

Sample Size Needed for Each Group ¹

Δ/σ	Number of Groups = 2											
	Alpha = 0.10				Alpha = 0.05				Alpha = 0.01			
	Beta				Beta				Beta			
	0.50	0.20	0.10	0.05	0.50	0.20	0.10	0.05	0.50	0.20	0.10	0.05
0.4	35	78			49				85			
0.5	23	51	70	88	32	64	86		55	96		
0.6	16	36	49	61	23	45	60	74	39	67	85	
0.7	12	26	36	45	17	34	44	55	29	50	63	75
0.8	10	21	28	35	14	26	34	42	23	39	49	58
0.9	8	16	22	28	11	21	27	34	19	31	39	46
1.0	7	14	18	23	9	17	23	27	15	26	32	38
1.2	5	10	13	16	7	12	16	20	11	18	23	27
1.4	4	8	10	12	6	10	12	15	9	14	17	20
1.6	4	6	8	10	5	8	10	12	7	11	14	16
1.8	3	5	7	8	4	6	8	10	6	10	11	13
2.0	3	4	6	7	4	6	7	8	6	8	10	11
2.5	2	3	4	5	3	4	5	6	4	6	7	8
3.0	2	3	3	4	3	4	4	5	4	5	6	6

Δ/σ	Number of Groups = 3											
	Alpha = 0.10				Alpha = 0.05				Alpha = 0.01			
	Beta				Beta				Beta			
	0.50	0.20	0.10	0.05	0.50	0.20	0.10	0.05	0.50	0.20	0.10	0.05
0.4	46	98			63				68			
0.5	30	63	85		41	79			68			
0.6	21	44	59	74	29	55	72	87	48	79	99	
0.7	16	33	44	54	22	41	53	65	35	59	73	86
0.8	12	25	34	42	17	32	41	50	28	45	57	67
0.9	10	20	27	33	14	25	33	40	22	36	45	53
1.0	8	17	22	27	11	21	27	32	18	30	37	43
1.2	6	12	16	19	8	15	19	23	13	21	26	31
1.4	5	9	12	15	7	11	14	17	10	16	20	23
1.6	4	7	10	12	5	9	11	14	9	13	16	18
1.8	4	6	8	9	5	8	9	11	7	11	13	15
2.0	3	5	7	8	4	6	8	9	6	9	11	12
2.5	3	4	5	6	3	5	6	7	5	7	8	9
3.0	2	3	4	4	3	4	5	5	4	5	6	7

¹Adapted from Nelson, L.S. (1985), "Sample Size Tables for Analysis of Variance," *Journal of Quality Technology*, 17, No. 3, 168-169.

Sample Size Needed for Each Group

Δ/σ	Number of Groups = 4											
	Alpha = 0.10				Alpha = 0.05				Alpha = 0.01			
	Beta				Beta				Beta			
	0.50	0.20	0.10	0.05	0.50	0.20	0.10	0.05	0.50	0.20	0.10	0.05
0.4	54				73							
0.5	35	72	96		48	89			76			
0.6	25	50	67	82	33	62	80	97	54	88		
0.7	18	37	49	61	25	46	59	72	40	65	80	94
0.8	14	29	38	47	20	36	46	55	31	50	62	73
0.9	12	23	30	37	16	28	36	44	25	40	49	58
1.0	10	19	25	30	13	23	30	36	21	33	40	47
1.2	7	14	18	22	10	17	21	25	15	23	29	33
1.4	6	10	13	16	7	13	16	19	11	18	22	25
1.6	5	8	11	13	6	10	13	15	9	14	17	20
1.8	4	7	9	10	5	8	10	12	8	12	14	16
2.0	4	6	7	9	4	7	9	10	7	10	12	13
2.5	3	4	5	6	3	5	6	7	5	7	8	9
3.0	2	3	4	5	3	4	5	5	4	5	6	7

Δ/σ	Number of Groups = 5											
	Alpha = 0.10				Alpha = 0.05				Alpha = 0.01			
	Beta				Beta				Beta			
	0.50	0.20	0.10	0.05	0.50	0.20	0.10	0.05	0.50	0.20	0.10	0.05
0.4	60				82							
0.5	39	79			53	97			84			
0.6	27	55	73	89	37	68	87		59	95		
0.7	20	41	54	66	28	50	64	77	44	70	86	
0.8	16	32	42	51	22	39	50	59	34	54	67	78
0.9	13	25	33	40	17	31	39	47	27	43	53	62
1.0	11	21	27	33	14	25	32	39	22	35	43	50
1.2	8	15	19	23	10	18	23	27	16	25	31	36
1.4	6	11	14	17	8	14	17	20	12	19	23	27
1.6	5	9	11	14	7	11	14	16	10	15	18	21
1.8	4	7	9	11	5	9	11	13	8	12	15	17
2.0	4	6	8	9	5	7	9	11	7	10	12	14
2.5	3	4	5	6	4	5	6	7	5	7	9	10
3.0	3	4	4	5	3	4	5	6	4	6	7	7

