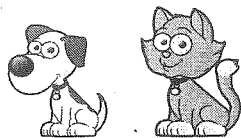
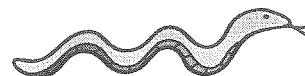


Part 1: Copy the table from on the class's data on the board.



What's your favorite pet?



Gender	Preferred Pet			Total
	Dog	Cat	Other	
Girl	5	0	3	8
Boy	6	1	3	10
Total	11	1	6	18

- By organizing data in tables, raw data can be become more than just a list.
- Above, this is an example of a TWO-WAY TABLE which lists the frequencies of paired values from a data set of two CATEGORICAL VARIABLES
- CATEGORICAL DATA is data that CANNOT BE EXPRESSED USING NUMBERS.
 - In our example, the two categorical values being compared are GENDER & PET
- What are some conclusions you can draw from the two-way table above? (USING OUR DATA)
 - NO GIRLS LIKE CATS
 - THE SAME NUMBER OF GIRLS & BOYS LIKE "OTHER PETS"
 - MORE BOYS THAN GIRLS
 - THE MOST POPULAR PET FOR BOYS IS A DOG; LEAST POPULAR IS A CAT.
 - MOST POPULAR PET FOR GIRLS IS ALSO DOGS & LEAST POPULAR IS CATS.

Part 2: Relative Frequencies

Categorical data can be interpreted as RELATIVE FREQUENCIES: TO SHOW WHAT PORTION OF DATA EACH CATEGORY MAKES UP FROM A GROUP, DIVIDE THE FREQUENCY OF EACH CATEGORY BY THE TOTAL OF ALL FREQUENCIES.

Preferred Pet	Dog	Cat	Other	Total
Frequency	$\frac{11}{18} = 0.611$ 61%	$\frac{1}{18} = 0.055$	$\frac{6}{18} = 0.333$	$\frac{18}{18} = 1 = 0.999$

- What types of numbers can you use to write relative frequencies?
DECIMAL OR FRACTION
- List the frequencies from the table in descending order.
0.611, 0.333, 0.055
- What does the denominator refer to?
18 IS THE SUM OF ALL FREQUENCIES: ITS HOW MANY STUDENTS PARTICIPATED

There are two types of relative frequencies found using a relative frequency table.

1. JOINT RELATIVE FREQUENCY: TELLS WHAT PORTION OF THE TOTAL HAS TWO SPECIFIC CHARACTERISTICS. IT IS FOUND BY DIVIDING THE FREQUENCY OF THAT CELL (MIDDLE OF TABLE) BY TOTAL FREQUENCY.
2. MARGINAL RELATIVE FREQUENCY: TELLS WHAT PORTION OF THE TOTAL HAS ONE SPECIFIED CHARACTERISTIC. IT IS FOUND BY DIVIDING A COLUMN OR ROW TOTAL BY THE GRAND TOTAL.

Find the relative frequencies for each cell. Interpret each cell.

Gender	Preferred Pet			Total
	Dog	Cat	Other	
Girl	Joint relative frequency: $\frac{5}{18} \approx 0.278$	Joint relative frequency: $\frac{0}{18} = 0$	Joint relative frequency: $\frac{3}{18} = 0.167$	Marginal relative frequency: $\frac{8}{18} = 0.445$
Boy	Joint relative frequency: $\frac{6}{18} = 0.333$	Joint relative frequency: $\frac{1}{18} = 0.0556$	Joint relative frequency: $\frac{3}{18} = 0.167$	Marginal relative frequency: $\frac{10}{18} = 0.555$
Total	Marginal relative frequency: $\frac{11}{18} = 0.611$	Marginal relative frequency: $\frac{1}{18} = 0.0556$	Marginal relative frequency: $\frac{6}{18} = 0.333$	1

Part 3: Conditional Relative Frequency

1. Finally, a CONDITIONAL RELATIVE FREQUENCY DESCRIBES WHAT PORTION OF A GROUP (ROW OR COLUMN GROUP) HAS A SPECIFIC CHARACTERISTIC.

a. Find the conditional relative frequency that a person prefers cats, given that the person is a girl.

like cats
freq of girls = $\frac{0}{8} = 0\%$

b. Find the conditional that a student chose other, given that the person is a boy.

chose other
frequency of Boys = $\frac{3}{10} = 0.3$

How to interpret conditional relative frequency

"GIVEN": THE DENOMINATOR IS THE CATEGORY DESCRIBED AFTER THE WORD GIVEN.

Example



Gather data as a class, and complete the table in your groups.

Gender	This morning's breakfast			Total
	Cereal	Not cereal	Did not eat breakfast	
Girl	0	6	2	8
Boy	2	7	1	10
Total	2	13	3	18

Answer the question, using the frequencies to justify your answer in your response.

- How many more girls than boys ate cereal for breakfast?
- Do more students eat breakfast or do not eat breakfast?
- Do more students eat cereal or do not eat cereal?
- Which gender do we have more of in this class?

Create a relative frequency table based on our cereal two-way table.

Breakfast	Cereal	Not cereal	None	Total
Frequency				

5. Form two conclusions based on the data in the relative frequency table.

Find the relative frequencies of each cell.

Gender	This morning's breakfast			Total
	Cereal	Not cereal	Did not eat breakfast	
Girl				
Boy				
Total				

6. Find the joint relative frequency of students surveyed who are boys who did not eat breakfast.
7. What is the marginal relative frequency of students surveyed who eat cereal for breakfast?
8. Find the conditional relative frequency that a person is a boy, given that the person did not eat cereal for breakfast.

↳ $\frac{7}{13} \approx 0.538$

9. Find the conditional relative frequency that a person did not eat cereal for breakfast, given that person is a boy.

$\frac{7}{10} \approx 0.70$

10. Describe what portion of the group the following marginal frequency describes:

Exit Ticket: How can a two-way table be used?

*Create your own survey with your own two-way table.
You do not have to use all columns (or you could use more).*

- Identify your two categorical variables:

Two-way Table

				<i>TOTAL</i>
				<i>TOTAL</i>
<i>TOTAL</i>				

Relative Frequency Table

Conditional Relative Frequency Table

- Identify and describe what each joint relative frequency stands for:

- Identify and describe what each marginal relative frequency stands for: