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

Independent variable: two different conditions of congruent and incongruent words.
Dependent variable: the time it takes under different conditions 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.

H0 : the population mean of time μ(i) taken under incongruent words condition won't be different from the population mean of time μ(c) under congruent words condition.

H_0: μ(i) = μ(c)

H1 : The population mean of time μ(i) taken under incongruent words condition is different from the population mean of time μ(c) under congruent words condition. Either longer or shorter.

H1: μ(i) <> μ(c)

The sample data collected is by testing on the time each participants taken under different conditions. each participant has been measured on two occasions on the same dependent variable. There are 24 samples under each group and we don't have the populations parameters (mean and standard deviation). It belongs to dependent T test issue.
The distribution of populations is approximately normal plus the hypothesis not considering any directions, I'm going to use two-tail T 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 :   Mediean :14.3565   Mean: 14.05   Standard Deviation: 3.56
Incongruent : Mediean of 21.0175   Mean: 22.02   Standard Deviation: 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.

The histogram shows the time under congruent condition is positively skewed and most participants take around 10.63 sec to 12.63 sec.

Sample of time under congruent condition
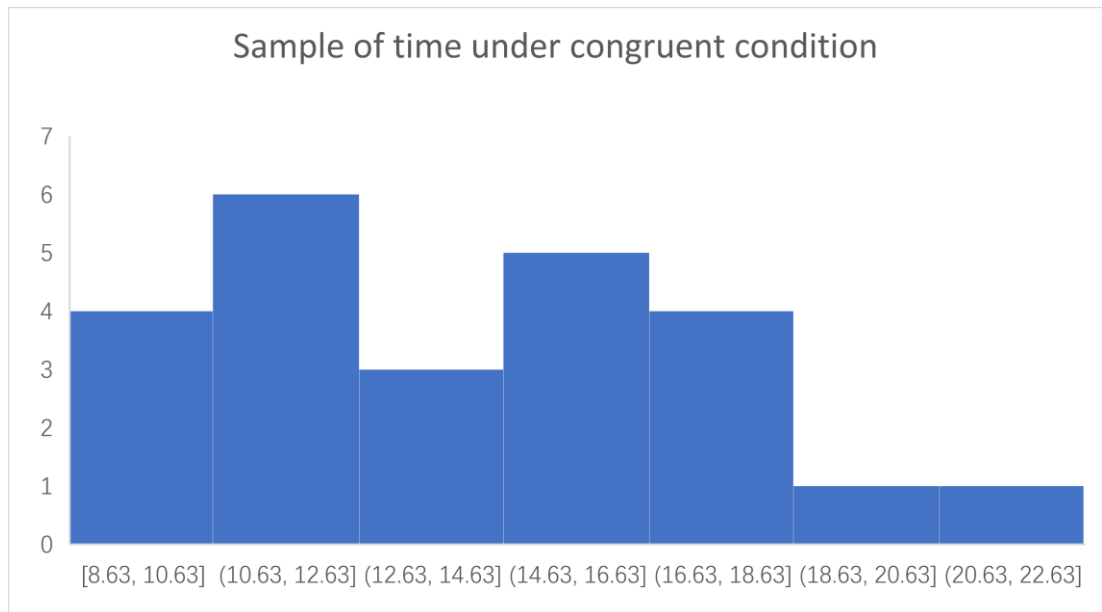
5. Now, perform the statistical test and report your results. What is your confidence level and your critical statistic value? Do you reject the null hypothesis or fail to reject it? Come to a conclusion in terms of the experiment task. Did the results match up with your expectations?
a is 0.05. T-critical is Probability = 0.025 df=23
Two tailed: t= 2.069
Reject the hypothesis.
The incongruent condition has statistical significance on the result under a=0.05
Since the t-statistic is 8.02. much greater than the T critical, which means it won't likely happen that there is no time different between congruent and incongruent condition.
The result match up with my expectation.

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!