1. What is our independent variable? What is our dependent variable?

   The independent variable is if the font color and the word are congruent or incongruent.

   The dependent variable is the amount of time it takes to answer if the font color and word are congruent or incongruent.

2. What is an appropriate set of hypotheses for this task? What kind of statistical test do you expect to perform? Justify your choices.

   The null hypothesis that I will test for is as follows:

   H_0: $U_C = U_I$
   H_1: $U_C \neq U_I$

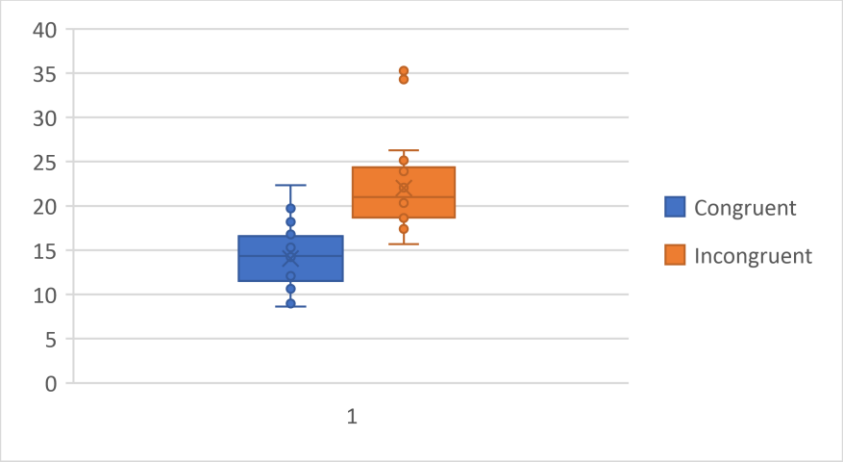
   Where U_C = mean congruent and U_I = mean incongruent

   I will perform a two tailed dependent t test with a significant level of 0.05 due to the following:
   - I need to test the null hypothesis in both directions, is reaction time greater or less when the font color and word are different?
   - We have a small sample size (http://www.investopedia.com/terms/t/t-test.asp)
   - We are testing for two sample means (congruent and incongruent)
   - Each person takes one congruent and incongruent test

3. Report some descriptive statistics regarding this dataset. Include at least one measure of central tendency and at least one measure of variability.

	Congruent	Incongruent
Mean	14.1	22.0
Std Dev	3.6	4.8

4. Provide one or two visualizations that show the distribution of the sample data. Write one or two sentences noting what you observe about the plot or plots.



I created a box plot illustrating the data distribution for both congruent and incongruent. We can see that incongruent has a higher mean and is less distributed over its 75th percentile than the congruent data set (ie the incongruent data set has shorter whiskers). The incongruent data also has two outliers at the 35 second range.

5. Now, perform the statistical test and report your results. What is your confidence level and your critical statistic value? Do you reject the null hypothesis or fail to reject it? Come to a conclusion in terms of the experiment task. Did the results match up with your expectations?

   The t-statistic is +- 8.0 and the pvalue I will be testing against is 0.05.
   There are 24 records in the dataset, which means there are 23 degrees of freedom. At p-value of 0.05 (0.025 per tail) 2.069 is the critical t value. Therefore, I will reject the null hypothesis since the statistic is +- 8.0 vs +- 2.069 critical t value. This did match my expectations because I was suspect that it would take longer to identify an incongruent data set.

   Finally, the 95% confidence interval is 5.9 to 10.1.