Many educators use multiple-choice questions (MCQs) as one method of assessing student comprehension. When creating alternative answers for MCQs, instructors often try to imitate or replicate student thoughts. For example, when testing student knowledge of Mendelian genetics, we may note the mistakes students typically make and use those mistakes as answer options. When student-generated mistakes aren’t available as answer options, we often create answer options that make sense to us. However, as individuals with a deep understanding of the material, we often forget what our naïve thoughts were before we developed proficiency. Additionally, we forget the cognitive struggle of examining multiple seemingly-reasonable alternatives. Hence we may produce answer options that are either spuriously confusing or perfectly acceptable to students, regardless of correctness. How then can we write MCQs that are appropriate to the students’ perspectives?

One area to focus on when writing MCQs is the language content. As faculty with larger vocabularies than students, we may use words requiring subtle distinctions that are unfamiliar to many students. Our use of such words may unreasonably cause confusion for students who understand the concept the question addresses. A few studies have examined student confusion over non-technical words in MCQs. For example, Pickersgill and Lock (1991), replicating earlier work by Cassels and Johnstone (1985), found that high school students didn’t understand such words as abundant, negligible, and factor (among other words common in science classrooms), to the extent that they often chose antonyms of these words when told to chose words “that mean the same as” the word in question. Such studies demonstrate that even the “filler” language we use in our MCQs can have a profound influence on student understanding of the question.

With language difficulties in mind, we decided to investigate student understanding of MCQs that we felt to be appropriate although challenging. As we were determining the methodology of our study, we realized that this investigation would require a generous amount of in-class time. For this reason, we chose to facilitate student discussion about a single MCQ covering an essential concept rather than lecture on that concept. In the case reported here, our MCQ covered the process of natural selection (two other sessions covered adaptation and population level change).

Specifically, we distributed one question with four possible answers to each student. Students read and answered the question individually and wrote a better answer option if they thought it appropriate. Students then divided into groups of three and examined the question and answer options together. For each option, they decided if the option was correct or incorrect and provided the reasoning that supported their determination. After they examined each option, each team created “the best possible answer” to the question. Each team wrote its best answer on the board. Finally, the instructor summed up the activity by reviewing the original question and highlighting the strongest elements of each team’s written answer.

Other educators have used a similar strategy as an actual testing mechanism. For example, in a reading course...