</i>	<i>18</i>		<i>72</i>
Section 3. Methods of studying arithmetic operations and developing computational skills in primary grades		72	18	18		36
10.	Topic 3.1. General questions of the methodology of studying arithmetic operations	14	4	4		6
11.	Topic 3.2. Methods of studying arithmetic operations in the topic "Numbers from 1 to 100"	22	6	6		10
12.	Topic 3.3. Methods of studying arithmetic operations in the topic "Numbers from 1 to 1000"	18	4	4		10
13.	Topic 3.4. Methods of studying arithmetic operations in the topic "Numbers that are greater than 1000"	18	4	4		10
	<i>Test</i>					
<i>Total for the 4th semester</i>		<i>72</i>	<i>18</i>	<i>18</i>		<i>36</i>
Section 4. Methods of developing the ability to solve arithmetic problems in primary school students		60	10	10		40
14.	Topic 4.1. General issues of the methodology of developing the ability to solve arithmetic problems	14	2	2		10

15.	Topic 4.2. Methods of developing the ability to solve simple arithmetic problems	22	4	4		14
16.	Topic 4.3. Methods of developing the ability to solve compound arithmetic problems	24	4	4		16
Section 5. Methods of studying quantities, algebraic, geometric and combinatorial lines of the initial course of mathematics		38,7	6	6		26,7
17.	Topic 5.1. Methods of studying basic quantities and their measurement in the initial course of mathematics	14	2	2		10
18.	Topic 5.2. Methods of studying the elements of algebra in the initial course of mathematics	14	2	2		10
19.	Topic 5.3. Methods of studying geometric material in the initial course of mathematics	10,7	2	2		6,7
20.	Exam	9,3				
<i>Total for the 5th semester</i>		<i>108</i>	<i>16</i>	<i>16</i>		<i>66,7</i>
Total number of academic hours:		288	52	52		174,7

Full-time and part-time education (not implemented)

Part-time education (not implemented)

III. EVALUATION MATERIALS FOR CONDUCTING CURRENT AND INTER-IM CERTIFICATION OF STUDENTS IN THE DISCIPLINE

The current certification is carried out in the form of a control work (in a traditional or test form), an abstract.

Standard version of the test paper

Section 1. In traditional form:

1. Highlight the main features of the structure of the initial course of mathematics.
2. Classify teaching methods on various grounds.

3. List the types of verification and assessment of the achievement of subject results in mathematics depending on the stage of its implementation.
4. Make a lesson plan on the topic "Quantitative and ordinal relations".
5. Make a conversation based on the illustrations in the textbook (preparatory period).

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In the test form:

1. The methodological system of teaching mathematics to primary school students includes:
 - a) 5 elements;
 - b) 5 elements and connections between them;
 - c) teacher skills;
 - d) research results of methodologists.

2. The subject of study of the methods of teaching mathematics as a science is:
 - a) mathematics lessons in primary school;
 - b) objective patterns that appear in the process of teaching mathematics to primary school students;
 - c) the teacher's activities in teaching mathematics to primary school students;
 - d) the activities of students in studying mathematics in primary school.

3. In the system of sciences, the connection between the methodology of teaching mathematics is not traced with:
 - a) mathematics;
 - b) didactics;
 - c) philosophy;
 - d) history of the Fatherland.

4. The socio-cultural background has a decisive impact primarily on such elements of the methodological system as:
 - a) the content of training;
 - b) the form of organization of training;
 - c) the purpose of training;
 - d) training methods.

5. The content of the basic mathematics course does not include:
 - a) elements of stochastics;
 - b) elements of algebra;
 - c) elements of geometry;
 - d) elements of trigonometry.

6. The implementation of the educational objectives of a mathematics lesson involves the formation in schoolchildren of:
 - a) a system of knowledge, skills, and abilities provided for by the program;
 - b) rational methods of thinking;
 - c) positive personality traits;
 - d) basic skills of academic work.

7. In the basic course of mathematics, at the level of conceptual generalization, the following is introduced:
 - a) the concept of a set;
 - b) some properties of arithmetic operations;
 - c) the concept of magnitude;

d) the concept of a natural number.

