

Predicting from Survey Results

The Student Government of Central High School wants to determine which activity students would enjoy most: a dance, an ice cream social, a carnival, or a movie night. They agreed on an appropriate sampling technique and conducted a survey of 400 students. The table below gives the results of the survey broken down by class.

	Dance	Ice Cream	Carnival	Movie	Total
Freshmen	9	14	40	37	100
Sophomores	27	12	57	4	100
Juniors	13	24	44	19	100
Seniors	19	11	59	11	100

Answer the following questions using the survey results.

1. If a high school junior is selected at random, what is the probability that he would favor a school dance? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.
2. If a high school freshman is selected at random, what is the probability that he would favor movie night? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.
3. If any high school student is selected at random, what is the probability that he would favor an ice cream social? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.
4. What percent of those who favor the carnival are seniors? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.
5. According to the data, what prediction should the Student Government make with respect to the school activity the students would enjoy the most? Use mathematics to justify your answer.
6. A student from Central High School is randomly selected and asked which social activity he prefers. Based on this data, what is the probability that he favors the school dance? Use mathematics to justify your answer.

7. Suppose the 400 students in the sample were not selected randomly. Would it be reasonable to conclude that 50% of all students favor a carnival? Use mathematics to justify your answer.

The diagram below shows the results of a two-question survey administered to 80 randomly selected students at Highcrest Middle School.

		Do you play a musical instrument?	
		Yes	No
Do you play on a sports team?	Yes	12	34
	No	20	14

8. Based on the data, what is the probability that a student selected at random plays on a sports team and plays a musical instrument? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.
9. Based on the data, what is the probability that a student who plays on a sports team also plays a musical instrument? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.
10. a. Based on the data, what is the probability that a student, chosen at random, plays a musical instrument?
- b. Of the 2100 students in the school, how many would you expect to play a musical instrument? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation

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Answer Key

1. $13/100 = 0.13$
2. $37/100 = 0.37$
3. $(14 + 12 + 24 + 11)/400 = 0.1525$
4. $40/(40 + 57 + 44 + 59) = 0.20 = 20\%$

5. Look at the following table.

Activity	Dance	Ice Cream	Carnival	Movie
Total # in Survey	68	61	200	71
Proportion	0.17	0.1525	0.50	0.1775

Half of the students in the survey favor the Carnival, so this is what the SGA should plan for.

6. Since 17% of those surveyed prefer a school dance, the probability that a student selected randomly from the population favors a dance is also 17%. Note: this is only true for results from simple random samples.
7. No. If the sample was not selected randomly, it may not reflect the true proportions of opinions of students in the school. It would not be reasonable to draw conclusions about a population from a sample *not* selected randomly.

8. $\frac{12}{80} = 0.15$

9. $\frac{12}{12 + 34} = 0.261$

10. a. $\frac{12 + 20}{80} = 0.40$
b. $0.40(2100) = 840$