A Parent's Guide to:

Fourth Grade Mathematics Standards

Your Child's Success in School – Begins at Home

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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 www.sdprn.org or call toll free at 800-219-6247.

The Mathematics standards for Fourth 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.

By the end of Fourth Grade children –

• Use the commutative property of addition and multiplication.
This means children. . .
– Know and use numbers forward and backward in addition and multiplication problems – this is called the commutative property. For example, 3 x 4 = 12 is the same as 4 x 3 = 12, and 3 + 4 = 7 is the same as 4 + 3 = 7.

• Identify and complete patterns and describe the associated rule.
This means children. . .
– Understand and determine how the pattern might be made. For example, “Here is a pattern: 2, 4, 6, 8, __. The pattern might be to add 2 each time OR Here is another pattern: 1, 3, 7, 13, ___. This pattern might be to add by 2 **more** each time (add 2, then add 4, then add 6, then add 8, etc.)”

• Write and solve number sentences using whole numbers.
This means children. . .
– Understand how to write out the problem. For example, twenty-one bike safety booklets have been put into three equal groups. How many booklets are in each group? (21 divided by 3 = 7)

• Simplify a two-step equation using whole numbers.
This means children. . .
– Understand how to write out a number problem that needs 2 steps to solve. For example, 6 + n = 15 + 8.
Step 1: subtract 6 from both sides of the equation leaving n = 15 + 8 – 6.
Step 2: complete the right hand of the equation. 15 +8 = 24; 24 – 6 = 17 so n = 17.

• Show relationships between all operations.
This means children. . .
– Know and understand the relationship between addition and subtraction such as 6 + 4 = 10 and 10 – n = 6 (n = 4) and the relationship between multiplication and division such as 2 x 6 = 12 and 12 divided by 2 = n (n = 6).

• Simplify whole number expressions in all operations.
This means children. . .
– Understand how to work through the different math operations to solve the problem. For example, 3 x 2 (2x5).
Step 1: first perform the operation inside the parenthesis so 3 x 2 (10).
Step 2: 2 (10) = 20
Step 3: final problem is 3 x 20 = 60

• Select appropriate relational symbols to make number sentences true.
This means children. . .
– Choose between < (is less than) or > (is greater than) or = (is the same) to make the number sentence true. For example, 10 + 20 ___ 80 – 30. 30 __ 50 The right symbol is the < or less than symbol. 30 < 50.

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.

By the end of Fourth Grade children –

• Identify and compare two- and three-dimensional figures, lines, and angles.

This means children. . .
– Recognize parallel lines, intersecting lines, and lines that are perpendicular (intersect to form right angles).

• Identify slide (translation).
This means children. . .
– Can explain how a shape has moved over from one position to another. For example, “Was the shape shifted vertically or horizontally? How far was it shifted?”

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. . .).

By the end of Fourth Grade children –

• Measure temperature, capacity, length, and weight.
This means children. . .
– Know that length is measured in inches, feet, yards, miles; temperature by degrees; capacity with cups, pints, quarts, gallons, and weight in ounces, pounds, tons.
– Select and use the right unit for a given item to be measured. For example, use a ruler to find the length of a line drawn on a piece of paper but use a tape measure or yardstick to measure the size of a front sidewalk and miles to measure the distance to Grandmas house in the next town. The weight of a car would be in tons, not pounds.
– Measure length to the nearest quarter inch. For example, the kitchen table is 48¼ inches long.

• Solve problems involving money.
This means children. . .
– Write money using the proper signs such as $4.50.
– Solve a problem dealing with money and change from smaller units to larger units such as quarters to dollars or dimes and nickels to quarters. For example, Roberta had six quarters, three dimes, and fourteen pennies. How much money did she have in all? $1.94.

• Identify equivalent periods of time.
This means children. . .
– Change smaller units of time such as days into larger units of time such as weeks, months, or years.
For example, 365 days = 1 year, 7 days = 1 week, 52 weeks = 1 year, 12 months = 1 year, 60 minutes = 1 hour, or how many months are in 3 years?
– Measure time using fractions of ½ and ¼. For example, ½ of a year = 6 months or ¼ of a year = 3 months, ½ of an hour = 30 minutes, ¼ of an hour = 15 minutes.