8. The use of visual aids helps develop abstract thinking in primary school students if, over time, their character changes according to the following scheme:

- a) natural – symbolic – figurative;
- b) figurative – natural – symbolic;
- c) natural – figurative – symbolic;
- d) symbolic – figurative – natural.

9. Specify a teaching method that does not belong to the group of methods built on the basis of the form of organization of joint activities of the teacher and students:

- a) presentation of knowledge by the teacher;
- b) conversation;
- c) practical;
- d) independent work of students.

10. Control by students is most typical:

- a) for frontal work;
- b) for individual work;
- c) for group work;
- d) for extracurricular work.

11. Homework in mathematics in elementary grades is offered to students:

- a) from the first half of the year of the 1st grade;
- b) from the second half of the year of the 1st grade;
- c) from the first half of the year of the 2nd grade;
- d) from the second half of the year of the 2nd grade.

Section 2. In traditional form:

- 1. Time, tasks, order of studying the topic "Numbers 1-10".
- 2. Methodology for studying oral numeration of numbers in the topic "Numbers 11-20"..
- 3. Highlight the knowledge, skills and abilities necessary for introducing a computational technique of the type: $10 + 5$. Provide the student's complete reasoning when solving the example.
- 4. Compile a final test on the topic "Numbers 1- 1000", indicate the purpose of each task.
- 5. Indicate the tasks that a teacher can use when preparing to study cases of multiplication by 10. 100, 1000.

In the test form:

- 1. The indicator of the assimilation of the concept of number by primary school students in the preparatory period is:
 - a) the ability to correctly count various sets of objects using cardinal and ordinal numerals;
 - b) the ability to fully and systematically characterize any number from 1 to 10;
 - c) the ability to designate a number with a digit;
 - d) the ability to count within 100.
- 2. The concept of a number as a member of a natural sequence begins to form in younger schoolchildren in the process of studying:
 - a) addition and subtraction of numbers 1-10;
 - b) the decimal number system and quantities;
 - c) numbers 1-10 and their relationships;

d) fractions.

3. A natural number begins to be understood by younger students as a set of abstract units, which within the set can be combined in different ways, when studying the topic:

- a) "Preparatory period";
- b) "Numbering numbers";
- c) "Addition and subtraction";
- d) "Multiplication and division".

4. To illustrate the decimal number system, it is advisable to use:

- a) a numbering table;
- b) a ruler;
- c) a tape 10, 100, 1,000;
- d) circles on an elastic band.

5. To illustrate the natural series of numbers, it is advisable to use:

- a) bundles of sticks;
- b) strips with circles;
- c) a numbering table;
- d) a tape 10, 100, 1,000.

6. When studying written numeration of numbers 11-20, it is advisable to use:

- a) a ruler;
- b) tape 10, 100, 1000;
- c) circles on an elastic band;
- d) an abacus.

7. Specify the concept that students develop when completing the task "Color the first and third cells with a yellow pencil, the second with a green pencil, and the last with a red pencil. What is the last cell?":

- a) ordinal number;
- b) cardinal number;
- c) natural number;
- d) magnitude.

8. Specify the concepts that are formed in students in the process of establishing a one-to-one correspondence between sets of objects:

- a) more, less, the same;
- b) ordinal and cardinal number;
- c) rule and axiom of counting;
- d) magnitude.

9. Select the concept that students develop in the process of counting objects:

- a) ordinal number;
- b) cardinal number;
- c) natural number;
- d) magnitude.

10. Determine the role that familiarization with the meter plays in the acquisition of numbering by primary school students:

- a) consolidation of knowledge of the principle of constructing the decimal number system;
- b) development of measurement skills;

- c) consolidation of knowledge of the place value composition of numbers;
- d) connection of learning with life.

11. Establish a sequence of tasks offered to students in order to consolidate the place value composition of a number:

- a) write down the numbers 21,34,46 as the sum of tens and units;
- b) write down all two-digit numbers that have 2 tens, increase (decrease) each of them by 1;
- c) how many tens and units are in the numbers 23, 27,29;
- d) write down the numbers that have 8 tens and 7 units, 5 tens and 2 units.

12. The concepts of single-digit and double-digit numbers are introduced in the topic:

- a) "Numbers 1-10";
- b) "Numbers 11-20";
- c) "Numbers 21-100";
- d) "Numbers 1-1,000".

