Activity: Graphing Survivorship Curves

1. Graph the three sets of data below on the same graph. Use a different color for each species. You are graphing the percent of maximum life span vs. the percentage of survivors, so your x and y axis intervals need to be 0 to 100.

Table 1: Life table for bullfrogs

Percent of Maximum Life Span	Percentage of Survivors
0	100
7	1.5
14	1.3
21	1.2
29	1.0
36	0.9
43	0.8
50	0.6
57	0.6
64	0.5
71	0.5
79	0.4
86	0.4
93	0.1
100	0

Table 2: Life table for squirrels

Percent of Maximum Life Span	Percentage of Survivors
0	100
17	50
33	15
50	4.5
67	2
83	0.5
100	0

Table 3: Life table for humans (2004 population)

Percent of Maximum Life Span	Percentage of Survivors
0	100
10	99.1
20	98.7
30	97.8
40	96.5
50	93.7
60	88.0
70	76.2
80	22.2
90	2.5
100	0

2. Each of the lines on the graph you created represent different types of survivorship curves. Species that exhibit a Type I curve usually produce few offspring but give them good care, increasing the likelihood that they will survive to maturity. Which of the species exhibit a Type I curve?_____

3. Species that exhibit a Type III curve indicates high death rates for the very young and then a period when death rates are much lower for those few individuals who survive to a certain age. Species with this type of survivorship curve usually produce very large numbers of offspring but provide little or no care for them. Which of the species exhibit a Type III curve?_____
4. A Type II curve is intermediate, with mortality more constant over the life span. Which of the species exhibit a Type II curve? _____

5. Label the types of survivorship curves on your graph.

6. What conclusions can you draw about the relationship between r/k strategists and survivorship curves?

_____
_____
_____

7. The floodplain on either side of a river is a volatile environment subject to frequent flooding. Would you expect plants that were r or k strategists to be dominant in the plant community, and why?

_____
_____
_____
_____
_____
_____

The *principle of allocation* predicts that organisms should balance out their allocation of energy to reproduction, growth, and survival. This leads to trade-offs for because energy allocated to survival is not available for growth or reproduction and energy allocated to reproduction is not available to survival and growth, etc. The degree to which a species allocates energy to one of these life history properties over another (i.e., its pattern of energy allocation) has evolved in response to its environment.

8. Two plant species co-occur in an oak savanna. One is fairly long-lived and produces few large seeds. The other is short-lived and produces many small seeds.
    a. Compare and contrast the advantages and disadvantages of these two life histories.

    b. Which species is most likely an r-selected and which species is most likely a K-selected species? Explain your answer in terms of the principle of allocation and the kind of environmental conditions to which these two life histories tend to correspond.