

How to Find P-Values in Google Sheets (Step-by-Step)

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PSYCHOLOGICAL SCALES. Retrieved from <https://scales.arabpsychology.com/?p=106909>

The easiest way to calculate p-values in Google Sheets is to use the **T.TEST()** function, which finds the p-value associated with a t-test and uses the following syntax:

T.TEST(range 1, range2, tails, type)

where:

range1: The first sample of data

range2: The second sample of data

tails: The number of tails to use for the test

1: One-tailed (or "one-sided") t-test

2: Two-tailed (or "two-sided") t-test

type: The type of t-test

1: Paired t-test

2: Two sample t-test with equal variance

3: Two sample t-test with unequal variance

This function returns the p-value that corresponds with the t-test.

The following step-by-step example shows how to use this function in practice.

Step 1: Create the Data

First, let's create a fake dataset that contains the height of two different plant species:

	A	B	C	D
1	Species 1 Height	Species 2 Height		
2	14	15		
3	15	17		
4	15	14		
5	16	17		
6	13	14		
7	8	8		
8	14	12		
9	17	19		
10	16	19		
11	14	14		
12	19	17		
13	20	22		
14	21	24		
15	15	16		
16	15	13		
17	16	16		
18	16	13		
19	13	18		
20	14	15		
21	12	13		
22				
23				
24				
25				
26				

Step 2: Calculate the P-Value of the t-Test

Next, suppose we want to perform a t-test to determine if the mean height between the two plant species is equal.

The following screenshots show which formulas to use to calculate the p-values of the tests.

Paired Samples t-Test

We can use the following formula to calculate the p-value for a :

	A	B	C	D	E	F
1	Species 1 Height	Species 2 Height		P-value		
2	14	15		0.1586		
3	15	17		=T.TEST(A2:A21, B2:B21, 2, 1)		
4	15	14				
5	16	17				
6	13	14				
7	8	8				
8	14	12				
9	17	19				
10	16	19				
11	14	14				
12	19	17				
13	20	22				
14	21	24				
15	15	16				
16	15	13				
17	16	16				
18	16	13				
19	13	18				
20	14	15				
21	12	13				
22						
23						
24						

The p-value turns out to be **0.1586**. Since this is not less than $\alpha = .05$, we fail to reject the null hypothesis of the test. We do not have sufficient evidence to say that the mean height between the two species is different.

Two Sample t-Test with Equal Variance

D3 fx =T.TEST(A2:A21, B2:B21, 2, 2)					
	A	B	C	D	E
1	Species 1 Height	Species 2 Height		P-value	
2	14	15		0.5300	
3	15	17		=T.TEST(A2:A21, B2:B21, 2, 2)	
4	15	14			
5	16	17			
6	13	14			
7	8	8			
8	14	12			
9	17	19			
10	16	19			
11	14	14			
12	19	17			
13	20	22			
14	21	24			
15	15	16			
16	15	13			
17	16	16			
18	16	13			
19	13	18			
20	14	15			
21	12	13			
22					
23					
24					

The p-value turns out to be **0.5300**. Since this is not less than $\alpha = .05$, we fail to reject the null hypothesis of the test. We do not have sufficient evidence to say that the mean height between the two species is different.

Two Sample t-Test with Unequal Variance

We can use the following formula to calculate the p-value for a two sample t-test with unequal variance:

D3 fx =T.TEST(A2:A21, B2:B21, 2, 3)

	A	B	C	D	E	F
1	Species 1 Height	Species 2 Height		P-value		
2	14	15		0.5302		
3	15	17		=T.TEST(A2:A21, B2:B21, 2, 3)		
4	15	14				
5	16	17				
6	13	14				
7	8	8				
8	14	12				
9	17	19				
10	16	19				
11	14	14				
12	19	17				
13	20	22				
14	21	24				
15	15	16				
16	15	13				
17	16	16				
18	16	13				
19	13	18				
20	14	15				
21	12	13				
22						
23						

The p-value turns out to be **0.5302**. Since this is not less than $\alpha = .05$, we fail to reject the null hypothesis of the test. We do not have sufficient evidence to say that the mean height between the two species is different.