



A Parent's Guide to: Your Child's Success in School – Begins at Home

Fifth Grade Mathematics Standards

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There has been a lot of discussion about “academic standards” and student achievement over these past few years. Standards set the target or the end result of teaching and learning for students at each grade level in reading, math, and other subject areas.

The mathematics standards have five different strands – Algebra, Geometry, Measurement, Number Sense, and Statistics and Probability. This comes as a surprise to many parents who are amazed to hear that their elementary child is learning Algebra or Geometry or Statistics – areas of math many parents were not taught until high school. Each of these strands provides instruction on specific skills that can be used to solve problems and gain information. These skills continue to build on each other from basic learning in the elementary years through more complex applications of knowledge in high school.

The following guide presents the “performance descriptors” or expectations for mathematics at the grade level and provides an explanation or example of the skills. Most importantly, this guide has some fun activities for you and your child to do at home. This guide is a start. If you want additional information about how your child is doing and what your child is learning at school, talk to your child's teacher. For other learning at home ideas, visit the South Dakota Parent Resource Network online at <http://www.sdprn.org/> or call toll free at 800-219-6247.

The Mathematics standards for Fifth Grade have five different strands – Algebra, Geometry, Measurement, Number Sense, Statistics and Probability. Each strand could contain several proficiency statements. Each proficiency statement is printed in bold print.

ALGEBRA

Algebra is the language of mathematics and the foundation for mathematical thinking. This begins through the understanding of patterns. Children need to learn about, understand, and use patterns in order to learn reasoning skills.

- **Write and solve number sentences to represent two-step problems using whole numbers.**
 - Can solve two steps word problems. For example, Don can spend one hour researching in the library to write a paper. He spends 25 minutes gathering books and then 31 minutes writing notes. How much time does he have left? Add the time already spent $\{25 + 31 = 56\}$, then subtracting $\{60 - 56 = 4\}$ gives the answer.
- **Identify information and apply it to a given formula.**
 - Can identify how to put information into a formula. For example, the formula for figuring out the area of a rectangle is $A = LW$ (the area is figured by length multiplied by width). If the

rectangle measures 3 cm in length by 5 cm in width, $A = LW$; $A = 3 \times 5$. Answer: area = 15 square cm.

• **Recognize and use associative property with addition and multiplication.**

- Can apply the associative property. For example,
 $(3 \times 2) \times 6 = 3 \times (2 \times 6)$ or $(6 + 4) + 3 = (3 + 4) + 6$
 $6 \times 6 = 3 \times 12$ $10 + 3 = 7 + 6$
 $36 = 36$ $13 = 13$

• **Use a variable to write addition and multiplication expressions.**

- Use a letter to represent the unknown information in a number sentence. For example, Mary has two more marbles than Tom. If Tom has n marbles then Mary has $2 + n$.

• **Write and solve one-step equations.**

- Write and solve an equation using whole numbers. For example, Doris has 10 marbles which is twice the number that John has. How many marbles does John have? X is the unknown. It represents how is 2 times what John has, so 2 times the unknown X equals the number of Dora's marbles. The equation is $2x = 10$. John has 5 marbles.
- Understand that a number sentence stays the same as long as the same operation is applied to both sides.

• **Solve problems using patterns.**

- Determine the operations being repeated in patterns of numbers.
For example, 1, 4, 2, 5, 3, ____, ____. This pattern might be made by adding 3, then subtracting 2.

GEOMETRY

Geometry assists students to understand the physical environment. Children study shapes and the properties of shapes in real and in abstract form allowing them to solve problems from different perspectives.

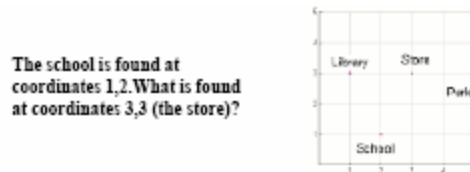
• **Describe two- and three-dimensional figures.**

- Describe and identify squares, rectangles, isosceles triangles (a triangle with two sides the same length), and equilateral triangles (a triangle with three sides the same length), pyramids, rectangular prisms (a rectangular shaped box), and cones.



• **Graph ordered pairs.**

- Locate points that coordinate on a graph with information on the vertical line and information on the horizontal line.



• **Identify a turn (rotation) or flip (reflection) of a given figure.**

- Recognize when a shape has turned to a different position or has rotated and when a shape has turned completely or flipped and is a reflection of the first shape.



- **Classify angles.**

- Determine if an angle is acute (measures less than 90 degrees), obtuse (measures more than 90 degrees), and right (measures exactly 90 degrees).



MEASUREMENT

Measurement skills involve knowing about and using different measurement tools and formulas. Children begin learning about measurement by measuring many different types of objects and comparing the different characteristics of these items (i.e. length, weight, capacity or volume. . .).

- **Use appropriate tools to solve problems involving measurement of length, time, temperature, and weight.**

- Determine which measuring tool should be used to get an accurate measurement. For example, use a ruler to measure a rectangle. What would be used to measure the amount of flour needed for a cake recipe?

- Solve problems using measuring skills. For example, Sam's temperature is 99.8 degrees F. Normal body temperature is about 98.6 degrees F. Sam's temperature is how many degrees above normal body temperature? Answer: 2 degrees

- Know how to determine time. For example, it is currently 3:00 P.M. What time will it be in 2 hours and 15 minutes? Answer: 5:15.

- **Convert U. S. Customary measurement units.**

- Use and convert U.S. measurement units of length (inches, feet, yard, and mile); weight (ounces, pounds, and tons); and capacity (cups, pints, quarts, gallons) from smaller units to larger units or larger units to smaller units. For example, convert inches to feet or quarts to cups or ounces to pounds or tons to pounds, etc.

