MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

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Curriculum
developed under O.Ya. Savchenko's guidance

Grade 3
Mathematics

Expected learning outcomes of students	Training Content
Numbers, actions with numbers. Quantities	
Student: *reproduces* a sequence of numbers within a thousand; *reads* and *writes* numbers, forms numbers in different ways; *determines the* discharge composition of the three-digit number; *determines* the total number of hundreds, tens, units; *presents* numbers in the form of the sum of discharging addends; *compares* numbers in different ways; *performs* addition and subtraction, multiplication and division based on numbering; *has the skill* of oral addition and subtraction of round numbers; *calculates verbally in* a way convenient for himself/herself; *has* the skill of adding and subtracting numbers in writing within 1,000; *predicts* the result of addition and subtraction;	Numbering of numbers within a thousand. Addition and subtraction of numbers within 1,000.
checks the correctness of calculations; *understands* the essence of the actions of multiplication and division; *applies* in calculations the constant law of multiplication, the relationship between the actions of multiplication and division; the rules of multiplication and division with the numbers 1 and 0, division of equal numbers, multiplication by 10; *has the skill* of tabular multiplication and division; *has the skill* of off-tabular multiplication and division of numbers within a thousand; *performs* division with the remainder;	Multiplication and division of numbers. Tabular multiplication and division. Special cases of multiplication and division. Off-tab multiplication and division.

understands that the remainder must be less than the divider; *checks* the correct division with the remainder; *applies* rational calculation techniques; *predicts* the result of multiplication and division, *checks the* correctness of calculations; *understands* the essence of multiple comparisons of numbers; *calculates the* result of the multiple comparisons of numbers; *finds* a number that is several times greater (less) than a given number; *applies* the rules for finding unknown components of arithmetic actions in calculations; *understands the method* of forming a part as one of several equal parts of a whole; *understands* the concept of the numerator and denominator of the fraction; *reads* and *writes* parts as a fraction with a numerator *compares* fractions with the numerator 1 using the means of visualization; *applies* in calculations the rule of finding the part of a number and the number by the value of its part *knows* the units of length (centimetre, decimeter, meter); mass (kilogram, centimetre), capacity (litre); time (day, week, hour, minute, second), time intervals (month, year) and the ratio between them; *enjoys the knowledge* of ratios between quantities in educational and practical situations; *measures* and *compares* the values: length, mass, capacity, time, *selects* the appropriate measure for measuring the value; *uses* tools, devices and other means to measure the values; *converts* values expressed in two units of names; *performs* arithmetic operations with named numbers; *determines* groups of interrelated values in educational and practical situations; *understands* that the buying-selling situation is described by three interrelated values: price, quantity, value; *understands* that work is described with the help of three interrelated values: productivity, work time, total production; *applies* the rules of finding one of the quantities by two known others to solve practical problems; *enjoys the knowledge* of the dependence between quantities in educational and practical situations,	Multiple comparison ratio. Increase or decrease the number several times. Finding the unknown multiplication and division component. Parts of the magnitude. The fraction with numerator 1. Comparison of fractions with the numerator 1. Finding the part of a number. Finding a number by the magnitude of its part. Values: length, mass, capacity, time. Actions with quantities. Groups of interrelated quantities. Interrelated quantities that characterize the situation of purchase and sale; work.

predicts the expected result; *compares the* obtained result with the predicted one; *understands* the essence of the perimeter of the polygon; *uses* the formula of calculating the perimeter of a rectangle (square) in educational and practical situations	Dependence of quantities. Polygon perimeter. The perimeter of a rectangle (square).

Expressions of equality, equality, inequality	
Student: *reads and writes* mathematical expressions submitted in text form using mathematical symbols; *sets* the ratio of equality and inequality between numbers and numerical expressions; *distinguishes between* true and false numerical equality and inequality; *finds* the value of a numeric expression and a letter expression with the specified letter value; *applies* the rules of the order of actions when calculating the values of expressions without brackets and with brackets; *understands* the essence of the concepts of 'equation', 'solution of the equation'; *solves the* equation based on the rules of finding an unknown component of arithmetic action and in other ways; *distinguishes between* numerical inequalities and inequalities with variables; *finds* separate solutions to the inequality with a variable in a way that is convenient for himself/herself	Mathematical expressions: numeric and letters. Numerical equality and inequality. Rules for the order of actions in numerical expressions. Equations. Solving the equation. Inequalities with variables. Solutions of inequality with a variable.