13. The concept of ten as a new unit of counting is introduced in the topic:

- a) "Numbers 1-10";
- b) "Numbers 11-20";
- c) "Numbers 21-100";
- d) "Numbers 1-1,000".

14. The concept of rank is introduced in the topic:

- a) "Numbers 1-10";
- b) "Numbers 1-100";
- c) "Numbers 1-1,000";
- d) "Numbers 1-1,000,000".

15. Select the unit of length measurement that is entered in the topic "Numbers 11-20":

- a) mm;
- b) cm;
- c) dm;
- d) m.

16 What is the total number of units in the number 234,520:

- a) 0;
- b) 23,452;
- c) 234,520;
- d) 520.

17. Name how many units of thousands are in the number 234, 520:

- a) 4;
- b) 234;
- c) 2;
- d) 23.

Section 3. In traditional form:

- 1. List the properties of a full-fledged computational skill.
- 2. Highlight the methodological stages of studying the specific meaning of the arithmetic operation of addition, indicate the purpose of each of them, describe the content of the work.

3. Perform a logical analysis of the computational technique: $+ 5, 6, 7, 8, 9$. Based on the completed analysis of this VP, build a model of the preparatory stage for its introduction.
4. Provide the student's reasoning at different stages of the stage of consolidating knowledge of the computational technique and forming the computational skill for the case of 21×3 .
5. Compose control tasks to check the formation of computational skills of tabular addition and subtraction with the transition through ten, indicate the purpose of each task.

In the test form:

1. Specify the sequence of stages in the study of arithmetic operations:
 - a) the stage of studying computational techniques and the formation of computational skills;
 - b) the stage of studying the specific meaning of arithmetic operations;
 - c) the stage of studying the properties of arithmetic operations.
2. Choose the correct answer. The specific meaning of the arithmetic operation of addition is revealed on the basis of:
 - a) removing the correct part of a set from it;
 - b) dividing a set into equal-sized subsets;
 - c) joining non-empty intersecting sets;
 - d) joining non-empty disjoint sets.
3. To form knowledge of the specific meaning of any arithmetic operation, it is necessary to consider situations of varying difficulty. Arrange the consideration of situations in the correct sequence:
 - a) situations where the execution of operations is not explicitly expressed;
 - b) situations where operations are expressed indirectly;
 - c) situations where the execution of a particular operation is indicated.
4. Choose the most accurate definition. A computational technique is:
 - a) a series of sequential operations performed when finding the result of a required arithmetic operation;
 - b) a system of operations determined by the theoretical basis of the technique and performed when finding the value of a mathematical expression;
 - c) a system of operations determined by the theoretical basis of a computational technique.
5. Establish the order of introducing computational techniques in the topic "Numbers 1-10. Addition and subtraction":
 - a) $a + 2, 3, 4$;
 - b) $6-a, 7-a, 8-a, 9-a, 10-a$;
 - c) $a+1, a-1$; d) $a+5, 6, 7, 8, 9$;
 - d) $a+0, a-0$.
6. Select the verbal formulation of the commutative property of addition, which takes place in the elementary course of mathematics:
 - a) the sum does not change when the order of the terms is changed;
 - b) the sum does not change when the order of the terms is changed;
 - c) the sum does not change when the order of the terms is rearranged.
7. Specify the theoretical basis for the computational technique of the type $1+8$:
 - a) the specific meaning of the arithmetic operation of addition;
 - b) the commutative property of addition;
 - c) numeral knowledge.

8. Select the complete student reasoning that should be performed when finding the value of the expression $7 + 5$:

- a) 7 is the sum of 5 and 2. Add 5 to 5, you get 10. Add 2 to 10, you get 12.
- b) First I add 3 to 7, to get 10. So 5 is 3 and 2. Add 3 to 7, you get 10. Add 2 to 10, you get 12.
- c) I replace 5 with the sum of 3 and 2. I get an example: add 3 and 2 to 7. It is more convenient to add 3 to 7, you get 10. Add 2 to 10, you get 12.

