Biology 4605/7220 NAMES for credit_____
30 November 2022 Worksheet Mixed models.

Mixed models contain at least one fixed and on random factor. Interaction terms in a mixed model can be either fixed (fixed crossed with fixed) or mixed (random crossed with fixed). The former are tested, the latter are not. The latter often appear as the denominator in correctly nested tests of fixed effects. For the example circled, fill out the variable table, write the model, and show df below each term in the model. Examples are from Cobb 2014 *Design and Analysis of Experiments.*

1. Dreaming of shrews. Three kinds of sleep were of interest: light slow-wave sleep LSW, deep slow-wave sleep DSW, and rapid eye movement sleep REM. Heart rate drops during slow-wave sleep; it goes up and down during REM sleep. The subjects were 6 tree shrews. Heart rate of each shrew was measured under all three conditions. Cobb (p249) reports a single number in each subject in each treatment.

			Explanatory variables	
Variable	Symbol	Response or explanatory?	Fixed or Random?	Crossed or Nested?

Model

2. Finger tapping. Scott and Chen (1944, *J. Pharmacol, Exptl Therapy* 82:89-97) reported the results of a study to compare the effects of caffeine, theobromine, and a placebo on finger tapping. Cobb (p268) reports a single number for each treatment for subjects labelled I, II, III, and IV.

			Explanatory variables	
Variable	Symbol	Response or explanatory?	Fixed or Random?	Crossed or Nested?

Model

Extra: on the reverse, rewrite the model for 2 measurements/subject. What terms do you think should be used to form the F-ratio for the treatment effect?