## Algebra 2 Year at a Glance

<table>
<thead>
<tr>
<th>Unit</th>
<th>Duration</th>
<th>Addressed Standards</th>
<th>Big Ideas</th>
<th>Essential Questions</th>
<th>Unit Assessment</th>
</tr>
</thead>
</table>
| **Unit 1**                | 23 days  | A.REI.1 A.REI.4 A.REI.4b A.REI.6 A.REI.7 A.REI.11 A.SSE.2 A.SSE.3b A.SSE.3c F.BF.1 F.BF.3 F.IF.4 F.IF.6 F.IF.8a F.IF.9 F.LE.5 N.CN.1 N.CN.2 N.CN.7 | - Modeling is the process of choosing and using appropriate mathematics and statistics to analyze empirical situations, to understand them better, and to improve decisions.  
- Functions can model real-world problems and their solutions.  
- A function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range.  
- Families of functions can be generated from parent functions using transformations. | - What information about a given function can be obtained from a graph, a table, and an equation of the function?  
- When patterns are repeated, can equations and functions model the patterns?  
- Over what values of \( x \) is the function defined and how can this be represented graphically?  
- How has the given function been transformed from its parent function, and how can this transformation be shown graphically and algebraically? | MCAP Style Type I items (multiple choice, drag/drop/select all that apply, etc.) and MCAP Style Type II/III items (reasoning, application, modeling free response) |
| **Unit 2**                | 18 days  | A.CED.1 A.REI.1 A.REI.2 F.IF.4 N.RN.1 N.RN.2 | - Complex algebraic expressions and functions can be rewritten in equivalent forms based on the structure of its terms, coefficients, exponents, etc.  
- The structure of an algebraic representation connects to the numeric and graphical representations.  
- Expressions and equations can be rewritten to more useful equivalent forms.  
- The structure of an analytic representation connects to the numeric and graphical representations. | - What is the relationship between \( \sqrt[n]{b^m} \) and \( b^{\frac{m}{n}} \)?  
- How can the graph and the algebraic representations be used to solve radical equations?  
- What algebraic manipulations are needed to simplify and solve the given equation?  
- Where does the rational function have roots, asymptotes, discontinuities, and other critical features? | MCAP Style Type I items (multiple choice, drag/drop/select all that apply, etc.) and MCAP Style Type II/III items (reasoning, application, modeling free response) |
### Algebra 2 Year at a Glance

<table>
<thead>
<tr>
<th>Unit</th>
<th>Duration</th>
<th>Addressed Standards</th>
<th>Big Ideas</th>
<th>Essential Questions</th>
<th>Unit Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 3</strong>&lt;br&gt;Exponential and Logarithmic Functions</td>
<td>23 days</td>
<td>A.SSE.3c, A.SSE.4, F.BF.1, F.BF.2, F.BF.4, F.BF.4a, F.BF.4c, F.BF.5, F.IF.3, F.IF.7e, F.IF.8b, F.LE.2, F.LE.4, F.LE.5</td>
<td>• Algebraic and graphic models are used to represent arithmetic sequences and geometric sequences.&lt;br&gt;• Inverse operations are used in solving equations.&lt;br&gt;• Mathematical tools and various representations facilitate working with extreme quantities that are otherwise difficult to manipulate and comprehend.&lt;br&gt;• Three-dimensional space can be represented graphically.&lt;br&gt;• A function can be strategically and purposefully modeled using multiple representations, such as algebraically, graphically, verbally, and numerical.</td>
<td>• How do you model inverse relationships algebraically, graphically, and in tables?&lt;br&gt;• How are exponential and logarithmic functions related?&lt;br&gt;• How do logarithms help solve exponential equations?&lt;br&gt;• How can two-dimensional graphs and equations be extended to three-dimensional situations?&lt;br&gt;• How can points, lines, curves, and plane be represented in three-dimensional space?&lt;br&gt;• How can systems of equations in three variables be applied to find a quadratic equation that passes through three given points?</td>
<td>MCAP Style Type I items (multiple choice, drag/drop/select all that apply, etc.) and MCAP Style Type II/III items (reasoning, application, modeling free response)</td>
</tr>
<tr>
<td><strong>IM Field Test Unit</strong>&lt;br&gt;Unit 4 (IM Unit 6) &lt;br&gt;Trigonometric Functions</td>
<td>15 days</td>
<td>F.TF.A, F.TF.C, F.TF.A.2, F.TF.C.8, F.TF.A.1, F.TF.B, F.TF.B.5, E.IF.B.4, E.IF.C, E.IF.C.7, E.IF.C.7e, F.BF.B.3, N.Q.A.1</td>
<td>• Periodic functions are those whose output values repeat at regular intervals and can be used to model a plethora of phenomena&lt;br&gt;• The trigonometric functions are related to each other in many ways that provide insight into how angle measures and side lengths are associated</td>
<td>• How can periodic functions be used to model real-world phenomena?&lt;br&gt;• How can the ways that trigonometric functions are related help make sense of mathematical structures as a whole?</td>
<td>This unit has a mid and an end of unit assessment. Human scored and computer scored items that assess content, reasoning, and problem solving.</td>
</tr>
</tbody>
</table>
## Algebra 2 Year at a Glance

<table>
<thead>
<tr>
<th>Unit</th>
<th>Duration</th>
<th>Addressed Standards</th>
<th>Big Ideas</th>
<th>Essential Questions</th>
<th>Unit Assessment</th>
</tr>
</thead>
</table>
| Unit 5 Polynomial Functions | 11 days | A.APR.2 A.APR.3 A.APR.4 A.APR.5 A.APR.6 A.APR.7 A.APR.7c | • Functions have distinguishing behaviors where the algebraic form provides information about the graph and conversely the graphical representation provides information about the algebraic form.  
• There are various ways to find the zeros of a function and these zeros provide information about the behavior of the graph of this function.  
• The degree of an equation determines the number of real and complex solutions.  
• The complex numbers are an extension of the real number system and have many useful applications.  
• Sequences can be used to describe patterns in the real world.  
• Equations can be used to represent sequences.  
• Series are used to represent the summation of sequences. | • How can algebraic and graphic representations of a polynomial functions be used to describe and interpret data?  
• How are the factors and roots of a polynomial function related?  
• What does the degree of a polynomial function indicate about the number of zeros?  
• How does the complex number system relate to the solutions of quadratic equations?  
• Does a given sequences have a common difference or a common ratio?  
• How can arithmetic and geometric sequences be written using both recursive and explicit formulas?  
• How is the sigma notation used to represent series? | MCAP Style Type I items (multiple choice, drag/drop/select all that apply, etc.) and MCAP Style Type II/III items (reasoning, application, modeling free response) |