9.. Identify which of the listed properties characterize a full-fledged computational skill of non-tabular addition:

- a) correctness;
- b) awareness;
- c) high level of automaticity;
- d) strength;
- e) a certain level of automaticity; e) rationality.

10. Select the knowledge, skills and abilities from those listed below that need to be updated at the stage of preparation for the introduction of the computational technique of type 51: 17:

-) knowledge of the specific meaning of the arithmetic operation of division;
- b) knowledge of the relationship between the components and the result of the arithmetic operation of multiplication;
- c) knowledge of the relationship between the components and the result of the arithmetic operation of division;
- d) computational skill of non-table multiplication.

Section 4. In traditional form:

1. Specify the type of simple arithmetic problem, the theoretical basis for choosing an arithmetic operation, and provide the student's full reasoning in the process of solving it. Select tasks for the preparatory stage for introducing problems of this type.
2. Specify the type of compound arithmetic problem, provide the student's full reasoning in the process of solving it. Select tasks for the stage of consolidating problems of this type.

In the test form:

1. An arithmetic problem is one of the types of tasks in which:
 - a) there is a condition, a requirement, but there is no indication of the AO that must be carried out on the numbers given in the condition in order to fulfill the requirement;
 - b) there is a condition, a requirement, and an indication of the AO that must be carried out on the numbers given in the condition in order to fulfill the requirement;
 - c) there are numerical data, a requirement, and a plan for its implementation is given;
 - d) there are numerical data and a plan for its implementation is given.
2. Arithmetic problems are divided into simple and complex depending on:
 - a) the theoretical basis for choosing an arithmetic operation;
 - b) the number of AO;
 - c) the solution method;
 - d) the structure of the problem.
3. Determine the structure of the following arithmetic problem: "How many planes took off from the airfield if first 6 planes took off, and then 4 planes?":
 - a) standard structure;

- b) combined;
- c) non-standard structure;
- d) inverse.

4. Determine the structure of the arithmetic problem: "Katya had 5 balloons. How many balloons does she have left if she has already given 2 to Nastya?"

- a) complex structure;
- b) combined structure;
- c) non-standard structure;
- d) standard structure.

5. Determine the structure of the following arithmetic problem: "Kolya had 5 stamps, and Sasha had 3 stamps. How many stamps do the children have in total?"

- a) standard;
- b) non-standard;
- c) combined;
- d) arbitrary.

6. Which property does not characterize the full ability to solve arithmetic problems:

- a) awareness;
- b) independence;
- c) correctness;
- d) automatism.

7. Specify the types of problem illustrations:

- a) objects, drawings, blueprints, diagrams, short notes;
- b) subject, artistic, schematic;
- c) subject, graphic, artistic;
- d) figurative, subject, schematic.

8.. Methodologists distinguish the following types of analysis of a compound arithmetic problem:

- a) analysis on the merits and graphic;
- b) formal analysis and graphic;
- c) analysis from the question to the numerical data and analysis on the merits;
- d) analysis on the merits and formal analysis.

9. One of the ways to check the correctness of the solution to problems is:

- a) mutual checking;
- b) establishing the correspondence of the obtained result to the conditions of the problem;
- c) checking at the board;
- d) commented solution.

10. Determine which types of activities are appropriate at the stage of consolidating the ability to solve problems of the type under consideration:

- a) solving similar problems;
- b) comparing problems and their solutions;
- c) managing the student's activities;
- d) updating knowledge that is the theoretical basis for choosing an arithmetic operation.

Section 5. In traditional form:

1. Name the geometric concepts that are studied in elementary grades. How are they defined in the school geometry course?
2. Name the techniques that are appropriate to use in elementary grades when studying a right angle, rectangle, square. Describe working with them.
3. Specify the time of introduction of the concept of "expression". Give examples of tasks during which students develop this concept.
4. Is it possible to use the same problem situations when studying area as when studying length? Justify your answer.
5. Provide a student's full reasoning when solving a combinatorial problem.

