

CARLSTADT-EAST RUTHERFORD REGIONAL HIGH SCHOOL DISTRICT
MATHEMATICS DEPARTMENT
Calculus / Calculus Honors

Calculus / Calculus Honors Curriculum Guide

<p>Pacing Guide</p> <p>Calculus/Calculus Honors is a full year course that meets on a rotating basis for three (3) 55-minute blocks and one (1) 40-minute block for every five (5) day cycle.</p>	<p>Unit 1 (Chapter 1 - Finney/Varberg): Prerequisites for Calculus/Preliminaries. 1-2 weeks</p> <p>Unit 2 (Chapter 2 – Finney/Varberg): Limits and Continuity/Functions and Limits. 2-3 weeks</p> <p>Unit 3 (Chapter 3 – Finney/Varberg): Derivatives/The Derivative. 3-5 weeks</p> <p>Unit 4 (Chapter 4 – Finney/Varberg): Applications of Derivatives/Applications of Derivatives. 4-5 weeks</p> <p>Unit 5 (Chapter 5 – Finney/Varberg): The Definite Integral/The Integral. 4-5 weeks</p> <p>Unit 6 (Chapter 6 – Finney/Varberg): Antiderivatives and Slope Fields/Applications of the Integral. 4-6 weeks</p> <p>Unit 7 (Chapter 7 – Finney/Varberg): Application of the Definite Integral/Transcendental Functions. 4-6 weeks</p> <p>Unit 8 (Chapter 8 - Varberg): HONORS ONLY - Techniques of Integration. 5 weeks</p> <p>Unit 9 (Chapter 9 - Varberg): HONORS ONLY - Indeterminate Forms and Improper Integrals. 6 weeks</p>
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21st Century Skills Standards: 9.1 Personal Finance Literacy 9.2 Career Awareness	9.1.12.D.3: Summarize how investing builds wealth and assists in meeting long-and short-term financial goals. 9.1.12.D.5: Justify the use of savings and investment options to meet targeted goals. 9.1.12.D.10: Differentiate among various investment products and savings vehicles and how to use them most effectively. 9.2.12.C.1: Review career goals and determine steps necessary for attainment. 9.2.12.C.4: Analyze how economic conditions and social changes influence employment trends and future education. 9.2.12.C.9: Analyze the correlation between personal and financial behavior and employability.
Technology Standards	8.1.12.A.4: Construct a spreadsheet, enter data, and use mathematical or logical functions to manipulate data, generate charts and graphs, and interpret the results. 8.1.12.B.2: Apply previous content knowledge by creating and piloting a digital learning game or tutorial. 8.1.12.F.1: Evaluate the strength and limitations of emerging technologies and their impact on educational, career, personal and or social needs. 8.2.12.C.5: Create scaled engineering drawings of products both manually and digitally with materials and measurements labeled 8.2.12.D.2: Write a feasibility study of a product to include: economic, market, technical, financial, and management factors, and provide recommendations for implementation.
Interdisciplinary Connections	SCIENCE HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. ENLGISH LANUGAGE ARTS WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research.

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<p>NJSLS Mathematical Practices – These practices are demonstrated throughout the curriculum.</p>	<ol style="list-style-type: none">1. Make sense of problems and persevere in solving them.2. Reason abstractly and quantitatively.3. Construct viable arguments and critique the reasoning of others.4. Model with mathematics.5. Use appropriate tools strategically.6. Attend to precision.7. Look for and make use of structure.8. Look for and express regularity in repeated reasoning.
<p>NJSLS Career Ready Practices – These practices are demonstrated throughout the curriculum</p>	<p>CRP2. Apply appropriate academic and technical skills. CRP4. Communicate clearly and effectively and with reason. CRP6. Demonstrate creativity and innovation. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence.</p>

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Differentiation/Accommodations/Modifications

Note: Each district should review the various strategies noted below and determine which are applicable for their population within varied grade levels and languages and make edits where needed.

