

AIM: TWO-WAY FREQUENCY TABLES

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

		Hair Color			Total
		Blonde	Red	Brunette	
Eye Color	Blue				total blue eyes
	Brown				total brown eyes
	Green				total green eyes
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.

_____ Frequency.

You are _____ one variable from the row with one variable from the column.

		Hair Color			Total
		Blonde	Red	Brunette	
Eye Color	Blue				total blue eyes
	Brown				total brown eyes
	Green				total green eyes
Total		total blonde hair	total red hair	total brunette hair	Table total

_____ Frequency.

The numbers on the edges (_____) of the table. The cells that contains the sum of the totals.

		Hair Color			Total
		Blonde	Red	Brunette	
Eye Color	Blue				total blue eyes
	Brown				total brown eyes
	Green				total green eyes
Total		total blonde hair	total red hair	total brunette hair	Table total

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 they "like" snowmobiles?	2. How many of the students "like" snowmobiles, but "do not like" longboards?	3. How many students said they "do not like" longboards?	4. Which of the following values is referred to as "marginal frequency"? a) 10 b) 25 c) 35 d) 45
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5. Give an example of a value that is part of "joint frequency". Explain what that value means. _____

Example 2: Use the two-way frequency table below to answer the following questions.

	Sport Utility Vehicle (SUV)	Sports Car	Totals
male	21	39	60
female	135	45	180
Totals	156	84	240

MathBits.com

- How many people responded to the survey?
- How many males responded to the survey?
- How many people chose an SUV?
- How many females chose a sports car?
- How many males chose an SUV?

Example 3: Finish filling in the two-way frequency table using the data provided below.

- 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	10	14	17			
Males	11	16	7			
Total	21	30	24	4		

- How many females chose telepathy as their favorite super power?
- How many students chose invisibility as their favorite super power?
- Which super power is the most popular?

Relative Frequency Is determined by *dividing* the values of each category by *the total number of values*.

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

Whole Table Relative Frequencies -
Divide all cells by 240.

Relative Frequency- Is determined by *adding* the joint relative frequencies in each row and column.

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

Whole Table Relative Frequencies -
Divide all cells by 240.

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

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

MathBits.com

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	$\frac{28}{210} \approx .13$	$\frac{52}{210} \approx .25$	$\frac{80}{210} \approx .38$
Paperback	$\frac{94}{210} \approx .45$	$\frac{36}{210} \approx .17$	130
Total	122	$\frac{88}{210} \approx .42$	210

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| 17. What is the joint relative frequency of nonfiction paperback books that the library sold? | 18. What is the marginal relative frequency of fiction books that the library sold? |
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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	$\frac{21}{93} \approx .226$	$\frac{30}{93} \approx 0.323$	$\frac{24}{93} \approx .258$	$\frac{4}{93} \approx .043$	$\frac{14}{93} \approx .151$	$\frac{93}{93} \approx 1$

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| 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. |

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?

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

Exit Ticket B

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?

Name: _____
Unit 4

Exit Ticket B

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?

Name: _____
Unit 4

Exit Ticket C

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

Exit Ticket C

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?

