A Module to Teach about Biotechnology in CTE Courses

Many of the high paying jobs in the future will be found in the field of biotechnology, so it is valuable to teach students about this career option. In this session, we present a module (that has been successfully used several times in a CTE course) to teach one aspect of biotechnology in a way that requires no prior expertise in the area. The module outlines how DNA microarrays can be used to rapidly identify DNA sequences. While this topic will be new to participants, emphasis is placed on making it easy to implement the module in a classroom setting.

A key aspect of this module is student participation. During a class, students work in teams to build models of DNA and DNA microarrays using Lego® bricks. Participants in this session will be taken through an entire classroom experience to demonstrate how the module may be used. Participants will also be given a starter kit which includes all of the electronic presentations materials, a movie showing an actual presentation, and enough Lego® bricks to teach the module to a small group of students. They will also receive a list of materials needed to extend the experience to a larger classroom.

This module was developed by J. Brandon Rogers, a student in chemical engineering at Brigham Young University, with supervision from Professor Thomas Knotts. Funding for this project was provided by the National Science Foundation (CBET-0828433).

Suggestions for Using the Module

A video is included on the DVD in each packet as well as starter kit of Lego® bricks. These materials can be used in several ways. First, a small group of students can use the materials provided in the packet to learn on their own by following along with the recorded presentation. The module can be expanded for use with a classroom of up to 40 students by purchasing additional Lego® bricks, as described below, using either the video recording or interactive teaching with the slides provided on the website.

Supply List for Module (Class of 40 Students)

From Lego Shop at Home (shop.lego.com)

Under ‘Theme’ choose ‘Pick a Brick’

10 Green Base Plates

1000 ‘Brick 2x2’ White

1000 ‘Brick 1x2’ White

250 ‘Brick 2x4’ Blue

250 ‘Brick 2x2’ Green

250 ‘Brick 2x4’ Yellow

250 ‘Brick 2x2’ Red

You may want super glue to glue the bricks together.

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Additional resources available at knotts.byu.edu