

## **EIGHTH GRADE MATHEMATICS CURRICULUM**

### **Rochelle Park Mission Statement**

We envision an educational community, which inspires and empowers all students to become self-sufficient and to thrive in a complex, global society.

### **Rochelle Park Vision Statement**

- ❖ Establish and maintain a shared responsibility among home, school, and the greater community which fosters student learning, accountability, and citizenship.
- ❖ To provide curricula that enables all students to meet or exceed current national, state, and local standards.
- ❖ We will utilize a variety of formative and summative assessments in order to differentiate and guide instruction.
- ❖ The district, as a Professional Learning Community, will provide on-going professional development training and opportunities for collaboration among faculty and staff.

## PACING CHART

Topic	Time Frame
Expressions, Equations, and Functions	14 days
Linear Equations	13 days
Linear Functions	11 days
Equations of Linear Functions	12 days
Linear Inequalities	11 days
Systems of Linear Equations and Inequalities	12 days
Exponents and Exponential Functions	12 days
Quadratic Expressions and Equations	16 days
Quadratic Functions and Equations	15 days
Radical Functions and Geometry	12 days
Rational Functions and Equations	12 days
Statistics and Probability	11 days

## **Mathematic Domains**

### Operations and Algebraic Thinking

- Represent and solve problems involving addition and subtraction.
- Understand and apply properties of operations and the relationship between addition and subtraction.
- Add and subtract within 20.
- Work with addition and subtraction equations.

### Number and Operations in Base Ten

- Extend the counting sequence.
- Understand place value.
- Use place value understanding and properties of operations to add and subtract.

### Measurement and Data

- Measure lengths indirectly and by iterating length units.
- Tell and write time.
- Represent and interpret data.

### Geometry

- Reason with shapes and their attributes.

## **Mathematical Practices**

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.

### **8.1 Educational Technology**

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

### **8.2 Technology Education, Engineering, Design, and Computational Thinking-Programming**

All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

## **Educational Technology**

**Indicators:** 8.1.8.A.1, 8.1.8.A.4, 8.1.8.A.5, 8.1.8.F.1

- Demonstrate knowledge of a real world problem using digital tools.
- Graph and calculate data within a spreadsheet and present a summary of the results
- Create a database query, sort and create a report and describe the process, and explain the report results.
- Explore a local issue by using digital tools to collect and analyze data to identify a solution and make an informed decision.

## 21<sup>st</sup> Century Life and Careers Skills

**Indicators:** 9.1.8.A.1, 9.1.8.B.2, 9.1.8.B.3, 9.1.8.B.4, 9.1.8.E.4, 9.1.8.E.6

- Explain the meaning and purpose of taxes and tax deductions and why fees for various benefits are taken out of pay.
- Construct a simple personal savings and spending plan based on various sources of income.
- Justify the concept of “paying yourself first” as a financial savings strategy.
- Relate the concept of deferred gratification to (investment), meeting financial goals, and building wealth.
- Prioritize personal wants and needs when making purchases.
- Compare the value of goods or services from different sellers when purchasing large quantities and small quantities.

## Career Ready Practices

**Indicators:** CRP1, CRP2, CRP4, CRP6, CRP7, CRP8, CRP9, CRP11, CRP12

- Act as responsible and contributing citizen and employee.
- Apply appropriate academic and technical skills.
- Communicate clearly and effectively and with reason.
- Demonstrate creativity and innovation.
- Employ valid and reliable research strategies.
- Utilize critical thinking to make sense of problems and persevere in solving them.
- Model integrity, ethical leadership and effective management.
- Use technology to enhance productivity.
- Work productively in teams while using cultural global competence.

<b>Grade:</b> Eighth Algebra		<b>Content:</b> Mathematics	
<b>Topic:</b> Expressions, Equations, & Functions			<b>Time Frame:</b> 14 days
<b>Standards:</b> A.CED.A.1                      A.SSE.A.2 A.CED.A.2                      F.IF.A.1 A.REI.B.3                        F.IF.A.2 A.R.D10                         F.IF.A.4 A.SSE.A.1a, 1b                N.Q.A.3		<b>Focus Mathematical Practices:</b> MP.1, MP.2, MP.3, MP.4, MP.7, MP.8	
<b>PARCC Model Content Framework:</b> Major: A.CEDD.A.1, A.CED.A.2, A.REI.B.3, A.REI.D.10, A.SSE.A.1a, 1b, 2, F.IF.A.1, F.IF.A.2, F.IF.A.4 Supporting: N.Q.A.3 Additional: n/a			

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>● Why is the Order of Operations an important part of Algebra?</li> <li>● Why is it useful to represent real life situations algebraically?</li> <li>● How do we translate verbal ideals into algebraic expressions/equations?</li> <li>● What are the different ways that a relation can be represented?</li> <li>● What makes a relation a function?</li> <li>● How do you find the function value?</li> </ul>	<ul style="list-style-type: none"> <li>● Simplify and evaluate expressions using Order of Operations.</li> <li>● Use properties of algebra to simplify expressions.</li> <li>● Represent relations as a set of ordered pairs, equation, table, mapping, or graph.</li> <li>● Identify what a function is and the difference between domain and range.</li> </ul>

Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>● Write verbal expressions for algebraic expressions.</li> <li>● Write algebraic expressions for verbal expressions.</li> <li>● Evaluate numerical/algebraic expressions by using the order of operations.</li> <li>● Use the Distributive Property to evaluate and expressions.</li> <li>● Solve equations with one or two variables.</li> <li>● Represent relations.</li> <li>● Interpret graphs of relations.</li> <li>● Determine whether a relation is a function.</li> <li>● Find function value.</li> <li>● Interpret intercepts, and symmetry of graphs of functions.</li> <li>● Interpret positive, negative, increasing, and decreasing behavior, extrema, and end behavior of graphs of functions.</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>● Explain the definition of a function, including the relationship between the domain and range.</li> <li>● Create linear equations in two variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</li> <li>● Explain the definition of a function, including the relationship between domain and range.</li> <li>● Interpret terms, factors, coefficients, and other parts of expressions in terms of a context.</li> </ul>

