



2008 ALICE for Mathematics and Science High School Teachers

Benefits:

- \$1000 honorarium
- Earn 4 continuing education credits at the Colorado School of Mines
- A Colorado School of Mines Graduate student providing direct classroom assistance.

Description of Project:

Alice is a programming environment designed to enable novice programmers to create 3-D virtual worlds, including animated movies and games. Unlike most 3-D programming environments, Alice was designed through an iterative process of studying how novices tried to describe the motions of objects in a 3-D world, and then modifying Alice so that the novices' expectations would be met. In Alice, 3-D models of objects (e.g., people, animals and vehicles) populate a virtual world. Alice makes use of program visualization to allow students to immediately see how their animation programs run, enabling students to easily understand the relationship between the programming statements and constructs and the behavior of their animations. In Alice, students learn the basics of computing, but where the objects of concern are actors and scenes in a virtual world. Alice programs have a strong object-oriented flavor, allowing students to control the appearance and motion of objects, have objects respond to mouse and keyboard input, or do any sort of computation that would normally be done in an introductory programming class. Students learn about objects and aggregation by addressing the component features within objects—lifting an arm, turning a head. Students learn about sequencing and iteration by constructing a series of actions in a scene.

Math students must use concepts of ratio and proportion, measurement, volume, and area to manipulate the program. Science concepts, especially those of motion, acceleration, velocity, and projectiles are easily illustrated with Alice. For more information about ALICE, go to ALICE.ORG.

The primary purpose of the project is to improve **high school** students' and teachers' content knowledge of **mathematics** and **science** as part of a program for increasing the number of highly qualified teachers. The program consists of two components: a **summer workshop** and **follow-up classroom visits** during the school year. Space is available for 12 math and science teachers. Funding for this program has been provided through the Colorado Department of Higher Education.

Time Commitment:

- Two one-week summer workshop sessions will be provided to study the uses of Alice software in your science or mathematics classroom. In the time between sessions, teachers will prepare a lesson plan using ALICE. These will be discussed and shared during the second week.

JULY 7– JULY 11 from 9:00 AM to 4:00 PM daily for background on ALICE

AUGUST 4 – 8 from 9:00 AM to 4:00 PM daily for classroom use of ALICE

- During this workshop, you will work directly with faculty and graduate teaching fellows at the Colorado School of Mines.
- Throughout the academic year, you will participate in follow-up sessions including graduate student aid in the classroom.

Qualifications:

- Must be assigned to teach mathematics or science at the high school level for the academic year 2008-2009. Contact Dr. Catherine Skokan (cskokan@mines.edu) for more details.

