STANDARD ERROR CALCULATION

Procedure:

Step 1: Calculate the mean (Total of all samples divided by the number of samples).

Step 2: Calculate each measurement's deviation from the mean (Mean minus the individual measurement).

Step 3: Square each deviation from mean. Squared negatives become positive.

Step 4: Sum the squared deviations (Add up the numbers from step 3).

Step 5: Divide that sum from step 4 by one less than the sample size (n-1, that is, the number of measurements minus one)

Step 6: Take the square root of the number in step 5. That gives you the "standard deviation (S.D.)."

Step 7: Divide the standard deviation by the square root of the sample size (n). That gives you the "standard error".

Step 8: Subtract the standard error from the mean and record that number. Then add the standard error to the mean and record that number. You have plotted mean± 1 standard error (S. E.), the distance from 1 standard error below the mean to 1 standard error above the mean

Example:

Name	Height to nearest 0.5 cm	2 Deviations (m-i)	3 Squared deviations $(m-i)^2$
1. Waldo	150.5	11.9	141.61
2. Finn	170.0	-7.6	57.76
3. Henry	160.0	2.4	5.76
4. Alfie	161.0	1.4	1.96
5. Shane	170.5	-8.1	65.61
n= 5	1 **Mean m** = 162.4 cm		4 Sum of squared deviations $\sum(m-i)^2$= 272.70

5 Divide by number of measurements-1**.** $\sum (m-i)^2 / (n-1) = 272.70 / 4 = 68.175$

6 **Standard deviation** = square root of $\sum (m-i)^2/n-1 = \sqrt{68.175} = 8.257$

7 **Standard error** = Standard deviation/$\sqrt{n}$ = 8.257/2.236 = 3.69

8 **m ± 1SE** = 162 ± 3.7 or 159cm to 166cm for the men (162.4 - 3.7 to 162.4 + 3.7).