

# ROCHELLE PARK SCHOOL DISTRICT



## PRE-ALGEBRA 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.

# ROCHELLE PARK SCHOOL DISTRICT



## PACING CHART

Topic	Time Frame
Ch. 1: Multiply and Divide Fractions	14 days
Ch. 2: Represent and Interpret Data	10 days
Ch. 3: Understand Multiplication	10 days
Ch. 4: Multiplication Facts and Strategies	13 days
Ch. 5: Use Multiplication Facts	8 days
Ch. 6: Understand Division	13 days
Ch. 7: Division Facts and Strategies	14 days
Ch. 8: Understand Fractions	14 days
Ch. 9: Compare Fractions	12 days
Ch. 10: Time, Length, Liquid, Volume, and Mass	10 days
Ch. 11: Perimeter and Area	15 days
Ch. 12: Two-Dimensional Shapes	12 days

# ROCHELLE PARK SCHOOL DISTRICT



## **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.E.4

- Explain the meaning and purposes of taxes and tax deductions and why fees for various benefits are taken out.
- Prioritize personal wants and needs when making purchases.

## 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.

# ROCHELLE PARK SCHOOL DISTRICT



<b>Grade:</b> Seventh Pre-Algebra		<b>Content:</b> Mathematics
<b>Domain:</b> Rational Numbers & Exponents	<b>Topic:</b> The Language of Algebra	<b>Time Frame:</b> 11 days
<b>Standards:</b> 7.NS.A.3 7.EE.A.1 7.EE.A.2 7.EE.B.3 7.EE.B.4	<b>Focus Mathematical Practices:</b> MP.1, MP.3, MP.4, MP.5, MP.7, MP.8	<b>PARCC Model Content Framework:</b> Major Content: NS.A.3, EE.A.1, EE.A.2, EE.B.3, EE.B.4 Supporting Content: n/a Additional Content: n/a

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>• How could you use the four-step plan with problems that you encounter in everyday life?</li> <li>• Why is it important to follow the order of operations?</li> <li>• After replacing the variables in the expression <math>a(x + y)</math> with their corresponding values, in which order would you evaluate the expression?</li> <li>• Given that the number 1 is the identity for multiplication, do you think that division has an identity?</li> <li>• How can I decide which strategy to use to solve a problem?</li> <li>• Why is the point M(4,3) different from the point N(3,4)?</li> <li>• What is an example of a situation in which it is best to represent a relation by a table? By an equation?</li> </ul>	<ul style="list-style-type: none"> <li>• When evaluating a numeric expression, there is a specific order, called the order of operations.</li> <li>• An algebraic expression is an expression that contains both numbers and variables that is simplified using the properties and combining like terms.</li> <li>• Understand there are multiple ways to represent a function.</li> </ul>

# ROCHELLE PARK SCHOOL DISTRICT



Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Use the four-step plan to solve problems. (1)</li> <li>• Solve multi-step problems. (1)</li> <li>• Translate verbal phrases into numerical expressions. (2)</li> <li>• Use the order of operations to evaluate expressions. (2)</li> <li>• Translate verbal phrases into algebraic expressions. (3)</li> <li>• Evaluate expressions containing variables. (3)</li> <li>• Identify and use properties of addition and multiplication. (4)</li> <li>• Use properties to simplify algebraic expressions. (4)</li> <li>• Use problem-solving strategies to solve nonroutine problems. (5)</li> <li>• Use ordered pairs to locate points. (6)</li> <li>• Use graphs to represent relations. (6)</li> <li>• Use multiple representations to represent relations. (7)</li> <li>• Translate among different verbal, tabular, graphical, and algebraic representations of relations. (7)</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>• Apply properties of operations as strategies to add, subtract, multiply, and divide rational numbers.</li> <li>• Apply the properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.</li> <li>• Rewrite algebraic expressions in equivalent forms to highlight how the quantities in it are related.</li> <li>• Solve multi-step real life and mathematical problems with rational numbers in any form by applying properties of operations and converting rational numbers between forms as needed.</li> <li>• Use variables to represent quantities in a real-world or mathematical problem by constructing simple equations and inequalities to represent 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>• 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> </ul>	Algebra, Algebraic expression, Coordinate plane, Coordinate system, Counterexample, Deductive reasoning, Defining a variable, Domain, Equation, Evaluate, Four-step plan, Graph, Guess, check and revise, Look for a pattern, Make a table, Numerical expression, Order of operations, Ordered pair, Origin, Properties, Range, Relation, Simplify, Variable, Work backward, X-axis, Y-axis, X-coordinate, Y-coordinate

# ROCHELLE PARK SCHOOL DISTRICT



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>	<p><b>Science Connection:</b> Use the conversion formula for Fahrenheit to Celsius to convert multiple temperatures between each other.</p> <p><b>Social Studies:</b> Use a map of the United States to find the longitude and latitude of various cities.</p>



# ROCHELLE PARK SCHOOL DISTRICT



<b>Grade:</b> Seventh Pre-Algebra		<b>Content:</b> Mathematics
<b>Domain:</b> Rational Numbers and Exponents	<b>Topic:</b> Operations with Integers	<b>Time Frame:</b> 12 days
<b>Standards:</b> 7.NS.A.4 7.NS.A.1a, 1b, 1c, 1d 7.NS.A.2, 2a, 2b, 2c 7.NS.A.3 7.EE.B.3	<b>Focus Mathematical Practices:</b> MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments & critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure.	<b>PARCC Model Content Framework:</b> Major Content: NS.A.1, NS.A.2, NS.A.3, EE.B.3 Supporting Content: n/a Additional Content: n/a

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>• How can you order the integers -12, -5, -15, -10, -3 from least to greatest without using a number line?</li> <li>• Without actually adding, how do you know that the sum of 5, 4, and -5 is positive?</li> <li>• If you write an expression involving the subtraction of a negative integer and then you write an equivalent addition expression, why is the result the same?</li> <li>• When multiplying more than two integers, how can you determine the sign of the product?</li> <li>• Why are the Associative Property and the Commutative Property not true for division of integers?</li> <li>• How does the location of the points (-7, 8) and (8, -7) change if you multiply each of the coordinates in each ordered pair by -1?</li> </ul>	<ul style="list-style-type: none"> <li>• Perform operations with integers.</li> <li>• Graph ordered pairs on the coordinate plane.</li> </ul>

