



Essential Standards: Mathematics

Grades: K-12

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Essential Standards Mathematics

Kindergarten

K.CC.3 Write numerals from 0–20. Represent a number of objects with a written numeral 0–20.

K.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.

a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.

K.CC.6 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.

K.G.2 Correctly name shapes regardless of their orientation or overall size

Essential Standards Mathematics

1st Grade

1.NBT.A.1 Count to 120 starting at any number less than 120. In this range, read, and write numerals and represent a number of objects with a written numeral.

1.NBT.B.2 Understand that the two digits of a two–digit number represent amounts of tens and ones. Understand the following as special cases.

10 can be thought of as a bundle of ten ones — called a "ten."

The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.

The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones)

1.NBT.B.3 Compare two two–digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$.

1.NBT.C.4 Add within 100, including adding a two–digit number and a one–digit number, and adding a two–digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two–digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

1.NBT.C.5 Given a two–digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

1.OA.A.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

1.OA.D.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? $6 = 6$, $7 = 8 - 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$.

1.OA.B.3 Apply properties of operations as strategies to add and subtract. Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$. (Associative property of addition.)

1.OA.C.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing

that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).

1.MD.B.3 Tell and write time in hours and half-hours using analog and digital clocks.

Essential Standards Mathematics

2nd Grade

2.NBT.A.1 Understand that the three digits of a three-digit number represents amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones.

2.NBT.A.2 Count within 1000; skip-count by 5s, 10s, and 100s.

2.NBT.B.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

2.NBT.B.7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

2.MD.C.7 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

2.MD.C.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately.

2.OA.A.1 Use addition and subtraction within 100 to solve one– and two–step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Essential Standards Mathematics

3rd Grade

3.NBT.1 Use place value understanding to round whole numbers to the nearest 10 or 100. Students will use place value to round numbers to the nearest 10 and 100.

3.NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties or operations, and/or the relationship between addition and subtraction. Students will be able to add and subtract numbers up to 1000 using a variety of strategies.

3.MD.1 Solve word problems involving addition and subtraction of time intervals in minutes, e.g. by representing the problem on a number line diagram. Students will use a number line to solve elapsed time problems.

3.NF.1 Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into b equal parts: understand a fraction $\frac{a}{b}$ as the quantity formed by a parts of $\frac{1}{b}$. Students will recognize fractions as a part of a whole and tell the difference between a numerator and denominator.

3.OA.3 Use multiplication within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. Students will use a variety of strategies to solve multiplication word problems.

Essential Standards Mathematics

4th Grade

4.NBT.2 Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on the meaning of the digits in each place, using symbols to record the results of comparisons. I can write a number in three different ways,

4.OA.4 Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite. I can find all the factors of a whole number.

4.NBT.6 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. I can answer a division problem.

4.MD.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. I can find the area and perimeter of any given figures.

4.NBT.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. I can multiply a four digit whole number by a one digit number.

4.NF.7 Compare two fractions with different numerators and different denominators by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$. Recognize that comparisons are valid only when the two fractions refer to the same whole. I can compare two fractions with the same or different denominators.

4.NF.6 Use decimal notation for fractions with denominators 10 or 100. I can use decimals to compare numbers.

Essential Standards Mathematics

5th Grade

5. NBT. 5 Fluently multiply multi-digit whole numbers using the standard algorithm.

5.NBT. 6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models

5. NF. 1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

5.MD.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

5.NBT.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Essential Standards Mathematics

6th Grade

6.NS.B.3 Fluently add, subtract, multiply, and divide multi-digit decimals.

6.RP.1 Understand the concept of a ratio and use it to describe a ratio relationship between two quantities ratios.

6.NS.5 Understand and use positive and negative numbers to describe quantities of having opposite directions or values

6.NS.A.1 Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

6.EE.B.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

6.EE.A.1 Write and evaluate numerical expressions involving whole-number exponents.

Essential Standards Mathematics

7th Grade

7.EE.B.4 Students can solve algebraic equations

7.NS.A.1 Students can add and subtract integers

7.RP.A.3 Students can solve real world percentage problems

7.RP.A.1 Students can solve real world ratio problems

7.NS.A.1 Students can add and subtract fractions

Essential Standards Mathematics

8th Grade

8.G.2 I can manipulate a shape on a coordinate grid using translation.

8.F.3 I can graph relationships between two variables (x & y)

8.G.8 I can use the Pythagorean Theorem to find missing measurements in right triangles

8.F.4 Students can recognize and use slope in a real world context

8.F.A Students can recognize and identify when a relationship between input and output is a function

8.EE.B.5 I can compare proportional relationships between two linear relationships

8.EE.C.7.B I can solve multi-step equations

Essential Standards Mathematics

Algebra I

(A-SSE.1.a) Students can write and simplify expressions.

(A-CED.A.1, A-REI.B.3) Students can create and solve equations.

(F-IF.C, F-FB.A, F-IF.B.6, G-GPE.B.5) Students can create, graph, and solve linear equations.

(A-REI.C.6) Students can solve systems of linear equations using graphing, elimination, and substitution methods.

(N-RN.A.1) Students use properties of exponents to simplify expressions

(A-APR.A.1) Students can perform operations on polynomials.

(A-APR.A.1, A-SSE.A.1) Students can factor polynomials.

(A-SSE.A.1, A-CED.A.1, A-CED.A.2, A-REI.B.4) Students can solve quadratic equations using multiple methods.

Essential Standards Mathematics

Geometry

(G-CO.A.1) Students can prove theorems using deductive reasoning.

(G-GPE.B.5) Students can prove lines are parallel and perpendicular.

(G-CO.C.10) Students can use theorems to prove triangles congruent, including Isosceles, equilateral, right, and overlapping triangles with corresponding parts.

(G-CO.C.11) Students can prove theorems regarding triangles.

(G-CO.C.11) Students can prove various types of special quadrilaterals.

(A-CED.A.1) Students can use congruence and similarity criteria for triangles to help solve problems and prove geometric relationships.

(G-SRT.C.8) Students can use trigonometry and the Pythagorean theorem to solve for lengths of sides and degrees of angles in triangles.

(G-CO.A.5) Students can use transformation to rotate, reflect, and translate geometric figures on a coordinate plane.

Essential Standards Mathematics

Algebra II

(A-REI.B) Students can solve equations and inequalities in one variable.

(A-CED.A) Students can graph and write equations of linear functions using given information about the line.

(F-IF.A) Students can identify functional relationships and use proper notation in their representation.

(A-REI.C) Students can solve systems of linear equations both graphically and algebraically.

(F-FB.B) Students can graph quadratics using transformations.

(A-SSE.B) Students can factor algebraic expressions.

(A-REI.B) Students can solve a quadratic equation by multiple methods.

(N-CN.A) Students can simplify expressions containing complex numbers.

(A-REI.A) Students can solve radical equations.

(F-IF.B) Students can graph rational functions, including zeros and asymptotes.

(A-APR.D) Students can add, subtract, multiply and divide rational functions.