

Chapter 14 / Example 10

Paired samples

Five candidates attended a revision course hoping to improve their chemistry grades. They were tested before the course started and again at the end of the course. The results were as follows.

Candidate	1	2	3	4	5
Score before course	64	43	29	56	61
Score after course	72	60	33	55	62

Determine at the 5% level whether the course improved the candidates' performance in their chemistry tests.

Press **STAT** 1:Edit and press **ENTER**

Type the before scores in the first column.

Press **ENTER** or **▼** after each number to move to the next cell.

Note: If the list contains other numbers, you can clear it by pressing **[STAT]** 4:ClrList and press **[ENTER]**. The home screen displays ClrList. Press **[2nd]** **[1]** **[L1]** and press **[ENTER]**. Press **[STAT]** 1:Edit and press **[ENTER]** to return to the table.

[illegible]

Press to move to the next column.

Enter the after scores in the second column.

[illegible]

Place the cursor in the cell marked L_3 .

Press **2nd** **2** **[L2]**

Type –

Press **2nd** **1** **[L1]**

Press **ENTER**.

L1	L2	L3	L4	L5	0
64	72	-----	-----	-----	
43	60				
29	33				
56	55				
61	62				
-----	-----				

$L_3 = L_2 - L_1$

The differences are shown in L_3 .

[illegible]

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$H_0: \mu_D = 0, H_1: \mu_D > 0$

To calculate the p -value Press **STAT** and **▶▶** to access the TESTS menu.

Select 2:T-Test... and press **ENTER**.

```
T-Test
Inpt: Stats
μ₀: 0
List: L₁
Freq: 1
μ: ≠μ₀ <μ₀ >μ₀
Color: BLUE
Calculate Draw
```

Choose Input: Data

$\mu_0 = 0$

List: L₃

Freq: 1

$\mu > \mu_0$

Navigate down to Calculate and press **ENTER**.

```
T-Test
Inpt: Data Stats
μ₀: 0
List: L₃
Freq: 1
μ: ≠μ₀ <μ₀ >μ₀
Color: BLUE
Calculate Draw
```

p -value = 0.0713 > 0.05, not significant so no reason to reject H_0 that the grades have not improved.

```
T-Test
μ>0
t=1.82141545
P=.0713211785
x̄=5.8
Sx=7.120393248
n=5
```