

AGH Practicals 2

1. Professor I just graded a Statistics quiz. The following table contains the grades organized according to the ink color and pen type used.

Color	Type	Grades						
Blue	Ball	16.25	12.50	15.00	16.50	11.50	10.00	16.00
Black	Ball	14.00	14.75	13.00	11.00	12.50	13.25	15.00
Green	Ball	15.00	12.75	16.00	9.50	11.75	14.50	17.00
Blue	Ink	18.00	14.25	17.50	14.00	15.25	15.25	14.50
Black	Ink	16.00	18.00	13.50	16.50	12.00	16.00	12.00

Carry out a one-way ANOVA to test for an effect of writing tool upon the performance.

2. To examine the resistance of fabric under pressure, tensile strength is measured. In this experiment, the researcher wants to determine the best level of the cotton percentage to achieve the highest tensile strength of the fiber. A fabric is made under five treatment conditions: cotton percentages ranging from 15% to 35% in increments of 5%. Tensile strengths are measured on five replicates, amounting to a total of 25 runs. Carry out a one-way ANOVA to test for the following data.

Cotton %	Replicates					Averages
15%	7	7	15	11	9	9.8
20%	12	17	12	18	18	15.4
25%	14	18	18	19	19	17.6
30%	19	25	22	19	23	21.6
35%	7	10	11	15	11	10.8

3. Scientists are interested in whether the energy costs involved in reproduction affect longevity. In this experiment, 125 male fruit flies were divided at random into five sets of 25. In one group, the males were kept by themselves. In two groups, the males were supplied with one or eight receptive virgin female fruit flies per day. In the final two groups, the males were supplied with one or eight unreceptive (pregnant) female fruit flies per day. Other than the number and type of companions, the males were treated identically. The longevity of the flies was observed. *Data from Hanley and Shapiro (1994).*

Companions	Longevity (days)												
None	35	37	49	46	63	39	46	56	63	65	56	65	70
	63	65	70	77	81	86	70	70	77	77	81	77	
1 pregnant	40	37	44	47	47	47	68	47	54	61	71	75	89
	58	59	62	79	96	58	62	70	72	75	96	75	
1 virgin	46	42	65	46	58	42	48	58	50	80	63	65	70
	70	72	97	46	56	70	70	72	76	90	76	92	
8 pregnant	21	40	44	54	36	40	56	60	48	53	60	60	65
	68	60	81	81	48	48	56	68	75	81	48	68	
8 virgin	16	19	19	32	33	33	30	42	42	33	26	30	40
	54	34	34	47	47	42	47	54	54	56	60	44	

Analyze these data to test the null hypothesis that reproductive activity does not affect longevity. Write a report on your analysis. Be sure to describe the experiment as well as your results.