# ROCHELLE PARK SCHOOL DISTRICT



Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Compare and order integers. (1)</li> <li>• Find the absolute value of an expression. (1)</li> <li>• Add two integers. (2)</li> <li>• Add more than two integers. (2)</li> <li>• Subtract integers. (3)</li> <li>• Find distance on the number line. (3)</li> <li>• Multiply integers. (4)</li> <li>• Simplify algebraic expressions. (4)</li> <li>• Divide integers. (5)</li> <li>• Find the mean (average) of a set of data. (5)</li> <li>• Graph points on a coordinate plane. (6)</li> <li>• Graph algebraic relationships. (6)</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>• Describe real-world situations in which rational numbers are combined, emphasizing rational numbers that combine to make 0.</li> <li>• Add and subtract rational numbers, showing that the distance between two points on a number line is the absolute value of their difference and representing subtraction using an additive inverse.</li> <li>• Solve multi-step real life and mathematical problems with rational numbers in any form by applying properties of operations and converting rational numbers between forms as needed.</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> </ul>	<ul style="list-style-type: none"> <li>• Tenmarks</li> <li>• Classroom Presentation component</li> <li>• Worksheets</li> <li>• UDL</li> <li>• Versatiles</li> </ul>	<ul style="list-style-type: none"> <li>• Absolute value</li> <li>• Additive inverse</li> <li>• Coordinate</li> <li>• Inductive reasoning</li> <li>• Inequality</li> <li>• Integer</li> <li>• Negative number</li> <li>• Opposites</li> <li>• Positive number</li> <li>• Quadrant</li> <li>• Zero pair</li> </ul>

# ROCHELLE PARK SCHOOL DISTRICT



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>	<p><b>Science:</b> Track the temperature of a given city over the period of five days. Identify the change in temperature between each day and the overall change at the end of the fifth day. Find the mean temperature over the five days.</p> <p><b>Literature:</b> Use the internet to research a particular stock and track it for a 10 day period. Explain the meaning of the positive and/or negative stock numbers as you track it.</p>

# ROCHELLE PARK SCHOOL DISTRICT



<b>Grade:</b> Seventh Pre-Algebra		<b>Content:</b> Mathematics	
<b>Domain:</b> Rational Numbers and Exponents		<b>Topic:</b> Operations with Rational Numbers	<b>Time Frame:</b> 10 days
<b>Standards:</b> 7.NS.A.1, 1d                      7.EE.B.3 7.NS.A.2, 2a, 2c, 2d        8.NS.A.1 7.NS.A.3		<b>Focus Mathematical Practices:</b> MP.1, MP.3, MP.4, MP.5, MP.6, MP.7	<b>PARCC Model Content Framework:</b> Major Content: NS.A.1, NS.A.2, NS.A.3, EE.B.3 Supporting Content: 8.NS.A.1 Additional Content: n/a

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>• How do you compare and order fractions and decimals?</li> <li>• Why is the estimate of the product <math>3 \frac{3}{5} \times 4 \frac{2}{3}</math> different from the actual product?</li> <li>• For a positive number <math>n</math>, why is <math>n \div \frac{1}{2} &gt; n</math>?</li> <li>• What types of problems might be solved by adding or subtracting fractions?</li> <li>• If you use 24 instead of 12 as a common denominator when finding <math>2 \frac{3}{4} - 5 \frac{5}{6}</math>, will you get the correct answer?</li> </ul>	<ul style="list-style-type: none"> <li>• Perform operations with rational numbers.</li> <li>• Convert decimals to fractions and fractions to decimals.</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 fractions as terminating or repeating decimals. (1)</li> <li>• Compare fractions and decimals. (1)</li> <li>• Write rational numbers as fractions. (2)</li> <li>• Identify and classify rational numbers. (2)</li> <li>• Multiply positive and negative fractions. (3)</li> <li>• Evaluate algebraic expressions with fractions. (3)</li> <li>• Divide positive and negative fractions using multiplicative inverses. (4)</li> <li>• Divide algebraic fractions. (4)</li> <li>• Add and subtract rational numbers with common denominators. (5)</li> <li>• Add and subtract unlike fractions. (6)</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>• Multiply and divide signed numbers, including rational numbers, and interpret the products and quotients using real-world contexts.</li> <li>• Convert a rational number to a decimal using long division and explain why the decimal is either a terminating or repeating decimal.</li> <li>• Represent a rational number with its decimal expansion, showing that it eventually repeats, and convert such decimal expansions into rational numbers.</li> </ul>

# ROCHELLE PARK SCHOOL DISTRICT



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> </ul>	<ul style="list-style-type: none"> <li>• Tenmarks</li> <li>• Classroom Presentation component</li> <li>• Worksheets</li> <li>• UDL</li> <li>• Versatiles</li> </ul>	<ul style="list-style-type: none"> <li>• Bar notation</li> <li>• Like fractions</li> <li>• Multiplicative inverse</li> <li>• Rational number</li> <li>• Reciprocal</li> <li>• Repeating decimal</li> <li>• Terminating decimal</li> <li>• Unlike fractions</li> </ul>
Differentiated Instruction		Interdisciplinary Connections
RTI/ELL	Enrichment	<p><b>Social Studies:</b> <math>\frac{2}{3}</math> of the earth's surface is made up of oceans. Work in a group to research the five major oceans. Create a table that shows what fraction each ocean occupies of the total <math>\frac{2}{3}</math>s.</p> <p><b>Science:</b> Research the average length of five different insects. Compare and order their lengths. What is the difference in length between the smallest and largest insect?</p>
<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>	

# ROCHELLE PARK SCHOOL DISTRICT



<b>Grade:</b> Seventh Pre-Algebra		<b>Content:</b> Mathematics
<b>Domain:</b> Rational Numbers and Exponents	<b>Topic:</b> Powers and Roots	<b>Time Frame:</b> 11 days
<b>Standards:</b> 8.NS.A.1 8.NS.A.2 8.EE.A.1 8.EE.A.2 8.EE.A.3 8.EE.A.4	<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 Content: EE.A.1, EE.A.2, EE.A.3, EE.A.4 Supporting Content: NS.A.1, N.A.2 Additional Content: n/a