Gifted and Talented	English Language Learners	Students with Disabilities	Students at Risk of School Failure
<p><i>(content, process, product and learning environment)</i></p> <p>Extension Activities:</p> <ul style="list-style-type: none"> • Conduct research and provide presentation of mathematical topics. • Design surveys to generate and analyze data to be used in discussion. • Use of higher level questioning techniques. • Provide assessments at a higher level of thinking. 	<p>Modifications for Classroom:</p> <p>Modifications for Homework/Assignments</p> <ul style="list-style-type: none"> • Modified assignments. • Extended time for assignment completion as needed. • Use graphing calculator. • Highlight formulas. 	<p><i>(appropriate accommodations, instructional adaptations, and/or modifications as determined by the IEP or 504 team)</i></p> <p>Modifications for Classroom:</p> <ul style="list-style-type: none"> • Ask students to restate information, directions, and assignments. • Repetition and practice. • Model skills / techniques to be mastered. • Extended time to complete class work. • Provide copy of classnotes. • Preferential seating to be mutually determined by the student and teacher. • Students may request books online, on tape/CD, as available and appropriate. • Assign peer helper in the class setting. • Provide regular parent / school communication • Provide oral reminders and check student work during independent work time. 	<p>Modifications for Classroom:</p> <ul style="list-style-type: none"> • Ask students to restate information, directions, and assignments. • Repetition and practice. • Model skills / techniques to be mastered. • Extended time to complete class work. • Provide copy of classnotes. • Preferential seating to be mutually determined by the student and teacher. • Students may request books online, on tape/CD, as available and appropriate. • Assign peer helper in the class setting. • Provide oral reminders and check student work during independent work time. • Assist student with long and short term planning of assignments • Provide regular parent / school communication. • Assign peer helper in the class setting.

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		<ul style="list-style-type: none"> • Assist student with long and short term planning of assignments <p>Modifications for Homework</p> <ul style="list-style-type: none"> • Extended time to complete assignments. • Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases. • Provide the student with clearly stated (written) expectations and grading criteria for assignments. <p>Modification for Assessments</p> <ul style="list-style-type: none"> • Extended time on classroom tests and quizzes. • Student may take / complete tests in an alternate setting as needed. • Restate, reread, and clarify directions/questions. • Distribute study guide for classroom tests. • Establish procedures for accommodations / modifications for assessments. 	<ul style="list-style-type: none"> • Provide oral reminders and check student work during independent work time. • Assist student with long and short term planning of assignments <p>Modifications for Homework</p> <ul style="list-style-type: none"> • Extended time to complete assignments. • Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases. • Provide the student with clearly stated (written) expectations and grading criteria for assignments. <p>Modification for Assessments</p> <ul style="list-style-type: none"> • Extended time on classroom tests and quizzes. • Student may take / complete tests in an alternate setting as needed. • Restate, reread, and clarify directions/questions. • Distribute study guide for classroom tests. • Establish procedures for accommodations / modifications for assessments.
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CONTENT: Chapter 1			
Theme: Prerequisites for Calculus/Preliminaries			
Essential Questions: Why is the behavior of a function important? What are the applications of a function and the properties that it contains?		How do we know a function is continuous? What is a limit? How do find the tangent lines of functions?	
Content <i>(As a result of this learning segment, students will know...)</i>	Skills <i>(As a result of this learning segment, students will be able to...)</i>	Assessments <i>(The above Essential Questions will be assessed with the following formative and summative measures:)</i>	Standards: TECH 8.1.12.A.4, 8.1.12.B.2, 8.1.12.F.1, 8.2.12.C.5, 8.2.12.D.2 PFL 9.1.12.D.3, 9.2.12.C.1, 9.1.12.B.2, 9.1.12.D.1 NJSLs MA 9-12 F-IF A.2, B.5 F-LE.A.1C
<ul style="list-style-type: none"> • 1.1 Lines/The Real Number System • 1.2 Functions and Graphs/Decimals, Calculators, Estimation • 1.3 Exponential Functions/Inequalities 	<ul style="list-style-type: none"> • To write linear equations. • To interpret various properties of elementary functions and their graphs, and review graphing calculator. • To differentiate between growth and decay, and understand how e is used. 	<ul style="list-style-type: none"> • Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam 	Time Frame: 1-2 weeks
			Materials: Textbook: 1999 Addison Wesley Calculus – Graphical, Numerical, Algebraic by Finney, ISBN 0-201-32445-8 Honors Calculus – 2000 Prentice Hall Calculus by Varberg, ISBN 0-13-081137-8 Graphing calculators: Ti-83/84 plus. Smart board, internet research and activities, graph papers, color pencils.

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CONTENT: Chapter 1			
Theme: Prerequisites for Calculus/Preliminaries			
Essential Questions: Why is the behavior of a function important? What are the applications of a function and the properties that it contains? How do we know a function is continuous?			
<p>Content <i>(As a result of this learning segment, students will know...)</i></p> <ul style="list-style-type: none"> • 1.4 Parametric Equations/Absolute Values, Square Roots, Squares • 1.5 Functions and Logarithms/The Rectangular Coordinate System • 1.6 Trigonometric Functions/The Straight Line • 1.7 Graphs of Equations (Honors Only) 	<p>Skills <i>(As a result of this learning segment, students will be able to...)</i></p> <ul style="list-style-type: none"> • To graph parametric curves and to give a parametric interval that traces a curve. • To find inverses of a functions and use properties of logarithms. • To find arc length, to graph and transform trigonometric functions, to determine the period of a function, and distinguish between even and odd. 	<p>Assessments <i>(The above Essential Questions will be assessed with the following formative and summative measures:)</i></p> <ul style="list-style-type: none"> • Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam 	<p>Standards: TECH 8.1.12.A.4, 8.1.12.B.2, 8.1.12.F.1, 8.2.12.C.5, 8.2.12.D.2 PFL 9.1.12.D.3, 9.2.12.C.1, 9.1.12.B.2, 9.1.12.D.1 NJSLS MA 9-12 F-TF.A.1, A.2, A.3 C.8, C.9</p> <p>Time Frame: 1-2 weeks</p> <p>Materials: Textbook: 1999 Addison Wesley Calculus – Graphical, Numerical, Algebraic by Finney, ISBN 0-201-32445-8 Honors Calculus – 2000 Prentice Hall Calculus by Varberg, ISBN 0-13-081137-8</p> <p>Graphing calculators: Ti-83/84 plus.</p> <p>Smart board, internet research and activities, graph papers, color pencils.</p>

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CONTENT: Chapter 2			
Theme: Limits and Continuity/Functions and Limits			
Essential Questions: What is a limit? How do find the tangent lines of functions?			
<p>Content <i>(As a result of this learning segment, students will know...)</i></p> <ul style="list-style-type: none"> • 2.1 Rates of Change and Limits/Functions and their Graphs • 2.2 Limits Involving Infinity/Operations on Functions • 2.3 Continuity/Trigonometric Functions • 2.4 Rates of Change and Tangent Lines/Introductions to Limits • 2.5 Rigorous Study of Limits (Honors only) • 2.6 Limit Theorems (Honors only) • 2.7 Limits Involving Trigonometric Functions (Honors only) • 2.8 Limits at Infinity, Infinite Limits (Honors only) • 2.9 Continuity of Functions (Honors only) 	<p>Skills <i>(As a result of this learning segment, students will be able to...)</i></p> <ul style="list-style-type: none"> • To find instantaneous speed, define a limit, and use properties of limits. • To find limits involving infinity and find end behavior models. • To find points of continuity and discontinuity. • To find average rates of change, tangent to a curve, slope of a curve, and normal to a curve. 	<p>Assessments <i>(The above Essential Questions will be assessed with the following formative and summative measures:)</i></p> <ul style="list-style-type: none"> • Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam 	<p>Standards: TECH 8.1.12.A.4, 8.1.12.B.2, 8.1.12.F.1, 8.2.12.C.5, 8.2.12.D.2 PFL 9.1.12.D.3, 9.2.12.C.1, 9.1.12.B.2, 9.1.12.D.1 NJSL MA 9-12 F-BF.A1, A1.a, A1.b, B.4d, B.5</p> <p>Time Frame: 2-3 weeks</p> <p>Materials: Textbook: 1999 Addison Wesley Calculus – Graphical, Numerical, Algebraic by Finney, ISBN 0-201-32445-8 Honors Calculus – 2000 Prentice Hall Calculus by Varberg, ISBN 0-13-081137-8</p> <p>Graphing calculators: Ti-83/84 plus.</p> <p>Smart board, internet research and activities, graph papers, color pencils.</p>

