

# The Plurality Method and Other Voting Systems

NAME \_\_\_\_\_

The forty members of your school's adventure club are trying to decide what type of trip to take. The chart shows how the club members rank the three options.

RANKING	NUMBER OF VOTERS					
	10	7	1	10	4	8
FIRST CHOICE	Skiing	Skiing	Rafting	Rafting	Caving	Caving
SECOND CHOICE	Rafting	Caving	Skiing	Caving	Skiing	Rafting
THIRD CHOICE	Caving	Rafting	Caving	Skiing	Rafting	Skiing

A common method of voting is called *plurality*. In this system, each person casts one vote for her top choice, and the option with the most votes wins.

1. On the basis of the chart, which activity is the winner under the plurality system? Why?
2. Which activity is liked least by the largest number of members? That is, which activity is ranked third by the greatest number of voters?
3. Why might the plurality method not produce results satisfactory to all voters?
4. Why do you think the plurality method is used most often?
5. Think of some variations of plurality voting or other voting techniques that might prove more satisfactory to the voters. Within your group, describe or develop at least two other vote-tallying methods that haven't been discussed in class.

The **Hare** voting system involves taking an initial poll in which each person casts one vote for his or her favorite option. The option receiving the least number of first-place votes is eliminated, then another poll is taken. Those who originally voted for the eliminated option vote for their second choice. Continually eliminate the least popular option until a single winner emerges.

- Using the table of votes from the Activity Club, which activity would the club choose? Describe the process as the options are eliminated.

The **Borda Count** is a voting method that takes into account each voter's first, second, and third choices. Each first-choice vote is awarded 2 points, each second-choice vote is awarded 1 point, and 0 points are awarded for a third choice. This way, each choice is assigned a point-value.

*Example:* With 17 first-choice votes and 5 second-choice votes, skiing has  $2(17) + 1(5) = 39$  points.

- Determine the total number of points for the other two activities, showing your calculations. Which activity has the most points using this method?

**Sequential pair-wise voting** involves a sequence of head-to-head contests. First, the group votes on any one of two of the options and then the preferred option is matched with the next option, while the 'loser' is eliminated. Continue eliminating the less popular option of a pairing, until one remains.

- Suppose a club member suggests that they should first vote between skiing and caving, and then the winner of that voting goes up against rafting, which is the remaining option. Which activity is chosen by that method?
- Which of these methods — plurality, Hare, Borda Count, or sequential pair-wise voting — is the fairest in this situation? Why? Which is the least fair? Why?
- Suppose that your preference is rafting. Devise a voting system that would enable rafting to be chosen and that would be found fair to the other club members.