Date: _____ Lesson 11

Name: _____

AIM: TWO-WAY FREQUENCY TABLES

DO NOW: Let's poll the class and fill in the table below.

			Hair Color		
		Blonde	Red	Brunette	Total
					total blue eyes
Or	Blue				
Col					total brown eyes
7e (Brown				
E					total green eyes
	Green				
	Total	total blonde hair	total red hair	total brunette hair	Table total

_____are a

visual representation of the possible relationships between two sets of categorical data.

							_ Freque	ency.	
You areone variable from the row with one variable from the col							from the colur	nn.	
				Hai	r Color				
			Blonde	; ;	Red	Brunett	te	Total	
	lor	Blue						total blue eyes	
	ye Cc	Brown						total brown eyes	
	Ē.	Green	L					total green eyes	
		Total	total blonde	hair tota	l red hair	total brunette	e hair	Table total	
Frequency.									
The nui contain	nbers c s the su	on the edg m of the t	es (totals.) of t	he table. The o	cells that
				Hair Colo	r		1		
			Blonde	Red	- I	Brunette		Total]
or	Blue	e					tot	al blue eyes	
ve Co	Brow	'n					tota	l brown eyes	
Ē	Gree	n					tota	al green eyes	
	Tota	l tota	l blonde hair	total red hair	tota	l brunette hair	1	Table total	

Unit 4

•

If your table *does not* include a **total row** and **total column**, you must ALWAYS add it!

The "sum of the row totals" ______ the "sum of the column totals.



Example 1: Use the two-way frequency table below to answer the following questions.

	Like Longboards	Do Not Like Longboards
Like Snowmobiles	80	25
Do not like Snowmobiles	45	10

1.	How many students said	2.	How many of the	3.	How many students	4.	Whic	ch of the	followir	ıg
	they "like"		students "like"		said they "do not		value	es is refei	red to a	S
	snowmobiles?		snowmobiles, but "do		like" longboards?		"mar	ginal fre	quency"	?
			not like" longboards?							
						a)	10	b) 25	c) 35	d)45

5. Give an example of a value that is part of "joint frequency". Explain what that value means._____

Example 2 below to a	2: Use the two inswer the follo	owing quest	ions.	data provid	ed belo	sh filling ow.	in the two-wa	iy frequenc	y table using	the
	Sport Utility Vehicle (SUV)	Sports Car	Totals	 4 stude 0 of the 	nts ind	icated "s dents wer	uper strength' e female.	" as their fa	vorite power	r.
male	21	39	60	• 14 stud	ents in	dicated "	telepathy" as	their favor	ite power.	
female	135	45	180	• 13 01 0	To	Freeze	ere lemale.	Super	T 1 1	
Totals	156	84	240		Fly	Time	Invisibility	Strength	Telepathy	Total
			MathBits.com	Females	10	14	17			
5. How many people responded to the survey?			Males	11	16	7				
7. How r	. How many males responded to the survey?			Total	21	30	24	4		
8. How r	nany people c	hose an SUV	/?	11. How m	any fe	males ch	ose telepathy	as their fav	orite super p	ower?
9. How 1	nany females	12. How many students chose invisibility as their favorite super								
10. How 1	nany males ch	ose an SUV	?	power.						
				13. Which super power is the most popular?						

