1 point for identifying the **independent variable**—drug/no drug or placebo.
1 point for identifying the **dependent variable**—effects of the drug on Alzheimer's symptoms; degree of progression of symptoms.
1 point for identifying the **experimental group**—participants who receive the drug.
1 point for identifying the **control group**—participants who receive a placebo or no drug group.
1 point for mentioning possible **confounding variables**—sex of patients and varying ages; misdiagnosis; other medical conditions during the trial period; not taking the dosage as prescribed.
1 point for describing how you would determine **effectiveness**—comparison of two group baseline scores and final results after the experimental period. Inferential statistics such as *t* test or ANOVA to determine significance of results. A *p* value of .05 or less will be considered significant.

Sample Essay

For the purpose of this essay, my neuroscientist will be Dr. Hylton, and her new drug will be called Lacetyl. Her research question is whether her new drug is effective, and her hypothesis is that if she administers the drug for a period of 6 weeks or more, then patients with early symptoms of Alzheimer's will not get worse. Collecting a representative sample is her first problem.

Since Alzheimer's is usually definitively diagnosed with an autopsy to determine whether or not neural tangles and plaques are present, she must solicit elderly patients (age 75 or older) who are showing early symptoms and then carefully screen them to rule out other conditions. Tests might include not only blood and urine tests, but also cognitive functioning tasks, especially dealing with memory loss. She might solicit volunteers through newspaper ads, but because of the problem with diagnosis, she may wish to contact gerontologists or specialists dealing with patients with Alzheimer's and solicit volunteers from them. Since impairment should be limited in the early stages, potential risks should be discussed with the volunteers, their written consent forms should be signed, and their identities should be kept anonymous. To prevent bias on her part, Dr. Hylton would create a double-blind condition in which neither she nor the patients will know whether or not they are taking the drug or the placebo. To prevent confounds, group matching will be used to assign the patients, with both groups representing a similar range of initial functioning.

The independent variable in this experiment is the drug and the dependent variable is its effectiveness in improving patients' symptoms. The experimental group receives the drug and the control group the placebo. It might also be beneficial to have a second control group that receives no drug at all. The drug would be administered daily and weekly tests of urine, blood, and cognitive tasks would be repeated for a period of 6 weeks. Any potential negative side effects would be noted, and the experiment would be halted immediately if these proved dangerous to any subjects receiving the drug.

Potential confounds are many. If a prescription is given, the patients may forget to take the medication. Sex, age, race, and other demographic variables not controlled in the sample could also prove a problem. Other medical conditions during testing and improper diagnosis in the first place could throw off our results. Obviously, when this study is concluded, replication would be necessary.

To determine whether Lacetyl is effective or not, baseline results would be compared in subjects and the differences between the results in the placebo and drug groups compared. Using inferential statistics, we would try to determine whether or not there was a significant