8.4 Relative Frequency
A Solidify Understanding Task

Rachel is thinking about the data she and her mom collected for the average number of texts a person sends each day and started thinking that perhaps a two-way table of the data they collected would help convince her mom that she does not send an excessive amount of texts for a teenager. The table separates each data point by age (teenager and adult) and by the average number of texts sent (more than 100 per day or less than 100 per day).

	Average is more than 100 texts sent per day	Average is less than 100 texts sent per day	Total
Teenager	20	4	24
Adult	2	22	24
Total	22	26	48

Write two observation statements of this two way table.

To further provide evidence, Rachel decided to do some research. She found that only 43% of people with phones send over 100 texts per day. She was disappointed that the data did not support her case and confused because it did not seem to match what she found in her survey. What questions do these statistic raise for you? What data should Rachel look for to support her case?

After looking more closely at the data, Rachel found other percentages within the same data that seemed more accurate with the data she collected from her teenage friends. How might Rachel use the data in the two way table to find percentages that would be useful for her case?

Part II: Once Rachel realized there are a lot of ways to look at a set of data in a two way table, she was self-motivated to learn about *relative frequency tables* and conditional frequencies. When the data is written as a percent, this is called a *relative frequency table*. In this situation, the 'inner' values represent a percent and are called conditional frequencies. The conditional values in a *relative frequency table* can be calculated as percentages of one of the following:

- the whole table (relative frequency of table)
- the rows (relative frequency of rows)
- the columns (relative frequency of column)

Since Rachel wants to emphasize that a person's age makes a difference in the number of texts sent, the first thing she decided to do is focus on the ROW of values so she could write conditional statements about the number of texts a person is likely to send based on their age. This is called a *relative frequency of row* table. Fill in the percentage of teenagers for each of the conditional frequencies in the highlighted row below:

Row ⟹

	Average is more than 100 texts sent per day	Average is less than 100 texts sent per day	Total
Teenager	20	4	24
% of teenagers	__%	__%	100%
% of Adults	2 8%	22 92%	24 100%
% of People	22 46%	26 54%	48 100%

Since the PERCENTAGES created focus on ROW values, all conditional observations are specific to the information in the row. Complete the following sentence for the *relative frequency of row:*

Of all teenagers in the survey, _____ % average more than 100 texts per day.

Write another statement based on the *relative frequency of row:*

Below is the *relative frequency of column* using the same data. This time, all of the percentages are calculated using the data in the column.

	Average is more than 100 texts sent per day	Average is less than 100 texts sent per day	Total
Teenagers	20 91%	4 15%	24 50%
Adults	2 9%	22 85%	24 50%
Total	22 100%	26 100%	48 100%

Write two conditional statements using the *relative frequency of column.*

This data represents the *relative frequency of whole table*:

	Average is more than 100 texts sent per day	Average is less than 100 texts sent per day	Total
% of Teenagers	20 42%	4 8%	24 50%
% of Adults	2 4%	22 46%	24 50%
% of Total	22 46%	26 54%	48 100%

Create two conditional distribution statements for the *relative frequency of whole table*

How do *relative frequency tables* impact the way you look at data in two way tables?