Sample Size Needed for Each Group

Δ/σ	Number of Groups = 6											
	Alpha = 0.10				Alpha = 0.05				Alpha = 0.01			
	Beta				Beta				Beta			
	0.50	0.20	0.10	0.05	0.50	0.20	0.10	0.05	0.50	0.20	0.10	0.05
0.4	65				89							
0.5	42	85			57				90			
0.6	30	59	78	95	40	73	93		63			
0.7	22	44	58	70	30	54	69	82	47	75	92	
0.8	17	34	44	54	23	42	53	63	36	58	71	82
0.9	14	27	35	43	19	33	42	50	29	46	56	65
1.0	12	22	29	35	15	27	34	41	24	38	46	53
1.2	8	16	20	25	11	19	24	29	17	27	32	38
1.4	7	12	15	19	9	15	18	22	13	20	24	28
1.6	5	9	12	15	7	11	14	17	10	16	19	22
1.8	5	8	10	12	6	9	12	14	9	13	15	18
2.0	4	7	8	10	5	8	10	11	7	11	13	15
2.5	3	5	6	7	4	6	7	8	5	8	9	10
3.0	3	4	4	5	3	4	5	6	4	6	7	8

Δ/σ	Number of Groups = 7											
	Alpha = 0.10				Alpha = 0.05				Alpha = 0.01			
	Beta				Beta				Beta			
	0.50	0.20	0.10	0.05	0.50	0.20	0.10	0.05	0.50	0.20	0.10	0.05
0.4	70				95							
0.5	46	90			61				96			
0.6	32	63	83		43	77	98		67			
0.7	24	47	61	74	32	57	73	87	50	79	96	
0.8	19	36	47	57	25	44	56	67	38	61	74	86
0.9	15	29	37	45	20	35	44	53	31	48	59	68
1.0	12	24	31	37	16	29	36	43	25	39	48	56
1.2	9	17	22	26	12	20	26	30	18	28	34	39
1.4	7	13	16	20	9	15	19	23	14	21	25	29
1.6	6	10	13	15	7	12	15	18	11	16	20	23
1.8	5	8	10	12	6	10	12	15	9	13	16	18
2.0	4	7	9	10	5	8	10	12	8	11	13	15
2.5	3	5	6	7	4	6	7	8	6	8	9	10
3.0	3	4	5	5	3	5	5	6	4	6	7	8

Sample Size Needed for Each Group

Δ/σ	Number of Groups = 8											
	Alpha = 0.10				Alpha = 0.05				Alpha = 0.01			
	Beta				Beta				Beta			
	0.50	0.20	0.10	0.05	0.50	0.20	0.10	0.05	0.50	0.20	0.10	0.05
0.4	75											
0.5	48	95			65							
0.6	34	67	87		46	81			71			
0.7	25	49	64	78	34	60	76	91	52	82		
0.8	20	38	49	60	26	46	59	70	40	63	77	90
0.9	16	30	39	48	21	37	47	55	32	51	62	71
1.0	13	25	32	39	17	30	38	45	26	41	50	58
1.2	9	18	23	27	12	21	27	32	19	29	35	41
1.4	7	13	17	20	10	16	20	24	14	22	26	30
1.6	6	10	13	16	8	13	16	18	11	17	21	24
1.8	5	9	11	13	6	10	13	15	9	14	17	19
2.0	4	7	9	11	5	9	11	12	8	12	14	16
2.5	3	5	6	7	4	6	7	8	6	8	9	11
3.0	3	4	5	5	3	5	6	6	4	6	7	8

Δ/σ	Number of Groups = 9											
	Alpha = 0.10				Alpha = 0.05				Alpha = 0.01			
	Beta				Beta				Beta			
	0.50	0.20	0.10	0.05	0.50	0.20	0.10	0.05	0.50	0.20	0.10	0.05
0.4	79											
0.5	51				69							
0.6	36	70	91		48	85			74			
0.7	27	52	67	81	36	63	79	94	55	86		
0.8	21	40	52	62	28	48	61	72	42	66	80	93
0.9	17	32	41	50	22	38	48	58	34	53	64	74
1.0	14	26	33	40	18	31	40	47	28	43	52	60
1.2	10	18	24	28	13	22	28	33	20	30	37	42
1.4	8	14	18	21	10	17	21	25	15	23	27	32
1.6	6	11	14	17	8	13	16	19	12	18	21	25
1.8	5	9	11	13	7	11	13	15	10	14	17	20
2.0	4	7	9	11	6	9	11	13	8	12	14	16
2.5	3	5	6	8	4	6	8	9	6	8	10	11
3.0	3	4	5	6	3	5	6	6	5	6	7	8