

Mathematics Educational Area

Mathematics

Year 3-4

4* or 5 hours per week, 140 or 175 hours per year
(* one hour is added to the study of the integrated subject
"I explore the world")

Proposed content

1. "Numbers. Calculation. Operations with numbers" content line

Natural multi-digit numbers. The formation of multi-digit numbers (principles of bitwise and positioning approaches). Reading and writing multi-digit numbers within a million. The positional value of digits in a multi-digit number form. The presentation of multi-digit numbers as a sum of bit parts.

Determining the total number of units, tens, hundreds, units of thousands, tens of thousands, hundreds of thousands in a multi-digit number. Comparison of multi-digit numbers. Numerical sequences.

Counting units – a thousand, ten thousand, one hundred thousand. Counting in thousands, tens of thousands, hundreds of thousands within a million. Counting in forward and reverse order within a million, counting within a numerical interval (from any number to a specified one) in forward and reverse order. Essential, general and distinctive features of objects.

Comparison, arrangement, generalization and classification of objects based on an essential feature.

Arithmetic operations of addition and subtraction of multi-digit numbers. Interconnection between the arithmetic operations of addition and subtraction. Dependence of the results of arithmetic operations of addition and subtraction on the change of one of the components. Techniques of performing arithmetic operations of addition and subtraction. The laws of addition and the properties of subtraction.

Multiplication and division of multi-digit number by a uni-digit and a multi-digit number. Interconnection between the arithmetic operations of multiplication and division.

Dependence of the results of arithmetic operations of multiplication and division on the change of one of the components. Techniques of performing arithmetic operations of multiplication and division. Division with remainder. The property of a remainder.

Laws of multiplication (commutative, associative, distributive) and properties of division. Properties of multiplication and division by 1, 10, 100; multiplication by 0, zero by number; division of zero by number, division of a number by an equal number.

Differential and multiple comparison.

Numeric and alphabetic expressions, equalities and inequalities. The calculation of numerical expressions containing several arithmetic operations of different degrees without brackets and with brackets.

Calculation of expressions with a variable(s) with its (their) given numerical value.

	<p>Solving one-variable equations in which one component or the right side of the equation is a numeric expression.</p> <p>Standard fractions. Formation of a standard fraction. Reading and writing fractions.</p> <p>The numerator and denominator of a fraction. Comparison and ordering of fractions with the same denominators. Finding a fraction of a number. Finding a number based on the value of its fraction.</p> <p>Life situations that are solved mathematically, texts of mathematical content, story problems, their solutions in different ways based on simple mathematical models. Checking the correctness of the solution of a problematic situation in different ways. Errors in calculations and ways to resolve errors.</p>
<p>2.</p>	<p>"Measurement of values" content line</p> <p>Measurement of values (length, mass, temperature, time, capacity (volume), cost, speed, area) with the help of improvised tools and measuring instruments. Units of measurement of values and the correlation between them.</p> <p>Length. Length units. Correlation between the units of length measurement.</p> <p>Capacity (volume). Unit of capacity (volume) measurement. The correlation between the units of measurement of capacity (volume).</p> <p>Mass. Mass measurement units. Correlation between the units of mass measurement.</p> <p>Area. Units of area measurement. Correlation between the units of area measurement.</p> <p>Time. The main units of time measurement and correlation between them. Electronic and mechanical watches. Time detection with a clock in the 12-hour and the 24-hour systems. Determination of time to the minute. The use of a clock and calendar to track and plan one's life's events.</p> <p>Money. Operations with money. Units of value. The calculation of the cost, the concept of the small change, how much is lacking, the change of money to smaller money, currency exchange etc. (financial tasks).</p> <p>The velocity of a body in a linear even motion. Units of speed. The relationship between the velocity of a body, the time and the path traveled during even linear motion and the formula for their calculation. Practically oriented problems about oncoming movement, movement in opposite directions and movement in the same direction.</p> <p>Concrete numbers. Transition from one measurement unit to another. Comparison, addition, and subtraction of concrete numbers. Multiplication and division of concrete numbers by a uni-digit number.</p> <p>The solution of direct and inverse problems of various types that arise from everyday life situations, containing groups of related quantities (proportional relation, proportional division, finding the unknown based on two differences, mutual work etc.).</p>
<p>3.</p>	<p>"Spatial relationships. Geometrical figures" content line</p> <p>Description and compilation of routes for travel that are associated with the direction and rotation.</p> <p>Calculating the perimeter of a polygon and the area of a rectangle in different (known) ways.</p> <p>The use of definitions perimeter and square of a rectangle and the properties of the opposite sides of a rectangle in solving direct and reverse story problems of practical inclination.</p>

	<p>The construction of planar figures of given dimensions. The elements of a circumference and a circle: center, radius, diameter. Diameter properties. Angle. Types of angles: right, acute, obtuse. Essential features of geometric shapes (triangle, rectangle, polygon, circumference and circle; cube, pyramid, parallelepiped, sphere, cone, cylinder). Classification and comparison of geometric shapes (form, size, area, perimeter, other features, etc.). Creating different designs from geometric shapes.</p>
4.	<p>"Working with data" content line</p> <p>Reading data from tables, charts, diagrams. Use of information provided in various forms to answer questions that go beyond direct reading of the data. Data presentation using tables, charts, bar and pie charts. Research of various ways to solve a problematic situation and the selection of an appropriate one.</p>

Compulsory learning outcomes of applicants for education (recording with the State standard of primary education).

Student:

- recognizes among life situations those that relate to quantitative relations/forms of objects of the world;
- analyzes the problem situations that arise in life; describes the problem life situations in measurements that are interrelated;
- predicts the result of solving the problem situation based on their own experience;
- converts information (heard, seen, read) in various ways into a diagram, table, schematic drawing;
- selects the method (s) of solving the problem situation;
- selects the data necessary and sufficient to solve the problem situation; justifies the choice of actions to solve the problem situation; solves the problem situation in different ways
- uses known means of selecting the necessary data to solve the problem situation;
- explores various ways to solve the problem situation, chooses a rational way to solve it;
- matches the result gained with the predicted result;
- checks the correctness of the problem solution in different ways; identifies and corrects errors;
- defines the essential, general and distinctive features of mathematical objects; compares, generalizes and classifies objects by their essential features;
- defines the number of objects; indicates the result of the count by a number; compares the numbers within a million and puts them in order;
- calculates orally and in writing in various life situations;
- orients on the plane and in space, moves along a certain route; plans routes;
- recognizes familiar geometric shapes in complex shapes;
- creates geometric shapes of different designs; builds a plane shapes at a given size;

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- defines the general property of objects in the outside world and interprets them as a value for measurement and comparison;
- uses the relationship between the components and the result of the arithmetic operation to solve the problem situation; uses letter symbols to write mathematical statements.



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