Quick Speciation Activity
by Larry Flammer

This is a quick and effective way to get across to students different ways new populations can emerge, be reproductively separated from the parent population, and eventually evolve into a new species. It is the basis for genetic drift and “bottleneck” speciation, as well as a vivid application of the point of the Hardy-Weinberg formula - without calculations!

Preparation:
Get two large plastic cups: one red and one blue; red = all the mommas in the population, blue = all the poppas. In each cup place equal numbers of green and red beads, say 50 green + 50 red (or any two colors). Small white or beige cups (Dixie cups), one per person in the class (these are “baby” cups). A wet sponge or big plastic (liter) bottle of water (with cap on) for dramatic “realism” + sound effects of waves crashing, or rushing river, etc.

Presentation (about 10-15 minutes)
Hand out little “baby” cups - one per student.
Take your two cups (a “mamma” cup and a “papa” cup) around to each student, ask each to quickly reach in (one hand into one cup, the other into the other cup, at the same time) and take a bead from each cup (without trying to pick a color) and place those two beads into his/her little cup. Quickly go around the room until each student has a pair of beads in his/her little cup. Each “take” means a pair of alleles received in a random “mating” from the population’s “gene pool”, and the cups are their “babies”.

Ask everyone with two green beads (alleles) to raise a hand. Note where raised hands are concentrated. If no concentration, ask all with two red beads to do the same. VARIATION: Have students raise one hand for each green bead they have; that way you can get a quick sense of where all green beads are concentrated - or red beads if you ask the same for red beads.

Wherever you see a pathway to go between and separate that cluster of students with an unusually high concentration of one color or the other from the other students, start moving through that pathway.

As you go, slosh your bottle of water, making “slosh-slosh” sounds, and say “I am a river - growing larger and larger” or “I am the Colorado River - growing larger and larger.” You could also say “I am a rift zone, pushing apart four continents, and making the Atlantic Ocean,” or “I am building the Rocky Mountains...” or “I am the rising sea level, making lowland hills into islands.” Use your creative imagination and lots of energy to dramatize whatever “barrier” you decide to build.

When done, announce that the population (students) with a high proportion of one color is now permanently separated from the parent (or other) population, and they can no longer mate with the other population. Due to a higher proportion of (green) genes, this little population has longer legs than the parent population, so they can run faster and escape predators, so they survive, and over many generations evolve into a new species with typically longer legs and accompanying features. [Always fun to capitalize on some feature of those students) - e.g., tallness, or long hair, etc. - as basis for new feature to become typical of new population (and the new species it will become).] Their new gene frequencies should be distinctively different from the parent population. You can take tally of total number of green beads in each population, then the number of red beads in each population, and not the different proportions in each. If the class has studied the Hardy-Weinberg Law, be sure to point out this application (if the students don’t) - or use this to illustrate Hardy-Weinberg.