Biology 4605 / 7220 Name _____

Worksheet - Single fixed variable Short Assignment A3 Yr 2020 Quiz 6 Year 2015

1. Walking Babies. Cobb (2015 *Design and Analysis of Experiments* p 150) reported the age (in months) at which babies first walked. The goal of the study was to find if special (structured) exercise lowered the age, compared to 3 control groups: (1) 12 minute/day of unstructured exercise; (2) no exercise and a weekly parental report; (3) no exercise and a single parental report at the end of the study. Six baby boys were assigned randomly to each level, only 5 values were obtained for the single parental report babies.

Age	Ex
9	Special
9.5	Special
9.75	Special
10	Special
13	Special
9.5	Special
11	Exercise
10	Exercise
10	Exercise
11.8	Exercise
10.5	Exercise
15	Exercise
11	Weekly Report
12	Weekly Report
9	Weekly Report
11.5	Weekly Report
13.3	Weekly Report
13	Weekly Report
13.3	Single Report
11.5	Single Report
12	Single Report
13.5	Single Report
11.5	Single Report

1a. Complete the table, use A for age and Ex for Exercise group

Name	Symbol	Resp/Explanatory	Type (NOIR)	Rand/Fixed
_____	A	_____	_____	
_____	Ex	_____	_____	_____

1b. 2c. Justify your choice of random or fixed factor

Number of groups being compared _____[1]

Sample size across all groups _____[1]

1a. Write a GLM, using A for age, and Ex for Exercise group. [5]

1b. The SS_{group} for this data was 14.448

Complete the ANOVA table [6]

	Df	Sum of Sq	Mean Sq	F-ratio	Pr(F)
Group					0.137
Residuals					
Total	22	58.554			

The p-value for SSgroup is 14.448.

What happens to the p-value when SS_{group} increases ? _____ [1]

1c. Use symbolic notation to state the null hypothesis being tested _____ [1]

Score _____/ 16

2. Follow-up study (next page).

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Worksheet - Single variable – Random or Fixed? Yr2021 Extension of Yr2020 A3

2. Transition from crawling to walking occurs over a period of weeks. Does the reported age at which babies first walk depend on the person doing the scoring?
Design a study to investigate this for one of the control groups.

2a. Choose one of the control groups and give a reason for your choice. [2]
(1) 12 minute/day of unstructured exercise;
(2) no exercise and a weekly parental report;
(3) no exercise and a single parental report at the end of the study.

2b. Several scorers need to be hired. As well, a certain number of babies need to be assigned to each scorer. Increasing the number of scorers costs more than increasing the number of babies. Assuming a similar number of babies (approximately 24) in the follow up study, make an allocation of babies to a defined number of scorers. [3]

Number of scorers.	__1__	_____	_24__
Number of babies/ scorers	_24__	_____	__1__
Total babies	_24__	_____	_24__

Describe how you chose this allocation. [2]

Complete the listing of variables table, for the follow-up study. [8]

Name	Symbol	Resp/Explanatory	Type (NOIR)	Rand/Fixed
_____	A	_____	_____	
_____	___	_____	_____	_____

2c. Scorers: Random or fixed factor? _____
Justify your choice. [2]

2d. Write a GLM, using A for age, and your symbol for the explanatory variable.. [5]