



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

*AP Calculus BC*

Unit title	Unit 4: Contextual Applications of Differentiation	Unit duration (hours)	2 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**

- 4.1 Interpreting the meaning of the derivative in context
- 4.2 Straight-line motion: Connecting position, velocity, and acceleration
- 4.3 Rates of change in applied contexts other than motion
- 4.4 Introduction to related rates
- 4.5 Solving related rates problems
- 4.6 Approximating values of a function using local linearity and linearization
- 4.7 Using L'Hospital's rule for determining limits of indeterminate forms

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

- Interpreting the meaning of the derivative in context
- Straight-line motion: Connecting position, velocity, and acceleration
- Rates of change in applied contexts other than motion
- Introduction to related rates
- Solving related rates problems
- Approximating values of a function using local linearity and linearization
- Using L'Hospital's rule for determining limits of indeterminate forms

**Vocabulary**

Straight line motion - Position, Velocity, Acceleration

Related Rates

Local Linearity Indeterminate form L'Hospital's Rule <u><b>Notation</b></u>
<b>Essential Questions</b>
How are derivatives used to solve problems regarding position, velocity, and acceleration? How can you use related rates to solve problems with multiple variables changing? How can we use L'Hopitals rule to determine the limit of an equation with an indeterminate form?
<b>Assessment Tasks</b>
<i>List of common formative and summative assessments.</i>
<u><b>Formative Assessment(s):</b></u> Notebooks, HW quizzes <u><b>Summative Assessment(s):</b></u> Unit Test

<u><b>Learning Experiences</b></u> Add additional rows below as needed.		
<b>Objective or Content</b>	<b>Learning Experiences</b>	<b>Personalized Learning and Differentiation</b>
4.2 Straight line motion	Mixed Six activity for Motion <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> </ol>	Collaborative groups Technology: desmos, graphing calculators, if desired.

	5. Extend a concept 6. Critique a fallacy	
4.4 Related Rates	Calc Medic Activity - Lesson 4.4 - Intro to related rates. (Unit 4 Day 7)	Collaborative groups Technology: desmos, graphing calculators, if desired.
4.4 Related Rates	Mixed Six activity for Related Rates 7. Factual recall 8. Carry out a procedure 9. Classify a mathematical object 10. Prove, show, justify 11. Extend a concept 12. Critique a fallacy	Collaborative groups Technology: desmos, graphing calculators, if desired.
<b>Content Resources</b>		
<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>• Calc Medic</li> <li>• Khan Academy</li> <li>• Delta Math</li> <li>• Master Math Mentor (pdf files and videos)</li> <li>• Teacher created resources</li> </ul>		