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CONTENT: Chapter 3			
Theme: Derivatives/The Derivative			
Essential Questions: What is a derivative and how is it used or applied? What do the derivatives of functions look like when graphed? How do we optimizations apply to derivatives? What are related rates and how do we apply them?			
<p>Content <i>(As a result of this learning segment, students will know...)</i></p> <ul style="list-style-type: none"> • 3.1 Definition of Derivative/Two Problems with One Theme • 3.2 Differentiability/The Derivative • 3.3 Rules for Differentiation/Rules for Finding Derivatives • 3.4 Velocity and Other Rates of Change/Derivatives of Trigonometry Functions • 3.5 Derivatives of Trigonometric Functions/The Chain Rule 	<p>Skills <i>(As a result of this learning segment, students will be able to...)</i></p> <ul style="list-style-type: none"> • To define a derivative. • To find where a function is differentiable, to find derivatives on a calculator, and to understand local linearity. • To use, the sum, product, quotient rules to differentiate functions. • To find instantaneous rates of change and applications of velocity and acceleration. • To find the derivatives of trigonometric functions. 	<p>Assessments <i>(The above Essential Questions will be assessed with the following formative and summative measures:)</i></p> <ul style="list-style-type: none"> • Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam 	<p>Standards: TECH 8.1.12.A.4, 8.1.12.B.2, 8.1.12.F.1, 8.2.12.C.5, 8.2.12.D.2 PFL 9.1.12.D.3, 9.2.12.C.1, 9.1.12.B.2, 9.1.12.D.1 NJSLs MA 9-12 K-12.1, 12.2, 12.4 F-IE.B, B.5</p> <p>Time Frame: 3-5 weeks</p> <p>Materials: Textbook: 1999 Addison Wesley Calculus – Graphical, Numerical, Algebraic by Finney, ISBN 0-201-32445-8 Honors Calculus – 2000 Prentice Hall Calculus by Varberg, ISBN 0-13-081137-8</p> <p>Graphing calculators: Ti-83/84 plus.</p> <p>Smart board, internet research and activities, graph papers, color pencils.</p>