Assessment/Project	Resources/Materials	Vocabulary
<ul style="list-style-type: none"> <li>● Do now</li> <li>● Exit ticket</li> <li>● Teacher observations</li> <li>● Group work</li> <li>● Quizzes</li> <li>● Chapter test</li> <li>● Class discussions</li> <li>● Classwork/homework</li> </ul>	<ul style="list-style-type: none"> <li>● Tenmarks</li> <li>● Classroom Presentation component</li> <li>● Worksheets</li> <li>● UDL</li> <li>● Versatiles</li> <li>● Anchor Charts</li> <li>● Interactive Student Guide</li> </ul>	<p>Algebraic expressions, variable, term, factor, product, power, exponent, base, evaluate, order of operations, equivalent expressions, additive identity, multiplicative identity, multiplicative inverse, reciprocal, like terms, simplest form, coefficient, open sentence, equation, solving solution, replacement set, set, element, solution set, identity, coordinate plane, x- and y-axes, origin, ordered pair, x- and y-coordinates, relation, mapping, domain, range, independent variable, dependent variable, function, discrete function, continuous function, vertical line test, function notation, nonlinear function, y-intercept, x-intercept, symmetry, positive, negative, increasing, decreasing, extrema, relative maximum/minimum, and end behavior.</p>
Differentiated Instruction		Interdisciplinary Connections
RTI/ELL	Enrichment	
<ul style="list-style-type: none"> <li>● Anchor charts/ posters</li> <li>● Small group instruction</li> <li>● Reteach book</li> <li>● Online tutors</li> </ul>	<ul style="list-style-type: none"> <li>● H.O.T. problems</li> <li>● Enrichment book</li> <li>● Be a peer tutor</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Language/Business</b>-Research some factors to be considered when starting a business. Analyze initial costs and expenses. Write expressions for each of the following costs in terms of months <math>m</math>, employees <math>x</math>, or both months and employees. Write and simplify and expression for total operating cost. Create a table showing the operating cost with a variety of number of employees.</li> </ul>

<b>Grade:</b> Eighth Algebra		<b>Content:</b> Mathematics
<b>Topic:</b> Linear Equations		<b>Time Frame:</b> 13 days
<b>Standards:</b> A.CED.A.1 A.CED.A.4 A.REI.A.1 A.REI.B.3 N.Q.A.1 N.Q.A.2	<b>Focus Mathematical Practices:</b> MP.1, MP.2, MP.3, MP.5, MP.6, MP.7, MP.8	<b>PARCC Model Content Framework:</b> Major: A.CED.A.1, A.CED.A.4, A.REI.A.1, A.REI.B.3 Supporting: N.Q.A.1, N.Q.A.2 Additional: n/a

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>• What is the proper order to solving multi-step equations, using the properties?</li> <li>• How can an absolute value equation be solved by setting up two cases?</li> <li>• How can proportional reasoning be used to find an unknown quantity?</li> <li>• How can proportional relationships be used to solve real-world problems?</li> <li>• How can you calculate an average for elements of different weights or values building upon the basic definition and formula for an <i>average</i>?</li> </ul>	<ul style="list-style-type: none"> <li>• Solve multi-step equations with/without absolute value using the Equality properties.</li> <li>• Use ratios and rates to compare quantities and make conversions.</li> <li>• Utilize proportional relationships to solve real world problems.</li> <li>• Solve real-world mixture problems using weighted averages.</li> </ul>

Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>● Translate sentences into equations.</li> <li>● Translate equations into sentences.</li> <li>● Solve equations by using addition, subtraction, multiplication, and division.</li> <li>● Solve equations involving more than one operation.</li> <li>● Solve equations involving consecutive integers.</li> <li>● Solve equations with the variable on each side.</li> <li>● Solve equations with grouping symbols.</li> <li>● Evaluate absolute value expressions</li> <li>● Solve absolute value expressions.</li> <li>● Compare ratios.</li> <li>● Solve proportions.</li> <li>● Find the percent of change.</li> <li>● Solve problems involving percent of change.</li> <li>● Solve equations for given variables.</li> <li>● Use formulas to solve real-world problems.</li> <li>● Solve mixture problems.</li> <li>● Solve uniform problems.</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>● Create linear equations and inequalities in one variable and use them in contextual situations to solve problems.</li> <li>● Solve linear equations and inequalities in one variable; justify each step in the process.</li> <li>● Solve multi-step problems, using units to guide solution, interpreting units consistently in formulas and choosing an appropriate level of accuracy on measurement quantities.</li> </ul>

Assessment/Project	Resources/Materials	Vocabulary
<ul style="list-style-type: none"> <li>● Do now</li> <li>● Exit ticket</li> <li>● Teacher observations</li> <li>● Group work</li> <li>● Quizzes</li> <li>● Chapter test</li> <li>● Class discussions</li> <li>● Classwork/homework</li> </ul>	<ul style="list-style-type: none"> <li>● Tenmarks</li> <li>● Classroom Presentation component</li> <li>● Worksheets</li> <li>● UDL</li> <li>● Versatiles</li> <li>● Anchor Charts</li> <li>● Interactive Student Guide</li> </ul>	Ratio, proportion, means, extremes, rate, unit rate, scale model, percent of change, percent of decrease, percent of increase, literal equation, dimensional analysis, unit analysis, weighted average, mixture problem, uniform motion problem, and rate problem.
Differentiated Instruction		Interdisciplinary Connections
RTI/ELL	Enrichment	
<ul style="list-style-type: none"> <li>● Anchor charts/ posters</li> <li>● Small group instruction</li> <li>● Reteach book</li> <li>● Online tutors</li> </ul>	<ul style="list-style-type: none"> <li>● H.O.T. problems</li> <li>● Enrichment book</li> <li>● Be a peer tutor</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Music/Language Connection-</b> Research what an octave is. Write and use an equation to find the number of octaves on a piano keyboard. Type up an explanation on your findings.</li> </ul>

