

First Grade Mathematics

Description The Appleton Area School District elementary mathematics program provides students opportunities to develop mathematical skills in thinking and applying problem-solving strategies. The framework of the program is based on providing students the knowledge of when and how to apply mathematical concepts and skills as well as an understanding of why the mathematical processes work.

Credits

Prerequisites

Textbooks/Resources

Fuson, Dr. Karen C. *Math Expressions Common Core: Student Activity Book, Volume 1 & 2.* Houghton Mifflin Harcourt, 2013. ISBN# 978-0-547-82472-7.

Required Assessments District-wide, standards-based assessments identified

Board Approved April 1999

Revised August 2008

AASD Mathematics Goals for K-12 Students

- *Become mathematical problem solvers.*
- *Learn to reason mathematically.*
- *Learn to communicate mathematically.*
- *Make mathematical connections.*
- *Develop conceptual understanding of mathematics.*
- *Develop procedural fluency.*
- *Learn to use technology appropriately.*

AASD Mathematics Standards for Students in Grade One

Mathematical Practice Standards

1. Make Sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Mathematics Content Standards

Domain

Cluster

I. Operations and Algebraic Thinking	<ul style="list-style-type: none"> A. Represent and solve problems involving addition and subtraction. B. Understand and apply properties of operations and the relationship between addition and subtraction. C. Add and subtract within 20. D. Work with addition and subtraction equations.
II. Number and Operations in Base Ten	<ul style="list-style-type: none"> A. Extend the counting sequence. B. Understand place value. C. Use place value understanding and properties of operations to add and subtract.
III. Measurement and Data	<ul style="list-style-type: none"> A. Measure lengths indirectly and by iterating length units. B. Tell and write time. C. Represent and interpret data.
IV. Geometry	<ul style="list-style-type: none"> A. Reason with shapes and their attributes.

Essential Learning Objectives	Performance Indicators	Classroom Assessments
1. Develop deep conceptual understanding of mathematics by engaging in age-appropriate mathematical habits.	Performance will be satisfactory when the student: <ol style="list-style-type: none"> makes Sense of problems and perseveres in solving them. reasons abstractly and quantitatively. constructs viable arguments and critiques the reasoning of others. models with mathematics. uses appropriate tools strategically. attends to precision. looks for and makes use of structure. looks for and expresses regularity in repeated reasoning. 	
Objectives are linked to the Mathematical Practice Standards.		
2. Represent and solve problems involving addition and subtraction.	Performance will be satisfactory when the student: <ol style="list-style-type: none"> uses 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. solves word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. 	
Objectives are linked to the following AASD Mathematics Domains: I. Operations and Algebraic Thinking		

Essential Learning Objectives	Performance Indicators	Classroom Assessments
<p>3. Understand and apply properties of operations and the relationship between addition and subtraction.</p>	<p>Performance will be satisfactory when the student:</p> <ul style="list-style-type: none"> a. applies properties of operations as strategies to add and subtract. <i>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.)</i> b. understands subtraction as an unknown-addend problem. <i>For example, subtract $10 - 8$ by finding the number that makes 10 when added to 8.</i> 	
<p>Objectives are linked to the following AASD Mathematics Domains: I. Operations and Algebraic Thinking</p>		
<p>4. Add and subtract within 20.</p>	<p>Performance will be satisfactory when the student:</p> <ul style="list-style-type: none"> a. relates counting to addition and subtraction (e.g., by counting on 2 to add 2). b. adds and subtracts within 20, demonstrating fluency for addition and subtraction within 10. Uses 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 $6 + 6 + 1 = 12 + 1 = 13$). 	
<p>Objectives are linked to the following AASD Mathematics Domains: I. Operations and Algebraic Thinking</p>		