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>• What are some advantages to using exponents to represent numeric values?</li> <li>• What is the difference between the expressions <math>(-3)^4</math> and <math>3^{-4}</math>?</li> <li>• How can you use division of powers to divide large numbers?</li> <li>• Why is the conclusion that <math>7.8 \times 10^3</math> is greater than <math>6.5 \times 10^2</math> because <math>7.8 &gt; 6.5</math> incorrect?</li> <li>• How does writing numbers in different ways help to make it easier to compute with very large or very small numbers?</li> <li>• When finding square roots of numbers that are not perfect squares, what is the difference between an exact value and an approximation?</li> <li>• What is the relationship between the area of a square and the lengths of its sides?</li> </ul>	<ul style="list-style-type: none"> <li>• Convert between scientific notation and standard form.</li> <li>• Perform operations using scientific notation.</li> <li>• Understand and apply the powers of exponents and calculate square and cube roots.</li> </ul>

# ROCHELLE PARK SCHOOL DISTRICT



Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Write and evaluate expressions containing exponents. (1)</li> <li>• Write expressions using negative exponents. (2)</li> <li>• Evaluate numerical expressions containing negative exponents. (2)</li> <li>• Multiply and divide monomials. (3)</li> <li>• Express numbers in standard form and in scientific notation. (4)</li> <li>• Compare and order numbers written in scientific notation. (4)</li> <li>• Add, subtract, multiply and divide numbers in scientific notation. (5)</li> <li>• Find square roots and cube roots. (6)</li> <li>• Identify and compare numbers in the real number system. (7)</li> <li>• Solve equations by finding square roots or cube roots. (7)</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>• Use rational numbers to approximate irrational numbers, locate irrational numbers on a number line, and estimate the value of expressions containing irrational numbers.</li> <li>• Estimate and express the values of very large or very small numbers with numbers expressed in the form of a single digit times an integer power of 10.</li> <li>• Perform operations using numbers expressed in scientific notation, including problems where both decimals and scientific notation are used.</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> </ul>	<ul style="list-style-type: none"> <li>• Tenmarks</li> <li>• Classroom Presentation component</li> <li>• Worksheets</li> <li>• UDL</li> <li>• Versatiles</li> </ul>	<ul style="list-style-type: none"> <li>• Base</li> <li>• Cube root</li> <li>• Exponent</li> <li>• Irrational number</li> <li>• Monomial</li> <li>• Negative exponent</li> <li>• Perfect cube, Perfect square</li> <li>• Power</li> <li>• Radical sign</li> <li>• Real number</li> <li>• Scientific notation</li> <li>• Square root</li> <li>• Standard form</li> </ul>

# ROCHELLE PARK SCHOOL DISTRICT



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:</b> Research the population of three different countries. Express the population number in standard and scientific notation. Using scientific notation, add the population of the three countries. How many times larger is the biggest country compared to the smallest country?</li><li>• <b>Science:</b> Bacteria can double every two hours. Find the number of bacteria over a 24 hour period expressed in scientific notation.</li></ul>



# ROCHELLE PARK SCHOOL DISTRICT



<b>Grade:</b> Seventh Pre-Algebra		<b>Content:</b> Mathematics	
<b>Domain:</b> Proportionality and Linear Relationships		<b>Topic:</b> Ratio, Proportion, and Similar Figures	<b>Time Frame:</b> 14 days
<b>Standards:</b> 7.RP.A.1 7.RP.A.2, 2a, 2b, 2c, 2d 7.RP.A.3 7.NS.A.3 7.G.A.1 8.EE.B.5		<b>Focus Mathematical Practices:</b> MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7	<b>PARCC Model Content Framework:</b> Major Content: RP.A.1, RP.A.2, RP.A.3, NS.A.3, 8.EE.B.5 Supporting Content: n/a Additional Content: n/a

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>• How do you write a ratio as a fraction in simplest form?</li> <li>• Why is a horse that runs <math>\frac{3}{4}</math> mile in 1 minute and 9 seconds considered to be faster than a sprinter who runs a 100-yard dash in 12 seconds?</li> <li>• How can complex fractions be used to solve problems involving ratios?</li> <li>• How would you convert 10 miles per hour to meters per second?</li> <li>• How do you determine whether or not a relationship is proportional?</li> <li>• How can you visually determine whether or not a graph represents a proportional relationship?</li> <li>• Is it easier to use cross products or the constant of proportionality to solve a proportion?</li> <li>• How are <i>scale</i> and <i>scale factor</i> alike and how are they different?</li> <li>• How can you determine whether or not two figures are similar?</li> <li>• What is a real-world example of when you might need to use indirect measurement, and how would you solve the problem?</li> </ul>	<ul style="list-style-type: none"> <li>• Utilize proportional relationships to solve real word problems.</li> <li>• Calculate rates and unit rates.</li> <li>• Distinguish between proportional and nonproportional relationships.</li> <li>• Convert between different units of measure.</li> </ul>

# ROCHELLE PARK SCHOOL DISTRICT



Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"><li>• Write ratios as fractions in simplest form. (1)</li><li>• Simplify ratios involving measurements. (1)</li><li>• Find unit rates. (2)</li><li>• Compare and use unit rates to solve problems. (2)</li><li>• Simplify complex fractions. (3)</li><li>• Find unit rates. (3)</li><li>• Convert rates using dimensional analysis. (4)</li><li>• Convert between systems of measurement. (4)</li><li>• Identify proportional and non-proportional relationships in tables. (5)</li><li>• Describe a proportional relationship using an equation. (5)</li><li>• Identify proportional relationships. (6)</li><li>• Analyze proportional relationships. (6)</li><li>• Use cross products to solve proportions. (7)</li><li>• Use the constant of proportionality to solve proportions. (7)</li><li>• Use scale drawings. (8)</li><li>• Construct scale drawings. (8)</li><li>• Find missing measures of similar figures. (9)</li><li>• Use scale factors to solve problems. (9)</li><li>• Solve problems involving indirect measurement using shadow reckoning. (10)</li><li>• Solve problems using surveying methods. (10)</li></ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"><li>• Calculate and interpret unit rates of various quantities involving ratios of fractions that contain like and different units.</li><li>• Determine if a proportional relationship exists between two quantities.</li><li>• Identify the constant of proportionality from tables, graphs, equations, diagrams, and verbal descriptions.</li><li>• Write equations to model proportional relationships in real-world problems.</li><li>• Use the graph of a proportional relationship to interpret the meaning of any point on the graph in terms of the situation.</li><li>• Solve multi-step ratios and percent problems using proportional relationships.</li><li>• Use ratio and proportion to solve problems involving scale drawings of geometric figures.</li><li>• Graph proportional relationships, interpreting slope as a unit rate, and compare two proportional relationships, each represented in different ways.</li></ul>

