Richmond Public Schools
Curriculum Framework
Algebra II

Strand: Statistics
AII.10   The student will represent and solve problems, including practical problems, involving inverse variation, joint variation, and a combination of direct and inverse variations.

Suggested Pacing
2 Class Periods

Spiraling Standards	

A.6-The student will
   a) determine the slope of a line when given an equation of the line, the graph of the line, or two points on the line;
   b) write the equation of a line when given the graph of the line, two points on the line, or the slope and a point on the line; and
   c) graph linear equations in two variables.
 	
A.8-The student, given a data set or practical situation, will analyze a relation to determine whether a direct or inverse variation exists, and represent a direct variation algebraically and graphically and an inverse variation algebraically.	

Essential Questions	Common Misconceptions
What is the difference between direct and inverse variation? What is joint variation? What is combined variation?	Students may confuse inverse and direct variation Students may miscalculate K Students may not correctly identify variations Students may not set up proportions properly

Understanding the Standard	Essential Knowledge and Skills

Vocabulary	Instructional Activities Organized by Learning Objective
- Practical problems can be represented and solved by using direct variation, inverse variation, joint variation, and a combination of direct and inverse variations. - A direct variation represents a proportional relationship between two quantities. The statement "*y* is directly proportional to *x*" is translated as $y = kx$. - The constant of proportionality (*k*) in a direct variation is represented by the ratio of the dependent variable to the independent variable and can be referred to as the constant of variation. - A direct variation can be represented by a line passing through the origin. - An inverse variation represents an inversely proportional relationship between two quantities. The statement "*y* is inversely proportional to *x*" is translated as $y = $. - The constant of proportionality (*k*) in an inverse variation is represented by the product of the dependent variable and the independent variable and can be referred to as the constant of variation. - The graph of an inverse variation is a rational function. - Joint variation is a combination of direct variations. The statement "*y* varies jointly as *x* and *z*" is translated as $y = kxz$. - The value of the constant of proportionality is typically positive when applied in practical situations.	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to** - Given a data set or practical situation, write the equation for an inverse variation. - Given a data set or practical situation, write the equation for a joint variation. - Solve problems, including practical problems, involving inverse variation, joint variation, and a combination of direct and inverse variations.

direct variation, inverse variation, joint variation, proportional, constant of proportion, ratio, dependent variable, independent variable, origin, product, quotient, rational function, equation	**Textbook** Algebra 2, ©2012, Price, et al, McGraw-Hill page(s) 586 - 592
Assessment	**Notes** Direct, Inverse, Joint Variations (Cliff Notes) Direct, Inverse, and Joint Variations (She Loves Math)
Common Assessment AII.10	**Resources** ● **Print** Coach book, Virginia edition, lesson 35 of chapter 4 VDOE Lesson Plan AII.10 ● **Technology-based** Direct and Inverse Variation (Study.com) **Station Activities** Teacher Made Activity
Cross-Curricular Connections	Tiered Differentiations
Science- Variations are used in determining relationships in science (density, speed, energy, etc.) **Finance**- Variations can be used to in calculations of expenses, costs, profit, pricing, etc.	**Tier 1**-Students will work practical problems involving variations **Tier 2**-Students will identify and solve variations based on equations **Tier 3**-Students will identify and solve variations based on tables