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

- Independent variable: The word displayed in a color of ink (congruent -incongruent)
- Dependent variable: The time it takes to name the ink colors.

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 hypotheses: I would say the time it takes to read the words when it's congruence word and compare it when it's incongruence words.

H0: The population mean of the time to name the incongruent words is the same as the population mean of the time to name the congruent words.

Ha: the population mean of the time to name the incongruent words is not the same as the population mean of the time to name the congruent words.

H0: μC(performance time) = μI(performance time)
HA: μC(performance time) != μI(performance time)

Perform Dependent t-test since we don't know the population statistics parameters, the sample is small (less than 30), and the same participants are tested more than once.

Performing Two-tailed test, because It's a good test to see if there's a significant difference between two sample.

reference: http://www.chem.utoronto.ca/coursenotes/analsci/stats/12tailed.html

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

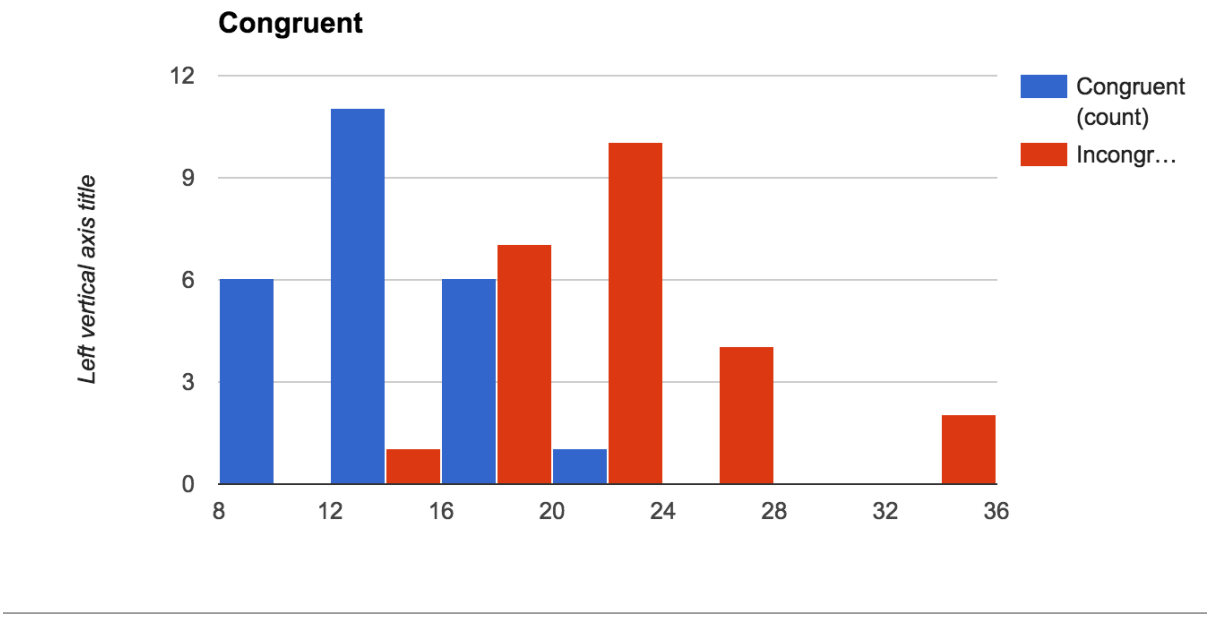
Kindly refer to the blew google sheet1.

https://docs.google.com/spreadsheets/d/1slBL7y2YSagSTYVMyJjPHYVO8nq9hbLkNTbyjOudu2I/edit?usp=sharing

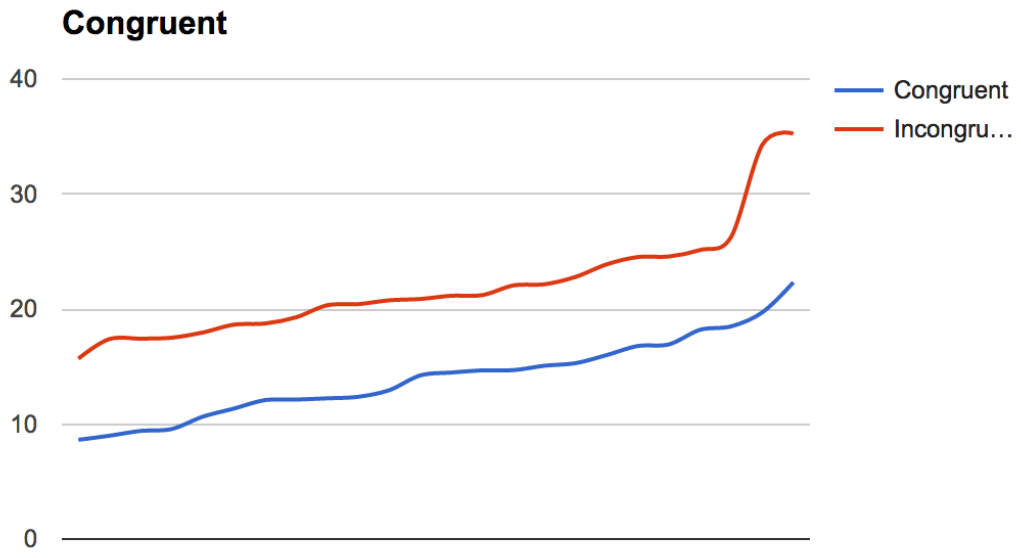
4. **Provide one or two visualizations that show the distribution of the sample data. Write one or two sentences noting what you observe about the plot or plots.**

The below Histogram represent that the congruent times values ranges different from the incongruent.

Congruent case: The most participant takes time between 8 to 12 seconds
The incongruent case: the most participant takes between 20 t0 24 .



The below line chart shows the values of time for the two charts, we can see that in the incongruent case t it takes more time than congruent case.



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?**

T-statistic	-8.020706944
Degrees of freedom	23
alpha	0.05
confidence interval (CI)	95%
T critical value	+/- 2.069 from the t-table

T statistic > critical value

Since the absolute value of the t-value **greater than (>)** critical value, we reject the null hypothesis. This result matched my expectation before the test there was a significant difference between the **time** of reading the Congruent words and incongruent words

Reference: http://stattrek.com/sampling/difference-in-means.aspx?tutorial=ap