Lesson Summary

- Univariate categorical data are displayed in a one-way frequency table.
- Bivariate categorical data are displayed in a two-way frequency table.
- *Relative frequency* is the frequency divided by a total $\left(\frac{\text{frequency}}{\text{total}}\right)$.
- A *cell relative frequency* is a cell frequency divided by the total number of observations.
- A *row relative frequency* is a cell frequency divided by the row total.
- A *column relative frequency* is a cell frequency divided by the column total.

Problem Set

Every student at Abigail Douglas Middle School is enrolled in exactly one extracurricular activity. The school counselor recorded data on extracurricular activity and gender for all 254 eighth-grade students at the school.

The counselor's findings for the 254 eighth-grade students are the following:

- Of the 80 students enrolled in band, 42 are male.Of the 65 students enrolled in choir, 20 are male.
- Of the 88 students enrolled in sports, 30 are female.
- Of the 21 students enrolled in art, 9 are female.

1. Complete the table below.

		Extracurricular Activities				
		Band	**Choir**	**Sports**	**Art**	**Total**
Gender	**Female**					
	Male					
	Total					

2. Write a sentence explaining the meaning of the frequency 38 in this table.

Use the table provided above to calculate the following relative frequencies.

3. What proportion of students are male and enrolled in choir?

4. What proportion of students are enrolled in a musical extracurricular activity (i.e., band or choir)?

5. What proportion of male students are enrolled in sports?

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6. What proportion of students enrolled in sports are male?

Pregnant women often undergo ultrasound tests to monitor their babies' health. These tests can also be used to predict the gender of the babies, but these predictions are not always accurate. Data on the gender predicted by ultrasound and the actual gender of the baby for 1,000 babies are summarized in the two-way table below.

		Predicted Gender	
		Female	**Male**
Actual Gender	**Female**	432	48
	Male	130	390

7. Write a sentence explaining the meaning of the frequency 130 in this table.

Use the table provided above to calculate the following relative frequencies.

8. What is the proportion of babies who were predicted to be male but were actually female?

9. What is the proportion of incorrect ultrasound gender predictions?

10. For babies predicted to be female, what proportion of the predictions were correct?

11. For babies predicted to be male, what proportion of the predictions were correct?

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