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CONTENT: Chapter 3			
Theme: Derivatives/The Derivative			
Essential Questions: What is a derivative and how is it used or applied? What do the derivatives of functions look like when graphed? How do we optimizations apply to derivatives? What are related rates and how do we apply them?			
Content <i>(As a result of this learning segment, students will know...)</i> <ul style="list-style-type: none"> • 3.6 Chain Rule/Liebniz Notation • 3.7 Implicit Differentiation/Higher-Order Derivatives • 3.8 Derivatives of Inverse Trigonometric Functions/Implicit Differentiation • 3.9 Derivatives of Exponential and Logarithmic Functions/Related Rates • 3.10 Differentials and Approximations(Honors Only) 	Skills <i>(As a result of this learning segment, students will be able to...)</i> <ul style="list-style-type: none"> • To find the derivatives of trigonometric functions. • To find the derivative of a Composite Function by using the Chain Rule. • To differentiate implicitly. • To find derivatives of Inverse Trigonometric Functions. • To find Derivatives of Exponential and Logarithmic Functions. 	Assessments <i>(The above Essential Questions will be assessed with the following formative and summative measures:)</i> <ul style="list-style-type: none"> • Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam 	Standards: TECH 8.1.12.A.4, 8.1.12.B.2, 8.1.12.F.1, 8.2.12.C.5, 8.2.12.D.2 PFL 9.1.12.D.3, 9.2.12.C.1, 9.1.12.B.2, 9.1.12.D.1 NJSLS MA 9-12 K-12.1, 12.2, 12.4 F-IE.B, B.5
			Time Frame: 3-5 weeks
			Materials: Textbook: 1999 Addison Wesley Calculus – Graphical, Numerical, Algebraic by Finney, ISBN 0-201-32445-8 Honors Calculus – 2000 Prentice Hall Calculus by Varberg, ISBN 0-13-081137-8 Graphing calculators: Ti-83/84 plus. Smart board, internet research and activities, graph papers, color pencils.

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CONTENT: Chapter 4			
Theme: Applications of Derivatives/Applications of Derivatives			
Essential Questions: What is a derivative and how is it used or applied? What do the derivatives of functions look like when graphed?		How do we optimizations apply to derivatives? What are related rates and how do we apply them? What is the connection between tangent lines and instantaneous velocity?	
Content <i>(As a result of this learning segment, students will know...)</i> <ul style="list-style-type: none"> • 4.1 Extreme Values of Function/Maxima and Minima • 4.2 Mean Value Theorem/Monotonicity and Concavity • 4.3 Connecting f'' and f' with the Graph of f/Local Maxima and Minima • 4.4 Modeling and Optimization/More Max-Min Problems 	Skills <i>(As a result of this learning segment, students will be able to...)</i> <ul style="list-style-type: none"> • To find Absolute (Global) Extreme Values, to find Local (Relative) Extreme Values, and to define a critical point. • To use the Mean value theorem and to identify increasing and decreasing functions. • To find local extreme using the first and second derivative test, to explore concavity of a function, to find points of inflection. • To use optimization in order to solve real-life problems. • To find a linearization, to use Newton's Method, to find absolute, relative, and percentage change. 	Assessments <i>(The above Essential Questions will be assessed with the following formative and summative measures:)</i> <ul style="list-style-type: none"> • Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam 	Standards: TECH 8.1.12.A.4, 8.1.12.B.2, 8.1.12.F.1, 8.2.12.C.5, 8.2.12.D.2 PFL 9.1.12.D.3, 9.2.12.C.1, 9.1.12.B.2, 9.1.12.D.1 NJSLS MA 9-12 K-12.1, 12.2, 12.4 F-IE.B, B.5 N-Q.A, Q.A.1, Q.A.2, Q.A.3 <hr/> Time Frame: 3-5 weeks <hr/> Materials: Textbook: 1999 Addison Wesley Calculus – Graphical, Numerical, Algebraic by Finney, ISBN 0-201-32445-8 Honors Calculus – 2000 Prentice Hall Calculus by Varberg, ISBN 0-13-081137-8 Graphing calculators: Ti-83/84 plus. Smart board, internet research and activities, graph papers, color pencils.

