

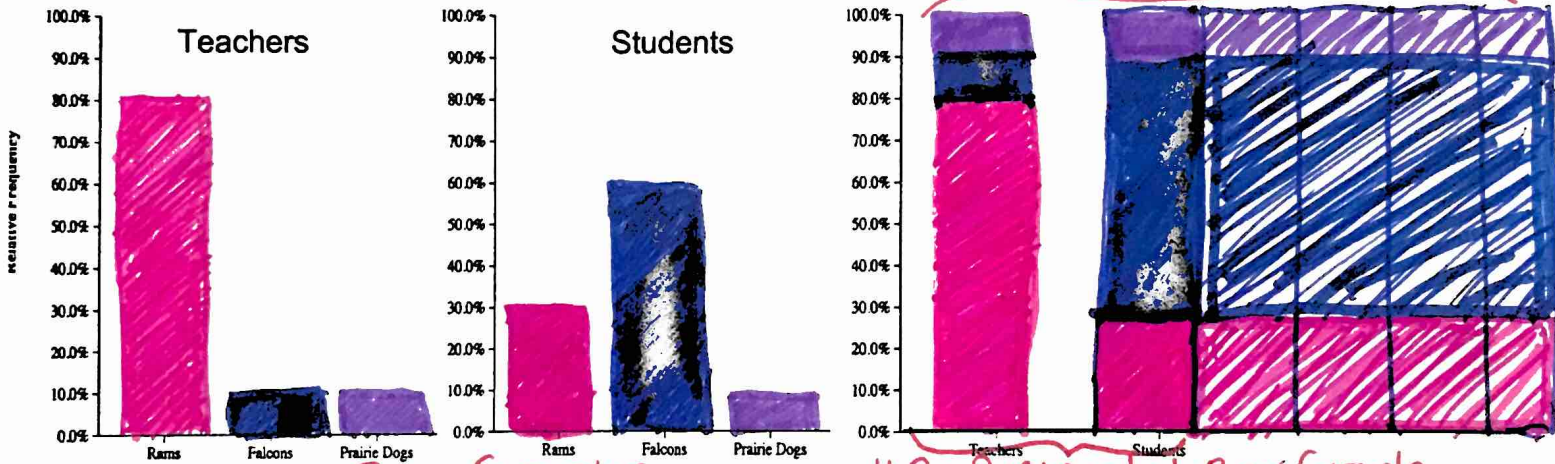
What will be the EK mascot?

When the high school was built in 1969, the school needed to pick a mascot. The principal decided to have the students and teachers vote between three choices: rams, falcons, or prairie dogs. He took a random sample of students and a random sample of teachers. The results of the surveys are given in the table.

	Rams	Falcons	Prairie Dogs
Teachers	80%	10%	10%
Students	30%	60%	10%

Conditional Distribution

1. Create two bar graphs below to display the results. Use three different colors for the bars.
2. Complete the third graph by taking each bar from the teacher sample and stacking them. Use the colors to mark each section. *#5: Mosaic Plot*



Bar Graphs

#2: Segmented Bar Graph

3. According to your displays, which mascot appears to have the most support? Explain.
The rams, if you stacked the bars for rams together for teachers and students it would be taller than the bars for falcons or prairie dogs.
4. Upon hearing the results of the surveys, the students argued that the decision was incorrect because 100 teachers had been surveyed and 500 students had been surveyed. Use this information to fill in the table below with the number of responses.

	Rams	Falcons	Prairie Dogs
Teachers	80	10	10
Students	150	300	50

Total: Rams 230, Falcons 310, Prairie Dogs 60

5. How many times more students were sampled than teachers? 5. How can you update the third graph in #1 to take into account the sample size? Adjust your graph.
Add 4 more student bars so there are 5 and only 1 teacher bar
6. What should they make the EK mascot? Explain.
The falcons, there were more people who chose falcons (310) than the other mascots (230 or 60). You can see this in the new graph because the falcon section covers the most area.

Topic 2.2 – Representing Two Categorical Variables

Important Ideas:

Categorical
vs. Quantitative:

- Categorical variables take on values that are names or labels.
- Quantitative variables are numerical & measure a quantity.

Displays of Categorical Variables:

Bar graphs, side-by-side bar graphs

Segmented bar graphs:

Each bar shows the proportion of individuals in each corresponding category.

Association:

If knowing the value of one variable helps us predict the value of the other, the two variables are associated.

Check Your Understanding:

Mosaic Plot: modified segmented bar graph where width is proportional to size of group.

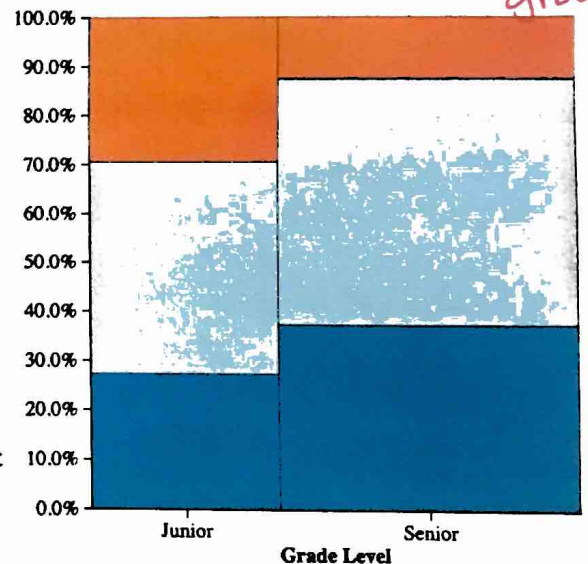
The following table gives the result of a random sample of upper level students at Rocky Vista University (the Fighting Prairie Dogs!), along with a mosaic plot.

Employment Status	Grade Level	
	Junior	Senior
Currently working	14	30
Not working but have had a job	22	40
Never had a job	15	10

51 80

Employment status

- Never had a job
- Not working but did in the past
- Currently working



- a. Calculate the proportion of Juniors that are currently working, not working but have had a job, and never had a job.

Jr. that currently work: $\frac{14}{51} = .27$ Jr. not working but have had job: $\frac{22}{51} = .43$ Jr. that never had job: $\frac{15}{51} = .29$

- b. Calculate the proportion of Seniors that are currently working, not working but have had a job, and never had a job.

Sr. that currently work: $\frac{30}{80} = .38$ Sr. not working but have had job: $\frac{40}{80} = .50$ Sr. that never had a job: $\frac{10}{80} = .13$

- c. Write a few sentences summarizing what the display in part (a) reveals about the association between grade level and job experience for the students in the sample.

There is an association between employment status and grade level. Knowing whether or not a student is a jr. or sr. impacts the likelihood of their employment status. For example a sr. is more likely to be currently working (.38) than a jr. (.27).