Name _____ Date _____

Could You Participate in Our Survey?
Interpreting Frequency Distributions

1. Forty workers arriving at an office building in a city were asked how they got to work that day. They were also asked if they were less than 40 years old or older. The survey results are shown in the table.

Age	Transportation Method	Age	Transportation Method
<40	Subway	<40	Bus
<40	Bus	<40	Bus
40+	Walk	<40	Subway
<40	Bus	40+	Car
<40	Subway	<40	Walk
40+	Car	40+	Taxi
40+	Car	40+	Walk
40+	Walk	<40	Subway
<40	Subway	40+	Car
40+	Taxi	<40	Taxi
<40	Walk	40+	Taxi
<40	Bus	<40	Bus
<40	Subway	< 40	Bus
40+	Bus	<40	Subway
<40	Bus	40+	Walk
40+	Walk	40+	Car
40+	Taxi	40+	Subway
<40	Subway	40+	Bus
40+	Car	<40	Subway
<40	Car	40+	Taxi

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a. Identify the variables for this survey. Are the variables categorical or quantitative? Explain your reasoning.

b. Construct a frequency marginal distribution for the survey data.

|						

c. Analyze the frequency marginal distribution. What was the most commonly used transportation method for each age group? Explain you how determined your answer.

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d. Construct a double bar graph of the frequencies. Let the *x*-axis represent the transportation method, and let the *y*-axis represent the number of workers. What conclusion(s) can you draw by examining this graph?

y

x
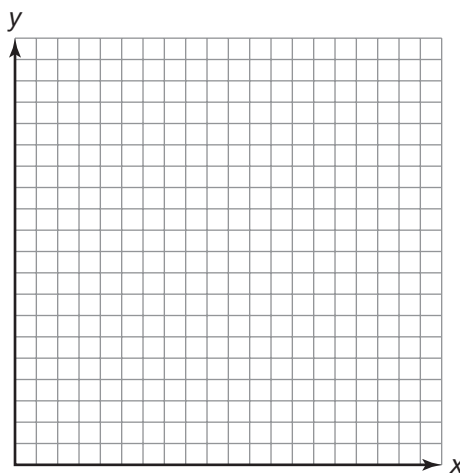
e. Construct a double bar graph of the frequencies. This time, let the *x*-axis represent the age levels. What conclusions can you draw by examining the graph?

y

x
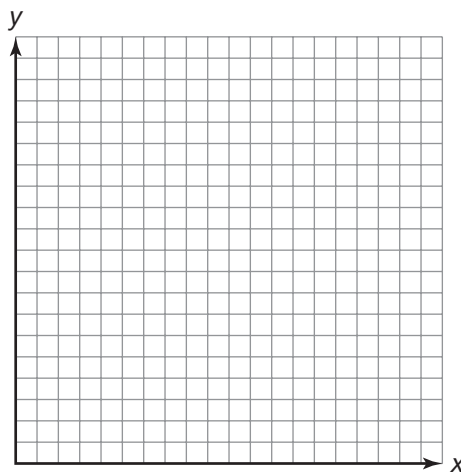
f. The manager of a firm in the building where the survey was taken has noticed that a number of his employees have been coming in late. The late employees often say they are late because of subway problems, but he also notices it is mostly younger workers who are using this excuse. He thinks these employees may be irresponsible because most of his older employees are not coming in late. Which graph could be used to show the manager that his thinking may be wrong?

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It's So Hot Outside!
Relative Frequency Distribution

1. The principal of Umber Elementary School (grades K − 4) would like to reward his students for recent good test scores on a standardized test. He thinks of four different types of assemblies. In order to please the most students, the principal asks his teachers to survey the students in their classes. The students from each grade are asked which assembly they would most want to see. The table shows the responses gathered from the surveys.

	Wild Animals	Hip Hop Show	Magic Show	Puppet Show
Kindergarten	18	5	8	33
Grade 1	26	10	21	15
Grade 2	21	19	17	12
Grade 3	22	28	20	8
Grade 4	19	44	7	2

a. Construct a relative frequency distribution and relative frequency marginal distribution of the data.

	Wild Animals	Hip Hop Show	Magic Show	Puppet Show	Total
Kindergarten					
Grade 1					
Grade 2					
Grade 3					
Grade 4					
Total					

b. The principal wants to choose one assembly that he can show to all of the students. Construct a stacked bar graph of the relative frequency distribution. Then tell which assembly he should choose for the students. Explain how you determined your answer.
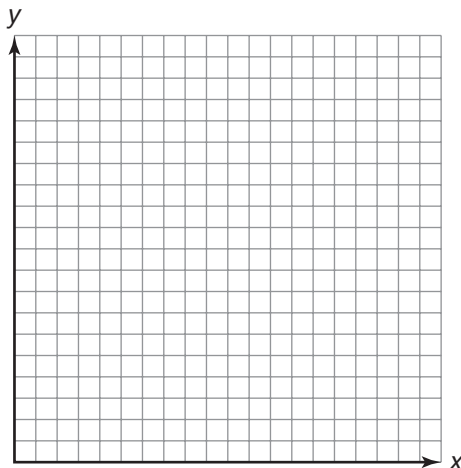
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c. The principal now thinks that each grade should get its own assembly. Construct a stacked back graph of the relative frequency distribution then tell which assembly should be shown to each grade. Explain how you determined your answer.
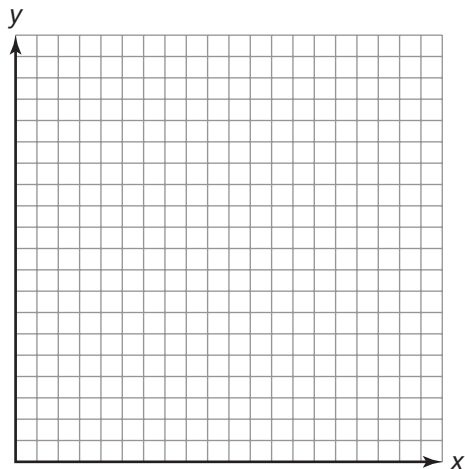
d. The principal has come up with an idea to hold a hip hop assembly for Grades 1 through 4 and a puppet show for Kindergarten. Do you think this is a good idea? Explain your reasoning.

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She Blinded Me with Science!
Relative Frequency Conditional Distribution

1. Angie is taking a broadcast communications class at her local college. The professor presents the students with the results of a survey that was conducted to determine where different age groups of people get their news. The table shows the results of the survey.

News Source

		Local TV	National TV	Radio	Newspaper	Internet	Total
Age Group	**Under 35**	95	72	74	53	110	
	35–49	110	107	100	78	84	
	50+	136	129	111	106	71	
	Total						

a. Complete the frequency marginal distributions.

b. Angie claims that overall more people get their news from local TV than any other source. Is she correct? Explain your reasoning.

c. Angie's classmate claims that the under 35 age group must use local TV less than the 35 to 49 age group because 95 is less than 110. Is she correct? Explain your reasoning.

d. Construct a relative frequency conditional distribution of news source given the age group.

News Source

	Local TV	National TV	Radio	Local Newspaper	Internet	Total
Under 35						
35–49						
50+						

Age Group

e. Which age group has the fewest number of people who receive their news from local TV? How does this compare to the claim made in part (c)?

2. A broadcast journalism class is given the results of a survey that was done to see if there is a difference between men and women and how they get their news. The results are shown in the table.

News Source

|	Local TV	National TV	Radio	Local Newspaper	Internet	Total
Male	51	44	50	43	48	
Female	41	48	27	37	53	
Total						

Gender

a. Complete the frequency marginal distribution.

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b. Construct a relative frequency conditional distribution of gender given the news source.

