

Recall the students' class subject preference data.

Elementary Students' Subject Preferences

	Math	English	Total
Males	42	47	89
Females	35	25	60
Total	77	72	149

The principal says that males in the interview have a stronger preference for math than females. Why might the principal say this?

The number is larger

We can determine the answer to questions like this by comparing **conditional relative frequencies**.

To evaluate whether there is a relationship between two categorical variables, look at the conditional relative frequencies.

- If there is a significant difference between the conditional relative frequencies, then there is evidence of an association between two categorical variables.

Is there an association between gender and class preference?

Yes! 58% of females liked math and only 47% of males did.

Conditional Relative Frequency Table

	Math	English	Total
Males	$\frac{42}{89} = .47$	$\frac{47}{89} = .53$	
Females	$\frac{35}{60} = .58$	$\frac{25}{60} = .42$	
Total			

What percentage of male students prefer math?

47%

What percentage of female students prefer math?

58%

These percentages are called **conditional relative frequencies**.

- Make a conjecture as to why they are called conditional relative frequencies.

Not based on total

When trying to predict a person's class preference, does it help to know his/her gender?

Yes!

Consider the high school students who were asked if they play video games.

Video Games Survey

	Play Video Games	Do Not Play Video Games	Total
Males	69	60	129
Females	65	85	150
Total	134	145	279

1. What percentage of the students who do not play video games are female?

$$\frac{85}{145} = 59\%$$

2. Given that a student is female, what is the probability that the student does not play video games?

$$\frac{85}{150} = 57\%$$

3. Of the students who are male, what is the probability that the student plays video games?

$$\frac{69}{129} = 54\%$$

4. What percentage of the students who play video games are male?

$$\frac{69}{131} = 52\%$$

1. Freshmen and sophomores were asked about their preferences for an end-of-year field trip for students who pass their final examinations. Students were given the choice to visit an amusement park, a water park, or a mystery destination. A random sample of 100 freshmen and sophomores was selected. The activities coordinator constructed a frequency table to analyze the data.

Students' Field Trip Preferences

	Amusement Park	Water Park	Mystery Destination	Total
Freshmen	25	10	20	55
Sophomores	35	5	5	45
Total	60	15	25	100

Part A: What does the relative frequency $\frac{10}{55}$ represent?

Out of 55 freshmen, 10 chose water park.

Part B: What percentage of students who want to go to an amusement park are sophomores?

$$\frac{35}{60} = 58\%$$

Part C: What activity should the coordinator schedule for sophomores? Justify your answer.

Amusement park 78%