

## 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:

<b>Group 1</b>	54	62	67	43	85	69	73	81	47	92	55	59	68	72
<b>Group 2</b>	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.

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

Open a new document and add a Lists & Spreadsheet page.

Type 'gr1' in the first cell.

Type the Group 1 scores in the first column.

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

A	gr1	B	C	D
1	54			
2	62			
3	67			
4	43			
5	85			

**Note:** 'gr1' is a label that will be used to calculate the  $p$ -value. You can use any letter or name to label the list.

Type 'gr2' in the cell to the right of 'gr1'

Enter the Group 2 scores in the second column.

Use the **▲ ▼ ► ◀** keys on the touchpad to navigate the spreadsheet.

A	gr1	B	gr2	C	D
1	54	73			
2	62	67			
3	67	58			
4	43	46			
5	85	91			

To calculate the  $p$ -value

Press **menu** 4:Statistics | 4:Stat Tests | 4:2-Sample t Test...

Choose Input Method: Data

Press **enter**.

t Interval

Data Input Method: Data

OK Cancel

Open the drop down lists with **►** and select using **▼** and **enter**

Choose 'gr1' for List 1 and 'gr2' for List 2.

$$H_a: \mu_1 \neq \mu_2$$

Pooled: Yes

Click the touchpad on OK or press **enter**

2-Sample t Test

List 1: gr1

List 2: gr2

Frequency 1: 1

Frequency 2: 1

Alternate Hyp: Ha:  $\mu_1 \neq \mu_2$

Pooled: Yes

OK Cancel

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# Two-sample $t$ -test

$p$ -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.

	A	gr1	B	gr2	C	D
=						=tTest_2S
1		54	73	Title		2-Samp...
2		62	67	Alternate...	$\mu_1 \neq \mu_2$	
3		67	58	t	-0.2349...	
4		43	46	PVal	0.81623	
5		85	91	df	24.	
DI	"2-Sample t Test"					