

Reasons for Water Usage	Gallons per Day
Laundrying	24.9
Watering lawn	143.7
Personal bathing	106.7
Cooking	5.1
Swimming pool	28.3
Dishwashing	12.3
Car washing	10.4
Drinking	7.9

What is the area of greatest usage? Where should she concentrate her efforts to reduce the water usage?

SOLUTION

A Pareto chart is useful for identifying the major areas of water usage and focusing on those areas where the greatest reduction can be achieved. The first step is to convert each of the activities to a percent and then to order them from largest to smallest. The total water usage per day is 339.3 gallons, found by totaling the gallons used in the eight activities. The activity with the largest use is watering lawns. It accounts for 143.7 gallons of water per day, or 42.4% of the amount of water used. The next largest category is personal bathing, which accounts for 31.4% of the water used. These two activities account for 73.8% of the water usage.

Reasons for Water Usage	Gallons per Day	Percent
Laundrying	24.9	7.3
Watering lawn	143.7	42.4
Personal bathing	106.7	31.4
Cooking	5.1	1.5
Swimming pool usage	28.3	8.3
Dishwashing	12.3	3.6
Car washing	10.4	3.1
Drinking	7.9	2.3
Total	339.3	100.0

To draw the Pareto chart, we begin by scaling the number of gallons used on the left vertical axis and the corresponding percent on the right vertical axis. Next we draw a vertical bar with the height of the bar corresponding to the activity with the largest number of occurrences. In the Grove City example, we draw a vertical bar for the activity watering lawns to a height of 143.7 gallons. (We call this the count.) We continue this procedure for the other activities, as shown in the Minitab output in Chart 19-1.

Below the chart, we list the activities, their frequency of occurrence, and the percent of the time each activity occurs. In the last row, we list the cumulative percentage. This cumulative row will allow us to quickly determine which set of activities account for most of the activity. These cumulative percents are plotted above the vertical bars. In the Grove City example, the activities of watering lawn, personal bathing, and pools account for 82.1% of the water usage. The city manager can attain the greatest gain by looking to reduce the water usage in these three areas.