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).

By the end of Fourth Grade children –

• Find multiples through 12.
This means children. . .
– Know the multiplication tables through twelve. For example, they are able to count in skips by the twos through twelves such as 10, 20, 30, 40, etc. or 4, 8, 16, 20, 24, etc.

• Read, write, order, and compare numbers from .01 to 1,000,000.
This means children. . .
– Read and write word names and use the correct symbols in writing number such as 312,000 < 425,000; 534,000 > 321,000; 1 >.5.
– Use place value terms from hundredths to millions correctly. For example, “The number 1095.9 is read one thousand ninety five and nine-tenths.”

• Compare fractions and mixed numbers using a number line.
This means children. . .
– Put fractions and mixed numbers into order from largest to smallest or smallest to largest. For example, ¼, ½, ¾, 1.
– Identify proper fractions, improper fractions, and mixed numbers. A proper fraction is ½ or ¼, an improper fraction is a fraction where the numerator (top number) of the fraction is larger than denominator (the bottom number) like 5/4 or 6/2, and a mixed number is a whole number and a fraction added together 2 ½ or 5 ¼.

• Interpret negative integers in temperature.
This means children. . .
– Recognize negative numbers of temperature as below zero such as -12º is 12 degrees below zero.

• Add and subtract decimals with the same number of decimal places.
This means children. . .
– Add and subtract numbers with the same number of decimal places. For example, 2.56 + 3.12 = 5.68 or 3.76 – 2.51 = 1.25.

• Find the products of two-digit factors and quotient of two natural numbers using a one-digit divisor.
This means children. . .
– Multiply two digit numbers such as 12 x 13 = 156.
– Find the answer to division problem (or the quotient) using a one digit divisor. For example, 48 divided by 6 = 8.

• Use estimation in problem solving.

– Estimate and determine if the estimate is close when adding or subtracting whole numbers. For example, 14 + 15 is about 30.

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.

By the end of Fourth Grade children –

• Interpret data from graphical representations.
This means children. . .
– Read, understand, and draw conclusions from information found in bar graphs, line graphs, pictographs, and charts.

• Identify median, mode, and range.
This means children. . .
– Understand the terms of median, mode, and range. For example, 1,3,3,4,6,7,8. The median would be the number in the exact middle so in this example it would be 4; the mode is the number or item that is repeated the most – in this example it would be 3. The range is the difference between the largest number and the smallest number or 7.

• Determine outcomes of events as equally likely and not equally likely.
This means children. . .
– Are learning about probability. For example. “A bag has 3 red cubes and 3 blue cubes. It is equally likely that a red cube or blue cube would be drawn. OR A bag has 3 red cubes and 5 blue cubes. It is more likely that a blue cube will be drawn.”

Fourth Grade Mathematics Home Activities

• Write down the odometer reading in the car. When you reach your destination, have your child determine how many miles you traveled. Have your child compare the actual mileage to the estimated mileage.

• Tie the ends of a long piece of string together. Hold the string at the correct places to form different shapes – circle, triangle, square, pentagon, etc. Use the string (untied) to model lines that are parallel, intersecting, or perpendicular (intersecting to form right angles.)

• On a shopping trip find examples of liquids which would be measured using cups, pints, quarts, and gallons.

• Plan an imaginary trip with your child – how far is it to the final destination, how many hours or miles do you plan on traveling a day, develop a budget – how much for lodging, meals, and other travel expenses.

• Using a candy bar that cost 50 cents, figure out how many 2, 3, 4, and 5 would cost. Is it cheaper to buy a package of candy bars?

• Have your child keep track of the amount of time they spend studying and watching TV for a week. Make a graph showing how much time is spend in these activities each night. Talk about the differences in the lines on the graph – if they have a night with lots of homework did amount of time watching TV decrease?

South Dakota Resource Network

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