

# Frequency and Histogram Notes

## Frequency Distribution Table

A frequency distribution table is a device for organizing and presenting grouped data. It categorizes the set of observation into intervals or classes. It also tells us how many observations are in each class.

### Steps in Constructing Frequency Distribution Table

1. Find the range  $R$ , using the formula:

$$R = \text{Highest Score} - \text{Lowest Score}$$

2. Compute for the number of intervals,  $n$ , by using the formula:

$$n = 1 + 3.3 \log N$$

Where  $n$  = number of class intervals

$N$  = population or total number

3. Compute for the *class size*,  $i$ , using the formula:

$$i = \frac{R}{n}$$

4. Using the lowest score as a lower limit, add  $(i - 1)$  to obtain the higher limit of the desired class interval.

5. The lower limit of the second interval may be obtained by adding the class size to the lower limit of the first interval. Add  $(i - 1)$  to the result to obtain the higher limit of the second interval.

6. Repeat step 5 to obtain the third class interval, and so on, and so forth.

7. When the  $n$  class intervals are completed, determine the frequency for each class interval by counting the elements.

## Histogram

A histogram is a type of graph where classes are labeled along the horizontal line while the class frequencies are along the vertical line. The height of the rectangles drawn adjacent to each other depicts the number of observations or the frequency of a particular class.

### Steps in Constructing Histogram

1. Complete frequency table first.
2. The maximum frequency suggests the value of the vertical scale; 0 is at the bottom.
3. The horizontal scale is designed to accommodate all the classes of the frequency table.
4. Each class and frequency is represented by a box; with no space between the box.

## Frequency and Histogram Notes

**Sample Problem 1:** Solve problem involving frequency distribution table.

The table below shows the score of the students in class A in the 100 items math exam.

Class intervals	Frequency
91-100	1
81-90	2
71-80	4
61-70	5
51-60	10
41-50	13
31-40	11
21-30	5
11-20	2
1-10	1
<b>Total</b>	<b>54</b>

a. If the passing score is 50, how many students pass the math exam? And how many failed?

22 passed and 37 failed the exam.

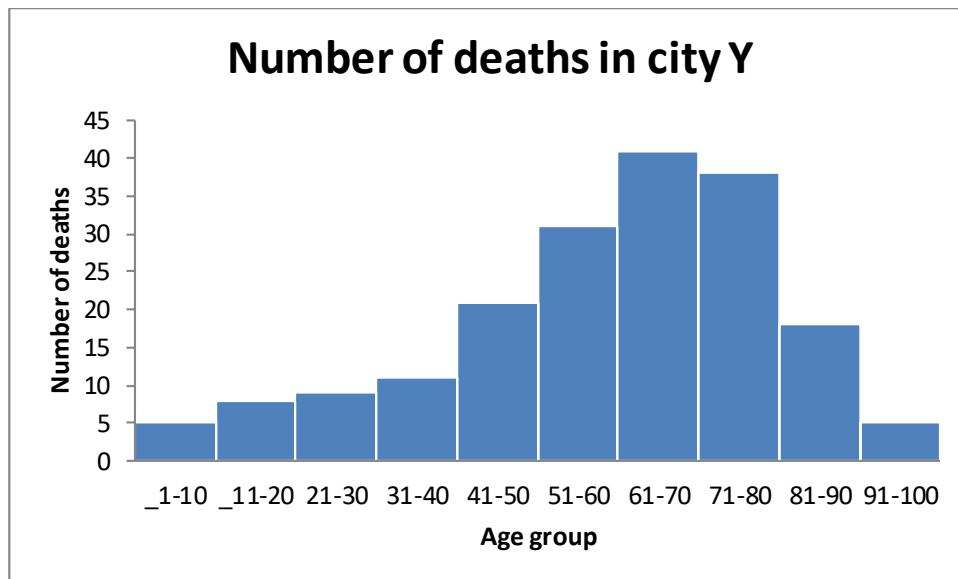
b. What is the most frequent score on the exam? And what is the least frequent?

The most frequent score is between 41-50, while the most least are 1-10 and 91-100.

## Frequency and Histogram Notes

**Sample Problem 2:** Solve a problem involving histogram.

Below is the graph of number of deaths in the city X by age.



a. Which age group has the most frequent number of deaths? And which is the least number of deaths?

The most frequent number of deaths is between the age 61-70, while the least number of deaths is between the age 1-10.

b. What is the difference in the number of deaths in the age group 51-60 and 61-70?

The number of deaths in the age group 51-60 is approximately 30, while number deaths in the age group 71-80 is approximately 43. The difference is approximately 13 number of deaths.

**Sample Problem 3:** Construct a frequency distribution table.

Below are the scores of class Y students in the physical exam.

52	51	46	56
53	50	45	56
48	51	47	61
49	53	52	60
56	52	53	62
58	48	54	62
62	47	55	60

a. Find the range.

$$R = 62 - 45 = 17$$

## Frequency and Histogram Notes

b. Compute for the number of intervals.

$$n = 1 + 3.3 \log (28) = 5.77 \text{ or } 6$$

c. Compute for the class size.

$$i = \frac{15}{6} = 2.5 \text{ or } 3$$

d. Draw the table

Class Intervals	Frequency

e. Create the class intervals.

Class Intervals	Frequency
45-47	
48-50	
51-53	
54-56	
57-59	
60-62	

Solution :

To find the higher limit  $45 + (3-1) = 47$ ; to find the second lower limit  $45 + 3 = 48$

To find the 2nd higher limit  $48 + (3-1) = 50$ ; to find the 3rd lower limit  $48 + 3 = 51$ , and so on.

e. Write down the frequency.

Class Intervals	Frequency
45-47	4
48-50	4
51-53	8
54-56	5
57-59	1
60-62	6

# Frequency and Histogram Notes

**Sample Problem 4:** Construct a histogram using a frequency distribution table.

Below is the frequency of the stat score of class X students.

Class Intervals	Frequency
10-14	5
15-19	12
20-24	14
25-29	6
30-34	2
35-39	4
<b>Total</b>	<b>43</b>

