

The
CLEMSON ALGEBRA PROJECT

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Materials Reproducible Only for Face-to-Face Instruction

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Introduction

Background

Scores on international tests such as the T.I.M.S.S. reveal a dramatic need for improvement in America's secondary mathematics education. The last decade has seen many calls for reforms, such as those made by the National Council of Teachers of Mathematics, along with the development of a myriad of technological tools that have the potential to improve mathematics education. Many workshops offer training on the available technology, but these workshops do not integrate the technology into current curricular guidelines. Consequently, teachers who attend these workshops do not have the resources they need to incorporate the technology into their classrooms. In order for reforms to occur, a concentrated effort is needed to merge technological materials with curricular materials and teacher education.

The Clemson Algebra Project merges technology training with ready-to-use materials that teachers can implement immediately in their classrooms to help their students master the key concepts in Algebra I and Algebra II. The technological tools utilized by this five-day program include graphing calculators (Casio's 9850Ga Plus and ALGEBRA FX2.0), data collectors (Casio's EA-100), digital cameras (Casio's QV-780), and the equipment used to connect and display them.

The program keys on sixteen fundamental units that have been adapted from NCTM's (1992) Core Curriculum and encompasses the major topics in the Algebra I and Algebra II courses taught in the vast majority of contemporary American high schools. To assist teachers in implementing the materials, the units have been correlated to the best selling Algebra I and Algebra II textbooks currently on the market. The materials supplement, but do not replace, the texts currently in place. In other words, the project integrates technology in a manner that both captures fundamental concepts and enriches student learning, while being fully compatible with the materials school districts have already adopted.

The Program

During each of the five days of the Clemson Algebra Project training sessions, time is allotted for participants to develop and make presentations. Just as a constructivist approach to teaching calls for students participating actively in their learning, so too does this workshop emphasize “doing” over listening. Ample opportunities are given for attendees to explore the technology within Algebra I and Algebra II settings.

On the beginning of the first day, teachers are introduced to the technological tools used throughout the project. After this introduction, we begin our work on the sixteen modules. Because we assume that the project participants already have mastered the Algebra I and Algebra II objectives, the time is spent on providing teachers with specific lessons that use technology to improve student learning. Within each unit, one real-world problem is posed, followed by a detailed discussion of one possible step-by-step solution.

At the conclusion of each unit, three additional problems are posed, the first of which is answered in detail. Participants, working with a small group, are given adequate time to arrive at reasonable solutions for the remaining two problems from each of the units covered during the day. Afterwards, groups are selected to make presentations in which they outline their solution for the other groups.

By this process, participants combine a growing facility for the tools with the algebraic concepts they will be teaching, experiencing many of the same things their students will experience in their inquiry-based classroom activities. The impact upon classroom teaching and learning will be felt immediately.

Clemson and Casio will provide on-going support throughout this process. Each participant will become part of a LISTSERV group established to discuss ideas, pose questions, and to build a community of teachers who are dedicated to improving their teaching of Algebra I and Algebra II.