Geometric Shapes	
Student: *focuses* on the plane and in space, *moves* along a defined route; plan the route of movement; *correlates* real objects with models and images of geometric figures; *names* elements of geometric shapes; *simulates* geometric shapes; *builds* a rectangle/square; *distinguishes* a circle and a circular disk, *marks* the elements of a circle and a circular disk in the figure (center, radius, diameter); *builds a* circle with a pencil compass	Geometric shapes on the plane and in space.

Mathematical problems and studies	
Student: *solves* simple and composite story problems, problems with geometric content, competently oriented problems; *solves* problems on finding the fourth proportional, on double reduction to one, on joint work; *makes* an expression for a problem with alphabetic data;	Simple and complex story problems. Default tasks. Tasks of geometric content. Competently oriented tasks. Tasks with alphabetic data. Tasks and studies to determine

solves simple problems to determine the duration of the event; *understands* the essence of the process and *composes* inverted tasks for this task; *creates* an auxiliary model of the task in various ways; *selects* the numerical data necessary and sufficient to answer the questions of the task; *plans* the solution/solution of the problem; *creates a* mathematical model of the problem;	the duration of the event, the start and end times. Inverted problems. Problem solving process.
checks the correct solution of the problem: draws up and solves the inverted problem, *solves the* problem in another way, etc.; *draws up* story problems; *performs* elementary studies of mathematical patterns and dependencies with the help of a teacher; *uses* the experience of mathematical activity during the performance of study tasks of a cross-subject nature, work on training projects, in problem situations of everyday life	Educational studies.
Data handling	
Student: *reads* uncomplicated tables, *uses* data from graphs, schematic representations, diagrams; *selects* the data necessary and sufficient to solve the problem situation; *enters* data into tables; *uses* data when solving practically oriented problems	Selection and sorting of data by a certain feature.
Extra topics: Rational ways of off-tabular multiplication and division. Signs of division into 2 and 5. Sign of divisibility by 10. Solving equations in which the right-hand part or one of the components is represented by a numerical expression. Solving equations in which one of the components is represented by an expression with a variable. Solving inequalities with a variable. Compound problems containing an increase or decrease in the number by/in several units are formulated in an indirect form. Complex problems with alphabetic data. Solving complex plot problems using the algebraic method. Non-standard problems. 'Magical Shapes'. Retrieves line charts.	

Grade 4
Mathematics

Expected learning outcomes of students	Training Content
Numbers, actions with numbers. Quantities	
Student: *reproduces* a sequence of numbers within a million; *reads* and *writes* numbers, forms numbers in different ways; *compares* numbers in different ways; *determines the* discharge composition of the multidigit number; *determines the* total number of units of a certain discharge; *presents* numbers in the form of the sum of discharging addends; *performs* addition and subtraction, multiplication and division based on numbering; *has* skills in adding and subtracting single-digit numbers within a million; *predicts* the result of addition and subtraction, checks the correctness of calculations; *has* the skills of written multiplication and division of a multi-digit number into a single-digit number; *possesses* computational skills of written multiplication and division by a two-digit number; *understands* the method of multiplying and dividing by a three-digit number; *performs* division with the remainder; *plans* the sequence of actions in written calculations;	Numbering of the numbers of the first million Addition and subtraction of numbers within a million. Multiplication and division of numbers within a million.
predicts the number of digits in the product, in proportion to the finding of the result; *checks the* correctness of calculations; *understands* the method of obtaining a fraction; *understands* the numerator and denominator of the fraction; *reads and writes* fractions; *distinguishes between* fractions that are equal to 1; *compares* fractions with the same denominators; *applies* the rules for finding a fraction of a number and the value of its fraction when solving practically oriented problems *knows* the units of length (millimetre, centimetre, decimeter, meter, kilometre); mass (gram, kilogram, centner, ton), capacity (litre); time (day, week, hour, minute, second), time intervals (month, year, century) and the ratio between	The concept of 'fraction'. Comparison of fractions. Finding a fraction of a number. Finding a number by the size of its fraction. Values: length, mass, capacity, time.