# ROCHELLE PARK SCHOOL DISTRICT



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> </ul>	<ul style="list-style-type: none"> <li>• Tenmarks</li> <li>• Classroom Presentation component</li> <li>• Worksheets</li> <li>• UDL</li> <li>• Versatiles</li> </ul>	<ul style="list-style-type: none"> <li>• Complex fraction</li> <li>• Congruent</li> <li>• Constant of proportionality</li> <li>• Corresponding parts</li> <li>• Cross products</li> <li>• Dimensional analysis</li> <li>• Indirect measurement</li> <li>• Non-proportional</li> <li>• Proportion, Proportional</li> <li>• Rate, Unit rate</li> <li>• Ratio</li> <li>• Scale</li> <li>• Scale drawing</li> <li>• Scale factor</li> <li>• Scale model</li> <li>• Similar figures</li> </ul>
Differentiated Instruction		Interdisciplinary Connections
RTI/ELL	Enrichment	<p><b>Literature:</b> Research qualifying times for a particular NASCAR race. Use this unit rate to explain and determine if it could predict the actual race time results.</p> <p><b>Science:</b> Have students record their individual pulse for 30 seconds. Use proportions to calculate pulse over a variety of different extended periods of time.</p>
<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>	

# ROCHELLE PARK SCHOOL DISTRICT



<b>Grade:</b> Seventh Pre-Algebra		<b>Content:</b> Mathematics	
<b>Domain:</b> Proportionality and Linear Relationships	<b>Topic:</b> Percents		<b>Time Frame:</b> 12 days
<b>Standards:</b> 7.RP.A.2a, 2c 7.RP.A.3 7.EE.A.2 7.EE.B.3	<b>Focus Mathematical Practices:</b> MP.1, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8		<b>PARCC Model Content Framework:</b> Major Content: RP.A.2, RP.A.3, EE.A.2, EE.B.3 Supporting Content: n/a Additional Content: n/a

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>• Is it reasonable to say 125% of 47 is 5.9? Why?</li> <li>• What are two different ways you could find 20% of 60 mentally?</li> <li>• What are two different expressions you could use to find the total cost of an item with a price of \$y if the sales tax is 8%?</li> <li>• How can I find the percent error in a given situation?</li> <li>• What is an example and solution of a real-world problem involving discount?</li> <li>• How does compound interest compare to simple interest?</li> </ul>	<ul style="list-style-type: none"> <li>• Calculate rates and unit rates.</li> <li>• Distinguish between proportional and non-proportional relationships.</li> </ul>

# ROCHELLE PARK SCHOOL DISTRICT



Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Use the percent proportion to solve problems. (1)</li> <li>• Apply the percent proportion to real-world problems. (1)</li> <li>• Compute mentally with percent. (2)</li> <li>• Estimate with percent. (2)</li> <li>• Solve percent problems using percent equations. (3)</li> <li>• Solve real-world problems involving taxes. (3)</li> <li>• Find percent of increase and decrease. (4)</li> <li>• Find percent error. (4)</li> <li>• Solve real-world problems involving markup. (5)</li> <li>• Solve real-world problems involving discount. (5)</li> <li>• Solve simple interest problems and apply the simple interest equation to real-world problems. (6)</li> <li>• Solve compound interest problems. (6)</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>• Rewrite algebraic expressions in equivalent forms to highlight how the quantities in it are related.</li> <li>• Solve multi-step real life and mathematical problems with rational numbers in any form by applying properties of operations and converting rational numbers between forms as needed.</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> </ul>	<ul style="list-style-type: none"> <li>• Tenmarks</li> <li>• Classroom Presentation component</li> <li>• Worksheets</li> <li>• UDL</li> <li>• Versatiles</li> </ul>	<ul style="list-style-type: none"> <li>• Discount, Markup</li> <li>• Interest, Compound Interest, Simple Interest</li> <li>• Percent equation</li> <li>• Percent error</li> <li>• Percent of change</li> <li>• Percent of decrease, Percent of increase</li> <li>• Percent proportion</li> <li>• Principal</li> <li>• Selling price</li> </ul>

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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>	<p><b>Literature Connection:</b> Read page 81 of the novel <i>Animal Farm</i>. Look on line for a food item that is on sale for a certain percentage off its original price. Calculate and describe the discount. Explain if the discount is a good deal or not.</p> <p><b>Social Studies:</b> Using <a href="http://www.census.gov">www.census.gov</a>, find the data from the Census of two different decades. Calculate the percent change in any five given categories.</p>

# ROCHELLE PARK SCHOOL DISTRICT



<b>Grade:</b> Seventh Pre-Algebra		<b>Content:</b> Mathematics
<b>Domain:</b> Proportionality and Linear Relationships	<b>Topic:</b> Algebraic Expressions	<b>Time Frame:</b> 10 days
<b>Standards:</b> 7.NS.A.2 7.NS.A.2c 7.EE.A.1 7.EE.A.2	<b>Focus Mathematical Practices:</b> MP.1, MP.2, MP.3, MP.4, MP.5, MP.7	<b>PARCC Model Content Framework:</b> Major Content: 7.NS.A.2, 7.EE.A.1, 7.EE.A.2 Supporting Content: n/a Additional Content: n/a

