

WORKED-OUT t-TEST WORKSHEET

(Using the dog and cat data from Table 3.1, p. 19.)

	Group 1: Dogs sleeping		Group 2: Cats sleeping	
	(a)	(a) × (a)	(b)	(b) × (b)
1	8	64	14	196
2	9	81	5	25
3	5	25	7	7
4	8	64	8	8
5	7	49	7	7
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
Sum	37 (c)	283 (d)	41 (e)	383 (f)
Count	5 (g)		5 (h)	

Step 1: Enter data in table in rows (a) and (b).

Step 2: Square (a) and put in column (a) × (a); square (b) and put in column (b) × (b).

Step 3: Sum columns (a), (a) × (a), (b) and (b) × (b) and put results on Sum row.

Step 4: Count measures in column (a) and (b) and enter them on the Count row.

Step 5: Calculate: $\frac{(c) \times (c)}{(g)} = \underline{273.8} \text{ (i)}$

$\frac{(e) \times (e)}{(h)} = \underline{336.2} \text{ (j)}$

Step 6: Calculate: (d) – (i) = 9.2 (k)

(f) – (j) = 46.8 (l)

Step 7: Calculate: (k) + (l) = 56 (m)

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Step 8: Calculate: $\frac{(m)}{(g) + (h) - 2} = \frac{7}{7} (n)$

Step 9: Calculate: $(n) \times \left(\frac{(1)}{(g)} + \frac{(1)}{(h)} \right) = (n) \times (0.2 + 0.2) = 2.8 (o)$

Step 10: Calculate: $\sqrt{(o)} = 1.67332 (p)$

Step 11: Calculate: $(g) = 7.4 (q)$ $(h) = 8.2 (r)$

Step 12: Calculate: $(q) - (r) = |0.8| (s)$ (Note: Absolute value of [s])

Step 13: Calculate: $t\text{-statistic} = \frac{(s)}{(p)} = 0.478$

Step 14: Calculate: degrees of freedom (d.f.) = $(g) + (h) - 2 = 8$

5% Significance Table			
Degrees of freedom	Critical value	Degrees of freedom	Critical value
4	2.78	15	2.13
5	2.57	16	2.12
6	2.48	18	2.10
7	2.37	20	2.09
8	2.31	22	2.07
9	2.26	24	2.06
10	2.23	26	2.06
11	2.20	28	2.05
12	2.18	30	2.04
13	2.16	40	2.02
14	2.15	60	2.00
		120	1.98

You must now compare your calculated t -statistic to the appropriate value in the significance table. Find the table value beside the appropriate degrees of freedom and enter it below.

Critical value: 2.31

Calculated t -statistic: 0.478

If the t -statistic you calculated is *less than* the critical value in the table above (for the correct degrees of freedom), then the difference between the two means is *nonsignificant*. This indicates that there is statistically *no difference* between the Group 1 and Group 2 data.

If the calculated t -statistic is *greater than* the critical value in the table above (for the correct degrees of freedom), then the difference between the two means is statistically *significant*. This indicates that *there is a statistical difference* between the Group 1 and Group 2 data.