CARLSTADT-EAST RUTHERFORD REGIONAL HIGH SCHOOL DISTRICT
CONTENT: MATHEMATICS DEPARTMENT
MATH LAB 11-12

Math Lab 11-12 Curriculum Guide

Pacing Guide **Math Lab 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.**	**Unit 1:** Review of Real Numbers 3 weeks **Unit 2:** First degree equations and inequality 3 weeks **Unit 3**: Systems of Equations 3 weeks **Unit 4:** Polynomials and Exponents 5 weeks **Unit 5:** Factoring 5 weeks **Unit 6:** Solving Quadratic Equations 2 weeks **Unit7:** Rational Exponents and Radicals 4 weeks **Unit 8:** Imaginary Numbers 2-3 weeks **Unit 9:** Sequences and Series 3-4 weeks

21st Century Skills Standards:	
9.1 Personal Finance Literacy	**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.
9.2 Career Awareness	**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.
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.
Interdisciplinary Connections	ENLGISH LANUGAGE ARTS WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research.

NJSLS Mathematical Practices – These practices are demonstrated throughout the curriculum.	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.
NJSLS Career Ready Practices – These practices are demonstrated throughout the curriculum	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.

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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
(content, process, product and learning environment) **Extension Activities:** • 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.	**Modifications for Classroom:** **Modifications for Homework/Assignments** • Modified assignments. • Extended time for assignment completion as needed. • Use graphing calculator. • Highlight formulas.	*(appropriate accommodations, instructional adaptations, and/or modifications as determined by the IEP or 504 team)* **Modifications for Classroom:** • 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	**Modifications for Classroom:** • 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.

		work time. • Assist student with long and short term planning of assignments **Modifications for Homework** • 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. **Modification for Assessments** • 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.	• Provide oral reminders and check student work during independent work time. • Assist student with long and short term planning of assignments **Modifications for Homework** • 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. **Modification for Assessments** • 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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<table>
<tr><td colspan="4">CONTENT: Unit 1</td></tr>
<tr><td colspan="4">Theme: Review of Real Numbers</td></tr>
<tr><td colspan="4">Essential Questions:
What are the mental computations necessary to work with real numbers?
How can you simplify expressions involving multiple steps?
What is the relationship between mathematical symbols?</td></tr>
<tr>
<td>Content (As a result of this learning segment, students will know…)

• Operations on rational numbers
• Variable Expressions
• Verbal Expressions and Variable Expressions</td>
<td>Skills (As a result of this learning segment, students will be able to…)

• Students will be able to add, subtract, multiply and divide real numbers
• Apply rules of PEMDAS
• Apply properties of algebra</td>
<td>Assessments (The above Essential Questions will be assessed with the following formative and summative measures:)

• Homework
• Warm up exercises
• Exit Tickets
• Group activities
• Section quizzes
• Unit tests
• Cumulative tests
• Projects / Presentations
• Midterm exam
• Final Exam</td>
<td>Standards:
TECH 8.1.12.A.4
PFL 9.2.12.C.1
NJSLS MA 9-12
N.Q.1
A.SSE.1

Time Frame:
3 weeks

Materials:
Worksheets, guided practice
Graphing calculators: Ti-83/84 plus.

Smart board, internet research and activities, graph papers, color pencils, white boards.</td>
</tr>
</table>

<table>
<tr><td colspan="4">CONTENT: Unit 2</td></tr>
<tr><td colspan="4">Theme: First-Degree Equations and Inequalities</td></tr>
<tr><td colspan="4">Essential Questions:
How can you solve equations involving multiple steps?
What is the significance of the mathematical symbols?</td></tr>
<tr>
<td>Content (As a result of this learning segment, students will know…)

• Equations in one variable
• Applications: Problems involving percent</td>
<td>Skills (As a result of this learning segment, students will be able to…)

• Students will be able to solve equations using the 4 basic operations
• Use the distributive property to solve equations
• Apply real world scenarios to solve equations</td>
<td>Assessments (The above Essential Questions will be assessed with the following formative and summative measures:)

• Homework
• Warm up exercises
• Exit Tickets
• Group activities
• Section quizzes
• Unit tests
• Cumulative tests
• Projects / Presentations
• Midterm exam
• Final Exam</td>
<td>Standards:
TECH 8.1.12.A.4
PFL 9.2.12.C.1
NJSLS MA 9-12
A.REI.3
A.CED.4

Time Frame:
3 weeks

Materials:
Worksheets, guided practice
Graphing calculators: Ti-83/84 plus.