category by the total number of value	es.		5			icii				
				W	hole Table					
				Relativ	e Frequencies -					
	Г	Sport Utility		Divide a	all cells by 240.					
	MathBits.com	Vehicle (SUV)	Sports Car	To	tals					
	male	$\frac{21}{240} = 0.09$	$\frac{39}{240} = 0.16$	$\frac{60}{240}$	= 0.25					
	female	$\frac{135}{240} = 0.56$	$\frac{45}{240} = 0.19$	180 240	= 0.75					
	Totals	$\frac{156}{240} = 0.65$	$\frac{84}{240} = 0.35$	$\frac{240}{240}$	=1.00					
Frequencies in each you and column	Relative F	Relative Frequency- Is determined by adding the joint relative								
* * * * * * * * * * * * * * * * * * * *		-	L L		e					
equencies in each row and column.			-		Whole Tab	ole				
equencies in each row and column.			-		Whole Tak Relative Freque	ole encies -				
equencies in each row and column.		Sport 11til	ity		Whole Tak Relative Freque Divide all cells b	ble encies - ly 240.				
equencies in each row and column.	MathBits.co	Sport Util Vehicle (St	ity JV) Sport	s Car	Whole Tak Relative Freque Divide all cells b Totals	ble encies - y 240.				
equencies in each row and column.	MathBits.co	Sport Util Vehicle (SU $\frac{21}{240} = 0.0$	ity JV) Sport 09 <u>39</u> 240	s Car	Whole TakRelative FrequeDivide all cells bTotals $\frac{60}{240} = 0.25$	ble encies - y 240.				
equencies in each row and column.	MathBits.co male female	Sport Util Vehicle (SU $\frac{21}{240} = 0.0$ $\frac{135}{240} = 0.5$	$\frac{1}{39}$ $\frac{1}{39}$ $\frac{1}{240}$ $\frac{1}{56}$ $\frac{1}{240}$	= 0.16 = 0.19	Whole Tak Relative Freque Divide all cells b Totals $\frac{60}{240} = 0.25$ $\frac{180}{240} = 0.75$	ble encies - γ 240.				

Example 4: Use the two-way frequency table below to answer the following questions.

Sport Utility Vehicle (SUV)	Sports Car	Totals
$\frac{21}{240} = 0.09$	$\frac{39}{240} = 0.16$	$\frac{60}{240} = 0.25$
$\frac{135}{240} = 0.56$	$\frac{45}{240} = 0.19$	$\frac{180}{240} = 0.75$
$\frac{156}{240} = 0.65$	$\frac{84}{240} = 0.35$	$\frac{240}{240} = 1.00$
	Sport Utility Vehicle (SUV) $\frac{21}{240} = 0.09$ $\frac{135}{240} = 0.56$ $\frac{156}{240} = 0.65$	Sport Utility Vehicle (SUV) Sports Car $\frac{21}{240} = 0.09$ $\frac{39}{240} = 0.16$ $\frac{135}{240} = 0.56$ $\frac{45}{240} = 0.19$ $\frac{156}{240} = 0.65$ $\frac{84}{240} = 0.35$

14. What percentage of the survey takers was female?

15. What is the relative frequency of males choosing a sports car?

16. Were there a higher percentage of males or females choosing an SUV?

Example 5: The table shows the number of books sold at a library sale. Fill in the two-way table of the joint and marginal relative frequencies to the nearest tenth.

	Fiction	Nonfiction
Hardcover	28	52
Paperback	94	36

	Fiction	Nonfiction	Total
Hardcover	$\frac{28}{210} \approx .13$	52	$\frac{80}{210} \cong .38$
Paperback	$\frac{94}{210} \approx .45$	$\frac{36}{210} \approx .17$	130
Total	122	$\frac{88}{210} \approx .42$	210

17. What is the joint relative frequency of nonfiction	18. What is the marginal relative frequency of fiction
paperback books that the library sold?	books that the library sold?

Example 6: Complete the table below by calculating the relative frequencies for each cell (nearest thousandth).

- 4 students indicated "super strength" as their favorite power & 0 of those students were female.
- 14 students indicated "telepathy" as their favorite power &13 of those students were female.

	To Fly	Freeze Time	Invisibility	Super Strength	Telepathy	Total
Females	$\frac{10}{93} \approx .108$	$\frac{14}{93} \approx .151$	$\frac{17}{93} \approx .183$		$\frac{13}{93} \approx .140$	$\frac{54}{93} \approx .581$
Males	$\frac{11}{93}$ \approx .118		$\frac{7}{93} \approx .075$	$\frac{4}{93} \approx .043$		$\frac{39}{93} \approx .419$
Total	$\frac{21}{93} \approx .226$	$\frac{30}{93} \approx 0.323$	²⁴ / ₉₃ ≈ .258	$\frac{4}{93} \approx .043$	$\frac{14}{93}$ \approx .151	$\frac{93}{93} \approx 1$

19. What percentage of students selected "telepathy" as their favorite superpower?	20. What percent of the total were males that preferred "super strength" as their favorite superpower?
21. What is the joint relative frequency for females who selected "invisibility" as their favorite superpower?	22. What is the marginal relative frequency for "freeze time"? Interpret the meaning of this value.

