1. What is our independent variable? What is our dependent variable?
   Independent variable: congruent words or incongruent words
   Dependent variable: time to recognize the word's color
2. What is an appropriate set of hypotheses for this task? What kind of statistical test do you expect to perform? Justify your choices.
   Null hypothesis: the average population response time will not change between congruent words and in congruent words.
   Alternative hypothesis: the average population response time for incongruent words will take longer time.

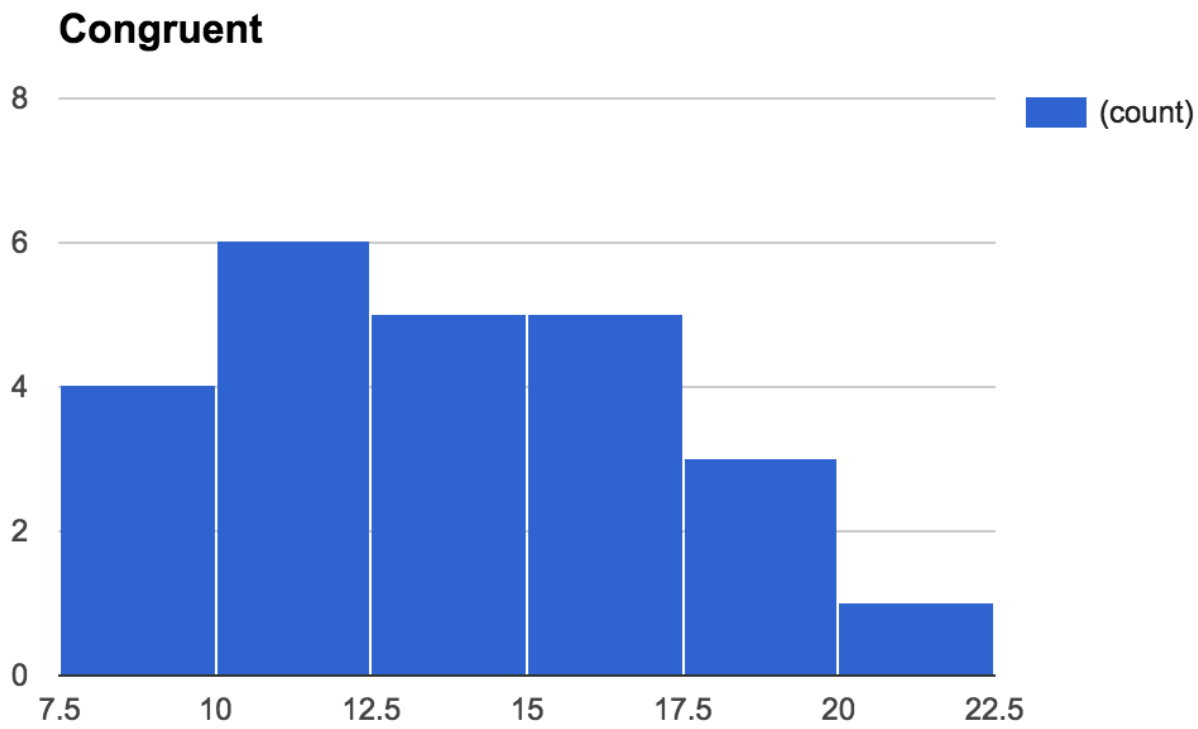
   H0: u1 – u2 = 0
   HA: u1 – u2 < 0
   U1 is the population mean of congruent response time.
   U2 is the population mean of in congruent response time.

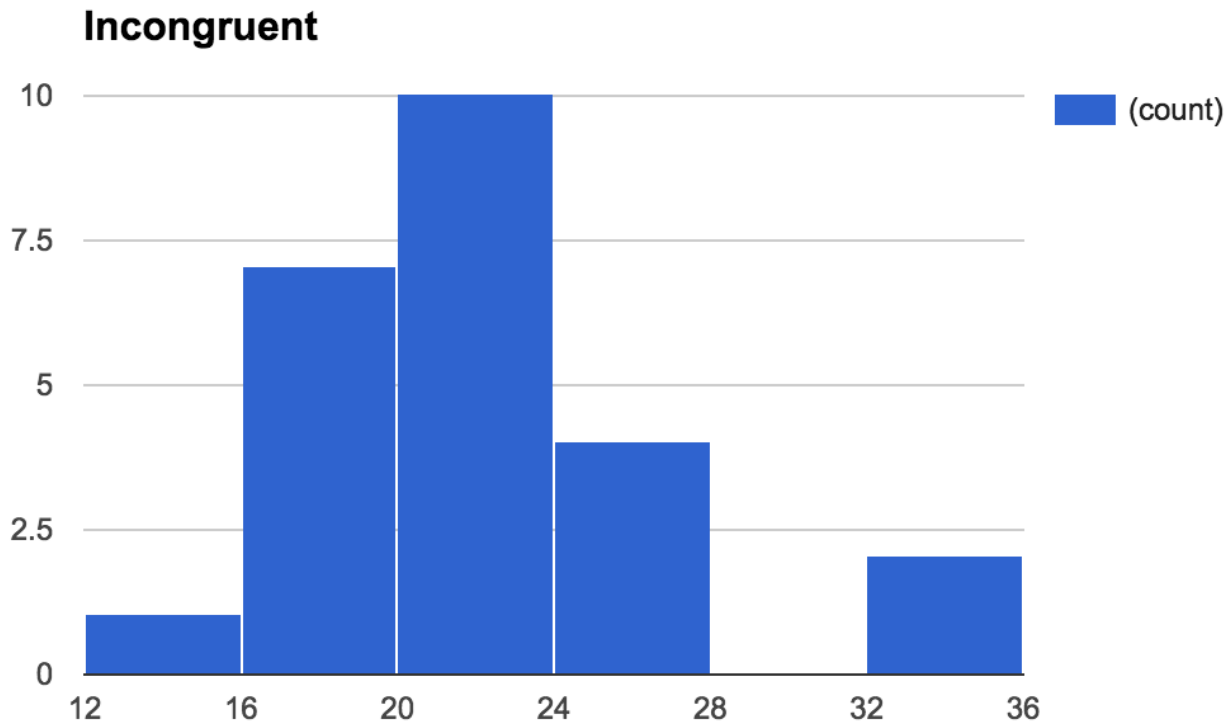
   It is t-test: Only samples presented. Know nothing about the population parameters.
   It is dependent test: the same participant will be given 2 conditions.
   One tailed: Alternative hypothesis is take longer time.

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	14.05	22.02
Median	14.36	21.02
Standard deviation	3.56	4.80

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.
   Congruent is close to uniform distribution and the mean is lower.
   Incongruent is close to normal distribution and the mean is high.





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?
H0: u1 – u2 = 0
HA: u1 – u2 < 0
Confidence level: 0.05
DF: 24-1=23
t-critical= -1.714
mean of difference = 14.05-22.02 = -7.96
standard deviation(a-b) = 4.86
t-statistics = -7.96 / (4.86/24^0.5) = -8.02
Reject null hypothesis. (t-statistics < t-critical)
Conclusion: the average population response time for incongruent words will take longer time.
Yes, the results match up with my expectations.

6. Optional: What do you think is responsible for the effects observed? Can you think of an alternative or similar task that would result in a similar effect? Some research about the problem will be helpful for thinking about these two questions!