

## ESTIMATING THE MEAN OF GROUPED DATA

Heights of females (in inches)	Frequency
60 – 62	4
63 – 65	5
66 – 68	8
69 – 71	1

To the left is a grouped frequency distribution of the heights (in inches) of female students in a physical education class. Use the calculator to assist you with estimating the mean of the grouped distribution.

### **STEP 1: Enter L1 and L2**

Determine the Midpoint for each interval. (Remember: the Midpoint = (Lower Class Limit + Upper Class Limit)/2.) Now, enter the Midpoint into L1 and the corresponding frequencies for each midpoint into L2. (Screen 1)

Screen 1

L1	L2	L3	2
61	4	-----	
64	5		
67	8		
70	1		
-----			
L2(5) =			

### **STEP 2: Create L3**

Create L3 by multiplying L1 times L2. This will give you  $xf$  – the midpoint times its corresponding frequency. (Remember we are using the concept of a weighted average. The midpoint is the data element in this case L1, and the frequency is the weight, in this case L2.)

Screen 2

L1	L2	L3	3
61	4	-----	
64	5		
67	8		
70	1		
-----			
L3 = L1 * L2			

To create L3 --- highlight **L3** and type  $2^{nd} > L1 * 2^{nd} > L2$  and hit enter. (Screen 2)

Screen 3

L1	L2	L3	3
61	4	244	
64	5	320	
67	8	536	
70	1	70	
-----	-----	-----	
L3(1)=244			

Upon hitting enter, your screen will show the results of multiplying the midpoint times its corresponding frequency  $xf$ . (Screen3)

**STEP 3: Find the sum of L3 (xf) and the sum of L2 (f)**

To sum a list follow the following sequence in order.

**2<sup>nd</sup>** > **List** (above STAT) > **Math** > **5** > (type in list – 2<sup>nd</sup> L3) > ) - {right hand parentheses} > **ENTER**

Look at the following screens to observe the sequence:

2<sup>nd</sup> > List (above STAT)  
Screen 4.

```
NAMES OPS MATH
1:L1
2:L2
3:L3
4:L4
5:L5
6:L6
7:RESID
```

Arrow over to MATH  
Screen 5

```
NAMES OPS MATH
1:min(
2:max(
3:mean(
4:median(
5:sum(
6:Prod(
7↓stdDev(
```

Select Option 5 by typing 5  
Screen 6

```
sum(
```

Type in the List to be summed, which in this case is L3. This will find the sum of the *xf* list containing the product of the midpoint and its corresponding frequency (weight). The following screens continue the sequence.

Screen 7

```
sum(L3)
```

Hit ENTER to obtain the Sum.  
Screen 8

```
sum(L3)          1170
```

The sum of L3 is 1170. (Screen 8)

Now do the following to find the sum of the frequency column L2 (weight):

**2<sup>nd</sup>** > **LIST** (above STAT) > **MATH** > **5** > (type in list- 2<sup>nd</sup> L2) > ) > **ENTER**

(Screen 9)

Screen 9

```
sum(L3)          1170
sum(L2)           18
```

**STEP 4: Find the estimate of the mean.**

Screen 10

The formula for the estimated mean is

$$\text{ESTIMATED MEAN} = \text{sum}(xf) / \text{sum}(f)$$

Sum(L3) is the sum of the  $xf$  and Sum(L2) is the sum of the  $f$ . In order to get the estimated mean, the sum of L3 must be divided by the sum of L2. In this example, divide 1170 by 18 and you will get 65.

(Screen 10)

sum(L3)	1170
sum(L2)	18
1170/18	65

The estimated mean is 65.