Exit Ticket A

Name: ______ Unit 4

	Have a Bike	Do Not Have a Bike	TOTAL
Boys	$\frac{9}{27} \approx .333$	$\frac{5}{27} \approx .185$	$\frac{14}{27} \approx .519$
Girls	$\frac{7}{27} \approx .259$	$\frac{6}{27} \approx .222$	$\frac{13}{27} \approx .481$
TOTAL	$\frac{16}{27} \approx .593$	$\frac{11}{27} \approx .407$	$\frac{27}{27} \approx 1.00$

The results from a survey of students are shown below. Complete the Table. (Round to nearest thousandths)

- 1. How many boys said they have a bike?
- 2. What is the joint relative frequency (percentage) of girls that do not have a bike?
- 3. What is the marginal relative frequency of students having a bike?

Name: ______ Unit 4

The results from a survey of students are shown below. Complete the Table. (Round to nearest thousandths)

	Have a Bike	Do Not Have a Bike	TOTAL
Boys	$\frac{9}{27} \approx .333$	$\frac{5}{27} \approx .185$	$\frac{14}{27} \approx .519$
Girls	$\frac{7}{27} \approx .259$	$\frac{6}{27} \approx .222$	$\frac{13}{27} \approx .481$
TOTAL	$\frac{16}{27} \approx .593$	$\frac{11}{27} \approx .407$	$\frac{27}{27} \approx 1.00$

- 1) How many boys said they have a bike?
- 2) What is the joint relative frequency (percentage) of girls that do not have a bike?
- 3) What is the marginal relative frequency of students having a bike?

Name:	
Unit 4	

	Have a Bike	Do Not Have a Bike	TOTAL
Boys	$\frac{9}{27} \approx .333$	$\frac{5}{27} \approx .185$	
Girls	$\frac{7}{27} \approx .259$	$\frac{6}{27} \approx .222$	
TOTAL			

The results from a survey of students are shown below. Complete the Table. (Round to nearest thousandths)

1) How many boys said they have a bike?

- 2) What is the joint relative frequency (percentage) of girls that do not have a bike?
- 3) What is the marginal relative frequency of students having a bike?

Name: _____ Unit 4

The results from a survey of students are shown below. Complete the Table. (Round to nearest thousandths)

	Have a Bike	Do Not Have a Bike	TOTAL
Boys	$\frac{9}{27} \approx .333$	$\frac{5}{27} \approx .185$	
Girls	$\frac{7}{27} \approx .259$	$\frac{6}{27} \approx .222$	
TOTAL			

- 1) How many boys said they have a bike?
- 2) What is the joint relative frequency (percentage) of girls that do not have a bike?
- 3) What is the marginal relative frequency of students having a bike?

Exit Ticket B

Name:		
Unit 4		

The results from a survey of students are shown below. Complete the Table. (Round to nearest thousandths)

	Have a Bike	Do Not Have a Bike	TOTAL
Boys	9		
Girls		6	13
TOTAL		11	

1) How many boys said they have a bike?

- 2) What is the joint relative frequency (percentage) of girls that do not have a bike?
- 3) What is the marginal relative frequency of students having a bike?

Name:	
Unit 4	

The results from a survey of students are shown below. Complete the Table. (Round to nearest thousandths)

	Have a Bike	Do Not Have a Bike	TOTAL
Boys	9		
Girls		6	13
TOTAL		11	

- 1) How many boys said they have a bike?
- 2) What is the joint relative frequency (percentage) of girls that do not have a bike?
- 3) What is the marginal relative frequency of students having a bike?

Exit Ticket C