

Materials Needed:

Stopwatch, straps.

Instructions:

Divide into teams of three people.

We will be determining the time it takes to complete a four-legged walk of a pre-determined distance. Each team of three should stand side by side and strap their legs together at the ankles. This is similar to a three-legged race except the middle person will have both legs strapped to another person.

Once the legs are strapped together, walk the length of the course and record the time it takes to finish. Then rearrange the order of the group and repeat the process so that each person has a chance to be in the middle once.

You should find two people not in your group to help with this. One of them can be the timer and one can be the recorder. A note for the timer and recorder – do not round the times off to the nearest second, give them with the two decimal places that the stopwatch gives.

1. Record the first names of the persons in each position and the time in seconds that it takes to complete the walk.

Heat	Left	Middle	Right	Time
1				
2				
3				

2. Give your results to the instructor, who will combine the data and provide a datafile for your use.

Use the combined class data to answer the remaining questions.

3. Identify the context of the data.

Who was the data collected about? Each "who" is called a case and corresponds to a row in the table. It does not need to be a person, it might be a what.

What data was collected? Each "what" is a variable and corresponds to a column in the table.

Where was the data collected?

When was the data collected?

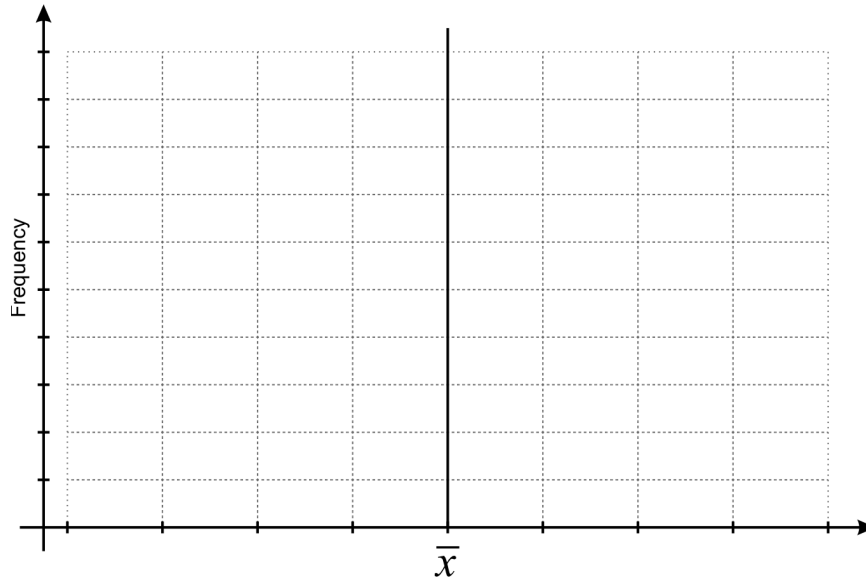
Why was the data collected?

How was the data collected?

4. Summarize the **time** variable. Do this for each heat as well as the combined data.

Heat	1	2	3	All
Sample Size				
Mean				
Median				
Standard Deviation				
Variance				

5. Generate a histogram that displays the region from $\bar{x} - 3s$ to $\bar{x} + 3s$ in six equal intervals of one standard deviation each. Label the boundary values for the histogram along the horizontal axis. The chart has room to go ± 4 standard deviations away from the mean, just in case you have some outliers.



6. Use the chart in question 4 to find the percent of the total values that lie within 1, 2, and 3 standard deviations of the mean and record them in the table.
- a. Complete the table with the percent of values.

% of values	w/in 1 std. dev.	w/in 2 std. devs.	w/in 3 std. devs.
Our sample data			
Empirical Rule	$\approx 68\%$	$\approx 95\%$	$\approx 99.7\%$
Chebyshev	Not Applicable	$\geq 75\%$	$\geq 88.9\%$

- b. Compare our results with the theoretical values for the empirical rule and Chebyshev's theorem. This empirical rule is only for unimodal, bell-shaped data while Chebyshev's theorem is supposed to apply to any distribution.

yes no Does the Empirical Rule apply to our data?

yes no Is Chebyshev's Theorem true for our data?