Lysozyme Experiment Analysis: Calculating Standard Deviation

The **standard deviation** measures spread around the mean.

Complete the following tables of data and plot on the graph.

$$S = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$$

Key

S = standard deviation

Σ = sum of

x = measured value (from the sample)

$\bar{x}$ = mean value

n = total number of values in the sample

Water Temperature 5°C

x	$(x - \bar{x})$	$(x - \bar{x})^2$
1405.00	-46.00	2116
1785.00	334.00	111556
2385.00	934.00	872356
895.00	-556.00	309136
1525.00	74.00	5476
1295.00	-156.00	24336
1345.00	-106.00	11236
1180.00	-271.00	73441
1260.00	-191.00	36481
1435.00	-16.00	256
$\bar{x} = 1451.00$	$\sum(x - \bar{x})^2$	1446390
	$\frac{\sum(x - \bar{x})^2}{n - 1}$	160710
	$\sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$	400.89
S = 400.89		

Water Temperature 10°C

x	$(x - \bar{x})$	$(x - \bar{x})^2$
1285.00	116.00	
1265.00	96.00	
1200.00	31.00	
1780.00	611.00	
575.00	-594.00	
1255.00	86.00	
770.00	-399.00	
920.00	-249.00	
1365.00	196.00	
1275.00	106.00	
$\bar{x} = 1169.00$	$\sum(x - \bar{x})^2$	
	$\frac{\sum(x - \bar{x})^2}{n - 1}$	
	$\sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$	
S =		

Water Temperature 18°C

x	$(x - \bar{x})$	$(x - \bar{x})^2$
1100.00		
1015.00		
1221.00		
1010.00		
1210.00		
1030.00		
850.00		
849.00		
1256.00		
995.00		
$\bar{x} =$	$\sum(x - \bar{x})^2$	
	$\frac{\sum(x - \bar{x})^2}{n - 1}$	
	$\sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$	
S =		

Lysozyme Experiment Analysis: Calculating Standard Deviation

The **standard deviation** measures spread around the mean.

Complete the following tables of data and complete the graph

$$S = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$$

Key

S = standard deviation

Σ = sum of

x = measured value (from the sample)

$\bar{x}$ = mean value

n = total number of values in the sample

Water Temperature 5°C

x	$(x - \bar{x})$	$(x - \bar{x})^2$
1405.00	-46.00	2116
1785.00	334.00	111556
2385.00	934.00	872356
895.00	-556.00	309136
1525.00	74.00	5476
1295.00	-156.00	24336
1345.00	-106.00	11236
1180.00	-271.00	73441
1260.00	-191.00	36481
1435.00	-16.00	256
$\bar{x} =$ 1451.00	$\sum(x - \bar{x})^2$	1446390
	$\frac{\sum(x - \bar{x})^2}{n - 1}$	160710
	$\sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$	400.89
S = 400.89		

Water Temperature 10°C

x	$(x - \bar{x})$	$(x - \bar{x})^2$
1285.00	116.00	13456
1265.00	96.00	9216
1200.00	31.00	961
1780.00	611.00	373321
575.00	-594.00	352836
1255.00	86.00	7396
770.00	-399.00	159201
920.00	-249.00	62001
1365.00	196.00	38416
1275.00	106.00	11236
$\bar{x} =$ 1169.00	$\sum(x - \bar{x})^2$	1028040
	$\frac{\sum(x - \bar{x})^2}{n - 1}$	114226.70
	$\sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$	337.97
S = 337.97		

Water Temperature 18°C

x	$(x - \bar{x})$	$(x - \bar{x})^2$
1100.00	46.40	2152.96
1015.00	-38.60	1489.96
1221.00	167.40	28022.76
1010.00	-43.60	1900.96
1210.00	156.40	24460.96
1030.00	-23.60	556.96
850.00	-203.60	41452.96
849.00	-204.60	41861.16
1256.00	202.40	40965.76
995.00	-58.60	3433.96
$\bar{x} =$ 1053.60	$\sum(x - \bar{x})^2$	186298.4
	$\frac{\sum(x - \bar{x})^2}{n - 1}$	20699.82
	$\sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$	143.87
S = 143.87		