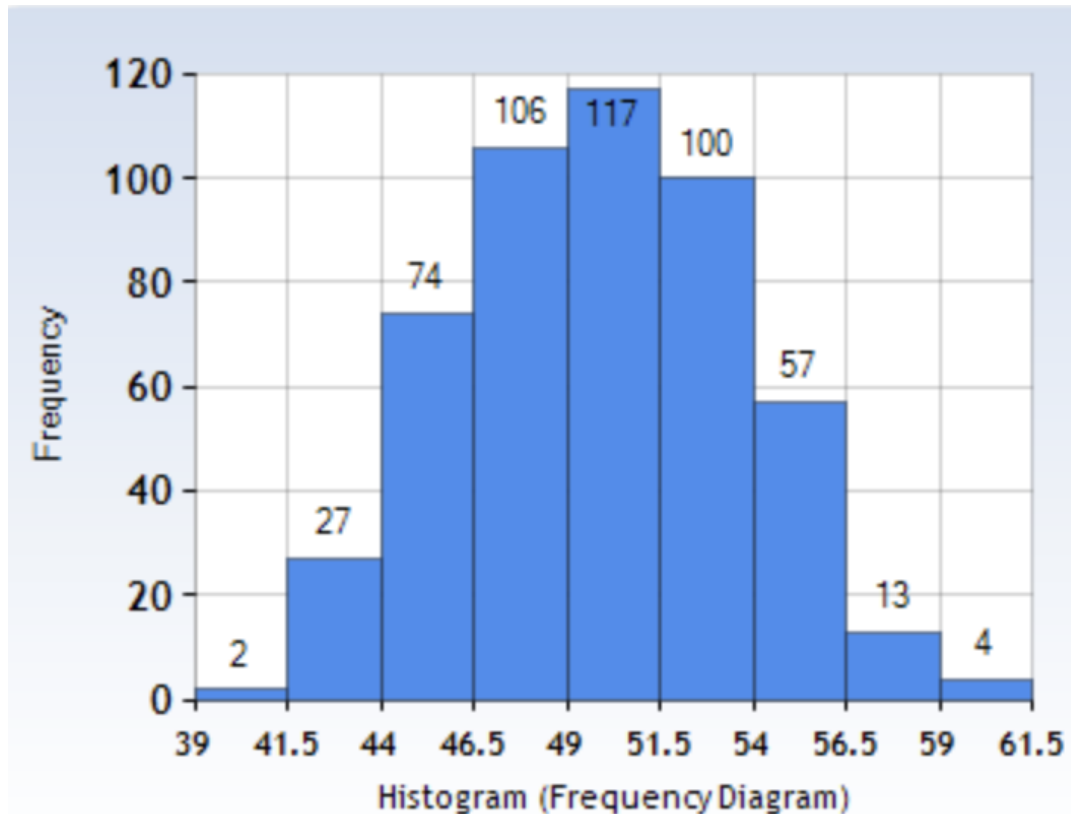Assume that the distribution of times it took students to complete a test is approximately normal. The histogram below shows the actual times (in minutes) of 500 students. The mean time of the test takers is 49.8491 minutes.

Histogram (Frequency Diagram)

a) Estimate the standard deviation of the histogram.

b) Using the standard deviation from part a, what percentage of times are at least two standard deviations from the mean?

c) The test is scheduled to take at least 44 minutes, what percentage of values are below 44 minutes?

A survey showed that the time spent shopping in supermarkets is normally distributed with a mean of 45 minutes and a standard deviation of 12 minutes.

What percentage of shoppers spent between 45 and 68 minutes in the supermarket?

What percentage of shoppers spent less that 60 minutes in the supermarket?

What percentage of shoppers spent between 30 and 50 minutes in the supermarket?

According to a survey by the National Center for Health Statistics, the heights of adult men in the United States are normally distributed with a mean of 69 inches and a standard deviation of 2.75 inches.

What percentage of men are more than 65 inches tall?

What percentage of men heights are between 6 feet and 6'5"?

What height would put a man in the top 10% of all hieghts?

A certain bank is busiest during the Friday rush evening rush hour from 3:00 pm until 6:00 pm. During these hours the waiting time for drive-through customers is normally distributed with a mean of 8 minutes and a standard deviation of 2 minutes.

What percentage of drive-through customers will wait for 10 minutes or longer during the Friday evening rush hours?

What is the probability that a customer will wait 2 minutes or less during the Friday evening rush hour?

What is the probability that a customer will have to wait between 3 and 7 minutes during the Friday evening rush hour?

In 1998 Ben took both the SAT and the ACT. On the math portion of the SAT, he earned a score of 630. On the math portion of the ACT, he earned a score of 33. For the SAT the mean was 512 with a standard deviation of 112. For the ACT the mean score was 21 and the standard deviation was 5.

On which exam did Ben score better? Explain.

What percentage of students outscored Ben on the math section of the SAT?

What percentage of students did Ben outscore on the math section of the ACT?

The weight of captive adult female lowland gorillas is normally distributed with a mean of 82.30 kg and standard deviation of 15.33 kg.

If a female gorilla weighs 85 kg, what is her percentile rank?

If Sasha is in the top 15% of all female gorillas, what is Sasha's weight?

Mrs. Burleson surveyed the 150 students in all her classes to find the number of minutes of homework they spent doing homework each night. She found that the data was normally distributed with a mean of 30 minutes and a standard deviation of 8 minutes.

How many students spent 38 minutes doing homework each night?

How many students spent 15 minute doing homework each night?

How many students spent less than 10 minutes and more than 45 minutes on homework each night?

For a science project, Brian wanted to determine whether eleventh-graders did better when they took a math test in silence or when Mozart was being played. Twenty-six randomly selected eleventh grade students were randomly divided into the two treatment groups. Part of Brian's results are in the table below.

Mozart (percentage correct)	Silence (percentage correct)
65	44
80	70
72	68
68	58
38	58
58	47
45	54
42	44
58	61
81	61
40	9
41	52
27	30
Mean = 55	Mean ≈ 50.46

What is the treatments? What is the response variable?

What type of study is this? Explain.

What exactly can you conclude from this study?

You conduct a test to see if an inexperienced person gets a bigger geyser if he or she drops Mentos candy into a liter bottle of cola by hand or by using a paper funnel. You find ten friends who have never done this demonstration and we are willing to participate. You write "by hand" on five slips of paper and "funnel" on five slips of paper. Each person draws a slip and is shown how to use that method. Then, each person drops Mentos into his or her bottle of cola using the method assigned. The maximum height of each geyser is measured. You find that difference between the mean heights of the geysers produced by your friends who used their hand and your friends who used a paper of funnel is not statically significant.

What type of study is this?

What are the treatments? What are the subjects?

Can you generalize the results of this study to some larger population? Explain your thinking.

Describe exactly what you can conclude from this study.

Researchers wanted to determine whether social class is related to smoking behavior. They conducted telephone interviews with 1,308 Massachusetts adolescents aged 12 to 17, selected by dialing at random. They found statically significant association between whether the adolescent smoked or not and the household income. Adolescents from households with less income were more likely to smoke, and this was true across all ages, for both sexes, for all races, and for all amounts of disposable income the adolescent had.

What type of study is this?

Can you conclude from this study that smoking is caused by an adolescent's social class? Can you think of a lurking variable that might be responsible for both?

Can you generalize the results of this study to some larger population? Explain your thinking.

Describe exactly what you can conclude from this study.