CARLSTADT-EAST RUTHERFORD REGIONAL HIGH SCHOOL DISTRICT
MATHEMATICS DEPARTMENT
ACT MATHEMATICS

ACT Mathematics Curriculum Guide

Pacing Guide **ACT Mathematics is a half-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:** Number and Quantity , 7 days **Unit 2:** Algebra, 8 days **Unit 3:** Functions, 7 days **Unit 4:** Statistics and Probability, 7 days

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.
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. **9.1.12.D.10:** Differentiate among various investment products and savings vehicles and how to use them effectively.
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.

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	CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP5. Consider the environmental, social and economic impacts of decisions. 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. CRP10. Plan education and career paths aligned to personal goals. CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence.
Interdisciplinary Connections	ENLGISH LANUGAGE ARTS WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research.

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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	**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

		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.	setting. • 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: ACT Mathematics</td></tr>
<tr><td colspan="4">Theme: Number and Quantity</td></tr>
<tr><td colspan="2">Essential Questions:
How to apply elementary number concepts such as rounding, ordering of decimals, ordering of fractions, primes, GCF and LCM?
How to understand absolute value in terms of distance?</td><td colspan="2">How to apply number properties involving prime factorization?
How to apply properties of real numbers and the real number system, including properties of irrational numbers?</td></tr>
<tr><td>Content (As a result of this learning segment, students will know…)

• Properties of real numbers.
• Perform one and multiple operations with whole numbers, fractions and decimals.
• Complex numbers
• Matrices</td><td>Skills (As a result of this learning segment, students will be able to…)

• Exhibit knowledge of elementary number concept
• Find the distance in the coordinate plane between two points with the same x-coordinate or y-coordinate.
• Understand absolute value in terms of distance.
• Apply properties of real numbers and the real number system, including properties of irrational numbers.
• Apply properties of complex numbers and the complex number system.
• Apply properties of matrices and properties of matrices as a number system.</td><td>Assessments (The above Essential Questions will be assessed with the following formative and summative measures:)

• Homework
• Warm up exercises
• Question of the day
• Homework quizzes
• ACT diagnostic tests
• ACT practice tests
• Quizzes
• Tests
• Midterm exam
• Final Exam</td><td>Standards:
NJSLS MA 9-12
N-RN.A, N-RN.B, N-Q.A
TECH 8.1.12.A.4

Time Frame:
Course is taught in one marking periods. Skills are reinforced throughout the entire marking period.

Materials:
Kaplan ACT 2016 Strategies, Practice & Review.

Kaplan ACT workbook.

College Board Question of the day and sample tests.

Scientific or graphic calculator.</td></tr>
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<table>
<tr><td colspan="4">CONTENT: ACT Mathematics</td></tr>
<tr><td colspan="4">Theme: Algebra</td></tr>
<tr><td colspan="2">Essential Questions:
How to evaluate algebraic expressions?
How to solve linear and quadratic function?</td><td colspan="2">How to add, subtract and multiply polynomials?
How to graph and recognize graphs of linear equation, linear inequality, absolute value and quadratic function?
How to solve system of equation?</td></tr>
<tr><td>Content (As a result of this learning segment, students will know…)

• Evaluate algebraic expressions.
• Polynomials and its operations.
• Solving system of equations.
• Graph linear, inequalities, absolute value and quadratic equations.
• Solve absolute value equations.
• Solve quadratic equations.
• Factor Polynomials.</td><td>Skills (As a result of this learning segment, students will be able to…)

• Evaluating algebraic expressions by substituting integers for unknown quantities.
• Add, subtract and multiply single algebraic expression and polynomials.
• Exhibit knowledge of slope and y-intercept.
• Solving linear inequalities.
• Solve system of two linear equations.
• Solve absolute value and quadratic equations.
• Factor polynomials.
• Work with scientific notation
• Work with square and cube roots.</td><td>Assessments (The above Essential Questions will be assessed with the following formative and summative measures:)

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• Question of the day
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• ACT diagnostic tests
• ACT practice tests
• Quizzes
• Tests
• Midterm exam
• Final Exam</td><td>Standards:
NJSLS MA 9-12
A.SSE.1, 2, 3, 4
A-APR.1, 2
TECH 8.1.12.A.4

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<tr><td colspan="4">CONTENT: ACT Mathematics</td></tr>
<tr><td colspan="4">Theme: Functions</td></tr>
<tr><td colspan="2">Essential Questions:
How to evaluate linear, polynomial and quadratic functions expressed in function notation?
How to find the next term in a sequence?</td><td colspan="2">How to find and identify the domain and range of a function?
How to graph and solve exponential and logarithmic functions?
How to use trigonometric concepts and basic identities to solve problems?</td></tr>
<tr><td>Content (As a result of this learning segment, students will know…)

• Definition of a function.
• Domain and Range of a function.
• Evaluate linear, polynomial and quadratic functions expressed in function notation
• Arithmetic and geometric sequences.
• Exponential and logarithmic functions.
• Introduction to trigonometry.</td><td>Skills (As a result of this learning segment, students will be able to…)

• Evaluate linear, polynomial and quadratic functions expressed in function notation
• Understand the domain and range in terms of valid input and output, and in terms of function graphs.
• Find the domain and range of polynomial functions and rational functions.
• Write an expression for the composite of two simple functions.
• Exhibit knowledge of arithmetic and geometric sequences and series.
• Find the next term in a sequence described recursively.
• Find a recursive expression for the general term in a sequence.
• Solve and graph exponential and logarithmic functions.
• Exhibit knowledge of unit circle trigonometry.
• Match graphs of basic trigonometric functions with their equations.
• Use trigonometric concepts and basic identities to solve problems.</td><td>Assessments (The above Essential Questions will be assessed with the following formative and summative measures:)

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NJSLS MA 9-12
F-IF.A, B, C
TECH 8.1.12.A.4

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<tr><td colspan="4">Theme: Statistics and Probability</td></tr>
<tr><td colspan="2">Essential Questions:
How to compute the mean, median, and mode for a list of numbers?
How read tables and charts ?</td><td colspan="2">How to determine the probability of an event?
How to distinguish between experiments and observational study?
How to recognize conditional and joint probability?</td></tr>
<tr><td>Content (As a result of this learning segment, students will know…)

• Mean, median, and mode
• Weighted mean
• Tables and graphs
• Probability rules
• Counting principles
• Conditional and joint probabilities
• Experiments and observational studies</td><td>Skills (As a result of this learning segment, students will be able to…)

• Calculate the mean, median, and mode of a list of numbers
• Analyze and draw conclusions based on information from tables and
• Determine the probability of a simple event and use the relationship between the probability of an event and the probability of its complement
• Describe events as combinations of other events (e.g., using and, or, and not)
• Exhibit knowledge of simple counting techniques and use Venn diagrams in counting
• Recognize the concept of independence expressed in real-world contexts
• Understand the role of randomization in surveys, experiments, and observational studies</td><td>Assessments (The above Essential Questions will be assessed with the following formative and summative measures:)

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