

Mathematical Models with Applications Curriculum Bundle #2

Title	Suggested Dates
Direct and Inverse Variation	September 14 – October 2 (14 Days)

Big Idea/Enduring Understanding	Guiding Questions
If two quantities are said to “vary directly” then the quantities change together – that is to say as one goes up or down, so does the other. If two quantities are said to “vary inversely” they change in opposite directions – that is to say that if one quantity increases the other will decrease and vice versa.	<ol style="list-style-type: none"> 1. How can you determine if a function varies directly or an inversely from equation form? From a graph? 2. How do you determine the domain and range of the graph of a function? 3. What are the similarities and differences between proportional relationships and direct variation relationships?

The resources included here provide teaching examples and/or meaningful learning experiences to address the District Curriculum. In order to address the TEKS to the proper depth and complexity, teachers are encouraged to use resources to the degree that they are congruent with the TEKS and research-based best practices. Teaching using only the suggested resources does not guarantee student mastery of all standards. Teachers must use professional judgment to select among these and/or other resources to teach the district curriculum.

Knowledge & Skills with Student Expectations	District Specificity/Examples	Suggested Resources (See note above)
PSAT sample problems intended for use as warm-ups starting on Sept 17th can be found in the campus shared folder called “PSAT Math Preparation 2009-10”		
M.1 The student uses a variety of strategies and approaches to solve both routine and nonroutine problems. M.1A compare and analyze various methods for solving a real-life problem	<ul style="list-style-type: none"> • Ongoing skill 	Pearson <u>Mathematical Models with Applications</u> Section 5.15 p. 618 - 624
M.1 The student uses a variety of strategies and approaches to solve both routine and nonroutine problems. M.1B use multiple approaches (algebraic, graphical, and geometric methods) to solve problems from a variety of disciplines;	<ul style="list-style-type: none"> • Use patterns to write equations 	Pearson <u>Mathematical Models with Applications</u> Section 5.15 p. 618 - 624
M.1 The student uses a variety of strategies and approaches to solve both routine and nonroutine problems. M.1C select a method to solve a problem, defend the method, and justify the reasonableness of the results.	<ul style="list-style-type: none"> • Ongoing skill 	Pearson <u>Mathematical Models with Applications</u> Section 5.15 p. 618 - 624

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<p>M.2 The student uses graphical and numerical techniques to study patterns and analyze data.</p> <p>M.2A interpret information from various graphs, including line graphs, bar graphs, circle graphs, histograms, scatterplots, line plots, stem and leaf plots, and box and whisker plots to draw conclusions from the data;</p>	<ul style="list-style-type: none"> • Use scatterplots to plat data and line graphs to graph equations 	<p>Pearson <u>Mathematical Models with Applications</u> Section 5.15 p. 618 - 624</p>
<p>M.2 The student uses graphical and numerical techniques to study patterns and analyze data.</p> <p>M.2D use regression methods available through technology to describe various models for data such as linear, quadratic, exponential, etc., select the most appropriate model, and use the model to interpret information.</p>	<ul style="list-style-type: none"> • Direct and inverse variation only 	<p>Region IV/Comap <u>Modeling with Mathematics – A Bridge to Algebra II</u> Sections 1.8 – 1.13, 1.15 p. 30 -53A, p. 59 – 59A</p>
<p>M.3 The student develops and implements a plan for collecting and analyzing data in order to make decisions.</p> <p>M.3A formulate a meaningful question, determine the data needed to answer the question, gather the appropriate data, analyze the data, and draw reasonable conclusions;</p>	<ul style="list-style-type: none"> • Direct and inverse variation only 	
<p>M.3 The student develops and implements a plan for collecting and analyzing data in order to make decisions.</p> <p>M.3C determine the appropriateness of a model for making predictions from a given set of data.</p>	<ul style="list-style-type: none"> • Direct and inverse variation only 	
<p>M.8 The student uses algebraic and geometric models to describe situations and solve problems.</p> <p>M.8C use direct and inverse variation to describe physical laws such as Hook's, Newton's, and Boyle's laws.</p>	<ul style="list-style-type: none"> • Apply to real world using the laws listed 	<p>Region IV/Comap <u>Modeling with Mathematics – A Bridge to Algebra II</u> Sections 1.6 – 1.7, 1.14 p. 22 – 29A, p. 54 – 58</p>