

Probability: Everyday Decisions Based on Probabilities**II.B Student Activity Sheet 6: Driving and Risk**

Javier will be a high school senior next year. He wants to get a vehicle to celebrate his graduation. Javier's mother researched vehicle safety and found that 1 of every 6 teenage drivers was involved in some kind of accident. While talking to his math teacher, Javier mentioned that he did not think the risk was high enough to be concerned. Javier decided to survey 500 students, 230 of whom were male, to help him convince his mother to allow him to get a vehicle. No student has both a car and a motorcycle.

The following are the data from Javier's survey:

	Car	Motorcycle
Males with vehicle	150	23
Males involved in accident	40	6
Females with vehicle	225	10
Females involved in accident	15	4

1. Draw a Venn diagram and a tree diagram of the data.
2. Using the data, what is the probability that Javier will be involved in an accident if he gets a motorcycle? Explain your reasoning.
3. Based on these survey data, Javier told his mother that he only has a 1% chance of getting in an accident. Is he correct? Why or why not?
4. Use your Venn diagram to write three facts that help Javier convince his mother to let him get a vehicle.
5. What probability model would you advise Javier to use when he tries to convince his mother?
6. **REFLECTION:** List some advantages and disadvantages for each type of model used in this problem.
7. **EXTENSION:** Research your favorite vehicle's safety measures and its likelihood of being involved in an accident. Prepare a short presentation of your findings.

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8. **EXTENSION:** Investigate other applications of decision making in situations involving risk—both situations where the risk is known (that is, you have some sort of data to determine mathematically how likely it is to occur) and situations where risk information is not known ahead of time. Examples include purchasing insurance, increasing or decreasing premiums on insurance, and not being eligible for insurance because of high risks. Prepare a short presentation of your findings to share with the class.