Hazardous materials handling procedures training for firefighters have become increasingly important, but it has also become increasingly expensive. My colleague and I were invited to produce and evaluate web-based training materials that would replace the current lecture approach. After an extensive materials development period, we tested our on-line training procedure that, if successful, would be used for all firefighters throughout the 12-State Midwestern Region. Since all of the firefighters needed to complete yearly certification, we felt assured of a representative sample. We were able to obtain permission to collect data from firefighters in Lincoln Nebraska, and were given a complete listing of the firefighters there. We divided that list of 240 firefighters by gender and rank and randomly chose 40 to represent combinations of those groups. All of those chosen would be taking the certification test for the first time. Knowing the importance of random assignment but limited by the Fire Captain's constraint that participants from the same station must all receive the same training program we randomly assigned members from Stations 1-7 to the lecture condition and Stations 8-14 to the web-based condition. Those in the lecture condition received their lecture instruction on June 18. Due to difficulties with the network used to provide the web-based instruction, those in that condition completed the training on July 24. However, as a control, all participants completed exactly the same national certification exam on July 25. Data collected from the 32 firefighters who completed the assigned training procedure and took the certification test were analyzed. The results showed consistently higher scores from those who completed the web-based training. We also found that all of the women firefighters in the sample had completed the web-based training, but concluded that this would not be an interpretive problem, because we had used random assignment. Thus, we feel that this evaluation provides evidence that, as expected, the web-based training produced better certification scores than the traditional training procedures.

Exam #1 – Story Problem How-to

The first time you read through the story you should carefully identify each variable, its type, and its role in the study. Also, identify the target population, selection/sampling procedures and the assignment procedure used. If you do this, the rest of the exam will be easy!

Hazardous materials handling procedures training for firefighters have become increasingly important, but it has also become increasingly expensive. My colleague and I were invited to produce and evaluate web-based training materials that would replace the current lecture approach. After an extensive materials development period, we tested our on-line training procedure that, if successful, would be used for all firefighters throughout the 12-State Midwestern Region. Since all of the firefighters needed to complete yearly certification, we felt assured of a representative sample. We were able to obtain permission to collect data from firefighters in Lincoln Nebraska, and were given a complete listing of the firefighters there. We divided that list of 240 firefighters by gender and rank and randomly chose 40 to represent combinations of those groups. All of those chosen would be taking the certification test for the first time. Knowing the importance of random assignment but limited by the Fire Captain's constraint that participants from the same station must all receive the same training program we randomly assigned members from Stations 1-7 to the lecture condition and Stations 8-14 to the web-based condition. Those in the lecture condition received their lecture instruction on June 18. Due to difficulties with the network used to provide the web-based instruction, those in that condition completed the training on July 24. However, as a control, all participants completed exactly the same national certification exam on July 25. Data collected from the 32 firefighters who completed the assigned training procedure and took the certification test were analyzed. The results showed consistently higher scores from those who completed the web-based training. We also found that all of the women firefighters in the sample had completed the web-based training, but concluded that this would not be an interpretive problem, because we had used random assignment. Thus, we feel that this evaluation provides evidence that, as expected, the web-based training produced better certification scores than the traditional training procedures.

Selection/Sampling
Target Population
Sampling Frame -- purposive
Selected Sample -- researcher-selected & stratified
Data Sample

Assignment
RA of intact groups (Stations)

Variables
Previous testing experience – subject variable/initial eq (constant)
Type of Training – the IV
Training Date/Training-testing Delay – proc var/ongoing eq (confound)
Testing Date – proc variable/ongoing eq (control)
Test Scores – the DV
Gender – subject variable/initial eq (confound)

Research Hypothesis
"produced better certification scores" → this is a causal research hypothesis