1. Know that the **null hypothesis** states that there is no relationship (or no effect) while the **alternative hypothesis** states that there is a relationship (or effect).

2. Know that the **research hypothesis** is the same as the alternative hypothesis and is supported by the rejection of the **null hypothesis**.

3. Know that a **Type I error** occurs when the null hypothesis is falsely rejected.

4. Know that a **Type II error** occurs when the researcher fail to reject the null hypothesis, but the alternative hypothesis is actually true. That is, the researcher fails to detect a true relationship.

5. Know that \( \alpha \) is the probability of a Type I error, \( \beta \) is the probability of a Type II error, and \( 1 - \beta \) is the probability of detecting a true relationship or effect.

6. Know that \( \alpha \) is known and determined by the researcher.

7. Know that \( \beta \) is unknown, and is small when (1) the effect is large, (2) the sample size is large, and/or (3) random error is small.

8. Know that statistical significance means that the null hypothesis is unlikely given the sample data. It does not mean that the difference is large enough to be important or that the independent variable caused the change in the dependent variable.

9. Know that the Z test is used when the test involves hypotheses concerning one or two population means, and it assumes that population standard deviation is known.

10. Know that the t-test is used when the test involves hypotheses concerning one or two population means, assumes the population is normally distributed, does not require that the population standard deviation be known, and is used far more often than the Z test.

11. Given a research situation, be able to determine whether you should conduct a one-sample t-test, a related sample t-test, or an independent samples t-test.

12. Be able to determine if a hypothesis for each of the three t-tests listed above is correctly stated. These may be presented as either a non-direction hypothesis (two-tailed test) or as a directional hypothesis (one-tailed test). Be able to make this determination for either a null or an alternative hypothesis.

13. Be able to determine if the results are statistical significant from the significance level reported by SPSS. That is, the results are statistically significant if the reported significance level is less than alpha.

14. Statistical significance can be determined from a confidence interval. Given the end points of a confidence interval and the level of confidence of that interval, be able to determine if a relationship (or effect) is statistically significant.

15. Given percentile limits from a bootstrapped empirical distribution, be able to determine if a relationship (or effect) is statistically significant.