<b>Grade:</b> Eighth Algebra		<b>Content:</b> Mathematics
<b>Topic:</b> Linear Functions		<b>Time Frame:</b> 11 days
<b>Standards:</b> F.IF.A.4 F.IF.B.6 F.IF.C.7a F.LE.A.1a F.LE.A.1b F.LE.A.2 A.REI.D.10 N.Q.A.1 F.BF.A.2	<b>Focus Mathematical Practices:</b> MP.1, MP.2, MP.4, MP.6, MP.7, MP.8	<b>PARCC Model Content Framework:</b> Major: F.IF.A.4, F.IF.B.6, A.REI.D.10 Supporting: F.IF.C.7a, F.LE.A.1a, 1b, 2, N.Q.A.1 Additional: n/a

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>• What are the different ways to graph a linear function?</li> <li>• How do you calculate rate of change (slope) given a graph, table, or 2 ordered pairs?</li> <li>• What steps would you take to determine whether or not an equation has a constant of variation?</li> <li>• How do you determine whether or not a relationship is proportional?</li> <li>• How are arithmetic sequence related to linear functions?</li> </ul>	<ul style="list-style-type: none"> <li>• Graph a line.</li> <li>• Find the rate of change (slope).</li> <li>• The first term in an arithmetic sequence and the common difference can be used to find any term in the sequence.</li> <li>• Write equations in function notation for graphs.</li> </ul>

Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>● Identify linear equations, intercepts, and zeros.</li> <li>● Graph linear equations.</li> <li>● Solve linear equations by graphing.</li> <li>● Estimate solutions to an equation by graphing.</li> <li>● Investigate the steepness of a line using concrete models.</li> <li>● Use rate of change to solve problems.</li> <li>● Find the slope of a line.</li> <li>● Write and graph direction variation equations.</li> <li>● Solve problems involving direct variation.</li> <li>● Recognize arithmetic sequences.</li> <li>● Relate arithmetic sequences to linear functions.</li> <li>● Write an equation for a proportional relationship.</li> <li>● Write an equation for nonproportional relationship.</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>● Write linear and exponential functions given a graph, table of values, or written description; construct arithmetic and geometric sequences.</li> <li>● Sketch graphs of linear and exponential functions expressed symbolically or from a verbal description.</li> <li>● Distinguish between and explain situations modeled with linear functions and with exponential functions.</li> </ul>

Assessment/Project	Resources/Materials	Vocabulary
<ul style="list-style-type: none"> <li>● Do now</li> <li>● Exit ticket</li> <li>● Teacher observations</li> <li>● Group work</li> <li>● Class discussions</li> <li>● Classwork/homework</li> <li>● Quizzes</li> <li>● Chapter test</li> </ul>	<ul style="list-style-type: none"> <li>● Tenmarks</li> <li>● Classroom Presentation component</li> <li>● Worksheets</li> <li>● UDL</li> <li>● Versatiles</li> <li>● Anchor Charts</li> <li>● Interactive Student Guide</li> </ul>	<p>Linear function, constant function, linear equation, standard form, constant, x-intercept, y-intercept, linear function, parent function, family of graphs, root, zero, rate of change, slope, direct variation, constant of variation, constant of proportionality, sequence, terms, arithmetic sequence, and common difference</p>

Differentiated Instruction		Interdisciplinary Connections
RTI/ELL	Enrichment	
<ul style="list-style-type: none"> <li>● Anchor charts/ posters</li> <li>● Small group instruction</li> <li>● Reteach book</li> <li>● Online tutors</li> </ul>	<ul style="list-style-type: none"> <li>● H.O.T. problems</li> <li>● Enrichment book</li> <li>● Be a peer tutor</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Career/Language Connection-</b> Research careers in retail sales. Locate a few available positions and determine the work requirements and salary structures of the positions. If necessary, contact local store managers to discuss rates for hourly pay and sales commissions. Write an equation to represent your salary if you worked 20 hours a week and are responsible for x dollars in sales. Create a graph to show potential earnings.</li> </ul>

<b>Grade:</b> Eighth Algebra		<b>Content:</b> Mathematics
<b>Topic:</b> Equations of Linear Functions		<b>Time Frame:</b> 12 days
<b>Standards:</b> F.LE.A.2 F.IF.C.7A F.BF.A.1 F.BF.B.3 F.BF.B.4a F.LE.A.2 S.ID.B.6 S.ID.B.6e S.ID.B.6c S.ID.C.7 S.ID.C.8 S.ID.C.9 A.CED.A.2	<b>Focus Mathematical Practices:</b> MP.1, MP.2, MP.3, MP.5, MP.6, MP.8	<b>PARCC Model Content Framework:</b> Major: S.ID.C.7, S.ID.C.8, S.ID.C.9, A.CED.A.2 Supporting: F.LE.A.2, F.IF.C.7a, F.BF.A.1, S.ID.B.6, 6c, 6e Additional: F.BF.B.3

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>• What steps do you follow to graph an equation using the slope and y-intercept?</li> <li>• How can you write an equation of a line given 2 points or 1 point and slope?</li> <li>• What are the similar/different characteristics of parallel and perpendicular lines?</li> <li>• How can you make predictions for real-world situations based on a scatter plot?</li> <li>• What are the steps to find the inverse function of a linear function?</li> </ul>	<ul style="list-style-type: none"> <li>• Know that a line on a graph can be represented by a linear equation in the following forms: Standard Form, Slope-Intercept Form, and Point-Slope Form.</li> <li>• Be able to write the equation of a line given characteristics of the line.</li> <li>• Write an equation for a best-fit line for a given scatter plot.</li> <li>• Find the inverse relation.</li> </ul>

Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● Write and graph linear equations in slope-intercept form.</li> <li>● Model real-world data with equations in slope-intercept form.</li> <li>● Write an equation of a line in slope-intercept form given the slope and one point or when given two points.</li> <li>● Write an equation of the line that passes through a given point, parallel/perpendicular to a given line.</li> <li>● Investigate relationships between quantities by using points on scatter plots.</li> <li>● Use lines of best fit to make and evaluate predictions.</li> <li>● Write equation of best-fit lines using linear regression.</li> <li>● Write equations of median-fit lines.</li> <li>● Find the inverse of a relation or a linear function.</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>● Represent data on a scatter plot, describe how the variables are related and use technology to fit a function of data.</li> <li>● Interpret the slope, intercept, and correlation coefficient of a data set of a linear model; distinguish between correlation and causation.</li> <li>● Given a context, write an explicit expression, a recursive process or steps for calculation for quadratic relationships.</li> <li>● Write explicit expressions, recursive processes and steps for calculation from a context that describes a linear or exponential relationship between two quantities.</li> </ul>