Smart board, internet research and activities, graph papers, color pencils, white boards.</td>
</tr>
</table>

Content: Unit 3

Theme: Systems of equations

Essential Questions:
How can you solve equations involving more than 1 variable?
In real-life scenarios, where are multiple variables used?

Content *(As a result of this learning segment, students will know…)*	**Skills** *(As a result of this learning segment, students will be able to…)*	**Assessments** (The above Essential Questions will be assessed with the following formative and summative measures:)	**Standards:** TECH 8.1.12.A.4 PFL 9.2.12.C.1 NJSLS MA 9-12 A.REI.6, A.REI.12 **Time Frame:** 3 weeks **Materials**: Worksheets, guided practice Graphing calculators: Ti-83/84 plus. Smart board, internet research and activities, graph papers, color pencils, white boards.
• Solving systems of linear equations by graphing and substitution method • Solving Systems of Linear Equations by the Addition Method • Application Problems	• Students will be able to solve equations with 2 variables • Solve equations with 3 variables • Solve word problems including banking and finances	• Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Unit tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam	

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CONTENT: Unit 4

Theme: Polynomials and Exponents

Essential Questions:
What are the properties of polynomials?
What are the methods used to add or subtract polynomials?
What are the steps to multiply and divide polynomials?

Content *(As a result of this learning segment, students will know…)*	**Skills** *(As a result of this learning segment, students will be able to…)*	**Assessments** (The above Essential Questions will be assessed with the following formative and summative measures:)	**Standards:** TECH 8.1.12.A.4 PFL 9.2.12.C.1 NJSLS MA 9-12 N.RN.1 A.APR.1 **Time Frame:** 5 weeks **Materials**: Worksheets, guided practice Graphing calculators: Ti-83/84 plus. Smart board, internet research and activities, graph papers, color pencils, white boards.
• Exponential Expressions • Introduction to polynomials • Multiplication of Polynomials • Division of Polynomials	• Students will be able to use the laws of exponents • Recognize the different parts of a polynomial • Perform the four basic operations on polynomials • Divide a polynomial by a monomial or binomial in both equations and word problem form	• Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Unit tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam	

<table>
<tr><td colspan="4">CONTENT: Unit 5</td></tr>
<tr><td colspan="4">Theme: Polynomials and Exponents</td></tr>
<tr><td colspan="4">Essential Questions:
What are the different forms of factoring?
How can factoring be related to real-world scenarios?</td></tr>
<tr><td>Content (As a result of this learning segment, students will know…)

• Factoring Polynomials
• Special Factoring
• Solving Equations by factoring</td><td>Skills (As a result of this learning segment, students will be able to…)

• Students will be able to factor using common factors
• Factor trinomials with and without coefficients
• Solve a polynomial in factored form</td><td>Assessments (The above Essential Questions will be assessed with the following formative and summative measures:)

• Homework
• Warm up exercises
• Exit Tickets
• Group activities
• Section quizzes
• Unit tests
• Cumulative tests
• Projects / Presentations
• Midterm exam
• Final Exam</td><td>Standards:
TECH 8.1.12.A.4
PFL 9.2.12.C.1

NJSLS MA 9-12
A.SSE.2
A.SSE.3a

Time Frame:
5 weeks

Materials:
Worksheets, guided practice

Graphing calculators: Ti-83/84 plus.

