



Spicing up a Developmental/First Year Algebra Classroom

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ABSTRACT

- Are you afraid of being the lone passenger on the reform train? This session introduces effective methods used to supplement a traditional curriculum with conceptual ideas in a Developmental/First year algebra setting. Faculty will be given strategies to have an enlightening classroom environment that balances the needful skills with much needed theory. Many departments across the country are still using traditional textbooks and curriculum in their algebra classrooms. Every day, Faculty find a hard time having their voices heard in a departmental setting to instill curriculum that promotes comprehending concepts in their courses. Attending this session will enable interested and deprived faculty create a learning environment that uses concepts as a central theme within the framework of a traditional curriculum. Faculty will benefit from acquiring the balance between teaching essential skills using a variety of perspectives and communicating the importance of the concepts that lie within.



FUNDAMENTALS OF ALGEBRA

A review of high school algebra. Topics include operations with integers and rational numbers, properties of real numbers, work with measurements, simplify and evaluate algebraic expressions, and elements of geometry.



MATHEMATICS LITERACY

This is a developmental course designed to prepare students for college-level QR requirements in the non STEM programs. Students will solve problems that require understanding of ratios, rates, and scaling. Students will also learn the language and structure of algebra as well as how to represent relationships between quantities in multiple ways. In particular, students will learn to solve problems that require an understanding of functions and modeling with functions.



INTRODUCTORY ALGEBRA

Further topics from high school algebra, including exponents, polynomials, linear equations and inequalities, quadratic and radical equations.



INTERMEDIATE ALGEBRA

- Review of introductory algebra, graphing of functions, inequalities and absolute value, radicals, roots and rational exponents, complex numbers, quadratic equations, exponential and logarithmic functions, right triangle trigonometry, applications.



MATH LITERACY AND FUNDAMENTALS OF ALGEBRA

- Number Sense
 - If a million seconds went by, how many days have gone by?
 - If a billion seconds went by, how many days have gone by?
 - If a trillion seconds went by, how many days have gone by?
- Decimal – application
- Percent – Handout 1 & Handout 2
- Linear Equations in one variable – applications
 - fulcrum idea
 - college football bowl game



INTEGRATING CONCEPTUAL & REFORM IDEAS IN A TRADITIONAL SETTING

- Distinguish between Ratios and Rates
- Average Rate of Change
 - rate of change & slope
 - slope
 - slope & equations of lines
- Function basics
 - lesson plan
 - Functions I.pdf
 - Functions II.pdf
 - Absolute Value Function.pdf
- Outside Class Project
 - End of Year Project 092.pdf



CONCEPTUAL & REFORM IDEAS FROM INTERMEDIATE ALGEBRA

- rational function introduction
- radical function
- Innovative Approach
 - introduction to rational equations – DLA, ILD, Student Practice, & Summary – handout
- quadratic translations leading to vertex form
- basic functions & properties
- end of year project



ACTIVE LEARNING METHODS

- Examples drawn from real life and skills learned in context
- Group learning activities, instructor led discussions
- Active participation and team work are essential
- Problems are approached using a variety of perspectives
- Summary

Examples: 1) [slope and linear functions\(DLA\).pdf](#)

2) [Rational Equations.pdf](#)

3) [Dick Aufman – Materials](#)



LEARNING OUTCOMES

- Identify and distinguish among different families of functions: linear, quadratic, rational, and radical by interpreting graphical, symbolic, numerical, and verbal representations
- Demonstrate the mathematical skills appropriate for each course
- Use the appropriate function model to analyze and solve application problems
- Use a graphing calculator when appropriate to explore and solve problems
- Explain how a function model relates to an applied situation and interpret problem solutions in the context of the situation
- Keep students engaged and interested in course using various activities throughout the lesson
- Projects are not just for Calculus students
- Peer led learning appreciated over time
- Vary your lecture methods depending on the dynamics of the class

