**Public Opinions and Leisure Time (Spotlight Task)

Name_____ **Date**_____

Mathematical Goals

- Practice summarizing categorical data from two-way frequency tables
- Interpret relative frequencies in the context of the data
- Recognize possible associations and trends in data

Essential Questions

- How do you interpret relative frequencies in the context of a two-way frequency table?

Common Core Georgia Performance Standards Addressed:
MCC9-12.S.ID.5 Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.★

Standards of Mathematical Practice Addressed: 2.
Reason abstractly and quantitatively**.**
3. Construct viable arguments and critique the reasoning of others. **4.**
Model with mathematics. **6.** Attend to precision.
7. Look for and make sense of structure.

Part I. A public opinion survey explored the association between age and support for increasing the minimum wage. Although age is a quantitative variable, the researchers create three categories of age groups and treated the age data as categorical. The results are found in the following two-way frequency table

	For	**Against**	**No Opinion**	**TOTAL**
Ages 21-40	25	20	5	**50**
Ages 41-60	30	30	15	**75**
Over 60	50	20	5	**75**
TOTAL	**105**	**70**	**25**	**200**

Frequency Count

1. What percentage of those individuals surveyed were in the 21 - 40 age group and for increasing the minimum wage? Show your work for finding this percentage. This percentage is called a joint percentage.

2. For the 21 to 40 age group, what percentage supports increasing the minimum wage? Explain how you arrived at your percentage. This percentage is called a conditional percentage.

3. For the 41 to 60 age group, what percentage supports increasing the minimum wage? Show your work.

4. For the over 60 age group, what percentage supports increasing the minimum wage? Show your work.

5. What percentage of all individuals surveyed favored increasing the minimum wage? Explain how you arrived at your percentage. This percentage is called a marginal percentage.

6. If there is no association between age group and opinion about increasing the minimum wage, we would expect the conditional percentages found in parts 2-4 to all be the same. We observe that the three percentages are different. What numerical value for the conditional percentage of each age group that favor increasing the minimum wage would we expect if there is no association between age group and opinion? Hint: Consider the percentage who favor increasing the minimum wage ignoring the age group classification of the individuals surveyed.

Part II. The table below gives the responses of 50 teachers' responses to a survey asking which activity they enjoyed most: dancing, playing/watching sports, or seeing movies. Is there an association between gender of the teacher and type of activity enjoyed the most?

	Dance	**Sports**	**Movies**	**TOTAL**
Female	16	6	8	**30**
Male	2	10	8	**20**
TOTAL	**18**	**16**	**16**	50

7. In exploring whether an association exists between gender and type of activity, we are interested in knowing if gender of the teacher helps predict the type of activity the teacher enjoys the most. Gender is the explanatory variable and type of activity is the response variable.

Finish constructing the table below displaying conditional percentages for type of activity conditioned upon gender.

	Dance	**Sports**	**Movies**	**TOTAL**
Female	16/30 = 53%			**100%**
Male	2/20=10%			**100%**

8. Construct a side-by-side bar graph displaying the information from the table in part 5.

9. If a teacher is female, what percentage enjoy sports the most?

10. If a teacher is male, what percentage enjoy sports the most?

11. Of all the teachers surveyed, what percentage enjoy sports the most?

12. Based on your answers to parts 6-8, does there appear to be an association between gender of teacher and type of activity enjoyed? Explain using your three percentages from parts 6-8.

13. Referring to parts 5 and 6, comment on how genders differ with respect to type of activity. Comment on any similarities.