In the test form:

1. Choose the correct answer. The topic "Point. Lines: curve, straight, segment, broken line" is considered in the concen
 - a) "Numbers from 1 to 10";
 - b) "Numbers from 21 to 100";
 - c) "Numbers from 11 to 20";
 - d) "Multi-digit numbers".
- : 2. Choose the correct answer. The study of the topic "Polygons" (angles, vertices, sides of a polygon) is considered in concentration:
 - a) "Numbers from 1 to 10";
 - b) "Numbers from 1 to 100";
 - c) "Numbers from 1 to 1000";
 - d) "Numbers from 1 to 1,000,000".
3. Specify the order of studying the questions:
 - a) Ray. Angle. Types of angles: right, acute, obtuse.
 - b) Types of triangles: right-angled, acute-angled, obtuse-angled.
 - c) Right and non-right angles.
 - d) Types of triangles: scalene, isosceles (equilateral).
4. Select: in which class the topic "Circle. Circumference. Center, radius, diameter of the circumference (circle)" is considered:
 - a) 1st grade;
 - b) 2nd grade;
 - c) 3rd grade;
 - d) 4th grade.
5. Choose the correct answer. Which of the listed angles is not considered in the basic course of mathematics:
 - a) right;
 - b) straight;
 - c) acute;
 -) obtuse
6. Indicate which concept is not studied in the basic course of mathematics:
 - a) equality and inequality;
 - b) mathematical expression;
 - c) equation;
 - d) variable.

7. Establish the sequence of possible forms of reading equalities at different stages of studying the topic "Numbers from 1 to 10":
- 4 plus 2 equals 6;
 - 4 increased by 2 equals 6;
 - the sum of the numbers 4 and 2 equals 6.
 - add 2 to 4 equals 6;
8. Establish the sequence of possible forms of reading equalities at different stages of studying the topic "Numbers from 1 to 10":
- 10 minus 2, you get 8;
 - subtract 2 from 10, you get 8;
 - decrease 10 by 2, you get 8;
 - the difference between the numbers 10 and 2 is 8.
9. Indicate which equations are not considered in the introductory course of mathematics:
- $x + 312 = 654 + 79$;
 - $580 : x = 290$;
 - $x + (128 + 542) = 800$;
 - $x \cdot 84 = 200 + 52$.
10. Select the quantities studied in the basic mathematics course:
- acceleration;
 - length;
 - capacity;
 - mass;
 - area;
 - density.

Sample topics for abstracts

Section 1.

- Content and features of the Federal State Educational Standard of Primary General Education.
- Methods of forming universal educational actions (UUD) in mathematics lessons.
- Modern educational technologies used in mathematics lessons in primary school.
- Excursions in the process of studying mathematics in primary grades.
- Requirements for a modern mathematics lesson in primary school.
- Features of the final check and assessment of the achievement of subject results by primary school students.
- Project activities of primary school students in the study of mathematics.

Section 2.

- Didactic games in the process of studying the numbering of numbers.
- Using historical information in the process of studying the numbering of numbers.
- Features of studying the numbering of numbers in developmental learning systems.

Section 3.

- Didactic games in the process of learning arithmetic operations.
- Implementation of a differentiated approach in the process of learning arithmetic operations by primary school students.
- Formation of universal educational actions in primary school students in the process of learning arithmetic operations.
- Typical mistakes of students when performing arithmetic operations in various concentrations.
- Alternative methods of adding and subtracting numbers.

Section 4.

1. Functions of arithmetic problems in the process of teaching mathematics to primary school students.
2. Using different types of models in the process of developing primary school students' ability to solve arithmetic problems.
3. Typical mistakes and difficulties of primary school students when solving compound problems, ways to overcome them.
4. Non-standard problems for primary school students and ways to solve them.

Section 5.

1. Formation of universal learning activities in primary school students in the process of studying quantities.
2. Implementation of an integrated approach in the process of studying quantities by primary school students.
3. Methodology for forming ideas about mass in primary school students.
4. Features of forming ideas about capacity in primary school students.
5. Features of forming ideas about area and units of its measurement in primary school students.
6. Features of forming time ideas in primary school students.
7. Features of forming ideas about the length of objects and segments in primary school students.
8. Features of forming ideas about speed in primary school students.
9. Historical information in the process of studying quantities.
10. Project activities of primary school students in the process of studying quantities.
11. Using problem tasks in the process of studying quantities (using a specific quantity as an example).
12. Excursions in the process of studying quantities.