Essential Learning Objectives	Performance Indicators	Classroom Assessments
<p>5. Work with addition and subtraction equations.</p>	<p>Performance will be satisfactory when the student:</p> <ul style="list-style-type: none"> a. understands the meaning of the equal sign, and determines if equations involving addition and subtraction are true or false. <i>For example, which of the following equations are true and which are false? $6 = 6$, $7 = 8 - 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$.</i> b. determines the unknown whole number in an addition or subtraction equation relating three whole numbers. <i>For example, determine the unknown number that makes the equation true in each of the equations $8 + ? = 11$, $5 = \square - 3$, $6 + 6 = \square$.</i> 	
<p>Objectives are linked to the following AASD Mathematics Domains: I. Operations and Algebraic Thinking</p>		
<p>6. Extend the counting sequence.</p>	<p>Performance will be satisfactory when the student:</p> <ul style="list-style-type: none"> a. counts to 120, starting at any number less than 120. In this range, reads and writes numerals and represents a number of objects with a written numeral. 	
<p>Objectives are linked to the following AASD Mathematics Domains: II. Number and Operations in Base Ten</p>		

Essential Learning Objectives	Performance Indicators	Classroom Assessments
<p>7. Understand place value.</p>	<p>Performance will be satisfactory when the student:</p> <ul style="list-style-type: none"> a. understands that the two digits of a two-digit number represent amounts of tens and ones. Understands the following as special cases: <ul style="list-style-type: none"> 1. 10 can be thought of as a bundle of ten ones — called a “ten.” 2. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. 3. 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). b. compares two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$. 	
<p>Objectives are linked to the following AASD Mathematics Domains: II. Number and Operations in Base Ten</p>		

Essential Learning Objectives	Performance Indicators	Classroom Assessments
<p>8. Use place value understanding and properties of operations to add and subtract.</p>	<p>Performance will be satisfactory when the student:</p> <ul style="list-style-type: none"> a. adds 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; relates the strategy to a written method and explains the reasoning used. Understands that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten. b. given a two-digit number, mentally finds 10 more or 10 less than the number, without having to count; explains the reasoning used. c. subtracts multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relates the strategy to a written method and explains the reasoning used. 	
<p>Objectives are linked to the following AASD Mathematics Domains: II. Number and Operations in Base Ten</p>		

Essential Learning Objectives	Performance Indicators	Classroom Assessments
<p>9. Measure lengths indirectly and by iterating length units.</p>	<p>Performance will be satisfactory when the student:</p> <ul style="list-style-type: none"> a. orders three objects by length; compares the lengths of two objects indirectly by using a third object. b. expresses the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understands that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. <i>Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.</i> 	
<p>Objectives are linked to the following AASD Mathematics Domains: III. Measurement and Data</p>		
<p>10. Tell and write time.</p>	<p>Performance will be satisfactory when the student:</p> <ul style="list-style-type: none"> a. tells and writes time in hours and half-hours using analog and digital clocks. 	
<p>Objectives are linked to the following AASD Mathematics Domains: III. Measurement and Data</p>		
<p>11. Represent and interpret data.</p>	<p>Performance will be satisfactory when the student:</p> <ul style="list-style-type: none"> a. organizes, represents, and interprets data with up to three categories; asks and answers questions about the total number of data points, how many in each category, and how many more or less are in one category than in another. 	
<p>Objectives are linked to the following AASD Mathematics Domains: III. Measurement and Data</p>		

Essential Learning Objectives	Performance Indicators	Classroom Assessments
<p>12. Reason with shapes and their attributes.</p>	<p>Performance will be satisfactory when the student:</p> <ul style="list-style-type: none"> a. distinguishes between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size) ; builds and draws shapes to possess defining attributes. b. composes two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and composes new shapes from the composite shape. c. partitions circles and rectangles into two and four equal shares, describes the shares using the words <i>halves</i>, <i>fourths</i>, and <i>quarters</i>, and uses the phrases <i>half of</i>, <i>fourth of</i>, and <i>quarter of</i>. Describes the whole as two of, or four of the shares. Understands for these examples that decomposing into more equal shares creates smaller shares. 	
<p>Objectives are linked to the following AASD Mathematics Domains: IV. Geometry</p>		

Resources and learning activities that address course objectives: