Pre-Algebra Name:
Two-Way Frequency Tables (Homicides) Date:

LT: I can analyze one way frequency tables and use them to make inferences and speculations.

Guiding Question: How does looking at different levels of data unveil a clearer picture of the situation?

Section 1 – One-Way Frequency Tables

1) Make an inference using the data below.

	White Victim	**Black Victim**	**TOTAL**
	3,074	2,609	5,683

-Race of Victim of Single Offender/Victim Homicides, 2015 FBI Homicide Data

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2) Make an inference using the data below.

	White Offender	**Black Offender**	**TOTAL**
	2,803	2,880	5,683

-Race of Victim of Single Offender/Victim Homicides, 2015 FBI Homicide Data

Pre-Algebra
Two-Way Frequency Tables (Homicides)

Name:
Date:

Below are some numbers from the 2010 census data.

White American	223,553,265	72.4 %
African Americans	38,929,319	12.6 %
Asian American	14,674,252	4.8 %
Native Americans or Alaska Native	2,932,248	0.9 %
Native Hawaiian or other Pacific Islander	540,013	0.2 %
Some other race	19,107,368	6.2 %
Two or more races	9,009,073	2.9 %
Total	**308,745,538**	**100.0%**

3) What do you notice about the populations of White Americans and African Americans?

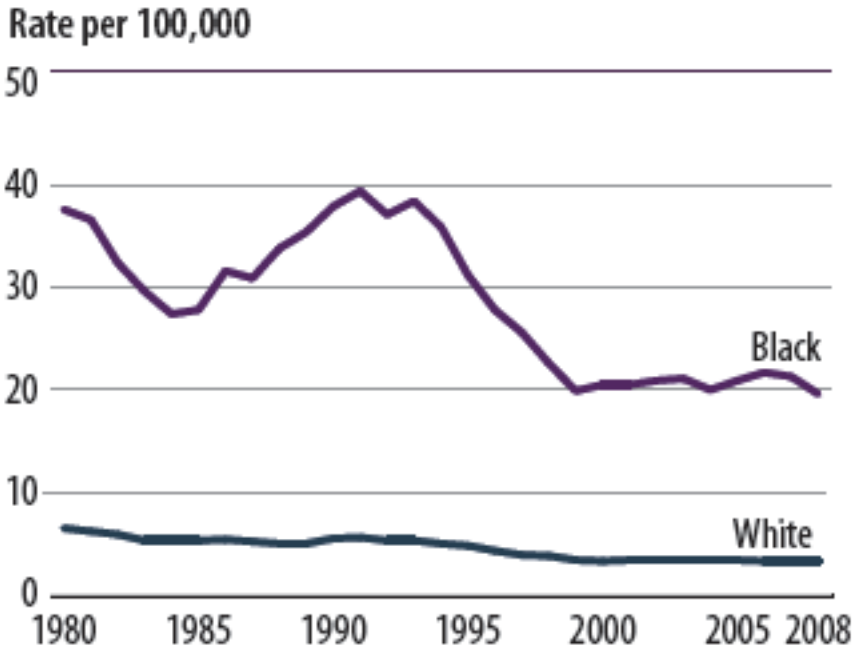
4) Does this new information change how you understand the homicide data on the first page?

Key Takeaways:

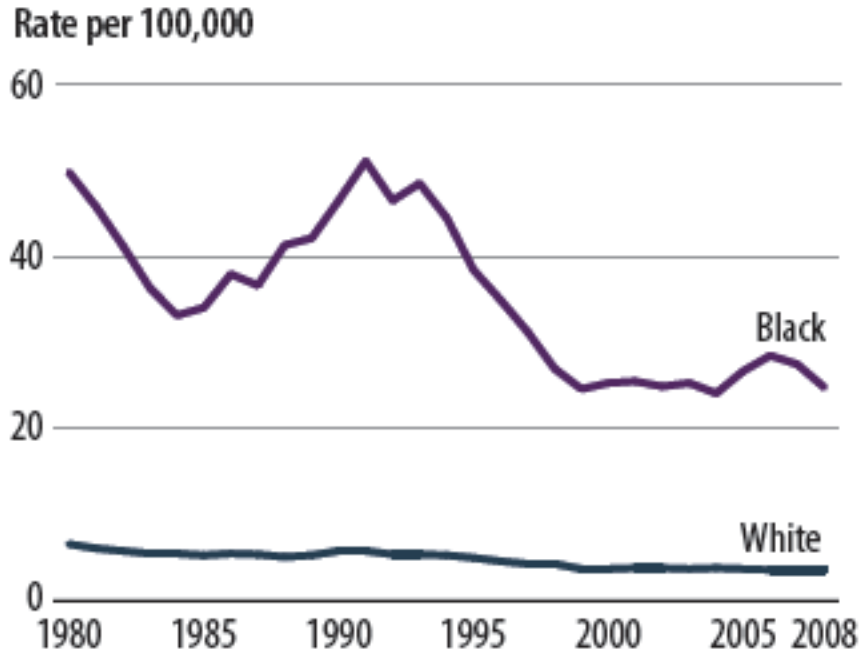
Pre-Algebra
Two-Way Frequency Tables (Homicides)

Name:
Date:

Homicide victimization rates, by race, 1980–2008



Homicide offending rates, by race, 1980–2008



-Bureau of Justice Statistics

Pre-Algebra Name:
Two-Way Frequency Tables (Homicides) Date:

LT: I can interpret two-way frequency tables and use them to make inferences and speculations.
LT: I can explain how studying the interaction of two categories of data uncovers more information.

Section 2 – Two-Way Frequency Table

1) Predict the number that goes into each of the four empty cells. Fill in the cells with your prediction. Make sure your numbers agree with row and column totals.

PREDICTION TABLE.

	White Victim	**Black Victim**	**TOTAL**
White Offender			2,803
Black Offender			2,880
TOTAL	3,074	2,609	5,683

-Race of Victim by Race of Offender of Single Offender/Victim Homicides, 2015 FBI Homicide Data

2) Explain the reasoning behind your predictions.

Pre-Algebra Name:
Two-Way Frequency Tables (Homicides) Date:

ACTUAL DATA TABLE.

	White Victim	**Black Victim**	**TOTAL**
White Offender	2,574	229	2,803
Black Offender	500	2,380	2,880
TOTAL	3,074	2,609	5,683

-Race of Victim by Race of Offender of Single Offender/Victim Homicides, 2015 FBI Homicide Data

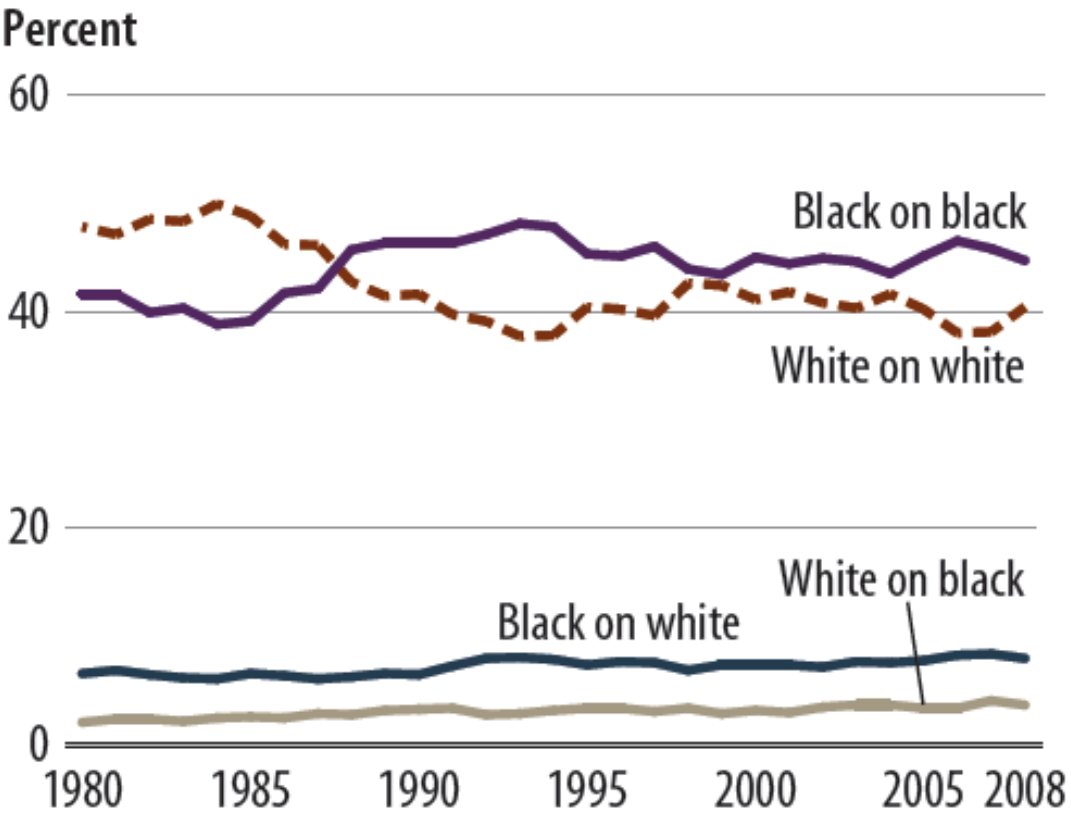
3) Make an inference based on the data.

4) Make a speculation on why the data looks this way.

Pre-Algebra
Two-Way Frequency Tables (Homicides)

Name:
Date:

Homicides, by race of offender and victim, 1980–2008



-Bureau of Justice Statistics

Key Takeaways:

Pre-Algebra Name:
Two-Way Frequency Tables (Homicides) Date:

LT: I can explain the significance of row totals vs. column totals.
LT: I can compute relative frequencies.

Section 3 – Row and Column Relative Frequencies

	White Victim	**Black Victim**	**TOTAL**
White Offender	2,574 (——— ≈)	229 (——— ≈)	2,803 (——— ≈)
Black Offender	500 (——— ≈)	2,380 (——— ≈)	2,880 (——— ≈)
TOTAL	3,074 (——— ≈)	2,609 (——— ≈)	5,683 (——— ≈)

1) Row Frequencies:

-Race of Victim by Race of Offender of Single Offender/Victim Homicides, 2015 FBI Homicide Data

a) Complete the following inferences using the relative row frequencies.

_____% of white offenders had a white victim.

_____% of all offenders had a white victim.

b) Write your own inference using the relative row frequency table.

Pre-Algebra Name:
Two-Way Frequency Tables (Homicides) Date:

2) Column Frequencies:

	White Victim	**Black Victim**	**TOTAL**
White Offender	2,574 $\left(\frac{2574}{3074} \approx 0.84\right)$	229 $\left(\frac{229}{2609} \approx 0.09\right)$	2,803 $\left(\frac{\quad}{\quad} \approx \quad\right)$
Black Offender	500 $\left(\frac{500}{3074} \approx 0.16\right)$	2,380 $\left(\frac{2380}{2609} \approx \quad\right)$	2,880 $\left(\frac{\quad}{\quad} \approx \quad\right)$
TOTAL	3,074 $\left(\frac{3074}{3074} \approx 1.00\right)$	2,609 $\left(\frac{\quad}{\quad} \approx \quad\right)$	5,683 $\left(\frac{\quad}{\quad} \approx \quad\right)$

-Race of Victim by Race of Offender of Single Offender/Victim Homicides, 2015 FBI Homicide Data

a) Complete the relative column frequencies in the table above.

b) Complete the following inference using the relative column frequencies.

_____% of black victims had a white offender.

c) Write two inferences using the relative column frequency table.

Pre-Algebra
Two-Way Frequency Tables (Homicides)

Name:
Date:

The following table provides counts of the total number of executions based on the race of the defendant and victim.

	White Victim	**Black Victim**	**TOTAL**
White Defendant	740 ( )	20 ( )	760 ( )
Black Defendant	282 ( )	167 ( )	449 ( )
TOTAL	1022 ( )	187 ( )	1209 ( )

-Total Executions, Race of Victim by Race of Defendant, 1976-2016, "Death Row USA" by NAACP

3) Record the relative row frequencies for the table above next to the matching counts. (The convention is to write the relative frequencies in parentheses after the actual frequency.)

4) Write two inferences based on your relative row frequencies

Key Takeaways:

Pre-Algebra Name:
Two-Way Frequency Tables (Homicides) Date:

LT: I can use relative frequencies to compare two-way tables based on different data sets.

Section 4 – Comparing Two-Way Frequency Tables

1) Here are two tables you have examined before. Record the relative row frequencies from the previous section.

	White Victim	**Black Victim**	**TOTAL**
White Offender	2,574 ( )	229 ( )	2,803 (1.00)
Black Offender	500 ( )	2,380 ( )	2,880 (1.00)

-Race of Victim by Race of Offender of Single Offender/Victim Homicides, 2015 FBI Homicide Data

1) Make an inference about the relative frequencies from row one.

2) Make an inference about the relative frequencies in row two.

Pre-Algebra
Two-Way Frequency Tables (Homicides)

Name:
Date:

	White Victim	**Black Victim**	**TOTAL**
White Defendant	740 ( )	20 ( )	760 (1.00)
Black Defendant	282 ( )	167 ( )	449 (1.00)

-Total Executions, Race of Victim by Race of Defendant, 1976-2016, "Death Row USA" by NAACP

3) Make an inference from row one.

4) Make an inference from row two.

5) What do you notice about your answers to questions 1-4? Speculate on why the data look this way.

Key Takeaways:

Pre-Algebra Name:
Two-Way Frequency Tables (Homicides) Date:

LT: I can explain how using a three-way table refines our understanding of a data set.

Section 5 – Three-Way Frequency Table

The table below provides the counts of the results of death sentence trials by jury based on race of defendant in Florida between 1976 and 1977. (There are usually around 23 jurors in a grand jury for murder trials.)

	Death Sentence		**TOTAL**
	Yes	**No**	
White Defendant	19 (0.12)	141 (0.88)	160 (1.00)
Black Defendant	17 (0.10)	149 (0.90)	166 (1.00)
TOTAL	36 (0.11)	290 (0.89)	326 (1.00)

-Defendants in homicide indictments in 20 Florida counties during 1976-1977 (Radelet 1981) - Two-Way Frequency

1) Based on this table, does race affect the outcome of trials? Why or why not?

Pre-Algebra
Two-Way Frequency Tables (Homicides)

Name:
Date:

The following table adds an additional layer of information by separating the counts by the race of the murder victims.

Defendant's Race	**Victim's Race**	**Death Sentence**		**TOTAL**
		Yes	**No**	
White	**White**	19 (0.13)	132 (0.87)	151 (1.00)
	Black	0 (0.00)	9 (1.00)	9 (1.00)
Black	**White**	11 (0.17)	52 (0.83)	63 (1.00)
	Black	6 (0.06)	97 (0.94)	103 (1.00)
TOTAL		36 (0.11)	290 (0.89)	326 (1.00)

-Defendants in homicide indictments in 20 Florida counties during 1976-1977 (Radelet 1981) - Three-Way Frequency

2) With the new layer of information, does race affect the outcome of the trial?

Key Takeaways:

Pre-Algebra Name:
Two-Way Frequency Tables (Homicides) Date:

LT: I can explain how additional research is needed to have an informed perspective.

Section 6 – A more recent study based on data from Louisiana

	Black Male	**Black Female**	**White Male**	**White Female**	**Total**
0 to 19 yrs	0.437	0.258	0.143	0.056	0.320
20 to 39 yrs	0.208	0.197	0.214	0.167	0.204
40 yrs to life	0.343	0.515	0.571	0.639	0.439
Death	0.012	0.030	0.071	0.139	0.037
Total (relative)	1.000	1.000	0.999	1.001	1.000
Total (N)	***245***	***66***	***84***	***36***	***431***

-Gender and race of victim by homicide sentence in Caddo Parish, LA during 1988-2008 (Pierce et al 2014)

1) Describe the table above in as much detail as possible based on what you have been exposed to thus far. Is it one-way, two-way or three-way? Relative frequency or just frequency? What is/are the variable(s)? What is the source of the data?

2) Make an inference based on this data and data from previous sections.

3) Speculate on why the data looks this way.

4) Look at the data on the next page. What do you think it tells you?

5) Now that you understand more about the data, speculate on what it might mean.

Pre-Algebra Name:
Two-Way Frequency Tables (Homicides) Date:

Table 8 Mean number of pages in case files for the independent variables and for sentence length (mean=422.95; N=412)

Independent Variable categories	Mean # of pages of evidence	F statistic significance
White defendant	527.05	
Black defendant	405.20	$p<0.001$
White victim (at least one)	593.94	
Black victim	355.94	$p<0.001$
Black-black	358.36	
Black-white	628.66	
White-white	555.44	
White-black	214.80	$p<0.001$
Male victim	363.09	
Female or female &male victim	612.19	$p<0.001$
Black male victim	313.16	
Black female victim	511.00	
White Male victim	506.10	
White female victim	797.23	$p<0.001$
Family/Friends	357.86	
Acquaintance	280.17	
Other known	404.98	
Stranger	670.84	
Unknown	30.67	$p<0.001$
0 Aggravators	247.83	
1 Aggravator	400.56	
2 Aggravators	538.49	
3 Aggravators	709.20	
4 Aggravators	1588.13	
5 Aggravators	3274.50	$p<0.001$
Sentence length categories		
0–19 years	214.88	
20–39 years	381.83	
40 years to life	482.73	
Death sentence	1777.79	$p<0.001$

-Mean # of Pages of Evidence for Homicide Cases in Caddo Parrish , LA during 1988-2008 (Pierce et al 2014)

Pre-Algebra Name:
Two-Way Frequency Tables (Homicides) Date:

Section 7 – Reflection

Please be specific in your answer for each question.

1) What types of math did we use in this investigation?

2) How does this investigation affect your opinion of the usefulness of math?

3) Why is it important for citizens to understand statistics?

Pre-Algebra Name:
Two-Way Frequency Tables (Homicides) Date:

4) How does looking at different levels of data unveil a clearer picture of the situation?

5) What are you left thinking about?