STATISTICAL SIGNIFICANCE: T-TEST

SAMPLE PROBLEM: One group of 6 oat seeds is grown in 0.1% salt water, and a second group (control) is grown in plain tap water. The measurments, after 10 days of growth, are recorded in the table below. Did the salt have a significant effect on growth?
To find out, copy the **values measured** into the lower "AUTO-CALC" tables (type "omitted" if item not counted). You should get the same t-value as in the sample, plus the meaning of that value (is the difference significant? Is it real?). **THEN,** in the **Auto-Calc Table,** replace those values measured with your TEAM's **values** to get YOUR results.

SAMPLE DATA TABLES COMPLETED

GROUP 1

ID No.	Values Measured (mm)	Deviations of each val. from avg. (A1-mm)=D	Squares of deviations from avg. (D^2)=S
1	31	-4	16
2	omitted		
3	19	8	64
4	23	4	16
5	34	-7	49
6	28	-1	1
	27 =Avg A1		146 =Tot T1
	5 =Qty N1		

GROUP 2

ID No.	Values Measured (m)	Deviations of each val. from avg (A2-mm)=D	Squares of deviations from avg. (D^2)=S
1	42	-7	49
2	37	-2	4
3	35	0	0
4	28	7	49
5	28	7	49
6	40	-5	25
	35 =Avg A2		176 =Tot T2
	6 =Qty N2		

t = sqr rt[(A1 - A2)^2)] / sqr rt [{(T1 + T2) / (N1 + N2 - 2)} X {(1/N1) + (1/N2)}]

t= 2.20875523 Find this value in the t-Table for sample size = N1+N2-2

AUTO-CALCULATING DATA TABLES; ENTER VALUES (in mm)

Open this Excel file on your computer and enter your **Values Measured**

GROUP 1

ID No.	Values Measured (mm)	Deviations of each val. from avg. (A1-mm)=D	Squares of deviations from avg. (D^2)=S
1			
2			
3			
4			
5			
6			
	=Avg A1		=Tot T1
	=Qty N1		

GROUP 2

ID No.	Values Measured (mm)	Deviations of each val. from avg (A2-mm)=D	Squares of deviations from avg. (D^2)=S
1			
2			
3			
4			
5			
6			
	=Avg A2		=Tot T2
	=Qty N2		

t = sqr rt[(A1 - A2)^2)] / sqr rt [{(T1 + T2) / (N1 + N2 - 2)} X {(1/N1) + (1/N2)}]

t= Find this value in the t-Table for sample size = N1+N2-2

The t-value for a given Sample Size tells us how confident we are that the difference is significant (real):

If t-value= then … there is NO significant difference...OR...
there IS a significant difference (at least 95% level)…
OR… there is a VERY significant difference (99% level)