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CONTENT: Chapter 4			
Theme: Applications of Derivatives/Applications of Derivatives			
Essential Questions: What is a derivative and how is it used or applied? What do the derivatives of functions look like when graphed?		How do we optimizations apply to derivatives? What are related rates and how do we apply them? What is the connection between tangent lines and instantaneous velocity?	
Content <i>(As a result of this learning segment, students will know...)</i> <ul style="list-style-type: none"> • 4.5 Linearization and Newton’s Model/Economic Applications • 4.6 Related Rates/Sophisticated Graphing • 4.7 The Mean Value Theorem (Honors Only) 	Skills <i>(As a result of this learning segment, students will be able to...)</i> <ul style="list-style-type: none"> • To find Absolute (Global) Extreme Values, to find Local (Relative) Extreme Values, and to define a critical point. • To use the Mean value theorem and to identify increasing and decreasing functions. • To find local extreme using the first and second derivative test, to explore concavity of a function, to find points of inflection. • To use optimization in order to solve real-life problems. • To find a linearization, to use Newton’s Method, to find absolute, relative, and percentage change. 	Assessments <i>(The above Essential Questions will be assessed with the following formative and summative measures:)</i> <ul style="list-style-type: none"> • Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam 	Standards: TECH 8.1.12.A.4, 8.1.12.B.2, 8.1.12.F.1, 8.2.12.C.5, 8.2.12.D.2 PFL 9.1.12.D.3, 9.2.12.C.1, 9.1.12.B.2, 9.1.12.D.1 NJSLS MA 9-12 K-12.1, 12.2, 12.4 F-IE.B, B.5 N-Q.A, Q.A.1, Q.A.2, Q.A.3 <hr/> Time Frame: 3-5 weeks <hr/> Materials: Textbook: 1999 Addison Wesley Calculus – Graphical, Numerical, Algebraic by Finney, ISBN 0-201-32445-8 Honors Calculus – 2000 Prentice Hall Calculus by Varberg, ISBN 0-13-081137-8 Graphing calculators: Ti-83/84 plus. Smart board, internet research and activities, graph papers, color pencils.

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CONTENT: Chapter 5			
Theme: The Definite Integral/The Integral			
Essential Questions: What are slopes fields and how do we interpret them by their appearance? How do you integrate by substitution?		How do you calculate exponential growth and decay? What are the applications of definite integrals?	
Content (<i>As a result of this learning segment, students will know...</i>)	Skills (<i>As a result of this learning segment, students will be able to...</i>)	Assessments (<i>The above Essential Questions will be assessed with the following formative and summative measures:</i>)	Standards: TECH 8.1.12.A.4, 8.1.12.B.2, 8.1.12.F.1, 8.2.12.C.5, 8.2.12.D.2 PFL 9.1.12.D.3, 9.2.12.C.1, 9.1.12.B.2, 9.1.12.D.1 NJSLS MA 9-12 K-12.1, 12.2, 12.4 N-Q.A, Q.A.1, Q.A.2, Q.A.3 N-RN.1-2., A-SSE.A.1
<ul style="list-style-type: none"> • 5.1 Estimating with Finite Sums/Antiderivatives • 5.2 Definite Integrals/Introduction to Differential Equations • 5.3 Definite Integrals and Anti-derivatives/Sums and Sigma Notation • 5.4 Fundamental Theorem of Calculus/Introduction to Area • 5.5 Trapezoidal Rule/The Definite Integral • 5.6 The First Fundamental Theorem of Calculus (Honors only) • 5.7 The Second Fundamental Theorem of Calculus and the Mean Value Theorem for Integrals (Honors Only) • 5.8 Evaluating Definite Integrals (Honors Only) 	<ul style="list-style-type: none"> • To use the Rectangular Approximation Method to find the volume of a sphere. • To use a definite integral to find area, volume. • To find the average value of a function, to use the Mean Value Theorem for Definite Integrals. • To find the average value of a continuous function on a closed interval. • To use the trapezoidal rule to make estimations about area under a curve. 	<ul style="list-style-type: none"> • Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam 	Time Frame: 4-5 weeks
			Materials: Textbook: 1999 Addison Wesley Calculus – Graphical, Numerical, Algebraic by Finney, ISBN 0-201-32445-8 Honors Calculus – 2000 Prentice Hall Calculus by Varberg, ISBN 0-13-081137-8 Graphing calculators: Ti-83/84 plus. Smart board, internet research and activities, graph papers, color pencils.

