world, using data analysis as a tool. They also begin to actively consider the likelihood of events through informal explorations. (NCTM)

Students are expected to:

A. Use problem solving strategies across the curriculum to solve a range of problems involving data collection and probability; select the necessary information, use appropriate tools including models, graphs, tables, and technology; estimate, use mental math, and round to predict results and determine if they are reasonable, determine whether the solution answers the question; and create their own word problems. **Example:** With a partner, roll a die 36 times. Take turns and each time you roll the die, record whether you get an even number or an odd number. Use tally marks.

Even #'s_____ Odd #'s_____

B. Read and interpret graphs using the process of collecting or reporting data. Students will read and interpret graphs including stem and leaf, pictograph, pie graph, & line graphs. Students will also create appropriate graphs for given data. **Example:** Develop a graph that represents the die data collected above.

C. Determine the likelihood of an event and calculate probabilities through prediction and experimentation. **Example:** Looking at the data above, is there a better way of rolling an even number than an odd number? Why or why not?
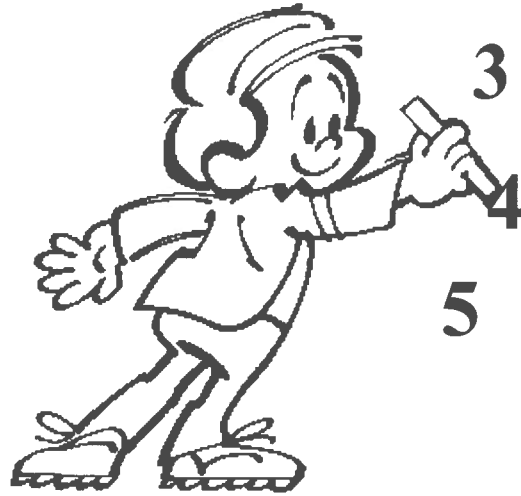
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If you have any questions, please feel free to contact your child's teacher.

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Galesburg
Fourth Grade
Academic Expectations
for
Mathematics

The teachers and administrators who work with fourth grade students have developed a very specific curriculum in mathematics. Assisted by consultants, our educators have specifically identified what fourth grade students are expected to know and be able to do in the area of mathematics at the end of fourth grade. This curriculum has been named Fourth Grade Academic Expectations. It defines each of the Performance Skills on the Fourth Grade Report Card.

Performance Skill: Number Sense

Numbers and operations on numbers play fundamental roles in helping us make sense of the world around us. Discussing and solving problems would be all but impossible without a sense of numbers and numerical operations. (ISBE)

Students are expected to:

A. Use problem solving strategies across the curriculum to solve a range of multi-step problems involving number sense; select necessary information; use appropriate tools including models, graphs, and tables; estimate, use mental math, and round to predict results and determine if they are reasonable; determine whether the solution answers the question; explain solutions in writing; and create their own word problems. **Example:** Greg has 36 baseball cards. Ronda has 24. How many cards must Greg give Ronda so that they each have the same number of cards? How many cards will each have? Explain your strategy and solution.

B. Use <, =, > symbols in a variety of situations to compare and order whole numbers. **Example:** Find the missing numbers:
10,000; 10,001; _____; _____; 10,004
81,997; 81,998, 81,999; _____;_____.

C. Use their knowledge of place value in a variety of situations in borrowing, carrying, regrouping, and comparing larger numbers up to seven digits. **Example:** Double 50. Divide by 5. Then subtract 11. Write the answer in the tens place. The digit in the ones place is not an even number. The sum of the digit in the thousands place and the digit in the ones place is 3. The sum of the digits in this number is 15. What is the number?___ ___ ___ ___

D. Show relationships between addition, subtraction, multiplication, and division using fact families. **Example:** Create a list of different ways to make 30. For instance: 15 x 2; 120 divided by 4; 12 + 18; and 1/2 of 60.

E. Develop a greater understanding of multiplication by using multiplication as the inverse operation of division; knowing multiplication facts using various strategies; and performing multi-digit multiplication using place value and the distributive property. **Example:** For her birthday, Sally wants each of her friends to get 2 cupcakes and a juice box. She set up 3 tables. There will be 4 children at each table. How many cupcakes will she need?

F. Develop a greater understanding of division by using division as the inverse of multiplication; knowing division facts using various strategies; dividing by 1-digit numbers and tens; and making sense of remainders in division. **Example:** I am a number between 90 and 100. I have a remainder of 4 when divided by 5. I have no remainder when divided by 3. Who am I?

G. Develop a greater understanding of fractions by solving one-step problems that require the use of fractions; comparing fractions and decimals in real-life situations; modeling equivalent fractions, decimals, and common percents; using models to add and subtract fractions with like denominators; and finding a fractional portion of a number. **Example:** When the giant clock in the town hall chimes, each chime takes 1/2 second. There is a 2-second interval between chimes. Thus, when it is 4 o'clock, the chiming takes 8 seconds. At the same rate, how long will it take to chime at 8:00?

