Appendix 1:

A. Example of a GCA question (Question 8).

A young man develops skin cancer that does not spread to any other tissues; the mutation responsible for the cancer arose in a single skin cell. If he and his wife (who does not have skin cancer) subsequently have children, which of the following statements is most correct?

a) All the man's children will inherit the mutation responsible for skin cancer.

b) All the man's children will inherit the mutation responsible for skin cancer if the mutation is dominant.

c) Some of the man's children may inherit the mutation responsible for skin cancer depending on which of his chromosomes they inherit.

d) None of the man's children will inherit the mutation responsible for skin cancer.

B. Example of a GCA question (Question 14). None of the 30 students we interviewed for this question chose answer a), although 30% of students did so on the pre-test.

Cystic fibrosis in humans is caused by mutations in a single gene and is inherited as an autosomal (non-sex-chromosome) recessive trait. A normal couple has two children. The first child has cystic fibrosis, and the second child is unaffected. What is the probability that the second child is a carrier (heterozygous) for the mutation that causes the disease?

a) 1/4

b) 1/2

c) 2/3

d) 3/4

e) 1