Assessment/Project	Resources/Materials	Vocabulary
<ul style="list-style-type: none"> <li>● Do now</li> <li>● Exit ticket</li> <li>● Teacher observations</li> <li>● Group work</li> <li>● Class discussions</li> <li>● Classwork/homework</li> <li>● Quizzes</li> <li>● Chapter test</li> </ul>	<ul style="list-style-type: none"> <li>● Tenmarks</li> <li>● Classroom Presentation component</li> <li>● Worksheets</li> <li>● UDL</li> <li>● Versatiles</li> <li>● Anchor Charts</li> <li>● Interactive Student Guide.</li> </ul>	<p>Slope-intercept form, constant function, constraint, linear extrapolation, point-slope form, parallel lines, perpendicular lines, bivariate data, scatter plot, line of fit, linear interpolation, best-fit line, linear regression, correlation coefficient, residual, median-fit line, inverse relation, and inverse function.</p>

Differentiated Instruction		Interdisciplinary Connections
RTI/ELL	Enrichment	
<ul style="list-style-type: none"> <li>● Anchor charts/ posters</li> <li>● Small group instruction</li> <li>● Reteach book</li> <li>● Online tutors</li> </ul>	<ul style="list-style-type: none"> <li>● H.O.T. problems</li> <li>● Enrichment book</li> <li>● Be a peer tutor</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Science Connection-</b> research the amount of oil drilled at an old field in Texas over the past 20 years. Create a scatter plot to show the data. Calculate the rate of change. Use this to predict the amount of oil drilled 10, 15, and 20 years from now.</li> </ul>

<b>Grade:</b> Eighth Algebra		<b>Content:</b> Mathematics
<b>Topic:</b> Linear Inequalities		<b>Time Frame:</b> 11 days
<b>Standards:</b> A.CED.A.1 A.REI.B.3	<b>Focus Mathematical Practices:</b> MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8	<b>PARCC Model Content Framework:</b> Major: A.CED.A.1, A.REI.B.3 Supporting: n/a Additional: n/a

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>• How can you solve linear inequalities using addition, subtraction, multiplication, or division?</li> <li>• How do you graph a linear inequality in the coordinate plane?</li> <li>• How do you set up and solve compound inequalities involving “and” or “or”?</li> <li>• What are the 2 cases to consider when solving compound inequalities involving absolute value?</li> </ul>	<ul style="list-style-type: none"> <li>• Relate solving inequalities to solving linear equations.</li> <li>• Identify the steps to solving and graphing the solutions for linear inequalities in one and two variables.</li> <li>• Solve absolute value inequalities.</li> </ul>

Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Solve linear inequalities by using addition or subtraction.</li> <li>• Solve linear inequalities by using multiplication or division.</li> <li>• Solve linear inequalities involving more than one operation.</li> <li>• Solve linear inequalities involving the Distributive Property.</li> <li>• Solve compound inequalities containing the word “and” or “or” and graph their solution set.</li> <li>• Solve and graph absolute value inequalities (<math>&lt;</math>) or (<math>&gt;</math>).</li> <li>• Graph linear inequalities on the coordinate plane.</li> <li>• Solve inequalities by graphing.</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>• Solve linear equations and inequalities in one variable; justify each step in the process.</li> <li>• Create linear equations and inequalities in one variable and use them in contextual situations to solve problems. Justify each step in the process and the solution.</li> </ul>

Assessment/Project	Resources/Materials	Vocabulary
<ul style="list-style-type: none"> <li>● Do now</li> <li>● Exit ticket</li> <li>● Teacher observations</li> <li>● Group work</li> <li>● Class discussions</li> <li>● Classwork/homework</li> <li>● Quizzes</li> <li>● Chapter test</li> </ul>	<ul style="list-style-type: none"> <li>● Tenmarks</li> <li>● Classroom Presentation component</li> <li>● Worksheets</li> <li>● UDL</li> <li>● Versatiles</li> <li>● Anchor Charts</li> <li>● Interactive Student Guide.</li> </ul>	<p>Set-builder notation, compound inequality, intersection, union, boundary, half-plane, and closed (open) half-plane.</p>
Differentiated Instruction		Interdisciplinary Connections
RTI/ELL	Enrichment	
<ul style="list-style-type: none"> <li>● Anchor charts/ posters</li> <li>● Small group instruction</li> <li>● Reteach book</li> <li>● Online tutors</li> </ul>	<ul style="list-style-type: none"> <li>● H.O.T. problems</li> <li>● Enrichment book</li> <li>● Be a peer tutor</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Science Connection-</b> research the Saffir-Simpson Hurricane Scale to find the range of the wind speed for the different categories of hurricanes. Write compound inequalities for the different categories of hurricanes.</li> </ul>

<b>Grade:</b> Eighth Algebra		<b>Content:</b> Mathematics
<b>Topic:</b> Systems of Linear Equations & Inequalities		<b>Time Frame:</b> 12 days
<b>Standards:</b> A.CED.A.2 A.REI.C.5 A.REI.C.6 A.REI.D.12	<b>Focus Mathematical Practices:</b> MP.1, MP.2, MP.3, MP.4, MP.6, MP.7, MP.8	<b>PARCC Model Content Framework:</b> Major: A.CED.A.2, A.REI.D.12 Supporting: n/a Additional: A.REI.C.5, A.REI.C.6

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>How can you model a real-world situation using a system of equations/inequalities and then solve the system?</li> <li>How do you determine the number of solutions a system of equations has based on the graph or solving it algebraically? (one, none, or infinitely many)</li> <li>How do you determine which method is best to use when solving a system of equations?</li> </ul>	<ul style="list-style-type: none"> <li>Systems of linear equations/inequalities can be used to model problems and can be solved by graphing, substituting or elimination of a variable.</li> </ul>

Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>Determine the number of solutions a system of linear equations has, if any.</li> <li>Solve systems of linear equations by graphing.</li> <li>Solve systems of equations by using substitution.</li> <li>Solve systems of equations by using elimination with addition or subtraction.</li> <li>Solve systems of equations by using elimination with multiplication.</li> <li>Solve real-world problems involving systems of equations.</li> <li>Determine the best method for solving systems of equations.</li> <li>Solve systems of linear inequalities by graphing.</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>Create linear equations in two variables to represent relationships between quantities.</li> <li>Solve multi-step contextual problems by identifying variable, writing equations and solving systems of linear equations in two variables algebraically and graphically.</li> <li>Graph linear inequalities and systems of linear inequalities in two variables and explain that the solution to the system.</li> </ul>

Assessment/Project	Resources/Materials	Vocabulary
<ul style="list-style-type: none"> <li>● Do now</li> <li>● Exit ticket</li> <li>● Teacher observations</li> <li>● Group work</li> <li>● Class discussions</li> <li>● Classwork/homework</li> <li>● Quizzes</li> <li>● Chapter test</li> </ul>	<ul style="list-style-type: none"> <li>● Tenmarks</li> <li>● Classroom Presentation component</li> <li>● Worksheets</li> <li>● UDL</li> <li>● Versatiles</li> <li>● Anchor Charts</li> <li>● Interactive Student Guide</li> </ul>	<p>System of equations, consistent, independent, dependent, inconsistent, substitution, elimination, and system of inequalities.</p>
Differentiated Instruction		Interdisciplinary Connections
RTI/ELL	Enrichment	<ul style="list-style-type: none"> <li>● <b>Social Studies Connection-</b> Research 2 major tourist destinations. Record the number of tourists for each place. Find the average change in tourists per year. Define variables and write an equation for each region's tourism rate. Determine in how many years would you expect the number of tourists to each region to be equal.</li> </ul>
<ul style="list-style-type: none"> <li>● Anchor charts/ posters</li> <li>● Small group instruction</li> <li>● Reteach book</li> <li>● Online tutors</li> </ul>	<ul style="list-style-type: none"> <li>● H.O.T. problems</li> <li>● Enrichment book</li> <li>● Be a peer tutor</li> </ul>	

<b>Grade:</b> Eighth Algebra		<b>Content:</b> Mathematics
<b>Topic:</b> Exponents and Exponential Functions		<b>Time Frame:</b> 12 days
<b>Standards:</b> A.SSE.A.2 F.BF.A.2 F.IF.A.3 F.IF.C.7e F.IF.C.8b F.LE.A.1 F.LE.A.2 N.RN.A.1 N.RN.A.2	<b>Focus Mathematical Practices:</b> MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8	<b>PARCC Model Content Framework:</b> Major: A.SSE.A.2, F.IF.A.3, Supporting: F.IF.C.7e, F.IF.C.8b, F.LE.A.1, F.LE.A.2 Additional: n/a

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>● How can you simplify expressions using exponents?</li> <li>● How can very large/small numbers be expressed using scientific notation?</li> <li>● What are the rules for performing operations involving scientific notation?</li> <li>● What are the characteristics of exponential functions and how do they relate to real-world problems?</li> <li>● How are geometric sequences related to exponential functions?</li> <li>● How can you write a recursive formula for a sequence?</li> </ul>	<ul style="list-style-type: none"> <li>● Know a single quantity may be represented by many different expressions, including positive and negative exponents.</li> <li>● Use properties of exponents can be used to simplify products and quotients.</li> <li>● Know what exponential growth and decay are.</li> </ul>

Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>● Multiply and divide monomials using the properties of exponents.</li> <li>● Simplify expressions using the multiplication properties of exponents.</li> <li>● Simplify expressions containing negative and zero exponents.</li> <li>● Evaluate a rewrite expressions involving rational exponents.</li> <li>● Solve equations involving expressions with rational exponents.</li> <li>● Express numbers in scientific notation.</li> <li>● Find products and quotients of numbers expressed in scientific notation.</li> <li>● Graph exponential functions.</li> <li>● Identify data that display exponential behavior.</li> <li>● Solve problems involving exponential growth or decay.</li> <li>● Identify and generate geometric sequences.</li> <li>● Relate geometric sequences to exponential functions.</li> <li>● Use a recursive formula to list the terms in a sequence.</li> <li>● Write recursive formulas for arithmetic and geometric sequences.</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>● Write linear and exponential functions given a graph, table of values, or written description; construct arithmetic and geometric sequences.</li> <li>● Distinguish between and explain situations modeled with linear functions and with exponential functions.</li> </ul>

Assessment/Project	Resources/Materials	Vocabulary
<ul style="list-style-type: none"> <li>● Do now</li> <li>● Exit ticket</li> <li>● Teacher observations</li> <li>● Group work</li> <li>● Class discussions</li> <li>● Classwork/homework</li> <li>● Quizzes</li> <li>● Chapter test</li> </ul>	<ul style="list-style-type: none"> <li>● Tenmarks</li> <li>● Classroom Presentation component</li> <li>● Worksheets</li> <li>● UDL</li> <li>● Versatiles</li> <li>● Anchor Charts</li> <li>● Interactive Student Guide</li> </ul>	<p>Monomial, constant, zero exponent, negative exponent, order of magnitude, rational exponent, cube root, <math>n^{\text{th}}</math> root, exponential equation, exponential function, exponential growth function, exponential decay function, compound interest, geometric sequences, common ratio, and recursive formula.</p>

Differentiated Instruction		Interdisciplinary Connections
RTI/ELL	Enrichment	
<ul style="list-style-type: none"> <li>● Anchor charts/ posters</li> <li>● Small group instruction</li> <li>● Reteach book</li> <li>● Online tutors</li> </ul>	<ul style="list-style-type: none"> <li>● H.O.T. problems</li> <li>● Enrichment book</li> <li>● Be a peer tutor</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Science Connection-</b> research and record the distances between the sun and each of the planets (in kilometers). Write the distances in scientific notation. Write and solve word problems involving these distances.</li> </ul>

<b>Grade:</b> Eighth Algebra		<b>Content:</b> Mathematics
<b>Topic:</b> Quadratic Expressions and Equations		<b>Time Frame:</b> 16 days
<b>Standards:</b> A.APR.A.1 A.SSE.A.1a A.SSE.A.2 A.SSE.B.3a A.REI.A.1 A.REI.B.4b	<b>Focus Mathematical Practices:</b> MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8	<b>PARCC Model Content Framework:</b> Major: A.APR.A.1, A.SSE.A.1a, A.SSE.A.2, A.REI.A.1, A.REI.B.4b Supporting: A.SSE.B.3a Additional: n/a