Performance Skill: Measurement

Measurement is used to describe attributes of objects and to describe and quantify the world. Measurement helps connect ideas within areas of mathematics and between mathematics and other subject areas. (NCTM)

Students are expected to:

A. **Use a variety of problem solving strategies across the curriculum** to solve a range of problems involving measurement including: making conversions within the English and metric systems; selecting necessary information; use appropriate tools including models, graphs, tables, and technology; estimate, use mental math, and round to predict results and determine if they are reasonable; determine whether the solution answers the question; explain solutions in writing; and create their own word problems. **Example:** How would you measure a puddle? Record all the different ways you can think of. Make sketches to show your ways.

B. **Demonstrate knowledge of money in a variety of situations** by performing multi-step money problems with money; counting and making change; and estimating the reasonable amount needed for a given situation. **Example:** Shelby has $5.00 in her piggy bank. Her piggy bank only has coins inside. What coins might Shelby have that add up to $5.00? Give at least two examples.

C. **Demonstrate knowledge of time in a variety of situations** by solving multi-step problems with time including elapsed time; using the language of time such as half past two and two-thirty; and correctly reading and creating a timeline. **Example:** It's 7:00 PM now, what time was it 5 hours ago? It's 1:00 PM. What time was it 4 hours ago? It's 4:00 AM. What time was it 5 hours ago?

D. **Demonstrate the ability to measure by choosing the appropriate instruments and units of measure**. **Example:** Describe a way to measure the distance around your wrist. What unit measurement would you use?

E. **Calculate perimeter, area, mass (weight), volume, or temperature in a problem-solving setting. Example:** A graduated cylinder is filled with 40 cc of water. Four marbles of the same size are added to the cylinder. The level of water rises to 52 cc. What is the volume of each marble? Show your work.

Performance Skill: Patterns/Algebra

Students in grade 4 are encouraged to look for patterns and to express them mathematically (in words or symbols) in order to help them discover, understand, and use properties of algebra to solve a variety of problems. (NCTM)

Students are expected to:

A. **Use a variety of problem solving strategies across the curriculum** to solve a range of problems involving patterns and unknown values; select necessary information, use appropriate tools including models, graphs, tables, and technology; estimate, use mental math, and round to predict results and determine if they are reasonable; determine whether the solution answers the question; explain solutions in writing; and create their own word problems. **Example:** What pattern do you see in the following figures:
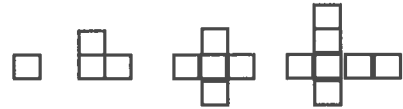
B. **Use variables in simple equations** and solve equations of one unknown using fact families and inverse operations. **Example:** I am thinking of a number. If I multiply it by 3, the answer is 24. What is the number?

C. **Read, interpret, and create coordinate graphs** in the context of solving problems. **Example:** On graph paper draw a triangle using these ordered pairs (graph coordinates) (1,2), (2,2), and (2,1).

D. **Recognize, extend, create, and correct errors in patterns** including numerical and geometric. They will describe and explain rules for the pattern. **Example:** Draw the two figures that come next.

E. **Develop a conceptual understanding of function** through exploration of function machines using input/output. **Example:** Reid and Ray picked up a total of 75 cans along the roadside. However, for every 2 cans Reid picked up Ray picked up 1 can. How many cans did each boy pick up?

F. **Recognize, explain, and apply the commutative, associative, distributive, and zero properties. Example:** Suppose a frog jumps 4 shoe lengths. In a 2nd jump it leaps 5 shoe lengths. Find the total shoe lengths the frog jumped. Write a number sentence and record the results. Change of the order of addends. Do you always get the same sum?

Performance Skill: Geometry

Students in the fourth grade have developed reasoning skills that allow them to investigate geometrical problems with increasing complexity. They should develop clarity and precision in describing properties of geometric objects and classify objects by these properties. They will learn about the relationships between 2- and 3-dimensional objects, and they learn about properties using spatial visualization. (NCTM)

Students are expected to:

A. **Use problem-solving strategies across the curriculum** to solve a variety of problems involving geometry; select the necessary information, use appropriate tools including models, graphs, tables, and technology; estimate, use mental math, and round to predict results and determine if are reasonable; determine whether the solution answers the question; and create their own word problems. **Example:**
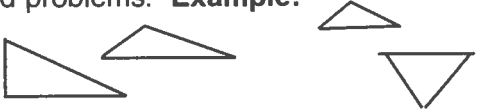
What pattern do you see? What are some shapes that fit the pattern? What are some shapes that do not fit the pattern?

B. **Identify and create figures including** congruent figures, slides, flips, and turns, 2- and 3-dimensional shapes; and lines of symmetry in a given shape. **Example:** Find pictures of objects that have line symmetry in newspapers and magazines. Record the number of lines of symmetry of each object.

C. **Identify and describe geometric figures in real-life settings** by comparing geometric figures. **Example:** Name all of the geometric shapes that you know. Identify places where you would find each of these shapes.

D. **Explore, identify, and create** acute, obtuse, 90 degree, and right angles; vertices; parallel and perpendicular lines. **Example:** Using a map of Galesburg, see if you can find the following: acute, obtuse, 90 degree, and right angles; parallel and perpendicular lines.

Performance Skill: Probability & Statistics

Students in 4th grade are ready to expand their knowledge about how to investigate, describe, and analyze information about their