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CONTENT: Chapter 6			
Theme: Antiderivatives and Slope Fields/Applications of the Integral			
Essential Questions: What is the area of a bounded region?		How do calculate volumes of resolutions and by slicing What is L'Hopital's Rule?	
Content (<i>As a result of this learning segment, students will know...</i>)	Skills (<i>As a result of this learning segment, students will be able to...</i>)	Assessments (<i>The above Essential Questions will be assessed with the following formative and summative measures:</i>)	Standards: TECH 8.1.12.A.4, 8.1.12.B.2, 8.1.12.F.1, 8.2.12.C.5, 8.2.12.D.2 PFL 9.1.12.D.3, 9.2.12.C.1, 9.1.12.B.2, 9.1.12.D.1 NJSLS MA 9-12 K-12.1, 12.2, 12.4 N-Q.A, Q.A.1, Q.A.2, Q.A.3 G-GMD.A.3, B.4
<ul style="list-style-type: none"> • 6.1 Slope Fields and Euler's Method/Application of an Integral • 6.2 Integration by Substitution/Volumes of a Solid: Slabs, Disks, Washers • 6.3 Integration by Parts/Volumes of Solids of Revolution: Shells • 6.4 Exponential Growth and Decay/Length of a Plane 	<ul style="list-style-type: none"> • To use the Rectangular Approximation Method to find the volume of a sphere. • To use a definite integral to find area, volume. • To find the average value of a function, to use the Mean Value Theorem for Definite Integrals. • To find the average value of a continuous function on a closed interval. • To use the trapezoidal rule to make estimations about area under a curve. 	<ul style="list-style-type: none"> • Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam 	Time Frame: 4-6 weeks
			Materials: Textbook: 1999 Addison Wesley Calculus – Graphical, Numerical, Algebraic by Finney, ISBN 0-201-32445-8 Honors Calculus – 2000 Prentice Hall Calculus by Varberg, ISBN 0-13-081137-8 Graphing calculators: Ti-83/84 plus. Smart board, internet research and activities, graph papers, color pencils.

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CONTENT: Chapter 7			
Theme: Application of the Definite Integral – Regular			
Essential Questions: What is the area of a bounded region? How do calculate volumes of resolutions and by slicing What is the surface of the figure?			
<p>Content <i>(As a result of this learning segment, students will know...)</i></p> <ul style="list-style-type: none"> • 7.1 Integral as Net Change • 7.2 Areas in a Plane • 7.3 Volumes • 7.4 Length of a Curve 	<p>Skills <i>(As a result of this learning segment, students will be able to...)</i></p> <ul style="list-style-type: none"> • To use the Rectangular Approximation Method to find the volume of a sphere. • To use a definite integral to find area, volume. • To find the average value of a function, to use the Mean Value Theorem for Definite Integrals. • To find the average value of a continuous function on a closed interval. • To use the trapezoidal rule to make estimations about area under a curve. 	<p>Assessments <i>(The above Essential Questions will be assessed with the following formative and summative measures:)</i></p> <ul style="list-style-type: none"> • Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam 	<p>Standards: TECH 8.1.12.A.4, 8.1.12.B.2, 8.1.12.F.1, 8.2.12.C.5, 8.2.12.D.2 PFL 9.1.12.D.3, 9.2.12.C.1, 9.1.12.B.2, 9.1.12.D.1 NJSLS MA 9-12 K-12.1, 12.2, 12.4 N-Q.A, Q.A.1, Q.A.2, Q.A.3 G-GMD.A.3, B.4 G-MG.A.2, A.3</p> <p>Time Frame: 4-6 weeks</p> <p>Materials: Textbook: 1999 Addison Wesley Calculus – Graphical, Numerical, Algebraic by Finney, ISBN 0-201-32445-8 Honors Calculus – 2000 Prentice Hall Calculus by Varberg, ISBN 0-13-081137-8</p> <p>Graphing calculators: Ti-83/84 plus.</p> <p>Smart board, internet research and activities, graph papers, color pencils.</p>