Interim assessment of students is carried out in the form of a test with a grade and an exam using the following assessment materials: a list of questions for the test, a list of questions for the exam.

Questions for the test (3rd semester, full-time education)

1. Methodological system of teaching mathematics to primary school students.
2. Principles of improving the methodological system of teaching mathematics to primary school students.
3. Methods of teaching mathematics to primary school students as a science.
4. Objectives of teaching mathematics to primary school students.
5. Construction of the initial course of mathematics.
6. Contents of the initial course of mathematics, planning of educational material.
7. Methods of primary teaching mathematics.
8. Means of primary teaching mathematics.
9. Types of mathematics lessons, their features and structure.
10. Extracurricular activities in mathematics, their types and features of organization.
11. Checking and assessing the achievement of planned results in mathematics by primary school students.
12. Features of the final assessment of the achievement of planned results in mathematics by primary school students (give examples of tasks for the final assessment of the achievement of planned results in mathematics).
13. Formation of universal learning activities in primary school students in the process of teaching mathematics.
14. Formation of the concept of natural number in primary school students.

15. General issues of studying numeration in elementary grades (distribution of material by years of study, the concept of oral and written numeration, the main issues of numeration considered in each concentration).
16. Psychological and didactic conditions for studying numeration.
17. Features of teaching first-graders mathematics in the preparatory period.
18. Methodology for studying the numeration of numbers in the topic "Numbers from 1 to 10": time, order, tasks of studying the topic, equipment of the educational process. Results of assimilation of the numeration of numbers at this stage (compile a final test "at the exit" indicating the purpose of each task).
19. Methodology for studying the formation of numbers 1-10, their designation by printed and written digits.
20. Methodology for studying the formation of numerical sequences and comparison of numbers 1-10, familiarization with the number and digit 0.
21. Methodology for studying the numbering of numbers in 11-20: reasons for isolating it into a separate concentration, time, order, objectives for studying the topic, equipment for the educational process. Results of mastering the numbering of numbers at this stage (compile a test work "at the exit" indicating the purpose of each task).
22. Methodology for studying the oral numbering of numbers 11-20.
23. Methodology for studying the written numbering of numbers 11-20.
24. Methodology for studying the numbering of numbers 21-100: time, order, objectives for studying the topic, equipment for the educational process. Results of mastering the numbering of numbers at this stage (compile a final test work "at the exit" indicating the purpose of each task).
25. Methodology for studying the numbering of numbers 21-100.
26. Methodology for studying the numbering of numbers in the topic "Numbers from 1 to 1000": time, order, objectives for studying the topic, equipment for the educational process. Results of mastering the numbering of numbers at this stage (compile a final test "at the exit" indicating the purpose of each task).
27. Methodology for studying the oral numbering of numbers 1-1000.
28. Methodology for studying the written numbering of numbers 1-1000.
29. Methodology for studying the numbering of numbers in the topic "Numbers greater than 1000": time, order, objectives for studying the topic. Basic concepts of numbering formed in this topic. Equipment for the educational process. Results of mastering the numbering of numbers at this stage.
30. Methodology for studying the formation of numbers 1-1000000, forming the ability to read and write them.
31. Methods for studying ordinal and quantitative relationships between numbers 1-1000000, developing computational skills based on numerical knowledge, and the ability to determine the total number of units of each rank in a number.

Questions for the test (4rd semester, full-time education)

1. The concepts of "computational technique" and "computational skill".
2. Stages of disclosure of the specific meaning of arithmetic operations (KS AO).
3. Features of studying addition and subtraction in the topic "Numbers from 1 to 10".
4. Features of addition and subtraction of numbers within 20.
5. Oral VP of addition and subtraction in the topic "Numbers from 1 to 100".
6. Written VP of addition and subtraction in the topic "Numbers from 1 to 100".
7. Methodology for developing skills of table multiplication and division.
8. Methodology for developing extra-tabular addition skills in primary school students.
9. Methodology for studying the topic "Division with remainder".
10. Features of addition and subtraction of numbers in the topic "Numbers from 1 to 1000".
11. Features of studying multiplication and division in the topic "Numbers from 1 to 1000".
12. Methods of studying addition and subtraction of numbers in the topic "Numbers that are greater than 1000".