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>• How can you use the Distributive Property and mental math to simplify <math>2\frac{1}{2} \times 4\frac{1}{2}</math>?</li> <li>• What error was made when <math>4x - 2(x + 5)</math> was simplified to <math>2x + 10</math>?</li> <li>• Without using numbers, how do you add linear expressions?</li> <li>• How can you use the rule for subtracting integers to subtract linear expressions?</li> <li>• How can I use the term <i>Distributive Property</i> to explain how the GCF is used to factor an expression?</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and utilize mathematical properties to simplify and rewrite algebraic expressions.</li> <li>• Combine like terms to simplify algebraic expressions.</li> <li>• Factor expressions.</li> </ul>

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Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Use the Distributive Property to write equivalent numerical expressions. (1)</li> <li>• Use the Distributive Property to write equivalent algebraic expressions. (1)</li> <li>• Identify parts of an algebraic expression. (2)</li> <li>• Use the Distributive Property to simplify algebraic expressions. (2)</li> <li>• Add linear expressions. (3)</li> <li>• Find perimeter by adding linear expressions. (3)</li> <li>• Subtract linear expressions. (4)</li> <li>• Solve real-world problems by subtracting linear expressions. (4)</li> <li>• Find the greatest common factor of two monomials. (5)</li> <li>• Use properties to factor linear expressions. (5)</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>• Apply the properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.</li> <li>• Rewrite algebraic expressions in equivalent forms to highlight how the quantities in it are related.</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> </ul>	<ul style="list-style-type: none"> <li>• Tenmarks</li> <li>• Classroom Presentation component</li> <li>• Worksheets</li> <li>• UDL</li> <li>• Versatiles</li> </ul>	<ul style="list-style-type: none"> <li>• Coefficient</li> <li>• Constant</li> <li>• Distributive property</li> <li>• Equivalent expressions</li> <li>• Factor</li> <li>• Factored form</li> <li>• Like terms</li> <li>• Linear expression</li> <li>• Simplest form</li> <li>• Simplifying the expression</li> <li>• Term</li> </ul>



# ROCHELLE PARK SCHOOL DISTRICT



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>21<sup>st</sup> Century Career:</b> Read pages 309, 309a about an engineer designing a roller coaster. Answer the questions for "A Thrilling Ride."</li><li>• <b>Social Studies:</b> Research a travel destination you would like to visit. Plan a trip with several variables including: Number of people, Activities and Excursions, and Meal plans. Calculate the cost of various scenarios.</li></ul>

# ROCHELLE PARK SCHOOL DISTRICT



<b>Grade:</b> Seventh Pre-Algebra		<b>Content:</b> Mathematics
<b>Domain:</b> Proportionality and Linear Relationships	<b>Topic:</b> Equations and Inequalities	<b>Time Frame:</b> 14 days
<b>Standards:</b> 7.EE.B.4, 4b, 4c 8.EE.C.7, 7a 7b	<b>Focus Mathematical Practices:</b> MP.1, MP.2, MP.3, MP.4, MP.5, MP.7	<b>PARCC Model Content Framework:</b> Major Content: 7.EE.B.4, 8.EE.C.7 Supporting Content: n/a Additional Content: n/a

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>• If your friend says he can solve <math>3x = 15</math> by using the Multiplication Property of Equality, is he correct?</li> <li>• When you evaluate <math>3(2) + 5</math> and then solve the equation <math>3x + 5 = 11</math>, how are the problems and solutions similar and how are they different?</li> <li>• How are two-step equations used to represent real-world problems?</li> <li>• How can I decide whether to use the Distributive Property or the Division Property of Equality as the first step when I solve an equation of the form <math>p(x + q) = r</math>?</li> <li>• How can I write a real-world problem that could be solved by using the equation <math>54 + 3.5x = 8x</math>, then solve the equation and interpret the solution?</li> <li>• How can I explain how to tell the difference between graphing an inequality with a closed circle and one with an open circle?</li> <li>• How do I explain how to solve inequalities that involve multiplication and division?</li> <li>• How can I determine if an equation has no solution, one solution, or if all numbers are solutions?</li> </ul>	<ul style="list-style-type: none"> <li>• Properly solve multi-step equations/inequalities using the equality properties.</li> <li>• Know when to reverse the inequality symbol when solving inequalities.</li> <li>• Write and solve equations and/or inequalities that represent a real-world situation.</li> </ul>

# ROCHELLE PARK SCHOOL DISTRICT



Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Solve equations by using the Division Property of Equality. (1)</li> <li>• Solve equations by using the Multiplication Property of Equality. (1)</li> <li>• Solve and write two-step equations. (2), (3)</li> <li>• Solve real-world problems involving two-step equations. (2)</li> <li>• Solve verbal problems by writing and solving two-step equations. (3)</li> <li>• Solve equations of the form <math>p(x + q) = r</math>. (4)</li> <li>• Solve verbal problems by writing and solving equations of the form <math>p(x + q) = r</math>. (4)</li> <li>• Solve equations with variables on each side. (5)</li> <li>• Write inequalities and graph inequalities on a number line. (6)</li> <li>• Solve inequalities by using the Addition and Subtraction Properties of Inequality. (7)</li> <li>• Solve inequalities by multiplying or dividing by a positive or negative number. (7)</li> <li>• Solve multi-step equations and inequalities. (8)</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>• Use variables to represent quantities in a real-world or mathematical problem by constructing simple equations and inequalities to represent problems.</li> <li>• Fluently solve equations; solve inequalities, graph the solution set of the inequality and interpret the solutions in the context of the problem.</li> <li>• Apply the distributive property and collect like terms to solve linear equations in one variable that contain rational numbers as coefficients.</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> </ul>	<ul style="list-style-type: none"> <li>• Tenmarks</li> <li>• Classroom Presentation component</li> <li>• Worksheets</li> <li>• UDL</li> <li>• Versatiles</li> </ul>	<ul style="list-style-type: none"> <li>• Empty set</li> <li>• Equivalent equations</li> <li>• Inverse operations</li> <li>• Identity</li> <li>• Null set</li> <li>• Solution</li> </ul>

# ROCHELLE PARK SCHOOL DISTRICT



		<ul style="list-style-type: none"> <li>Two-step equation</li> </ul>
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>	<p><b>Literature Connection:</b> Read the graphic novel <i>Cell Phone Surprise</i>. (Pg. 11 Real World Connection 2) Answer “Practice on Your Own” questions on pg. 12.</p> <p><b>Science:</b> Use the triple-beam balance to represent inequalities. Use cups (filled with an unknown number of counters) and counters to create inequality scenarios. Solve for the unknown.</p>

