

An outline map of Bedford County, Virginia, showing its irregular shape and coastline. The map is centered on the page, and the title text is overlaid on it.

# Third Grade Curriculum Map for Mathematics

Bedford County Public Schools

The content of the mathematics standards is intended to support the following five goals for students: becoming mathematical problem solvers, communicating mathematically, reasoning mathematically, making mathematical connections, and using mathematical representations to model and interpret practical situations.

### **Problem Solving**

Students will apply mathematical concepts and skills and the relationships among them to solve problem situations of varying complexities. Students also will recognize and create problems from real-life data and situations within and outside mathematics and then apply appropriate strategies to find an acceptable solution. To accomplish this goal, students will need to develop a repertoire of skills and strategies for solving a variety of problem types. A major goal of the mathematics program is to help students become competent mathematical problem solvers.

### **Mathematical Communication**

Students will use the language of mathematics, including specialized vocabulary and symbols, to express mathematical ideas precisely. Representing, discussing, reading, writing, and listening to mathematics will help students to clarify their thinking and deepen their understanding of the mathematics being studied.

### **Mathematical Reasoning**

Students will recognize reasoning and proof as fundamental aspects of mathematics. Students will learn and apply inductive and deductive reasoning skills to make, test, and evaluate mathematical statements and to justify steps in mathematical procedures. Students will use logical reasoning to analyze an argument and to determine whether conclusions are valid. In addition, students will learn to apply proportional and spatial reasoning and to reason from a variety of representations such as graphs, tables, and charts.

### **Mathematical Connections**

Students will relate concepts and procedures from different topics in mathematics to one another and see mathematics as an integrated field of study. Through the application of content and process skills, students will make connections between different areas of mathematics and between mathematics and other disciplines, especially science. Science and mathematics teachers and curriculum writers are encouraged to develop mathematics and science curricula that reinforce each other.

### **Mathematical Representations**

Students will represent and describe mathematical ideas, generalizations, and relationships with a variety of methods. Students will understand that representations of mathematical ideas are an essential part of learning, doing, and communicating mathematics. Students should move easily among different representations—graphical, numerical, algebraic, verbal, and physical—and recognize that representation is both a process and a product.

**1<sup>st</sup> Nine Weeks**

<b>Standards of Learning</b>	<b>Essential Knowledge and Skills – The student will:</b>
<p><b>3.1</b> The student will read and write six-digit numerals and identify the place value for each digit.</p>	<ul style="list-style-type: none"> <li>• Investigate and identify the place value for each digit in a six-digit numeral, using base-10 manipulatives (e.g., base-10 blocks).</li> <li>• Read six-digit numerals orally.</li> <li>• Write six-digit numerals that are stated verbally or written in words.</li> </ul>
<p><b>3.3</b> The student will compare two whole numbers between 0 and 9,999, using symbols (&gt;, &lt;, or =) and words (greater than, less than, or equal to).</p>	<ul style="list-style-type: none"> <li>• Describe the meaning of the terms greater than, less than, and equal to.</li> <li>• Determine which of two whole numbers between 0 and 9,999 is greater.</li> <li>• Determine which of two whole numbers between 0 and 9,999 is less.</li> <li>• Compare two whole numbers between 0 and 9,999, using the symbols &gt;, &lt;, or =.</li> </ul>
<p><b>3.2</b> The student will round a whole number, 9,999 or less, to the nearest ten, hundred, and thousand.</p>	<ul style="list-style-type: none"> <li>• Round a given whole number, 9,999 or less, to the nearest ten, hundred, and thousand.</li> <li>• Solve problems, using rounding of numbers, 9,999 or less, to the nearest ten, hundred, and thousand.</li> </ul>
<p><b>3.4</b> The student will recognize and use the inverse relationships between addition/subtraction and multiplication/division to complete basic fact sentences. Students will use these relationships to solve problems such as <math>5 + 3 = 8</math> and <math>8 - 3 = \underline{\quad}</math>.</p>	<ul style="list-style-type: none"> <li>• Write three related basic fact sentences when given one basic fact sentence for addition/subtraction. For example, given <math>2 + 6 = 8</math>, write <math>\underline{\quad} + 6 = 8</math>, <math>8 - 6 = \underline{\quad}</math>, and <math>8 - \underline{\quad} = 6</math>.</li> <li>• Use the inverse relationships between addition/subtraction to solve related basic fact sentences. For example, <math>5 + 3 = 8</math> and <math>8 - 3 = \underline{\quad}</math>.</li> </ul>
<p><b>3.8</b> The student will solve problems involving the sum or difference of two whole numbers, each 9,999 or less, with or without regrouping, using various computational methods, including calculators, paper and pencil, mental computation, and estimation.</p>	<ul style="list-style-type: none"> <li>• Determine whether an estimate is an appropriate solution for addition and subtraction problems.</li> <li>• Determine whether to add or subtract in problem situations.</li> <li>• Estimate and find the sum of two whole numbers, each 9,999 or less, with or without regrouping, using calculators, paper and pencil, or mental computation.</li> <li>• Add or subtract two whole numbers, each 9,999 or less.</li> <li>• Estimate and find the difference of two whole numbers, each 9,999 or less, with or without regrouping, using calculators, paper and pencil, or mental computation.</li> <li>• Solve problems involving the sum or difference of two whole numbers, each 9,999 or less, with or without regrouping.</li> </ul>
<p><b>3.25</b> The student will</p> <p><b>a)</b> investigate and create patterns involving numbers, operations (addition and multiplication), and relations that model the identity and commutative properties for addition and multiplication; and</p> <p><b>b)</b> demonstrate an understanding of equality by recognizing that the equal sign (=) links equivalent quantities, such as <math>4 \cdot 3 = 2 \cdot 6</math>.</p>	<ul style="list-style-type: none"> <li>• Recognize that the equals sign relates equivalent quantities.</li> <li>• Write number sentences to represent equivalent mathematical relationships (e.g., <math>4 \times 3 = 2 \times 6</math>).</li> <li>• Identify number sentences that show appropriate use of the equals sign.</li> </ul>

**1<sup>st</sup> Nine Weeks (continued)**

<b>Standards of Learning</b>	<b>Essential Knowledge and Skills – The student will:</b>
<b>3.24</b> The student will recognize and describe a variety of patterns formed using concrete objects, numbers, tables, and pictures, and extend the pattern, using the same or different forms (concrete objects, numbers, tables, and pictures).	<ul style="list-style-type: none"><li>• Recognize repeating and growing numeric and geometric patterns (e.g., skip counting, addition tables, and multiplication tables).</li><li>• Describe repeating and growing numeric and geometric patterns formed using concrete objects, numbers, tables, and/or pictures, using the same or different forms.</li><li>• Extend repeating and growing numeric and geometric patterns formed using concrete objects, numbers, tables, and/or pictures, using the same or different forms.</li></ul>
<b>3.13</b> The student will determine by counting the value of a collection of bills and coins whose total value is \$5.00 or less, compare the value of the coins or bills, and make change.	<ul style="list-style-type: none"><li>• Count the value of collections of coins and bills up to \$5.00.</li><li>• Compare the values of two sets of coins or bills, up to \$5.00, using the terms greater than, less than, and equal to.</li><li>• Make change from \$5.00 or less.</li></ul>

## 2<sup>nd</sup> Nine Weeks

Standards of Learning	Essential Knowledge and Skills – The student will:
<p><b>3.10</b> The student will represent multiplication and division, using area and set models, and create and solve problems that involve multiplication of two whole numbers, one factor 99 or less and the second factor 5 or less.</p>	<ul style="list-style-type: none"> <li>• Model multiplication, using area and set models.</li> </ul>
<p><b>3.4</b> The student will recognize and use the inverse relationships between addition/subtraction and multiplication/division to complete basic fact sentences. Students will use these relationships to solve problems such as <math>5 + 3 = 8</math> and <math>8 - 3 = \underline{\quad}</math>.</p>	<ul style="list-style-type: none"> <li>• Write three related basic fact sentences when given one basic fact sentence for multiplication/division. For example, given <math>3 \times 2 = 6</math>, write <math>\underline{\quad} \times 3 = 6</math>, <math>6 \div 3 = \underline{\quad}</math>, and <math>6 \div \underline{\quad} = 3</math>.</li> </ul>
<p><b>3.10</b> The student will represent multiplication and division, using area and set models, and create and solve problems that involve multiplication of two whole numbers, one factor 99 or less and the second factor 5 or less.</p>	<ul style="list-style-type: none"> <li>• Model division, using area and set models.</li> </ul>
<p><b>3.4</b> The student will recognize and use the inverse relationships between addition/subtraction and multiplication/division to complete basic fact sentences. Students will use these relationships to solve problems such as <math>5 + 3 = 8</math> and <math>8 - 3 = \underline{\quad}</math>.</p>	<ul style="list-style-type: none"> <li>• Use the inverse relationships between multiplication/division to solve related basic fact sentences. For example, <math>4 \times 3 = 12</math> and <math>12 \div 4 = \underline{\quad}</math>.</li> </ul>
<p><b>3.9</b> The student will recall the multiplication and division facts through the nines table.</p>	<ul style="list-style-type: none"> <li>• Recall and write the multiplication and division facts through the nines table.</li> <li>• Recall and state the multiplication and division facts through the nines table.</li> </ul>
<p><b>3.10</b> The student will represent multiplication and division, using area and set models, and create and solve problems that involve multiplication of two whole numbers, one factor 99 or less and the second factor 5 or less.</p>	<ul style="list-style-type: none"> <li>• Create and solve word problems involving multiplication, where one factor is 99 or less and the second factor is 5 or less.</li> </ul>
<p><b>3.21</b> The student, given grid paper, will</p> <p><b>a)</b> collect and organize data on a given topic of his/her choice, using observations, measurements, surveys, or experiments; and</p> <p><b>b)</b> construct a line plot, a picture graph, or a bar graph to represent the results. Each graph will include an appropriate title and key.</p>	<ul style="list-style-type: none"> <li>• Formulate questions to investigate (data collection).</li> <li>• Design data investigations to answer formulated questions, limiting the number of categories for data collection to four.</li> <li>• Collect data, using surveys, polls, questionnaires, scientific experiments, and observations.</li> <li>• Organize data and construct a bar graph on grid paper representing 16 or fewer data points for no more than four categories.</li> <li>• Label bar graphs with a title, a description of each axis, and a key where appropriate. Limit increments on the numerical axis to whole numbers representing multiples of 1, 2, 5, or 10.</li> </ul>

**2<sup>nd</sup> Nine Weeks (continued)**

<b>Standards of Learning</b>	<b>Essential Knowledge and Skills – The student will:</b>
<b>3.22</b> The student will read and interpret data represented in line plots, bar graphs, and picture graphs and write a sentence analyzing the data.	<ul style="list-style-type: none"><li>• Read the information presented on a simple bar or picture graph (e.g., the title, the categories, the description of the two axes, the key).</li><li>• Read information presented in line plots.</li><li>• Identify parts of the data that have special characteristics, including categories with the greatest, the least, or the same (e.g., most students prefer scrambled eggs).</li><li>• Describe the categories of data and the data as a whole (e.g., data were collected on four types of eggs — scrambled, fried, hard boiled, and egg salad — eaten by students).</li><li>• Analyze and interpret information from simple picture and bar graphs, with data points limited to 16 and categories to 4, by writing at least one statement.</li><li>• Analyze and interpret information from line plots, with data points limited to 16, by writing at least one statement.</li><li>• Select a correct interpretation of a graph from a set of interpretations of the graph, where one is correct and the remaining three are incorrect. For example, a bar graph containing data on four types of eggs — scrambled, fried, hard boiled, and egg salad — eaten by students shows that more students prefer scrambled eggs. A correct answer response, if given, would be that more students prefer scrambled eggs than any other type of eggs.</li></ul>

### 3<sup>rd</sup> Nine Weeks

Standards of Learning	Essential Knowledge and Skills – The student will:
<p><b>3.5</b> The student will</p> <p>a) divide regions and sets to represent a fraction; and</p> <p>b) name and write the fractions represented by a given model (area/region, length/measurement, and set). Fractions (including mixed numbers) will include halves, thirds, fourths, eighths, and tenths.</p>	<ul style="list-style-type: none"> <li>• Name and write fractions and mixed numbers represented by drawings or concrete materials for halves, thirds, fourths, eighths, and tenths.</li> <li>• Represent a given fraction or mixed number, using concrete materials, pictures, and symbols for halves, thirds, fourths, eighths, and tenths. For example, write the symbol for one-fourth, and represent it with concrete materials and pictures.</li> </ul>
<p><b>3.6</b> The student will compare the numerical value of two fractions having like and unlike denominators, using concrete or pictorial models involving areas/regions, lengths/measurements, and sets.</p>	<ul style="list-style-type: none"> <li>• Compare the values of two fractions having like denominators where the denominators are 2, 3, 4, 8, or 10, using concrete or pictorial models. Use the terms greater than, less than, or equal to or symbols <math>&gt;</math>, <math>&lt;</math>, or <math>=</math> to compare their values.</li> <li>• Compare the values of two unit fractions (a fraction in which the numerator is one), having unlike denominators, where the denominators are 2, 3, 4, 8, or 10, using concrete or pictorial models. Use the terms greater than, less than, or equal to or symbols <math>&gt;</math>, <math>&lt;</math>, or <math>=</math> to compare their values.</li> <li>• Compare the values of two fractions having unlike denominators where the denominators are 2, 3, 4, 8, and 10, using concrete or pictorial models. Use the terms greater than, less than, or equal to or symbols <math>&gt;</math>, <math>&lt;</math>, or <math>=</math> to compare their values.</li> </ul>
<p><b>3.11</b> The student will add and subtract with proper fractions having like denominators of 10 or less, using concrete materials and pictorial models representing areas/regions, lengths/measurements, and sets.</p>	<ul style="list-style-type: none"> <li>• Demonstrate a fractional part (halves, thirds, fourths, eighths, and tenths) of a whole, using             <ul style="list-style-type: none"> <li>– region/area models (e.g., pie pieces, pattern blocks, geoboards, drawings);</li> <li>– set models (e.g., chips, counters, cubes, drawings); and</li> <li>– measurement models (e.g., nonstandard units such as cuisenaire rods, connecting cubes, and drawings).</li> </ul> </li> <li>• Name and write fractions and mixed numbers represented by drawings or concrete materials for halves, thirds, fourths, eighths, and tenths.</li> <li>• Represent a given fraction or mixed number, using concrete materials, pictures, and symbols, for halves, thirds, fourths, eighths, and tenths. For example, write the symbol for one-fourth and represent it with concrete materials and/or pictures.</li> <li>• Add and subtract with proper fractions having denominators of 10 or less, using concrete materials and pictorial models representing area/regions (circles, squares, and rectangles), length/measurements (fraction bars and strips), and sets (counters).</li> </ul>
<p><b>3.7</b> The student will read and write decimals expressed as tenths and hundredths, using concrete materials and models.</p>	<ul style="list-style-type: none"> <li>• Investigate the ten-to-one relationship of the decimal places, using base-10 place-value models.</li> <li>• Read and write decimals expressed as tenths, which are represented with base-10 blocks, grid paper, circular fraction pieces, and/or ten-frames.</li> <li>• Read and write decimals expressed as hundredths, which are represented with base-10 blocks and/or grid paper.</li> </ul>
<p><b>3.12</b> The student will add and subtract with decimals expressed as tenths, using concrete materials, pictorial representations, and paper and pencil.</p>	<ul style="list-style-type: none"> <li>• Add and subtract with decimals expressed as tenths, using concrete materials (e.g., grid paper, base-10 materials, and circular regions divided into tenths).</li> <li>• Add and subtract with decimal numbers expressed as tenths, using paper and pencil.</li> </ul>

### 3<sup>rd</sup> Nine Weeks (continued)

Standards of Learning	Essential Knowledge and Skills – The student will:
<p><b>3.15</b> The student will tell time to the nearest five-minute interval and to the nearest minute, using analog and digital clocks.</p>	<ul style="list-style-type: none"> <li>• Tell time to the hour, half-hour, quarter-hour, nearest five-minute interval, and nearest minute, using analog and digital clocks.</li> <li>• Match the times shown on analog and digital clocks to written times.</li> </ul>
<p><b>3.16</b> The student will identify equivalent periods of time, including relationships among days, months, and years, as well as minutes and hours.</p>	<ul style="list-style-type: none"> <li>• Identify the number of minutes in an hour and the number of hours in a day.</li> <li>• Identify equivalent relationships observed in a calendar, including the number of days in a given month, the number of days in a week, the number of days in a year, and the number of months in a year.</li> </ul>
<p><b>3.14</b> The student will estimate and then use actual measuring devices with metric and U.S. Customary units to measure</p> <ul style="list-style-type: none"> <li>a) length–inches, feet, yards, centimeters, and meters;</li> <li>b) liquid volume–cups, pints, quarts, gallons, and liters; and</li> <li>c) weight/mass–ounces, pounds, grams, and kilograms.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and use the following units of length: centimeters, meters, inches, feet, and yards.</li> <li>• Estimate and then measure lengths of objects to the nearest centimeter and meter and the nearest inch, foot, and yard.</li> <li>• Identify and use the following units of liquid volume: cups, pints, quarts, gallons, and liters.</li> <li>• Estimate and then measure liquid volume to the nearest cup, pint, quart, gallon, and liter.</li> <li>• Identify and use the following units of weight/mass: ounces, pounds, grams, and kilograms.</li> <li>• Estimate and then measure the weight/mass of objects to the nearest ounce and pound and the nearest gram and kilogram.</li> </ul>
<p><b>3.17</b> The student will read temperature to the nearest degree from a Celsius thermometer and a Fahrenheit thermometer. Real thermometers and physical models of thermometers will be used.</p>	<ul style="list-style-type: none"> <li>• Read temperature to the nearest degree from real Celsius and Fahrenheit thermometers and from physical models (including pictorial representations) of such thermometers.</li> </ul>

**4<sup>th</sup> Nine Weeks**

<b>Standards of Learning</b>	<b>Essential Knowledge and Skills – The student will:</b>
<p><b>3.19</b> The student will identify and draw representations of line segments and angles, using a ruler or straightedge.</p>	<ul style="list-style-type: none"> <li>• Identify and locate examples of a point, line segment, and angle.</li> <li>• Draw line segments and angles, using a ruler or straightedge.</li> <li>•</li> </ul>
<p><b>3.18</b> The student will analyze two-dimensional (plane) and three-dimensional (solid) geometric figures (circle, square, rectangle, triangle, cube, rectangular solid [prism], square pyramid, sphere, cone, and cylinder) and identify relevant properties, including the number of corners, square corners, edges, and the number and shape of faces, using concrete models.</p>	<ul style="list-style-type: none"> <li>• Identify by name, models and pictures of plane geometric figures (circle, square, rectangle, and triangle).</li> <li>• Identify plane geometric figures by counting the number of sides, corners, and square corners.</li> </ul>
<p><b>3.20</b> The student, given appropriate drawings or models, will identify and describe congruent and symmetrical, two-dimensional (plane) figures, using tracing procedures.</p>	<ul style="list-style-type: none"> <li>• Locate examples of congruent figures and verify their congruency by laying one on top of the other.</li> <li>• Determine if given figures are congruent, using tracing procedures.</li> <li>• Locate examples of symmetrical figures, and verify their symmetry by using tracing procedures.</li> <li>• Determine if given figures have a line or lines of symmetry (vertical, horizontal, diagonal), using tracing procedures.</li> </ul>
<p><b>3.18</b> The student will analyze two-dimensional (plane) and three-dimensional (solid) geometric figures (circle, square, rectangle, triangle, cube, rectangular solid [prism], square pyramid, sphere, cone, and cylinder) and identify relevant properties, including the number of corners, square corners, edges, and the number and shape of faces, using concrete models.</p>	<ul style="list-style-type: none"> <li>• Identify by name, models and pictures of solid geometric figures (cube, rectangular solid, square pyramid, sphere, cone, and cylinder).</li> <li>• Identify geometric solids by counting the number of corners, square corners, and edges, and by the shapes of the faces.</li> <li>• Classify, compare, and contrast plane and solid geometric figures (e.g., circle/sphere, square/cube, triangle/pyramid, and rectangle/rectangular solid), using corners, square corners, faces, and edges.</li> </ul>
<p><b>3.23</b> The student will investigate and describe the concept of probability as chance and list possible results of a given situation.</p>	<ul style="list-style-type: none"> <li>• Define probability as the chance that an event will happen.</li> <li>• List all possible outcomes for a given situation (e.g., heads and tails are the two possible outcomes of flipping a coin).</li> <li>• Identify the possible outcomes for a common event, using terms such as impossible, unlikely, equally likely, likely, and certain.</li> </ul>