

Chapter 14 / Example 9

Two-sample t -test

Mr Arthur gives his two chemistry groups the same test. He wants to find out if there is any difference between the achievement levels of the two groups.

The results are:

Group 1	54	62	67	43	85	69	73	81	47	92	55	59	68	72
Group 2	73	67	58	46	91	48	82	81	67	74	57	66		

- Write down the null and alternative hypotheses.
- Perform a t -test at the 5% significance level.
- Write down the conclusion to the test.

$$H_0: \mu_1 = \mu_2, H_1: \mu_1 \neq \mu_2$$

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

Type the Group 1 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.

L1	L2	L3	L4	L5	1
54					
62					
67					
43					
85					
69					
73					
81					
47					
92					
55					
L1(11)= 55					

Press **[→]** to move to the next column.

Enter the Group 2 scores in the second column.

L1	L2	L3	L4	L5	2
54	73				
62	67				
67	58				
43	46				
85	91				
69	48				
73	82				
81	81				
47	67				
92	74				
55	57				
L2(11)= 57					

To calculate the p -value press **[STAT]** and **[→]** **[→]** to access the TESTS menu.

Select 4:2-SampTTest... and press **[ENTER]**.

Choose Input: Data

$$\mu_1 \neq \mu_2$$

Pooled: Yes

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

2-SampTTest	
Inpt:	Data Stats
List1:	L1
List2:	L2
Freq1:	1
Freq2:	1
μ_1 :	$\neq \mu_2$ $< \mu_2$ $> \mu_2$
Pooled:	No Yes
Color:	BLUE
Calculate	Draw

$$p\text{-value} = 0.816$$

$0.816 > 0.05$, not significant so no reason to reject the null hypothesis that there is no significant difference between the two groups.

2-SampTTest	
$\mu_1 \neq \mu_2$	
t=	-0.2349643711
p=	0.8162295679
df=	24
\bar{x}_1 =	66.21428571
\bar{x}_2 =	67.5
Sx1=	14.0886128
Sx2=	13.6947236