# ROCHELLE PARK SCHOOL DISTRICT



<b>Grade:</b> Seventh Pre-Algebra		<b>Content:</b> Mathematics
<b>Domain:</b> Proportionality and Linear Relationships	<b>Topic:</b> Linear Functions	<b>Time Frame:</b> 12 days
<b>Standards:</b> 7.RP.A.2, 2a, 2b, 2d 7.EE.B.4 8.EE.B.5 8.EE.B.6 8.EE.C.8 8.EE.C.8a, 8b, 8c	<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 Content: RP.A.2, EE.B.4, 8.EE.B.5, 8.EE.B.6, 8.33.C.8 Supporting Content: n/a Additional Content: n/a

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>• How can the relationship between water depth and time to ascend to the water's surface be a function? How are the two variables related, and can water depth ever correspond to two different times?</li> <li>• Why does a linear function have infinitely many solutions and which representations shows all the solutions of a linear function: a table, a graph, or an equation?</li> <li>• Is the statement "A linear relationship that has a constant rate of change is a proportional relationship." always, sometimes, or never true?</li> <li>• What steps would you take to determine whether or not an equation has a constant of variation?</li> <li>• What steps do you follow to graph an equation using the slope and y-intercept?</li> <li>• What are the three ways that two lines can be related?</li> <li>• How can you describe a system of equations in two variables that has infinitely many solutions, both graphically and algebraically?</li> </ul>	<ul style="list-style-type: none"> <li>• Calculate constant rate of change/slope.</li> <li>• Calculate direct variation.</li> <li>• Solve systems of equations by graphing or algebraically.</li> </ul>

# ROCHELLE PARK SCHOOL DISTRICT



Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Determine whether a relation is a function. (1)</li> <li>• Write a function using function notation. (1)</li> <li>• Solve linear functions with two variables. (2)</li> <li>• Graph linear functions using ordered pairs. (2)</li> <li>• Find the constant rate of change for a linear relationship. (3)</li> <li>• Find the slope of a line. (3)</li> <li>• Identify direct variation. (4)</li> <li>• Use direct variation to solve problems. (4)</li> <li>• Determine slopes and y-intercepts of lines. (5)</li> <li>• Graph linear equations using the slope and y-intercept. (5)</li> <li>• Solve systems of linear equations by graphing. (6)</li> <li>• Determine the number of solutions of a system of linear equations. (6)</li> <li>• Solve a system of equations algebraically. (7)</li> <li>• Interpret the meaning of the solutions of a system of equations. (7)</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>• Graph proportional relationships, interpreting slope as unit rate, and compare two proportional relationships, each represented in different ways.</li> <li>• Derive the equation of a line and use similar triangles to explain why the slope is the same between any two points on a non-vertical line in the coordinate plane.</li> <li>• Solve systems of linear equations in two variables algebraically and by inspection. Estimate solutions by graphing explain that points of intersection satisfy both equations simultaneously, and interpret solutions in 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> </ul>	<ul style="list-style-type: none"> <li>• Tenmarks</li> <li>• Classroom Presentation component</li> <li>• Worksheets</li> <li>• UDL</li> <li>• Versatiles</li> </ul>	Constant of variation, Constant rate of change, Direct variation, Function, Function notation, Function rule, Function table, Dependent variable, Independent variable, Linear equation, Linear relationship, Rate of change, Slope, Slope-intercept form, Substitution, System of equations, Vertical line test, X-intercept, Y-intercept

# ROCHELLE PARK SCHOOL DISTRICT



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>	<p><b>Literature:</b> Read the graphic novel, <u>The Outliers 3</u>, pgs. 15-18. Create a table and write a function based on the reading.</p> <p><b>Social Studies:</b> Research two different ski resorts to find the steepness of their different ski runs. Compare courses and slopes.</p>

# ROCHELLE PARK SCHOOL DISTRICT



<b>Grade:</b> Seventh Pre-Algebra		<b>Content:</b> Mathematics	
<b>Domain:</b> Introduction to Sampling and Inference		<b>Topic:</b> Statistics and Probability	<b>Time Frame:</b> 15 days
<b>Standards:</b> 7.SP.A.1            7.SP.C.6 7.SP.A.2            7.SP.C.7, 7a, 7b 7.SP.B.3            7.SP.C.8, 8a, 8b, 8c 7.SP.B.4 7.SP.C.5		<b>Focus Mathematical Practices:</b> MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7	<b>PARCC Model Content Framework:</b> Major Content: n/a Supporting Content: SP.A.1, SP.A.2, SP.C.5, SP.C.6, SP.C.7, SP.C.8 Additional Content: SP.B.3, SP.B.4

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>Using the Internet to find some real-world data, which measure of center best represents the data you found, and what is the measure of center?</li> <li>How do outliers affect the calculation of measures of variability in a data set?</li> <li>Why might the mean absolute deviation be useful when considering two real-world distributions with the same mean and median?</li> <li>If Marcia recorded the daily temperatures for two cities for 30 days, which city can you more accurately predict the daily temperature if the two populations have similar centers, but City A has a greater variability than City B?</li> <li>Why is sampling an important part of the manufacturing process, and how can you illustrate your answer with an unbiased and a biased sampling method you can use to check the quality of DVDs?</li> <li>How do you find the probability of an event by first calculating the probability of the complement of the event?</li> <li>How can I compare and contrast the theoretical and experimental probabilities in a real-world problem involving choosing socks from a drawer?</li> </ul>	<ul style="list-style-type: none"> <li>Determine how data is collected, organized and displayed.</li> <li>Analyze the results of a statistical investigation and how they can be used to refute or support an argument.</li> <li>Predict the probability of an event's occurrence.</li> <li>Calculate measures of center and variability.</li> </ul>



