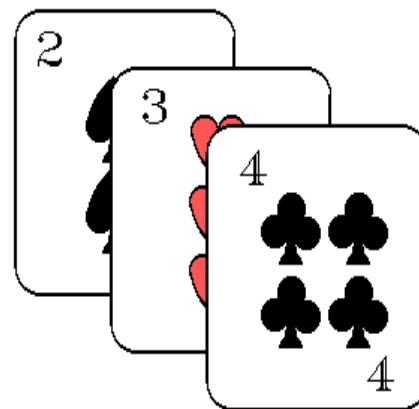# Cross Classifying Objects

PROBLEM

How can classification be used to aid prediction?

INTRODUCTION

Classification is grouping things into categories based on similarities and differences in their characteristics. The purpose of classification is to organize information so it can be better understood. A good classification scheme even has predictive ability. The *Periodic Table of the Elements* is a classification scheme that classifies elements by more than one characteristic at a time. When something is classified by more than one characteristic it is **cross classified.**

You are already familiar with cross classification. When you sort a deck of 51 cards to see which card is missing, you are cross classifying. The three cards shown at the right differ from each other in two ways - by suits and by denominations. You can use these characteristics to group cards into categories. In a full deck of cards there are four suits (hearts, diamonds, spades, and clubs), and 13 denominations (ace through king). This results in 52 possible combinations of suits and denominations. If you arrange a deck of 51 cards in four rows, one for each suit, and in 13 columns for each of the denominations (preferably in numerical order), it will become immediately obvious which card is missing.

In this laboratory exercise, you will be given an incomplete set of assorted wood splints to classify. You will observe as many different characteristics of the splints as you can and devise a classification scheme to predict how many wood splints are missing and what their characteristics might be.

MATERIALS (*per group*)

Plastic strips

PROCEDURE

1. Remove the plastic strips from the envelope and examine their characteristics carefully. There are several ways the strips can be grouped. Organize them into groups based on only one of the characteristics you observed.

2. After you organize the strips into groups describe the characteristic you selected for your first classification in the data table on the next page. (In the example above, *SUITS* was an example of a characteristic used to classify cards.)

3. After describing the characteristic you used to classify or group the strips, list the different categories of this classification or grouping in the data table. (In the example above, the different categories of the cards grouped into suits were *HEARTS*, *DIAMONDS*, *SPADES*, and *CLUBS*.)

4. Repeat this procedure until you have listed all the characteristics and their categories that you have observed.

5. Move the strips around and arrange them into rows and columns so that they are grouped together by two or more characteristics at a time. Then draw a chart below showing these rows and columns (like the periodic table of the strips!!). Label the rows and columns of the chart with the characteristics and categories by which the sticks were cross classified. Fill in each of the boxes with any other characteristics of the wood strips not already described by the labels on the rows and columns of the chart.

OBSERVATIONS

Classification	Characteristic	Categories
#1		
#2		
#3		
#4		

CHART

CONCLUSIONS

1. How many strips would there be if none were missing? _____

2. What are the characteristics of the missing strips? _____

_____

3. How can classification be used to aid prediction? Give an example. _____

_____

_____