Notes: The T-Test

The Student's *t*-test is a statistical test that compares the _____ and _____ _____ of two samples to see if there is a _____ between them.

$$t = \frac{(\bar{x}_1 - \bar{x}_2)}{\sqrt{\frac{(s_1)^2}{n_1} + \frac{(s_2)^2}{n_2}}}$$

Where:

- $\bar{x}_1$ is the mean of sample 1
- s_1 is the standard deviation of sample 1
- n_1 is the sample size of sample 1
- x_2 is the mean of sample 2
- $\bar{s}_2$ is the standard deviation of sample 2
- n_2 is the sample size in sample 2

	Students in Room 1					Students in Room 2				
Student Height (cm)	145	140	138	142	154	148	153	157	161	162
	154	158	160	166	166	162	163	167	172	172

HOW TO CALCULATE T:

1. **Calculate the mean (X) of a each sample**

   Room 1: _____ Room 2: _____

2. **Find the *absolute value* of the difference between the means**

3. **Work out the standard deviation for each sample (use a calculator…)**

   Room 1: _____ Room 2: _____

4. **Square the standard deviation for each group**

5. **Divide each squared standard deviations by the sample size of that group.**

6. **Add these two values**

7. **Take the square root of the number**

8. **Divide the difference in the means (step 2) by the standard error of the difference (step 7)**

9. **Determine the degrees of freedom (df) for the test. In the t-test, the degrees of freedom is the sum of the sample sizes of both groups minus 2.**

10. **Given the df, look up the critical t-value in a standard table of significance**

Use the 95% (p=0.05) confidence limit

11. **Check your answers on-line using the t-test calculator posted at www.biologyforlife.com**

SO WHAT?

If your calculated t value is _____ than the number in the table, you conclude that the difference between the means for the two groups is _____ _____different.

Meaning: _____ _____

If your calculated t value is _____ than the number in the table, you conclude that the difference between the means for the two groups is _____ different.

Meaning: _____ _____

Do not worry if you do not understand *how* or *why* the test works .... Follow the instructions CAREFULLY