

Name Key  
Date \_\_\_\_\_

## How Do We Determine The Mean, Median, and Mode From A Table?

When the range is small, we use intervals of length one to group data. For example, let's examine the table below which represents the number of times last summer that a certain number of students went to Jones Beach. After looking over the table, answer these questions:

- (a) What is the total frequency? 15 → n  
 (b) What is the mean? 7 →  $\frac{105}{15} = \frac{\sum X}{T.F.}$   
 (c) What is the median? 7  
 (d) What is the mode? 6 (Highest Freq#)

# of times they went Interval	# of times it occurs Frequency # of people
10	1 → # of people
9	2
8	3 → # of people
7	2
6	4 → IIII
5	3 → III

1 person went 10 times

$\frac{\sum X}{T.F.}$

total sum  $\sum X = 105$   
 $\frac{105}{15} = 7$

Trick for median:  $\frac{Total\ Freq}{2} = \frac{15}{2} = 7.5$   
 \* must start from lowest interval # → 8

$\bar{x} = \frac{\sum x}{n}$   
 $\sum x = \text{Total sum}$   
 in calc!

State a procedure that can be used to determine the mean for a table of grouped data when the length of the interval is one.

1. Multiply each interval by the corresponding frequency
2. Add the products
3. Divide by the total frequency

Modal Interval - The interval with the highest frequency.

1) The data below is grouped in intervals other than length one. Find:

- (a) the total frequency 26  
 (b) the interval which contains the median 35-44  
 (c) the modal interval 45-54

*no multipliers*

Interval	Frequency
55 - 64	3
45 - 54	8
35 - 44	7
25 - 34	6
15 - 24	+ 2

$$\frac{T.o.F.}{2} = \frac{26}{2} = 13$$

\* must start from lowest interval when doing the median trick

total freq → 26 → n

2) From the grouped data find:

- (a) the total frequency 15  
 (b) the mode 65  
 (c) the median 64  
 (d) the mean 64

→ shortcut:  $\frac{T.F. \cdot 15}{2} = 7.5 \rightarrow$  rank 8

\* must start at lowest grade when doing the median trick

$\bar{x} = \frac{\sum X}{T.F.} = \frac{960}{15} = 64$

Grade	Number (Frequency)
60	1
61	1
62	1
63	2
64	3
65	4
66	2
67	1
68	+ 0

60, 61, 62, 63, 63, 64, 64, 64, 65, 65, 65, 65, 66, 66, 67

= 60  
 = 61  
 = 62  
 = 126  
 = 192  
 = 260  
 = 132  
 = 67  
 = 0

$\frac{960}{15} = 64$   
 ← sum of #'s = 960  
 15 → total frequency

total freq → 15 → n      + 960 →  $\sum X$

3) The prices of seven race cars sold last week are listed in the table below.

Interval Frequency

Price per Race Car	Number of Race Cars	
\$126,000	1	= 126,000
\$140,000	2	= 280,000
\$180,000	1	= 180,000
\$400,000	2	= 800,000
\$819,000	1	= 819,000
		<u>2,205,000</u> ← $\Sigma x$

total frequency  $\rightarrow n$

What is the **mean** value of these race cars, in dollars?

$$\bar{x} = \frac{\Sigma x}{\text{T.F.}} = \frac{2,205,000}{7} = 315,000 \quad \boxed{\$315,000}$$

What is the **median** value of these race cars, in dollars?

$n \rightarrow \frac{\text{T.F.}}{2} = \frac{7}{2} = 3.5 \xrightarrow{\text{round}} 4$

$\$180,000$

126, 140, 140, 180, 400, 400, 819

\*MUST start at lowest \$ when doing median trick

State which of these measures of central tendency best represents the value of the seven race cars. Justify your answer.

The median best represents the value b/c the outlier of \$819,000 affects the mean

4) Three consecutive even integers can be represented by  $x$ ,  $x + 2$ , and  $x + 4$ . The average of these consecutive even integers is 20. Find the integers.

$$\frac{x + x + 2 + x + 4}{3} = 20$$

$$\frac{3x + 6}{3} = 20$$

$$3x + 6 = 60$$

$$\frac{3x}{3} = \frac{54}{3}$$

$$\begin{aligned} x &= 18 \\ x + 2 &= 20 \\ x + 4 &= 22 \end{aligned}$$

the 3 CEI's whose mean is 20 are 18, 20, 22

5) The values of 11 houses on Washington St. are shown in the table below  
 (a) Find the **mean** value of these houses in dollars.

Value per House	Number of Houses
\$100,000	1
\$175,000	5
\$200,000	4
\$700,000	1

$\frac{\sum x}{n}$  → sum → 2,475,000  
 total frequency → 11  
 $\frac{2,475,000}{11} = 225,000$   
 $\sum x$  (correct)  
 $n$  (correct)  
**\$225,000**

total freq → 11  
 $\frac{2,475,000}{11} = 225,000$   
 $\sum x$

(b) Find the **median** value of these houses in dollars.

$\frac{n+1}{2} = \frac{11+1}{2} = 6$   
 rounded  
**\$175,000**

100, 175, 175, 175, 175, 175, 200, 200, 200, 200, 700

Must start from the lowest & when doing the median trick

(c) State which measure of central tendency, the mean or the median, best represents the values of these 11 houses. Justify your answer.

The median best represents.  
 The value of the outlier of \$700,000 affects the mean.

b) The heights of the players on the basketball team are shown in the frequency table: Find the mean, median, mode and range.

Height	Freq
77	2
76	0
75	4
73	3
72	2
71	1
64	3
<hr/>	
	15

Height (Inches)	Frequency (# of players)
71	1
72	2
73	3
64	3
75	4
76	0
77	2

max - min  
Range:  $77 - 64 = 13$  inches

Mode: 75 inches

Median:  $\frac{15}{2} = 7.5 \rightarrow 8$  (73 inches)  
 → must start from the lowest height

Mean:  $\frac{\sum x}{n} = \frac{1080}{15} = 72$  inches

NO "76" include!  
 B/C NO one was that height

total freq → n = 15     $\sum x = 1080$

7) The scores for a science quiz are shown in the table. What are the median and mode(s) of the scores?

Int Score	Number of Students
30	1
40	2
50	4
60	5
70	8
80	11
90	1
100	2

→ Frequency

total frequency → 34 → n

Mode: 80 → highest frequency

Median:  $\frac{I.F.}{2} = \frac{34}{2} = 17$  → 70

must start from lowest score when doing the median trick

8) The numbers of season home runs hit by players on a baseball team are shown in the table.

- Find the mean number of runs.
- Find the median number of runs.

Player	Number of Runs
Briggs	11
Velez	17
O'Neil	0
Aziz	9
Gold	5
Williams	14
Sanders	2
Lin	8
Trask	15

Must count B/C that is what they actually got  
 "must put in calc when doing mean"

9 players → n  
 total freq

a) Mean:  $\frac{\sum x}{n} = \frac{81}{9} = 9$

b) Median: 9

0, 2, 5, 8, 9, 11, 14, 15, 17

Can't use the median trick B/C it's not

Diff B/C it's not freqs of #s it's names

