Stat 581 Problem Set # 1

An experiment is designed to investigate whether the time to drill holes in rock differs using wet or dry drilling. A completely randomized design (CRD) is used. Each method is replicated on 12 rocks. The drilling times (in 1 / 100 minutes) are observed to be

dry	727	965	904	987	847	918
	814	750	804	989	902	939
wet	607	549	762	665	588	798
	704	772	780	599	603	699

The data is available on Blackboard as an Excel File.

1. State the hypotheses of interest. Provide an interpretation, stated in the context of the problem.

2. Give two advantages of the completely randomized design.
3. Give two disadvantages of the completely randomized design.

4. Compute the sample means, the sample standard deviations, and the pooled sample standard deviation.
5. Compute the t_o statistic, the critical point for a level $\alpha = .05$ test, and the p-value.
6. Provide an interpretation, stated in the context of the problem.

7. Create a Boxplot as a graphical display of the data.
8. Refering to the boxplot, is it true that all dry drilling times exceed all wet drilling times? In what sense can the experiment find that dry drilling takes longer than wet drilling?