# Second 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# 978-0-547-82473-4.

**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 Two

***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** | A. Represent and solve problems involving addition and subtraction.<br>B. Add and subtract within 20.<br>C. Work with equal groups of objects to gain foundations for multiplication. |
| **II. Number and Operations in Base Ten** | A. Understand place value.<br>B. Use place value understanding and properties of operations to add and subtract. |
| **III. Measurement and Data** | A. Measure and estimate lengths in standard units.<br>B. Relate addition and subtraction to length.<br>C. Work with time and money.<br>D. Represent and interpret data. |
| **IV. Geometry** | 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:**<br>a. makes Sense of problems and perseveres in solving them.<br>b. reasons abstractly and quantitatively.<br>c. constructs viable arguments and critiques the reasoning of others.<br>d. models with mathematics.<br>e. uses appropriate tools strategically.<br>f. attends to precision.<br>g. looks for and makes use of structure.<br>h. 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:**<br>a. uses 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. | |
| **Objectives are linked to the following AASD Mathematics Domains:**<br>I. Operations and Algebraic Thinking | | |
| **3. Add and subtract within 20.** | **Performance will be satisfactory when the student:**<br>a. fluently adds and subtracts within 20 using mental strategies. By end of Grade 2, knows from memory all sums of two one-digit numbers. | |
| **Objectives are linked to the following AASD Mathematics Domains:**<br>I. Operations and Algebraic Thinking | | |

| Essential Learning Objectives | Performance Indicators | Classroom Assessments |
|---|---|---|
| **4. Work with equal groups of objects to gain foundations for multiplication.** | **Performance will be satisfactory when the student:**<br>a. determines whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; writes an equation to express an even number as a sum of two equal addends.<br>b. uses addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; writes an equation to express the total as a sum of equal addends. | |
| **Objectives are linked to the following AASD Mathematics Domains:**<br>I. Operations and Algebraic Thinking | | |
| **5. Understand place value.** | **Performance will be satisfactory when the student:**<br>a. understands that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understands the following as special cases:<br>1. 100 can be thought of as a bundle of ten tens — called a “hundred.”<br>2. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).<br>b. counts within 1000; skip-counts by 5s, 10s, and 100s.<br>c. reads and writes numbers to 1000 using base-ten numerals, number names, and expanded form.<br>d. compares two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons. | |
| **Objectives are linked to the following AASD Mathematics Domains:**<br>II. Number and Operations in Base Ten | | |

| Essential Learning Objectives | Performance Indicators | Classroom Assessments |
|---|---|---|
| **6. Use place value understanding and properties of operations to add and subtract.** | **Performance will be satisfactory when the student:**<br>a. fluently adds and subtracts within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.<br>b. adds up to four two-digit numbers using strategies based on place value and properties of operations.<br>c. adds and subtracts within 1000, 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. Understands 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.<br>d. mentally adds 10 or 100 to a given number 100–900, and mentally subtracts 10 or 100 from a given number 100–900.<br>e. explains why addition and subtraction strategies work, using place value and the properties of operations. | |
| **Objectives are linked to the following AASD Mathematics Domains:**<br>II. Number and Operations in Base Ten | | |

| Essential Learning Objectives | Performance Indicators | Classroom Assessments |
|---|---|---|
| **7. Measure and estimate lengths in standard units.** | **Performance will be satisfactory when the student:**<br>a. measures the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.<br>b. measures the length of an object twice, using length units of different lengths for the two measurements; describes how the two measurements relate to the size of the unit chosen.<br>c. estimates lengths using units of inches, feet, centimeters, and meters.<br>d. measures to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit. | |
| **Objectives are linked to the following AASD Mathematics Domains:**<br>III. Measurement and Data | | |
| **8. Relate addition and subtraction to length.** | **Performance will be satisfactory when the student:**<br>a. uses addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.<br>b. represents whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represents whole-number sums and differences within 100 on a number line diagram. | |
| **Objectives are linked to the following AASD Mathematics Domains:**<br>III. Measurement and Data | | |

| Essential Learning Objectives | Performance Indicators | Classroom Assessments |
|---|---|---|
| **9. Work with time and money.** | **Performance will be satisfactory when the student:**<br>a. tells and writes time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.<br>b. solves word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. *Example: If you have 2 dimes and 3 pennies, how many cents do you have?* | |
| **Objectives are linked to the following AASD Mathematics Domains:**<br>III. Measurement and Data | | |
| **10. Represent and interpret data.** | **Performance will be satisfactory when the student:**<br>a. generates measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Shows the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.<br>b. draws a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solves simple put-together, take-apart, and compares problems using information presented in a bar graph. | |
| **Objectives are linked to the following AASD Mathematics Domains:**<br>III. Measurement and Data | | |

| Essential Learning Objectives | Performance Indicators | Classroom Assessments |
|---|---|---|
| **11. Reason with shapes and their attributes.** | **Performance will be satisfactory when the student:**<br>a. recognizes and draws shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identifies triangles, quadrilaterals, pentagons, hexagons, and cubes.<br>b. partitions a rectangle into rows and columns of same-size squares and counts to find the total number of them.<br>c. partitions circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describes the whole as two halves, three thirds, four fourths. Recognizes that equal shares of identical wholes need not have the same shape. | |
| **Objectives are linked to the following AASD Mathematics Domains:**<br>IV. Geometry | | |

## Resources and learning activities that address course objectives: