

<b>Essential Understandings</b>	<ul style="list-style-type: none"> <li>Sequences and series can be used to model real-life situations.</li> </ul>
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>What are sequences and series?</li> <li>How do you generate the <math>n</math>th term of a sequence?</li> <li>How do you differentiate between an Arithmetic sequence and a Geometric sequence?</li> <li>How do you find the sum of a finite or infinite series?</li> </ul>
<b>Essential Knowledge</b>	<ul style="list-style-type: none"> <li>Sequences are generated by an underlying pattern.</li> <li>The <math>n</math>th term of a sequence is calculated algebraically.</li> <li>The common difference or common ratio determines the type of sequence.</li> <li>There are formulae which can be used to sum a series.</li> </ul>
<b>Vocabulary</b>	<ul style="list-style-type: none"> <li><u>Terms</u>:             <ul style="list-style-type: none"> <li>arithmetic sequence, geometric sequence, finite, infinite, common ratio, common difference, series, partial sum, limit, summation notation, infinite geometric series, convergent, divergent</li> </ul> </li> </ul>
<b>Essential Skills</b>	<ul style="list-style-type: none"> <li>Calculate common differences and common ratios.</li> <li>Calculate the <math>n</math>th term of a sequence using the appropriate formula.</li> <li>Determine if a series is convergent or divergent.</li> <li>Calculate the sum of a finite or infinite series.</li> </ul>
<b>Related Maine Learning Results</b>	<p><u>Mathematics</u></p> <p>A. Number</p> <p>Real Number</p> <p>A1.Students will know how to represent and use real numbers.</p> <ol style="list-style-type: none"> <li>Use the concept of <math>n</math>th root.</li> <li>Estimate the value(s) of roots and use technology to approximate them.</li> <li>Compute using laws of exponents.</li> <li>Multiply and divide numbers expressed in scientific notation.</li> <li>Understand that some quadratic equations do not have real solutions and that there exist other number systems to allow for solutions to these equations.</li> </ol>

<p><b>Related Maine Learning Results</b></p>	<p>B. Data Measurement and Approximation B1.Students understand the relationship between precision and accuracy.</p> <ul style="list-style-type: none"> <li>a. Express answers to a reasonable degree of precision in the context of a given problem.</li> <li>b. Represent an approximate measurement using appropriate numbers of significant figures.</li> <li>c. Know that most measurements are approximations and explain why it is useful to take the mean of repeated measurements.</li> </ul> <p>D. Algebra Symbols and Expressions D1.Students understand and use polynomials and expressions with rational exponents.</p> <ul style="list-style-type: none"> <li>a. Simplify expressions including those with rational numbers.</li> <li>b. Add, subtract, and multiply polynomials.</li> <li>c. Factor the common term out of polynomial expressions.</li> <li>d. Divide polynomials by <math>(ax+b)</math>.</li> </ul>
--	---

**Brunswick School Department**  
**Algebra II: Academic**  
**Unit 10: Sequences and Series**

<b>Related Maine Learning Results</b>	<p>Equations and Inequalities</p> <p>D2.Students solve families of equations and inequalities.</p> <ol style="list-style-type: none"> <li>Solve systems of linear equations and inequalities in two unknowns and interpret their graphs.</li> <li>Solve quadratic equations graphically, by factoring in cases where factoring is efficient, and by applying the quadratic formula.</li> <li>Solve simple rational equations.</li> <li>Solve absolute value equations and inequalities and interpret the results.</li> <li>Apply the understanding that the solution(s) to equations of the form <math>f(x) = g(x)</math> are x-value(s) of the point(s) of intersection of the graphs of <math>f(x)</math> and <math>g(x)</math> and common outputs in table of values.</li> <li>Explain why the coordinates of the point of intersection of the lines represented by a system of equations is its solution and apply this understanding to solving problems.</li> </ol> <p>D3.Students understand and apply ideas of logarithms.</p> <ol style="list-style-type: none"> <li>Use and interpret logarithmic scales.</li> <li>Solve equations in the form of <math>x + b^y</math> using the equivalent form <math>y = \log_b x</math>.</li> </ol> <p>Functions and Relations</p> <p>D4.Students understand and interpret the characteristics of functions using graphs, tables, and algebraic techniques.</p> <ol style="list-style-type: none"> <li>Recognize the graphs and sketch graphs of the basic functions.</li> <li>Apply functions from these families to problem situations.</li> <li>Use concepts such as domain, range, zeros, intercepts, and maximum and minimum values.</li> <li>Use the concepts of average rate of change (table of values) and increasing and decreasing over intervals, and use these characteristics to compare functions.</li> </ol> <p>D5.Students express relationships recursively and use iterative methods to solve problems.</p> <ol style="list-style-type: none"> <li>Express the <math>(n+1)</math>st term in terms of the <math>n</math>th term and describe relationships in terms of starting point and rule followed to transform one terms to the next.</li> <li>Use technology to perform repeated calculations to develop solutions to real life problems involving linear, exponential, and other patterns of change.</li> </ol>
<b>Sample Lessons And Activities</b>	<ul style="list-style-type: none"> <li>▪ Find the first five terms of a sequence.</li> <li>▪ Find the <math>n</math>th term of a sequence.</li> <li>▪ Write a series using a summation notation.</li> <li>▪ Expand and evaluate a series.</li> </ul>
<b>Sample</b>	<ul style="list-style-type: none"> <li>▪ Evaluate homework.</li> </ul>

<b>Classroom Assessment Methods</b>	<ul style="list-style-type: none"><li>▪ Quizzes.</li><li>▪ Chapter test.</li></ul>
<b>Sample Resources</b>	<ul style="list-style-type: none"><li>▪ <u>Publications:</u><ul style="list-style-type: none"><li>○ Holt Algebra 2</li><li>○ McDougal Littell Algebra 2</li></ul></li><li>▪ <u>Other Resources:</u><ul style="list-style-type: none"><li>○ Graphing calculators</li><li>○ The A+ learning system for remediation</li></ul></li></ul>