- **Solve problems involving money including making change.**

- Work story problems dealing with money. For example, Sara paid \$10.00 for a tape that cost \$6.95. The sales tax was 49 cents. How much money should Sara get back in change?

Step 1: $\$6.95 + \$0.49 = \$7.44$

Step 2: $\$10.00 - \$7.44 = \$2.55$

Sara should receive \$2.55 in change.

NUMBER SENSE

Number sense provides the basic tools for solving math problems. Number sense includes simple counting through being able to easily compute mathematical problems. Elementary children should be competent and capable of using number sense skills in all mathematical operations (i.e. addition, subtraction, multiplication, division).

- **Find prime, composite, and factors of numbers from 1 to 50.**

- Know that prime numbers are divisible by only the number one and the number itself. For example, some prime numbers are 1, 2, 3, 5, 7, 11, 13, etc.
- Composite numbers are numbers that can be divided by other numbers besides one and itself.
- A factor is one of two or more numbers that are multiplied together. For example, 5 and 3 are factors of 15.

- **Read, write, order, and compare numbers from .001 to 1,000,000,000.**
 - Determine the value of a number and place numbers in order from lesser value to greater value.
 - Write numbers in decimal forms.
 - Read numbers according to place values.

- **Convert fractions and decimals (tenths, fourths, halves, and hundredths).**
 - Recognize that fractions can be written as decimals ($\frac{1}{2}$ can be written as .5) and decimals can be written as fractions (.1 can be written as $\frac{1}{10}$). To convert a fraction to a decimal, divide the numerator (top number) by the denominator (bottom number) so that $\frac{3}{4}$ becomes 3 divided by 4 which is 0.75.

- **Interpret negative integers on a number line.**
 - Know that negative numbers are equally spaced to the left of zero on a number line.

- **Solve problems using estimation.**
 - Use different strategies to guess the answer of problems involving whole numbers, decimals, and fractions to the nearest whole number. For example, I spent \$4 for a book and \$2.39 for some markers and \$3.49 for a notebook. I spent about \$10 total.

- **Find the quotient of whole numbers using a two-digit divisor.**
 - Divide by a two-digit number. 72 divided by 24 is 3.
 - Understand that division is the reverse operation of multiplication. For example, 45 divided by 9 is 5. 5 times 9 is 45.
 - Find a missing factor by dividing. For example, $7 \times _ = 56$. Since 56 divided by 7 is 8, the missing factor is 8.

- **Determine equivalent fractions.**
 - Reduce fractions to their lowest terms and determine when fractions are equal. For example, is $\frac{3}{4}$ the same as $\frac{25}{100}$? $\frac{25}{100}$ when reduced to its terms is $\frac{1}{4}$ so it is not equal to $\frac{3}{4}$. The fraction that reduces $\frac{3}{4}$ is $\frac{75}{100}$.

- **Multiple and divide decimals.**
 - Understand how to multiply and divide decimals. For example, 4.16 divided by $4 = 1.04$ or $42 \times 0.4 = 16.8$.

- **Determine squares of numbers.**
 - Determine the square of numbers 1 - 12. To square a number is to multiply that number times itself. For example, $6 \times 6 = 36$.

STATISTICS AND PROBABILITY

Statistics is the study of data and probability is the study of outcomes. Children will learn how to collect and study data, but also how to evaluate the usefulness of information.

- **Gather, graph, and interpret data.**

- Develop survey questions about a given topic.
- Graph information on bar graphs, line graphs, pictographs, or line plots.
- Answer question, ask questions, and draw conclusions from information graphed.

- **Calculate and explain mean for a whole number data set.**

- Explain the concept of an average (mean) and to figure the average of several whole numbers. For example, the average of 12, 14, 42, 32, 16, 28 is 24. To figure the average, you must –

Step 1: add all the numbers (in this example, the numbers given total 144).

Step 2: divide that sum by the number of entries (there are 6 numbers in the example). Since 144 divided by 6 is 24, the average is 24.

- **Classify probability as certain, likely, or unlikely.**

- Determine whether an outcome is certain, likely, or unlikely to happen. For example, all the jelly beans in the bag are yellow, so pulling out a yellow jelly bean is certain to happen. There are 30 yellow jelly beans and 1 red jelly bean in the bag, so it is likely that a yellow jelly bean will be pulled out of the bag, or it is unlikely that a red jelly bean will be pulled out of the bag.

FIFTH GRADE MATHEMATICS HOME ACTIVITIES

- Choose coins and hold out in your closed hand and ask questions such as:

- I have four coins in my hand. They're worth 8 cents. What coins do I have? (a nickel and 3 pennies)
- I have four coins in my hand. They're worth 17 cents. What coins do I have? (a dime, a nickel, and 2 pennies)
- I have four coins in my hand. They're worth 12 cents. What coins do I have? (2 nickels and 2 pennies)
- I have four coins in my hand. They're worth 31 cents. What coins do I have? (3 dimes and 1 penny) Ask your child how they know the answers.

- Write the word BOB or KICK on paper using capital letters. Place a small mirror with one straight edge in the middle of the word. The reflection in the mirror is an example of bilateral symmetry. Experiment with other letters such as D, W, X, Y to find the lines of symmetry. Experiment with the capital letters to find the ones, such as N, S, & Z, which appear the same when rotated one-half of a complete turn.

- Weigh several members of the family and convert their weight into ounces.

- When you eat out help your child determine a tip. What would 15% or 20% be? If you are shopping for clothes, how much does 20% off a purchase mean?

- What is the price paid for a gallon of milk? Use a pattern to show how much 6 gallons would cost.

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- Predict how many times a coin will come up heads out of 20 tosses. Keep track of your tosses and discuss the outcome. What happens if you toss it 20 more times?

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