13. Methods of studying multiplication and division in the topic "Numbers that are greater than 1000".
14. Formation of universal learning activities in primary school students in the process of studying arithmetic operations.
15. Typical mistakes of students when performing arithmetic operations in various concentrations.

Practical task: Perform a logical analysis of one of the computational techniques studied in mathematics.

Exam Questions
(5th semester, full-time education)
Section 4.

1. Arithmetic problems in the basic course of mathematics: concept, structure, functions, classification.
2. Analysis of the process of solving simple arithmetic problems.
3. Analysis of the process of solving compound arithmetic problems.
4. The quality of a full-fledged ability to solve arithmetic problems.
5. Stages in the formation of the ability to solve arithmetic problems and the content of work on each of them.
6. Methodology for working on a separate problem: types of illustrations; types of analysis used in finding its solution.
7. Methodology for working on a separate problem: forms of recording the solution of an arithmetic problem; methods for checking the correctness of the solution.
8. Methodology for developing the ability to solve simple arithmetic problems to find the sum, remainder.
9. Methodology for developing the ability to solve simple arithmetic problems to find unknown addends, minuends and subtrahends.
10. Methods of developing the ability to solve simple arithmetic problems on increasing (decreasing) a number by several units (direct and indirect forms).
11. Methods of developing the ability to solve simple arithmetic problems on difference comparison.
12. Methods of developing the ability to solve simple arithmetic problems on finding the sum of identical terms.
13. Methods of developing the ability to solve simple arithmetic problems on division by content and into equal parts.
14. Methods of developing the ability to solve simple arithmetic problems on increasing (decreasing) a number several times (direct and indirect forms) and multiple comparison.
15. Methods of preparatory work and familiarization with the first compound problems.
16. Methods of developing the ability to solve compound arithmetic problems on finding the fourth proportional.
17. Methods of developing the ability to solve compound arithmetic problems on proportional division.
18. Methods of developing the ability to solve compound arithmetic problems on finding an unknown by two differences.
19. Methods of developing the ability to solve compound arithmetic problems on oncoming movement.
20. Methods of developing the ability to solve compound arithmetic problems on movement in opposite directions.

Section 5.

1. Methods of studying geometric material in elementary grades (general questions)
2. Methods of studying a point, a straight and curved line, a straight segment.
3. Methods of studying polygons, angles, a circle.
4. Methods of studying a broken line, the length of a broken line, the perimeter of a polygon.
5. Methods of studying numerical expressions in the basic course of mathematics.
6. Methods of studying letter expressions in the basic course of mathematics.

7. Methods of studying the rules of the order of performing arithmetic operations in complex expressions, identical transformations of expressions.
8. Methods of studying numerical equalities and inequalities in elementary grades.
9. Methods of studying equations in elementary grades.
10. Methods of developing the ability of younger students to solve simple arithmetic problems by composing an equation.
11. Methods of studying quantities in elementary grades (general questions).
12. Methods of studying length in elementary grades.
13. Methods of studying area in elementary grades.
4. Methods of studying mass in elementary grades.
15. Methods of studying capacity in elementary grades. 16. Methods of studying time in elementary grades.

Practical tasks: 1. Specify the type of simple arithmetic problem and the theoretical basis for choosing an arithmetic operation, provide the student's complete reasoning in solving it.
2. Specify the type of compound arithmetic problem, provide the student's complete reasoning in solving it.

IV. LIST OF REFERENCES REQUIRED FOR MASTERING THE DISCIPLINE

4.1. Main literature

1. Dolgosheeva E.V. Monitoring and testing knowledge and methodological skills in the process of preparing future teachers to teach mathematics to primary school students: a tutorial / E.V. Dolgosheeva, S.N. Chislova. - Yelets: Yelets State University named after I.A. Bunin, 2021. - 79 p. - URL: https://elsu.ru/uploads/files/2021-11/1637674442_dolgosheeva_chislova
2. Shadrina I.V. Methods of teaching the basic course of mathematics: a textbook and workshop for universities / I.V. Shadrina. - Moscow: Yurait Publishing House, 2024. - 279 p. - (Higher education). - ISBN 978-5-534-08528-0. - Text: electronic // EBS Yurait [site]. – URL: <https://urait.ru/bcode/536695> (date of access: 02.09.2024)