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>• How are the properties of real numbers related to polynomials?</li> <li>• What is FOIL and how is it used to multiply two binomials?</li> <li>• How can factoring help to simplify a polynomial?</li> <li>• What are the different ways to factor a binomial, trinomial, and polynomial?</li> </ul>	<ul style="list-style-type: none"> <li>• Add and subtract polynomials, only like terms can be combined.</li> <li>• Multiply polynomials using FOIL or the Distributive Property.</li> <li>• Factor polynomials using a variety of methods.</li> </ul>

Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>● Write polynomials in standard form.</li> <li>● Add, subtract, and multiply polynomials.</li> <li>● Solve equations involving the products of monomials and polynomials.</li> <li>● Multiply binomials by using the FOIL method.</li> <li>● Multiply polynomials by using the Distributive Property.</li> <li>● Find squares of sums and differences.</li> <li>● Find the product of a sum and difference.</li> <li>● Use the Distributive Property to factor polynomials.</li> <li>● Solve quadratic equations of the form <math>ax^2 + bx = 0</math>.</li> <li>● Factor trinomials of the form <math>x^2 + bx + c</math> and <math>ax^2 + bx + c</math>.</li> <li>● Solve equations of the form <math>x^2 + bx + c = 0</math> and <math>ax^2 + bx + c = 0</math>.</li> <li>● Factor binomials that are the difference of squares.</li> <li>● Use the difference of squares to solve equations.</li> <li>● Factor perfect square trinomials.</li> <li>● Solve equations involving perfect squares.</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>● Add, subtract, and multiply polynomials, relating these to arithmetic operations with integers.</li> <li>● Use properties of exponents to produce equivalent forms of exponential expressions in one variable.</li> <li>● Create linear equations and inequalities in one variable and use them in contextual situations to solve problems.</li> </ul>

Assessment/Project	Resources/Materials	Vocabulary
<ul style="list-style-type: none"> <li>● Do now</li> <li>● Exit ticket</li> <li>● Teacher observations</li> <li>● Group work</li> <li>● Class discussions</li> <li>● Classwork/homework</li> <li>● Quizzes</li> <li>● Chapter test</li> </ul>	<ul style="list-style-type: none"> <li>● Tenmarks</li> <li>● Classroom Presentation component</li> <li>● Worksheets</li> <li>● UDL</li> <li>● Versatiles</li> <li>● Anchor Charts</li> <li>● Interactive Student Guide</li> </ul>	<p>Polynomial, binomial, trinomial, degree of a monomial, degree of a polynomial, leading coefficient, FOIL method, quadratic expression, factoring, factoring by grouping, Zero Product Property, quadratic equation, prime polynomial, difference of two squares, and perfect square trinomial.</p>

Differentiated Instruction		Interdisciplinary Connections
RTI/ELL	Enrichment	
<ul style="list-style-type: none"> <li>● Anchor charts/ posters</li> <li>● Small group instruction</li> <li>● Reteach book</li> <li>● Online tutors</li> </ul>	<ul style="list-style-type: none"> <li>● H.O.T. problems</li> <li>● Enrichment book</li> <li>● Be a peer tutor</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Art Connection-</b> from the art teacher, get a variety of rectangular projects (or even just paper). Imagine that a border (frame) is going to be placed around it that is <math>x</math> inches wide. Write expressions for each that would represent the total area of the project and frame.</li> </ul>

<b>Grade:</b> Eighth Algebra		<b>Content:</b> Mathematics
<b>Topic:</b> Quadratic Functions and Equations		<b>Time Frame:</b> 15 days
<b>Standards:</b> F.IF.B.4 F.IF.B.6 F.IF.C.7a F.IF.C.7b F.IF.C.8a F.LE.A.1 A.REI.B.4 A.REI.B.4b A.SSE.B.3b	<b>Focus Mathematical Practices:</b> MP.1, MP.2, MP.3, MP.4, MP.6, MP.7, MP.8	<b>PARCC Model Content Framework:</b> Major: F.IF.B.4, F.IF.B.6, A.REI.B.4, 4a Supporting: F.IF.C.7a, 7b, F.IF.C.8a, A.SSE.B.3b Additional: n/a

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>• How do you graph a quadratic function?</li> <li>• How can the transformations of the graph of a parent function be described?</li> <li>• How can factoring help to solve an equation?</li> <li>• How can completing the square and the Quadratic Formula be used as a method to find the solutions to a quadratic equation?</li> <li>• How can the discriminant be used to identify the number of solutions of a quadratic equation?</li> </ul>	<ul style="list-style-type: none"> <li>• Understand the characteristics and properties of a graph of a quadratic (parabola).</li> <li>• Determine and write the transformations of a parabola.</li> <li>• Solve quadratic equations.</li> <li>• Apply quadratic formula and understand what the discriminant tells us.</li> </ul>

Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>● Analyze the characteristics of the graphs of quadratic functions.</li> <li>● Graph quadratic functions.</li> <li>● Solve quadratic equations by graphing.</li> <li>● Estimate solutions of quadratic equations by graphing.</li> <li>● Apply translations and dilations of quadratic functions.</li> <li>● Complete the square to write perfect square trinomials.</li> <li>● Solve quadratic equations by completing the square.</li> <li>● Solve quadratic equations by using the Quadratic Formula</li> <li>● Use the discriminant to determine the number of solutions to a quadratic equation.</li> <li>● Identify linear, quadratic, and exponential functions from given data.</li> <li>● Write equations that model data.</li> <li>● Identify and graph step functions.</li> <li>● Identify and graph absolute value and piecewise-define functions.</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>● Interpret key features of functions from graphs and tables.</li> <li>● Calculate and interpret the average rate of change of a function presented symbolically or as a table; estimate the rate of change from a graph.</li> <li>● Graph quadratic functions by hand in simple cases and with technology in complex cases, showing intercepts, extreme values and symmetry of the graph.</li> <li>● Derive the quadratic formula by completing the square and recognize when there are no real solutions.</li> <li>● Solve quadratic equations in one variable using a variety of methods and write complex solutions in a <math>a \pm bi</math> form.</li> </ul>