Smart board, internet research and activities, graph papers, color pencils, white boards.</td></tr>
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<table>
<tr><td colspan="4">CONTENT: Unit 6</td></tr>
<tr><td colspan="4">Theme: Solving Quadratic Equations</td></tr>
<tr><td colspan="4">Essential Questions:
What happens if an equation is not factorable?
What are the parts of the Quadratic Formula?
What does it mean to complete the square?</td></tr>
<tr><td>Content (As a result of this learning segment, students will know…)

• Solving Quadratic Equations by Completing the square and using the Quadratic Formula</td><td>Skills (As a result of this learning segment, students will be able to…)

• Use the Quadratic Formula to find factors
• Complete the square as another method of finding factors</td><td>Assessments (The above Essential Questions will be assessed with the following formative and summative measures:)

• Homework
• Warm up exercises
• Exit Tickets
• Group activities
• Section quizzes
• Unit tests
• Cumulative tests
• Projects / Presentations
• Midterm exam
• Final Exam</td><td>Standards:
TECH 8.1.12.A.4
PFL 9.2.12.C.1
NJSLS MA 9-12
N.CN.7

Time Frame:
2 weeks

Materials:
Worksheets, guided practice

Graphing calculators: Ti-83/84 plus.

Smart board, internet research and activities, graph papers, color pencils, white boards.</td></tr>
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CONTENT: Unit 7

Theme: Rational Exponents and Radicals

Essential Questions:
How are perfect and non-perfect roots different?
What does it mean to rationalize?
How does one solve an equation containing a radical?

Content *(As a result of this learning segment, students will know…)*	**Skills** *(As a result of this learning segment, students will be able to…)*	**Assessments** (The above Essential Questions will be assessed with the following formative and summative measures:)	**Standards:** TECH 8.1.12.A.4 PFL 9.2.12.C.1 NJSLS MA 9-12 N.RN.1 N.RN.2 **Time Frame:** 4 weeks **Materials**: Worksheets, guided practice Graphing calculators: Ti-83/84 plus. Smart board, internet research and activities, graph papers, color pencils, white boards.
• Rational Exponents and Expressions • Operations on Radical Expressions • Solving Equations containing Radical Equations	• Students will be able to use properties of radicals to simplify • Solve fractional radicals • Apply the rules of algebra to solve an equation that contains a radical	• Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Unit tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam	

CONTENT: Unit 8

Theme: Rational Exponents and Radicals

Essential Questions:
How does the student perform mathematical operations with imaginary and complex numbers?
How are real, imaginary, and complex numbers related?
What are the properties of imaginary and complex numbers?

Content *(As a result of this learning segment, students will know…)*	**Skills** *(As a result of this learning segment, students will be able to…)*	**Assessments** (The above Essential Questions will be assessed with the following formative and summative measures:)	**Standards:** **Standards:** TECH 8.1.12.A.4 PFL 9.2.12.C.1 NJSLS MA 9-12 N.CN.2 **Time Frame:** 2 weeks **Materials**: Worksheets, guided practice Graphing calculators: Ti-83/84 plus. Smart board, internet research and activities, graph papers, color pencils, white boards.
• Complex Numbers	• Students will be able to recognize the properties of non-real numbers • Apply the 4 basic operations to all non-real numbers	• Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Unit tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam	

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<table>
<tr><td colspan="4">CONTENT: Unit 9</td></tr>
<tr><td colspan="4">Theme: Sequences and Series</td></tr>
<tr><td colspan="4">Essential Questions:
What is the difference between a sequence and a series?
How do arithmetic and geometric sequences differ?
Why are patterns important in everyday life?</td></tr>
<tr>
<td>Content (As a result of this learning segment, students will know…)

• Introduction to Sequences and Series
• Arithmetic Sequence and Series
• Geometric Sequence and Series</td>
<td>Skills (As a result of this learning segment, students will be able to…)

• Students will be able to determine general term and specific term
• Determine sequences
• Find series using formulas</td>
<td>Assessments (The above Essential Questions will be assessed with the following formative and summative measures:)

• Homework
• Warm up exercises
• Exit Tickets
• Group activities
• Section quizzes
• Unit tests
• Cumulative tests
• Projects / Presentations
• Midterm exam
• Final Exam</td>
<td>Standards:
Standards:
TECH 8.1.12.A.4
PFL 9.2.12.C.1
NJSLS MA 9-12
F.IF.3
F.BF.2
A.SSE.4
A.SSE.3

Time Frame:
3 weeks

Materials:
Worksheets, guided notes

Graphing calculators: Ti-83/84 plus.

Smart board, internet research and activities, graph papers, color pencils, white boards.</td>
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