# ROCHELLE PARK SCHOOL DISTRICT



<ul style="list-style-type: none"> <li>• How might a tree diagram be more useful than the Fundamental Counting Principle when finding probability?</li> </ul>	
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Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Use the mean, median, and mode as measures of center. (1)</li> <li>• Choose an appropriate measure of center and recognize measures of statistics. (1)</li> <li>• Find measures of variability. (2)</li> <li>• Use measures of variability to interpret and analyze data. (2)</li> <li>• Find the mean absolute deviation of a set of data. (3)</li> <li>• Compare the mean absolute deviation for two data sets. (3)</li> <li>• Compare two populations using the measures of center and variability. (4)</li> <li>• Compare two populations when only one is symmetric. (4)</li> <li>• Identify various sampling techniques. (5)</li> <li>• Determine the validity of a sample and predict the actions of a larger group. (5)</li> <li>• Find the probability of simple events. (6)</li> <li>• Find the probability of the complement of an event. (6)</li> <li>• Find and compare experimental and theoretical probabilities. (7)</li> <li>• Predict the actions of a larger group. (7)</li> <li>• Find the number of outcomes for an even. (8)</li> <li>• Find the probability of a compound event. (8)</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>• Distinguish between representative and non-representative samples of a population.</li> <li>• Use random sampling to produce a representative sample.</li> <li>• Develop inferences about a population using data from a random sample and assess the variation in estimates after generating multiple samples of the same size.</li> <li>• Visually compare the means of two distributions that have similar variability; express the difference between the centers as a multiple of a measure of variability.</li> <li>• Draw informal comparative inferences about two populations using their measures of center and measures of variability.</li> <li>• Interpret and express the likelihood of a chance event as a number between 0 and 1, relating that the probability of an unlikely event happening is near 0, a likely event is near 1, and <math>\frac{1}{2}</math> is neither likely nor unlikely.</li> <li>• Approximate the probability of a chance event by collecting data and observing long-run relative frequency; predict the approximate relative frequency given the probability.</li> <li>• Develop a uniform probability model by assigning equal probability to all outcomes.</li> <li>• Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams, identifying the outcomes in the sample space, which compose the event.</li> <li>• Design and use a simulation to generate frequencies for compound events.</li> </ul>

# ROCHELLE PARK SCHOOL DISTRICT



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> </ul>	<ul style="list-style-type: none"> <li>• Tenmarks</li> <li>• Classroom Presentation component</li> <li>• Worksheets</li> <li>• UDL</li> <li>• Versatiles</li> </ul>	<p>Biased sample, Box plot, Complement, Compound event, Convenience sample, Distribution, Double box plot, Experimental probability, First quartile, Fundamental Counting Principle, Interquartile range, Mean absolute deviation, Measures of center, Measures of variability, Outcome, Outliers, Population, Probability, Quartiles, Random, Range, Relative frequency, Sample, Sample space, Simple event, Simple random sample, Simulation, Statistics, Stratified random sample, Systematic random sample, Theoretical probability, Third quartile, Tree diagram, Unbiased sample, Uniform probability model, Visual overlap, Voluntary response sample</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>	<p><b>Physical Education:</b> Have two stations set up in the gym. (Shooting a basket and kicking a goal.) Calculate the theoretical probability of shooting a basket and scoring a goal. Have each student complete the two activities and record the results. Calculate the experimental probability and then compare both probabilities.</p> <p><b>Science:</b> Using a Punnett Square, calculate the probabilities of eye color using different parent phenotypes/genotypes.</p>

# ROCHELLE PARK SCHOOL DISTRICT



<b>Grade:</b> Seventh Pre-Algebra		<b>Content:</b> Mathematics	
<b>Domain:</b> Creating, Comparing, and Analyzing Geometric Figures		<b>Topic:</b> Congruence, Similarity, and Transformations	<b>Time Frame:</b> 14 days
<b>Standards:</b> 7.G.A.2 7.G.B.5 8.G.A.1, 1a, 1b, 1c 8.G.A.2 8.G.A.3		<b>Focus Mathematical Practices:</b> MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7	<b>PARCC Model Content Framework:</b> Major Content: 8.G.A.1, 8.G.A.2, 8.G.A.3, 8.G.A.4, 8.G.A.5 Supporting Content: n/a Additional Content: G.A.2, G.B.5

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>Suppose two parallel lines are cut by a transversal and an exterior angle measures <math>90^\circ</math>. What can you conclude about the measures of the other seven angles that are formed?</li> <li>Why does every triangle have at least two acute angles?</li> <li>What is the difference between a regular polygon and an irregular polygon, and how can I find the measure of an interior angle of a regular polygon?</li> <li>A figure is translated by <math>(2, -3)</math> and then the image is translated by <math>(-2, 3)</math>. How can I describe the final position of the figure without graphing?</li> <li>What are the similarities and differences between reflections and rotations?</li> <li>Why do rotations, reflections, and translations create congruent images?</li> <li>A triangle has one vertex at point <math>(3, 6)</math>, is dilated with a center at the origin by a scale factor of 3, and then the resulting image is dilated with a scale factor of <math>1/3</math>. What are the coordinates of that vertex?</li> <li>What is the difference between using transformations to create similar and congruent figures?</li> </ul>	<ul style="list-style-type: none"> <li>Use transformations and dilations to find an image.</li> <li>Find and calculate various angle measurements using angle relationships.</li> <li>Classify triangles by their interior angles and sides.</li> </ul>

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Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"><li>• Examine relationships between pairs of angles. (1)</li><li>• Examine relationships of angles formed by parallel lines and a transversal. (1)</li><li>• Find the missing angle measure of a triangle. (2)</li><li>• Classify a triangle by its angles and by its sides. (2)</li><li>• Classify polygons. (3)</li><li>• Determine the sum of the measures of the interior angles of a polygon. (3)</li><li>• Define and identify transformations. (4)</li><li>• Draw translations and reflections on a coordinate plane. (4)</li><li>• Define, identify, and draw rotations. (5)</li><li>• Determine if a figure has rotational symmetry. (5)</li><li>• Identify congruency by using transformations. (6)</li><li>• Identify transformations. (6)</li><li>• Graph dilations on a coordinate plane. (7)</li><li>• Find the scale factor of a dilation. (7)</li><li>• Use a series of transformations to identify similar figures. (8)</li><li>• Use a scale factor to create similar figures. (8)</li></ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"><li>• Use free-hand, mechanical and technological tools to draw geometric shapes with given conditions focusing on constructing triangles.</li><li>• Explain and model the properties of rotations, reflections, and translations with physical representations and/or geometry software using pre-images and resultant images of lines, line segments, and angles.</li><li>• Describe and perform a sequence of rotations, reflections, and/or translations on a two dimensional figure in order to prove that two figures are congruent.</li><li>• Use the coordinate plane to locate images or pre-images of twodimensional figures and determine the coordinates of a resultant image after applying dilations, rotations, reflections, and translations.</li><li>• Apply an effective sequence of transformations to determine that figures are similar when corresponding angles are congruent and corresponding sides are proportional.</li><li>• Give informal arguments to justify facts about the exterior angles of a triangle the sum of the measures of the interior angles of a triangle, the angle-angle relationship used to determine the similar triangles, and the angles created when parallel lines are cut by a transversel.</li></ul>