them;	
enjoys the knowledge of ratios between quantities in educational and practical situations;	Actions with quantities.
measures and *compares* the values: length, mass, capacity, time;	Groups of interrelated quantities.
selects the appropriate measure for measuring the value;	
uses tools, devices and other means to measure the values;	
converts values expressed in two units of names;	The interconnected quantities characterize the movement of the body.
performs arithmetic operations with named numbers;	
determines groups of interrelated values in educational and practical situations;	
enjoys the knowledge of the dependence between values in educational and practical situations;	Dependence between quantities.
understands that the movement of the bodies is described using the three	
interconnected quantities: path, speed and time;	Geometric values: polygon perimeter, shape area.
understands the speed of the moving body as the path it has travelled in a unit of time;	
knows the names and designations of speed units; *uses* formulas to find the speed, travel path, time when solving practically oriented problems *predicts* the expected result;	
compares the obtained result with the predicted one;	
finds the perimeter of the polygon in educational and practical situations;	
finds the length of the side of the square by a known perimeter;	
understands the area as a property of flat figures;	
knows the units of the area;	
determines the area of the figure using a pallet;	
uses the formula of calculating the area of a rectangle (square) in educational and practical situations;	
finds the length of one side of the rectangle by known dimensions, area, and other side	

Expressions of equality, equality, inequality	
Student:	Numerical expressions.
records mathematical statements submitted in text form using mathematical symbols;	Alphabetic expressions. Numerical equations.
sets the ratio of equality and inequality between numbers and numerical expressions;	Numerical inequalities.
finds the value of a numeric expression and a letter expression with the specified letter value;	Equations.
applies the rules of the order of actions when calculating the values of expressions without brackets and with brackets;	
solves an equation with a single rule-based variable finding an unknown component of arithmetic action;	Inequalities with variables.
checks that the resulting numerical value of the variable is the	

solution to the equation; *understands that* inequality with a variable may have one, several, or a multitude of solutions, may not have solutions; *finds* separate solutions to the inequality with a variable in a way that is convenient for himself/herself	
Geometric Shapes	
Student: *focuses* on the plane and in space, *moves* along a defined route; plans the route of movement; *describes* or schematically *depicts* the placement, direction and movement of objects; *recognizes* and *classifies* geometric figures by essential features; *classifies* angles (straight, sharp, blunt); *draws* straight angles using a bevel; *names* the essential features of a rectangle (square); *uses* the property of opposite sides of the rectangle when solving practical problems; *builds* a rectangle (square); *builds* a circle, a circle by a given value of the radius, diameter; *names* elements of geometric shapes in space; *simulates* geometric shapes;	Geometric shapes on a plane. Angle. Types of angles: straight, sharp, blunt. Rectangle. Square, triangle. Circular disk. Circle. Geometric shapes in space: cone, cylinder, pyramid, ball, rectangular parallelepiped (cube).
Mathematical problems and studies	
Student: *solves* simple and composite story problems (including those with fractions), problems with geometric content, competently oriented problems; *solves* problems on finding the fourth proportional in different ways, on double reduction to one, on proportional division, on finding the unknown by two differences, for joint work, for a rectilinear uniform distribution of the two bodies; *solves problems* with alphabetic data; *solves* simple problems for calculating the duration of the event, the date of the event start, the date of event end; *draws up* and *solves* inverted problems; *creates* an auxiliary model of the task in various ways; *selects* the numerical data necessary and sufficient to answer the questions of the task; *plans* the solving/solution of the problem; *creates a* mathematical model of the problem; *checks* the correct solution of the problem; *draws up* simple story problems; *performs* elementary studies of mathematical patterns and dependencies with the help of a teacher;	Simple and complex story problems. Default tasks. Tasks of geometric content. Competently oriented tasks. Tasks with alphabetic data. Tasks and studies to determine the duration of the event, the start and end times. Inverted problems. Problem solving process.

plans uncomplicated educational study; *uses* the experience of mathematical activities during the performance of study tasks of an interdisciplinary nature, work on training projects, in problem situations of everyday life	Educational studies.

Data handling	
Student: *reads* uncomplicated tables, line diagrams; *completes* line diagrams; *compares* and *summarizes the* data contained in the tables in the diagrams; *selects* the data necessary and sufficient to solve the problem situation; *uses* data when solving practically oriented problems	Selecting and organizing data according to a specific feature

Extra topics:

Rational computational techniques.

Oral multiplication and division by 5, 50, 500.

Oral multiplication and division by 25; 250; 2,500. Multiplication by 11; 101; 1,001. Multiplication by 9, 99, 999. Written multiplication by a three-digit number. Written division by a three-digit number.

Equations in which one of the action components is an expression with a variable. Algebraic method of solving plot complex problems. Solving inequalities with a variable.

Addition and subtraction of composite named numbers submitted in time units.

Multiplication and division of the named numbers given in units of length and mass by a two-digit number.

Dependence of speed on the change in distance at constant time; on the change in time at constant distance. Tasks for moving in one direction.

Tasks for the movement of bodies upstream and downstream of the river.

Types of triangles around corners. Types of triangles by sides. Non-standard problems, problems of a logical nature.

Pie Charts