To construct a frequency distribution, follow these rules:

A. Grouped Frequency Distributions:

1. There should be between 5 and 20 classes. Although there is no hard-and-fast rule for the number of classes contained in a frequency distribution, it is of the utmost importance to have enough classes to present a clear description of the collected data.

2. It is preferable but not absolutely necessary that the class width be an odd number. This ensures that the midpoint of each class has the same place value as the data.
The class midpoint Xm is obtained by adding the lower and upper limits and dividing by 2.
For the class $75 - 124$ it would be $Xm = \frac{75+124}{2} = 99.5$

3. The classes must be mutually exclusive. Mutually exclusive classes have nonoverlapping class limits so that data cannot be placed into two classes. **Overlap** occurs when you have something like:

75-124	11
124-174	24

4. The classes must be continuous. Even if there are no values in a class, the class must be included in the frequency distribution. There should be no gaps in a frequency distribution. The only exception occurs when the class with a zero frequency is the first or last class. A class with a zero frequency at either end can be omitted without affecting the distribution.

5. The classes must be exhaustive. There should be enough classes to accommodate all the data.

6. The classes must be equal in width. This avoids a distorted view of the data.

Width: A Lower-class limit minus previous lower-class limit: example $125 - 75 = $ **50**
In addition, the differences between lower- and upper-class limits must be constant. In the following table the differences 124-75 = 49, 174-125 = 49 etc., are all 49.

Example of Frequency distribution:

Time (secs)	Frequency
75-124	11
125-174	24
175-224	10
225-274	3
275-324	2

First Class: 75 – 124.
Lower limit: 75, Upper limit 124.
Boundaries: Lower -0.5 Upper+0.5   Therefore for the class 75 -124 **the boundaries are**: 74.5 – 124.5

The boundaries for all classes are:

Time (secs)	Frequency
74.5-124.5	11
124.5-174.5	24
174.5-224.5	10
224.5-274.5	3
274.5-324.5	2

Boundaries are [closed, open) intervals; therefore, values do not overlap.
[74.5, 124.5): it means that 124.5 is an open interval (remember the concept from Algebra?); therefore, 124.5 is rounded up and belongs to the second class, 125-174 whose boundaries are [124.5 – 174.5)

Procedure Table

Constructing a Grouped Frequency Distribution

Step 1 Determine the classes.

Find the highest and lowest values.

Find the range.

Select the number of classes desired.

Find the width by dividing the range by the number of classes and rounding up.

Select a starting point (usually the lowest value or any convenient number less than the lowest value); add the width to get the lower limits.

Find the upper class limits.

Find the boundaries.

Step 2 Tally the data.

Step 3 Find the numerical frequencies from the tallies, and find the cumulative frequencies.

B. Categorical Frequency Distributions:
The categorical frequency distribution is used for data that can be placed in specific categories, such as nominal- or ordinal-level data. For example, data such as political affiliation, religious affiliation, or major field of study would use categorical frequency distributions. In this type of Frequency distribution is customary to find the percentage of values in each class.

Example: Twenty-five army inductees were given a blood test to determine their blood type. The data set is: A, B, B, AB, O, O, O, B, AB, B, B, B, O, A, O, A, O, O, O, AB, AB, A, O, B, A. The frequency distribution for the data:

Class (Type of Blood)	Frequency (count)	Percent
A	5	20
B	7	28
O	9	36
AB	4	16