Question 1: How can I tell whether to **use StatKey applets about mean(s) or proportion(s)** just from the question asked?

Answer:

Look at the way the variable(s) in the problem are described.

> For a variable, make up at least two possible values you might observe on that variable.

> If the values you make up are numbers – meaning that you counted something or measured something for which you will get a number, then this is a quantitative variable and the summary statistic is a mean.

> If the values you get are not coming from measurements of some sort, but just words or categories - like eye color (blue, brown, etc.) - then you will summarize that data by proportion(s.)   For the eye color, you would give the proportion of people with blue eyes, the proportion of people with brown eyes, etc.

Question 2: When analyzing data in proportions, how do I **know whether two proportions are independent**?

Answer:

Each proportion comes from a fraction.   The denominator of the fraction is the number in the entire population or sample you are looking at.   The numerator of the fraction is the number in the group who have in the category you're interested in.

Two proportions are NOT independent if the denominators of their fractions are the same group.

> Example 1:   Question: Among the pilots for a particular airline, what is the distribution of their eye colors?
> Variable: Eye color.   Categories: blue, brown, other. (In reality, we'd probably have more categories.)
> If we compute the proportions of the three categories for color from this particular group, they will all have the same denominator.   **These proportions are not independent**.

> Example 2:   Task: Compare the proportions of cat owners among people who are doctors and people who are lawyers.
> Variable: Cat ownership. Categories: Yes, No.
> For the group of doctors, we find a proportion, such as 23 cat owners out of 44 doctors, so 23/44. For the group of lawyers, we find a proportion such as 18 cat owners out of 51 lawyers, so 18/51. **These are independent proportions.**

> Example 3:   Task: Compare the proportions of cat owners in a population.
> Variable: Cat ownership. Categories: Yes, No.
> If we want to compute these proportions of these two categories in any group, we even think of comparing, statistically, these two proportions. In fact, we only need ONE of these proportions to fully summarize these data, because the two proportions must sum to 1 (same group in the two denominators.)   **These two proportions are NOT independent.**