4.2. Additional literature

1. Beloshistaya A.V. Methods of Teaching Mathematics in Primary School: Lecture Course / A.V. Beloshistaya. - Moscow: Vldos, 2016. - 456 p. - (Higher education). - Bibliography in the book. - ISBN 5-691-01422-6 ; Ditto [Electronic resource]. - URL: <http://biblioclub.ru/index.php?page=book&id=116490>
2. Boykina, M.V. Monitoring and Evaluation of Learning Outcomes in Primary School: Methodological Recommendations / M.V. Boykina, Yu.I. Glagoleva. - St. Petersburg: KARO, 2016. - 128 p. : ill. - ISBN 978-5-9925-1120-8 ; Ditto [Electronic resource]. – URL: <http://biblioclub.ru/index.php?page=book&id=461765>
3. Faustova N. P. Organization of independent work of students studying according to an individual plan, when studying the course "Methodology of teaching mathematics in elementary grades": a teaching aid / N. P. Faustova, E. V. Dolgosheeva, S. N. Chislova; Ministry of Education and Science of the Russian Federation, Federal Agency for Education, State Educational Institution of Higher Professional Education "Yelets State University named after I. A. Bunin". - Yelets: ESU named after I. A. Bunin, 2012. - 255 p. - Bibliography: pp. 227-231. ; Ditto [Electronic resource]. - URL: <http://biblioclub.ru/index.php?page=book&id=272348>
4. Fugelova T.A. Educational programs of primary school: textbook and practical training for universities / T.A. Fugelova. - 2nd ed., Stereotype. - Moscow: Yurait Publishing House, 2020. - 465 p. - (Higher education). - ISBN 978-5-534-11269-6. - Text: electronic // EBS Yurait [site]. - URL: <http://biblioclub.ru/bcode/456905>

V. LIST OF RESOURCES OF THE INFORMATION AND TELECOMMUNICATION NETWORK "INTERNET" REQUIRED FOR MASTERING THE DISCIPLINE

№	Link to information resource	Name of the development in electronic form	Availability
1.	https://infourok.ru/	Infourok: educational internet project of Russia. Includes: lesson plans, presentations, tests, video lessons and other materials on school curriculum subjects.	Free access
2.	http://edu.ru/	Russian Education: Federal Portal. Includes links to portals and websites of educational institutions; state educational standards; regulatory documents; catalog of excursions and educational programs.	Free access
3.	http://window.edu.ru/	The information system "Single Window of Access to Educational Resources" provides free access to the catalog of educational Internet resources and a full-text electronic educational and methodological library for general and professional education	Free access
4.	http://fcior.edu.ru/	The Federal Center for Information and Educational Resources (FCIER) provides access to electronic educational resources and services for all levels and stages of education.	Free access

VI. MODERN PROFESSIONAL DATABASES AND INFORMATION REFERENCE SYSTEMS

1.	http://www.biblioclub.ru	Electronic library system (ELS) University library online	Registration via a university computer. Further individual unlimited access from any point where there is access to the Internet
2.	www.garant.ru	Information and legal portal	Free access
3.	http://fgosvo.ru/	Portal of Federal State Educational Institutions of Higher Education	Free access
4.	www.elibrary.ru	Russian information portal in the field of science, technology, medicine and education	Free access
5.	https://fgos.ru/	Federal State educational standards (for all levels of education)	Free access

VII. LICENSED AND FREELY DISTRIBUTED SOFTWARE

The following licensed and freely distributed software is used in the implementation of the academic discipline:

- Microsoft Windows;
- Microsoft Office;
- LibreOffice and others.

VIII. EQUIPMENT AND TECHNICAL TEACHING EQUIPMENT REQUIRED FOR THE IMPLEMENTATION OF THE EDUCATIONAL PROCESS IN THE DISCIPLINE

Training sessions are held in classrooms equipped with specialized furniture, including stationary or portable technical training equipment (projector, screen, computer/laptop).

Independent work is carried out in classrooms equipped with computer equipment with the ability to connect to the Internet and provide access to the electronic information and educational environment of the university.