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CONTENT: Chapter 8			
Theme: Techniques of Integration – Honors			
Essential Questions: How do you integrate through substitution?		How do you integrate through parts? What is partial fraction integration?	
Content <i>(As a result of this learning segment, students will know...)</i>	Skills <i>(As a result of this learning segment, students will be able to...)</i>	Assessments <i>(The above Essential Questions will be assessed with the following formative and summative measures:)</i>	Standards:
<ul style="list-style-type: none"> • 8.1 Integration by Substitution • 8.2 Some Trigonometric Integrals • 8.3 Rationalizing Substitution • 8.4 Integration by Parts • 8.5 Integration of Rational Functions 	<ul style="list-style-type: none"> • To use the Rectangular Approximation Method to find the volume of a sphere. • To use a definite integral to find area, volume. • To find the average value of a function, to use the Mean Value Theorem for Definite Integrals. • To find the average value of a continuous function on a closed interval. • To use the trapezoidal rule to make estimations about area under a curve. 	<ul style="list-style-type: none"> • Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam 	TECH 8.1.12.A.4, 8.1.12.B.2, 8.1.12.F.1, 8.2.12.C.5, 8.2.12.D.2 PFL 9.1.12.D.3, 9.2.12.C.1, 9.1.12.B.2, 9.1.12.D.1 NJSLS MA 9-12 K-12.1, 12.2, 12.4 N-Q.A, Q.A.1, Q.A.2, Q.A.3 F-IF.A.2 and B
			Time Frame: Honors Only – 5 weeks
			Materials: Textbook: 1999 Addison Wesley Calculus – Graphical, Numerical, Algebraic by Finney, ISBN 0-201-32445-8 Honors Calculus – 2000 Prentice Hall Calculus by Varberg, ISBN 0-13-081137-8 Graphing calculators: Ti-83/84 plus. Smart board, internet research and activities, graph papers, color pencils.

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CONTENT: Chapter 9			
Theme: Indeterminate Forms and Improper Integrals – Honors			
Essential Questions: What are some other ways of to integrate? What are some the ways to apply integration?			
<p>Content <i>(As a result of this learning segment, students will know...)</i></p> <ul style="list-style-type: none"> • 9.1 Indeterminate form of Type 0/0 • 9.2 Other Indeterminate Forms • 9.3 Improper Integrals; Indefinite Limits of Integration • 9.4 Improper Integrals; Infinite Integrands 	<p>Skills <i>(As a result of this learning segment, students will be able to...)</i></p> <ul style="list-style-type: none"> • To use the Rectangular Approximation Method to find the volume of a sphere. • To use a definite integral to find area, volume. • To find the average value of a function, to use the Mean Value Theorem for Definite Integrals. • To find the average value of a continuous function on a closed interval. • To use the trapezoidal rule to make estimations about area under a curve. 	<p>Assessments <i>(The above Essential Questions will be assessed with the following formative and summative measures:)</i></p> <ul style="list-style-type: none"> • Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam 	<p>Standards: TECH 8.1.12.A.4, 8.1.12.B.2, 8.1.12.F.1, 8.2.12.C.5, 8.2.12.D.2 PFL 9.1.12.D.3, 9.2.12.C.1, 9.1.12.B.2, 9.1.12.D.1 NJSLS MA 9-12 K-12.1, 12.2, 12.4 N-Q.A, Q.A.1, Q.A.2, Q.A.3 F-IF.A.2 and B</p> <p>Time Frame: Honors Only 6 weeks</p> <p>Materials: Textbook: 1999 Addison Wesley Calculus – Graphical, Numerical, Algebraic by Finney, ISBN 0-201-32445-8 Honors Calculus – 2000 Prentice Hall Calculus by Varberg, ISBN 0-13-081137-8</p> <p>Graphing calculators: Ti-83/84 plus.</p> <p>Smart board, internet research and activities, graph papers, color pencils.</p>