Before beginning a unit on frog anatomy, a seventh-grade biology teacher gives each of the 24 students in the class a pretest to assess their knowledge of frog anatomy. The teacher wants to compare the effectiveness of an instructional program in which students physically dissect frogs with the effectiveness of a different program in which students use computer software that simulates the dissection of a frog. After completing one of the two programs, students will be given a posttest to assess their gained knowledge of frog anatomy. The teacher will than analyze the results (posttest minus pretest).

   a) Describe a method for assigning the 24 students to two groups of equal size that will allow for a statistically valid comparison of the two programs.

   b) Suppose the teacher decided to allow the students in the class to select which instructional program (physical dissection or computer simulation dissection) they prefer to take, and 11 choose actual dissection and 13 choose the computer dissection method. How might the self-selection process jeopardize a statistically valid comparison of the changes in the tests scores (posttest minus pretest). Provide a specific example to support your answer.