Assessment/Project	Resources/Materials	Vocabulary
<ul style="list-style-type: none"> <li>● Do now</li> <li>● Exit ticket</li> <li>● Teacher observations</li> <li>● Group work</li> <li>● Class discussions</li> <li>● Classwork/homework</li> <li>● Quizzes</li> <li>● Chapter test</li> </ul>	<ul style="list-style-type: none"> <li>● Tenmarks</li> <li>● Classroom Presentation component</li> <li>● Worksheets</li> <li>● UDL</li> <li>● Versatiles</li> <li>● Anchor Charts</li> <li>● Interactive Student Guide</li> </ul>	<p>Quadratic functions, standard form, parabola, axis of symmetry, vertex, minimum, maximum, double root, transformation, translation, dilation, reflection, vertex form, completing the square, Quadratic Formula, discriminant, step function, piecewise-linear function, greatest integer function, absolute value function, and piecewise-defined function.</p>

Differentiated Instruction		Interdisciplinary Connections
RTI/ELL	Enrichment	
<ul style="list-style-type: none"> <li>● Anchor charts/ posters</li> <li>● Small group instruction</li> <li>● Reteach book</li> <li>● Online tutors</li> </ul>	<ul style="list-style-type: none"> <li>● H.O.T. problems</li> <li>● Enrichment book</li> <li>● Be a peer tutor</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Physical Education/Language Connection</b>-toss a tennis ball with a partner. Describe how the path of the ball can be modeled by a quadratic function. Roughly trace out the path on large paper. Write the equation of a function that models the path.</li> </ul>

<b>Grade:</b> Eighth Algebra		<b>Content:</b> Mathematics
<b>Topic:</b> Radical Functions and Geometry		<b>Time Frame:</b> 12 days
<b>Standards:</b> F.IF.B.4 F.IF.C.7b A.REI.B.4a A.CED.A.2 N.RN.A.2	<b>Focus Mathematical Practices:</b> MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8	<b>PARCC Model Content Framework:</b> Major: F.IF.B.4, A.REI.B.4a, A.CED.A.2 Supporting: F.IF.C.7b Additional: n/a

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>● How are radical expressions represented and simplified?</li> <li>● What are the characteristics of square root functions?</li> <li>● How can you solve a radical equation?</li> <li>● What is the relationship between the square of the length of the hypotenuse and the sum of the squares of the lengths of the legs?</li> <li>● How are trigonometric ratios written and used to find missing parts of a right triangle?</li> </ul>	<ul style="list-style-type: none"> <li>● Radical expressions can be simplified using properties of square roots.</li> <li>● Some radical equations can be solved by squaring both sides and testing the solutions.</li> <li>● Pythagorean Theorem and trigonometric ratios can be used to solve problems.</li> </ul>

Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>● Graph and analyze dilations, reflections, and translations of radical functions.</li> <li>● Simplify radical expressions by using the Product Property of Square Roots</li> <li>● Simplify radical expressions by using the Quotient Property of Square Roots.</li> <li>● Add, subtract, and multiply radical expressions.</li> <li>● Solve radical equations, with or without extraneous solutions.</li> <li>● Solve problems by using the Pythagorean Theorem.</li> <li>● Determine whether a triangle is a right triangle.</li> <li>● Find trigonometric ratios of angles.</li> <li>● Use trigonometry to solve triangles.</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>● Sketch graphs of linear and exponential functions expressed symbolically or from a verbal description.</li> <li>● Graph linear, square root, cube root, and piecewise –defined functions expressed symbolically.</li> <li>● Derive the quadratic formula by completing the square and recognize when there are no real solutions.</li> </ul>

Assessment/Project	Resources/Materials	Vocabulary
<ul style="list-style-type: none"> <li>● Do now</li> <li>● Exit ticket</li> <li>● Teacher observations</li> <li>● Group work</li> <li>● Class discussions</li> <li>● Classwork/homework</li> <li>● Quizzes</li> <li>● Chapter test</li> </ul>	<ul style="list-style-type: none"> <li>● Tenmarks</li> <li>● Classroom Presentation component</li> <li>● Worksheets</li> <li>● UDL</li> <li>● Versatiles</li> <li>● Anchor Chart</li> <li>● Interactive Student Guide</li> </ul>	<p>Square root function, radical function, radicand, radical expression, rationalizing the denominator, conjugate, radical equations, extraneous solutions, hypotenuse, legs, converse, Pythagorean triple, Distance Formula, midpoint, trigonometry, trigonometric ratio, sine, cosine, tangent, solving the triangle, inverse sine, inverse cosine, and inverse tangent.</p>

Differentiated Instruction		Interdisciplinary Connections
RTI/ELL	Enrichment	
<ul style="list-style-type: none"> <li>● Anchor charts/ posters</li> <li>● Small group instruction</li> <li>● Reteach book</li> <li>● Online tutors</li> </ul>	<ul style="list-style-type: none"> <li>● H.O.T. problems</li> <li>● Enrichment book</li> <li>● Be a peer tutor</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Social Studies/Language Connection-</b> research and summarize the life of the mathematician Pythagoras. Research where right triangles are seen the in the real world. Use these scenarios to write word problems that would involve Pythagorean Theorem or Trigonometric ratios.</li> </ul>

<b>Grade:</b> Eighth Algebra		<b>Content:</b> Mathematics
<b>Topic:</b> Rational Functions and Equations		<b>Time Frame:</b> 13 days
<b>Standards:</b> A.CED.A.2	<b>Focus Mathematical Practices:</b> MP.1, MP.2, MP.3, MP.4, MP.6, MP.7, MP.8	<b>PARCC Model Content Framework:</b> Major: A.CED.A.2 Supporting: n/a Additional: n/a

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>• How are rational expressions represented?</li> <li>• What are the characteristics of rational functions?</li> <li>• How can rational expressions be simplified?</li> <li>• How can you solve a rational equation?</li> <li>• How is substitution used to identify any extraneous solutions?</li> </ul>	<ul style="list-style-type: none"> <li>• To simplify a rational expression, divide out the common factors from the numerator and denominator.</li> <li>• Rational expressions and polynomials can be simplified using the same properties to add, subtract, multiply, and divide fractions.</li> <li>• A rational equation can be solved by finding the LCD.</li> </ul>

Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Identify and use inverse variations.</li> <li>• Graph inverse variations.</li> <li>• Identify excluded values.</li> <li>• Identify and use asymptotes to graph rational functions.</li> <li>• Identify values excluded from the domain of a rational expressions.</li> <li>• Simplify rational expressions.</li> <li>• Multiply and divide rational expressions.</li> <li>• Divide a polynomial by a monomial and a binomial.</li> <li>• Add and subtract rational expressions with like and unlike denominators.</li> <li>• Simplify mixed expressions and complex fractions.</li> <li>• Solve rational equations; use rational equations to solve problems.</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>• Create linear equations in two variables to represent relationships between quantities.</li> </ul>

Assessment/Project	Resources/Materials	Vocabulary
<ul style="list-style-type: none"> <li>● Do now</li> <li>● Exit ticket</li> <li>● Teacher observations</li> <li>● Group work</li> <li>● Class discussions</li> <li>● Classwork/homework</li> <li>● Quizzes</li> <li>● Chapter test</li> </ul>	<ul style="list-style-type: none"> <li>● Tenmarks</li> <li>● Classroom Presentation component</li> <li>● Worksheets</li> <li>● UDL</li> <li>● Versatiles</li> <li>● Anchor Charts</li> <li>● Interactive Student Guide</li> </ul>	<p>Inverse variation, product rule, rational function, excluded value, asymptote, rational expression, least common multiple (LCM), least common denominator (LCD), mixed expression, complex fraction, rational equation, extraneous solution, and work and rate problems.</p>
Differentiated Instruction		Interdisciplinary Connections
RTI/ELL	Enrichment	
<ul style="list-style-type: none"> <li>● Anchor charts/ posters</li> <li>● Small group instruction</li> <li>● Reteach book</li> <li>● Online tutors</li> </ul>	<ul style="list-style-type: none"> <li>● H.O.T. problems</li> <li>● Enrichment book</li> <li>● Be a peer tutor</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Language Connection-</b> Using a Venn Diagram, compare and contrast direct and inverse variation. Include a description of the relationship between slope and the graphs of a direct and inverse variation.</li> </ul>

<b>Grade:</b> Eighth Algebra		<b>Content:</b> Mathematics
<b>Topic:</b> Statistics and Probability		<b>Time Frame:</b> 11 days
<b>Standards:</b> S.ID.A.2 S.ID.A.3 S.ID.B.5	<b>Focus Mathematical Practices:</b> MP.1, MP.2, MP.4, MP.5, MP.6, MP.8	<b>PARCC Model Content Framework:</b> Major: S.ID.A.2, S.ID.A.3 Supporting: S.ID.B.5 Additional: n/a

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>● How can collecting and analyzing data help you make decisions or predictions?</li> <li>● How is probability related to real world events?</li> <li>● How can you find the number of arrangements for a situation when order matters/order doesn't matter?</li> <li>● How can you find the probability of more than one event?</li> </ul>	<ul style="list-style-type: none"> <li>● Different measures can be used to interpret and compare sets of a data.</li> <li>● Counting methods can be used to find the number of possible ways to choose objects with and without regard to order.</li> <li>● Probabilities can be determined for multiple events.</li> </ul>

Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>● Classify and analyze samples and studies.</li> <li>● Identify sample statistics and populations parameters.</li> <li>● Analyze data sets using statistics.</li> <li>● Describe the shape of a distribution; use the shape of distributions to select appropriate statistics.</li> <li>● Determine the effect that transformations of data have on measures of central tendency and variation.</li> <li>● Compare data using measures of central tendency and variation.</li> <li>● Calculate experimental probabilities.</li> <li>● Design simulations and summarize data from simulations.</li> <li>● Use permutations and combinations.</li> <li>● Find probabilities of independent and dependent events.</li> <li>● Find probabilities of mutually exclusive events.</li> <li>● Find probabilities by using random variables.</li> <li>● Find the expected value of a probability distribution.</li> </ul>	<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>● Compare center and spread of two or more data sets, interpreting differences in shape, center, and spread in the context of the data taking into account the effects outliers.</li> <li>● Summarize and interpret categorical data for two categories in two-way frequency tables.</li> </ul>

Assessment/Project	Resources/Materials	Vocabulary
<ul style="list-style-type: none"> <li>● Do now</li> <li>● Exit ticket</li> <li>● Teacher observations</li> <li>● Group work</li> <li>● Class discussions</li> <li>● Classwork/homework</li> <li>● Quizzes</li> <li>● Chapter test</li> </ul>	<ul style="list-style-type: none"> <li>● Tenmarks</li> <li>● Classroom Presentation component</li> <li>● Worksheets</li> <li>● UDL</li> <li>● Versatiles</li> <li>● Anchor Charts</li> <li>● Interactive Student Guide</li> </ul>	<p>Population, sample, simple random sample, systematic sample, self-selected sample, convenience sample, stratified sample, bias, survey, observational study, experiment, statistical inference, statistic, parameter, mean absolute deviation (MAD), standard deviation, variance, distribution, negatively skewed distribution, symmetric distribution, positively skewed distribution, linear transformation, theoretical probability experimental probability, relative frequency, simulation, probability model, permutation, factorial, combination, compound events, joint probability, independent events, dependent event, mutually exclusive events, random variable, discrete random sample, probability distribution, and expected value.</p>
Differentiated Instruction		Interdisciplinary Connections
RTI/ELL	Enrichment	
<ul style="list-style-type: none"> <li>● Anchor charts/ posters</li> <li>● Small group instruction</li> <li>● Reteach book</li> <li>● Online tutors</li> </ul>	<ul style="list-style-type: none"> <li>● H.O.T. problems</li> <li>● Enrichment book</li> <li>● Be a peer tutor</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Science/Social Studies Connection-</b> select 2 cities which are in different parts of the world. Record the daily low temperature in each city for 30 days. Describe the center and spread of the data. Construct a double box and whisker plot to compare the data. Write about how the two cities' low temperatures compare and contrast. Discuss your findings.</li> </ul>