

Mathlets in Lecture, Segment 2 Conclusion

Mathlets: An Introduction

This is a good place for me to stress the following point. You must practice your use of the Mathlet in lecture. Decide in advance exactly what you want to do with it, which parts you want to call attention to, and in what order. What sliders you want to move and to what settings. And how you want to mix the Mathlet demonstration with chalk or projector content.

Remember, things that interest you and seem obvious to you on the screen may not attract the interest of students or seem at all obvious to them. The Mathlets support a variety of active learning methods in lecture. For example, one can design concept quizzes around them. This methodology was systematized in physics education by Harvard physicist, Eric Mazur. The idea is that one can interrupt a lecture with questions, which all the students are really expected to answer.

The key elements of this method is to force each student to declare his or her belief about the answer to some conceptual question. If they're right, they're rewarded by having their belief confirmed. If they're wrong, they have to admit to themselves that they have been harboring a misapprehension. And this is the first step in learning.

A well constructed concept quiz results in a diversity of answers by students, because it surfaces a variety of common misunderstandings. When this happens, you have to grasp the opportunity to let the students try to persuade each other of the correctness of their answer. This is peer instruction. It's also important to wrap up each such episode with a confirmation of the correct answer.

In many classrooms in the United States, students answer these concept quizzes using clickers, which are handheld infrared or radio frequency communicators. I prefer to use a simpler technology, which I call flash cards. Each student is given a pack of eight quarter pages with large numbers, 1 through 8, printed on them. They hold up the number labeling what they believe to be the correct answer.

This is a surprisingly private form of communication. I see all the responses, but the students respect the privacy of their peers. The privacy afforded by flash cards or clicker technology really is important. Misapprehensions can be brought to the surface and addressed only in a safe environment.

This module illustrates other strengths of the Mathlet technology. It can break up a lecture into bite sized chunks. And the graphical and artistic nature of the Mathlets can excite interest in your students. Now, please see the course website for exercises in using the Mathlets in lecture.