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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> </ul>	<ul style="list-style-type: none"> <li>• Tenmarks</li> <li>• Classroom Presentation component</li> <li>• Worksheets</li> <li>• UDL</li> <li>• Versatiles</li> </ul>	<p>Adjacent angles, Alternate exterior angles, Alternate interior angles, Center of rotation, Complementary angles, Congruent, Corresponding angles, Diagonal, Dilation, Exterior angle, Image, Interior angle, Line of reflection, Line segment, Parallel lines, Perpendicular lines, Polygon, Reflection, Regular polygon, Rotation, Rotational symmetry, Supplementary angles, Tessellation, Transformation, Translation, Transversal, Triangle, Vertex, Vertical angles</p>
Differentiated Instruction		Interdisciplinary Connections
RTI/ELL	Enrichment	<p><b>Art:</b> Pick an object in the room and draw it twice to two different scales showing similarity.</p> <p><b>Social Studies:</b> Use the town map of Rochelle Park to identify angle and line relationships. See if you can identify different types of triangles formed and various polygons.</p>
<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>	

# ROCHELLE PARK SCHOOL DISTRICT



<b>Grade:</b> Seventh Pre-Algebra		<b>Content:</b> Mathematics
<b>Domain:</b> Creating, Comparing, and Analyzing Geometric Figures	<b>Topic:</b> Volume and Surface Area	<b>Time Frame:</b> 17 days
<b>Standards:</b> 7.G.A.3 7.G.B.4 7.G.B.6 8.G.C.9	<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 Content: n/a Supporting Content: n/a Additional Content: G.A.3, G.B.4, G.B.6, 8.G.C.9

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>• How can I describe the relationship between the circumference and radius of a circle and how one is affected by an increase or decrease in the other?</li> <li>• How can I find the area of a circle given the radius, diameter, or circumference?</li> <li>• How can circles and polygons help me find the area of a composite figure?</li> <li>• Are cylinders polyhedrons?</li> <li>• How does doubling the length, width, and height of a box change the volume of the box?</li> <li>• How is the formula for the volume of a cylinder similar to the formula for the volume of a rectangular prism?</li> <li>• Given the dimensions of a cylinder, what are the dimensions of a cone with the same volume?</li> <li>• What is the difference between surface area and volume?</li> <li>• If a cube and half a cylinder have equal volumes, how do their surface areas compare?</li> <li>• How can I find the surface area of a cone if I am given the diameter and slant height of the cone?</li> </ul>	<ul style="list-style-type: none"> <li>• Calculate the circumference and area of a circle.</li> <li>• Calculate the area of composite figures by decomposing into known polygons.</li> <li>• Find the volume and surface area of three-dimensional figures.</li> </ul>

# ROCHELLE PARK SCHOOL DISTRICT



Skills	NJDOE Model Curriculum (Student Learning Objectives)
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Find the circumference of circles. (1)</li> <li>• Solve problems involving circumference. (1)</li> <li>• Find areas of circles. (2)</li> <li>• Use areas of circles to solve problems. (2)</li> <li>• Find the area of composite figures. (3)</li> <li>• Solve problems involving the area of composite figures. (3)</li> <li>• Identify three-dimensional figures. (4)</li> <li>• Describe and draw vertical, horizontal, and angled cross sections of three-dimensional figures. (4)</li> <li>• Find volumes of prisms. (5)</li> <li>• Find volumes of composite figures. (5)</li> <li>• Find the volumes of circular cylinders. (6)</li> <li>• Find the volumes of composite figures involving circular cylinders. (6)</li> <li>• Find the volumes of pyramids and cones. (7)</li> <li>• Find the volumes of spheres. (7)</li> <li>• Find lateral area and surface area of prisms. (8)</li> <li>• Find surface area of real-world objects shaped like prisms. (8)</li> <li>• Find lateral and surface areas of cylinders. (9)</li> <li>• Compare surface areas of cylinders. (9)</li> <li>• Find lateral areas and surface areas of pyramids. (10)</li> <li>• Find lateral areas and surface areas of cones. (10)</li> </ul>	<p><b>Students will know how to:</b></p> <ul style="list-style-type: none"> <li>• Know the formulas for the area and circumference and use them to solve problems.</li> <li>• Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.</li> <li>• Describe all of the 2-dimensional figures that result when 3- dimensional figures are sliced from multiple angles.</li> <li>• Apply formulas to find the volume of a cone, cylinder, or a sphere when solving real-world and mathematical problems.</li> </ul>

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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> </ul>	<ul style="list-style-type: none"> <li>• Tenmarks</li> <li>• Classroom Presentation component</li> <li>• Worksheets</li> <li>• UDL</li> <li>• Versatiles</li> </ul>	<p>Bases, Center, Circle, Circumference, Composite figure, Cone, Cross section, Cylinder, Diameter, Edge, Face, Lateral area, Lateral faces, Pi, Plane, Polyhedron, Prism, Pyramid, Radius, Regular pyramid, Slant height, Solids, Sphere, Surface area, Vertex, Volume</p>
Differentiated Instruction		Interdisciplinary Connections
RTI/ELL	Enrichment	<p><b>Physical Education:</b> In the gym, students will measure dimensions of various equipment. Then they will calculate appropriate measures such as circumference, area, volume and surface area.</p> <p><b>Art:</b> Draw an abstract shape incorporating circles and polygons. Calculate the area of the finished figure.</p>
<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>	