



**Marietta City Schools**  
**2023–2024 District Unit Planner**

*AP Calculus BC*

Unit title	Unit 6: Integration & Accumulation of Change	Unit duration (hours)	3 weeks
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**Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit):** *What will students learn?*

**GA DoE Standards**

**Standards**

- 6.1 Exploring accumulations of change
- 6.2 Approximating areas with Reimann sums
- 6.3 Riemann sums, summation notation, and definite integral notation
- 6.4 The fundamental theorem of calculus and accumulation functions
- 6.5 Interpreting the behavior of accumulation functions involving area
- 6.6 Applying properties of definite integrals
- 6.7 The fundamental theorem of calculus and definite integrals
- 6.8 Finding antiderivatives and indefinite integrals: basic rules and notation
- 6.9 Integrating using substitution
- 6.10 Integrating functions using long division and completing the square
- 6.11 Integrating using integration by parts
- 6.12 Using linear partial fractions
- 6.13 Evaluating improper integrals
- 6.14 Selecting techniques for antidifferentiation

**Concepts/Skills to support mastery of standards**

- Exploring accumulations of change
- Approximating areas with Reimann sums
- Riemann sums, summation notation, and definite integral notation
- The fundamental theorem of calculus and accumulation functions
- Interpreting the behavior of accumulation functions involving area

- Applying properties of definite integrals
- The fundamental theorem of calculus and definite integrals
- Finding antiderivatives and indefinite integrals: basic rules and notation
- Integrating using substitution
- Integrating functions using long division and completing the square
- Integrating using integration by parts
- Using linear partial fractions
- Evaluating improper integrals
- Selecting techniques for antidifferentiation

### **Vocabulary**

Riemann Sums, Trapezoidal Sums, Trapezoidal Rule, Definite integral , indefinite integral, summation notation, Fundamental Theorem of Calculus, accumulation, antidifferentiation, integration, u-substitution,

### **Notation**

$$\sum_{i=1}^n a_i$$

$$\int_a^b f(x) dx$$

### **Essential Questions**

How can integration be used to describe how a value changes over time?  
 How is integration related to finding area?  
 How are integration and differentiation related?

### **Assessment Tasks**

*List of common formative and summative assessments.*

### **Formative Assessment(s):**

Notebook, HW quizzes, AP Classroom Progress Checks

### **Summative Assessment(s):**

Unit Test
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<p style="text-align: center;"><b><u>Learning Experiences</u></b></p> <p style="text-align: center;">Add additional rows below as needed.</p>		
Objective or Content	Learning Experiences	Personalized Learning and Differentiation
6.7 The fundamental theorem of calculus and definite integrals	Calc Medic 6.7 Go Figure task Relating velocity to total distance traveled to exemplify the fundamental theorem of calculus.	Collaborative groups Technology: desmos, graphing calculators, if desired.
6.11 Integrating using integration by parts	Mixed Six activity for The Second Derivative <ol style="list-style-type: none"> <li>1. Factual recall</li> <li>2. Carry out a procedure</li> <li>3. Classify a mathematical object</li> <li>4. Prove, show, justify</li> <li>5. Extend a concept</li> <li>6. Critique a fallacy</li> </ol>	Collaborative groups Technology: desmos, graphing calculators, if desired.
6.13 Evaluating improper integrals	Mixed Six activity for The Second Derivative <ol style="list-style-type: none"> <li>1. Factual recall</li> <li>2. Carry out a procedure</li> <li>3. Classify a mathematical object</li> <li>4. Prove, show, justify</li> <li>5. Extend a concept</li> <li>6. Critique a fallacy</li> </ol>	Collaborative groups Technology: desmos, graphing calculators, if desired.
<p style="text-align: center;"><b>Content Resources</b></p>		
<ul style="list-style-type: none"> <li>● AP Classroom (within AP Central, collegeboard.org)</li> <li>● Calculus textbook: Calculus, 11e, Larson &amp; Edwards</li> <li>● Tony Record (Avon HS) created resources</li> <li>● flippedmath.com</li> <li>● Khan Academy</li> <li>● Delta Math</li> </ul>		

- Master Math Mentor (pdf files and videos)
- Teacher created resources