News Source

<table>
<tr><td rowspan="4">**Gender**</td><td></td><td>**Local TV**</td><td>**National TV**</td><td>**Radio**</td><td>**Local Newspaper**</td><td>**Internet**</td></tr>
<tr><td>**Male**</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>**Female**</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>**Total**</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

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c. Construct a stacked bar graph of the relative frequency conditional distribution.
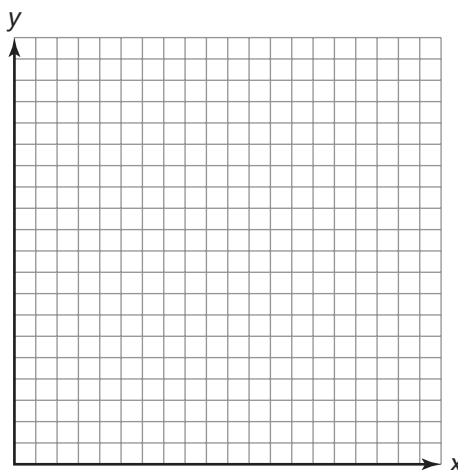
d. A company that produces men's shaving cream has created a new advertisement. They want to make sure the ad reaches as many men as possible. What source of news would you suggest they use? Explain your reasoning.

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Oh! Switch the Station!
Drawing Conclusions from Data

1. The sales manager for a car dealership is working on the new car order for the next quarter. He knows it is important to order cars that will sell quickly, so the manager decides to look at the most recent batch of new cars that sold according to make and color. The data that he gathered is shown.

Car Type	Color				
	Red	**Black**	**White**	**Green**	**Navy**
SUV		x			
SUV		x			
Sports Car	x				
Sedan					x
SUV			x		
SUV				x	
Minivan	x				
Sports Car	x				
Sports Car		x			
SUV			x		
SUV				x	
Sports Car				x	
Sedan			x		
Minivan	x				
Minivan					x
SUV					x
SUV		x			
Sedan	x				
Sports Car	x				
Sports Car		x			
Sports Car				x	
SUV		x			
SUV					x

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Car Type	Color				
	Red	Black	White	Green	Navy
Minivan				x	
Sedan				x	
SUV			x		
Sports Car			x		
Sports Car	x				
Minivan	x				
Sedan		x			
Sedan			x		
Minivan	x				
Sports Car		x			
Minivan	x				
Minivan				x	
Minivan			x		
SUV					x
SUV		x			
Sedan	x				
SUV			x		
Sports Car		x			
Sedan				x	
Sports Car	x				
SUV					x
SUV		x			
SUV		x			
SUV					x
SUV					x
Sedan			x		
SUV			x		
Sports Car			x		
SUV				x	

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   a. By looking at the table, can you determine which color car is most popular?

   b. Organize the information to help the sales manager determine which color of car is most popular.

   c. The manager decides that for his next order of new cars he will order a majority of them in black. Do you agree with his decision? Explain your reasoning.

d. The manufacturer wants the manager to justify his sales order. The sales manager knows that giving the manufacturer the marginal frequency table may be confusing. Recommend and then create a clear method the manager can use to present the information to the manufacturer that will help justify his order.

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2. The sales manager of a car dealership is interested in determining if there is a difference in the type of new car bought versus the gender of the buyer. After looking at the new car sales from the last month, the manager constructs the following frequency marginal distribution.

Car Type

	Hybrid	Sports Car	SUV	Sedan	Minivan	Total
Male	5	15	12	10	4	46
Female	4	3	1	3	7	18
Total	9	18	13	13	11	64

Gender

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a. The manager decides that males buy hybrid cars more than females do. Is this true? Explain why or why not.

b. The sales manager wants to only stock and sell cars that will move quickly. He knows that an equal number of men and women shop at his dealership. Recommend which type(s) of cars he should stock so both men and women buy them. Explain your reasoning.

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