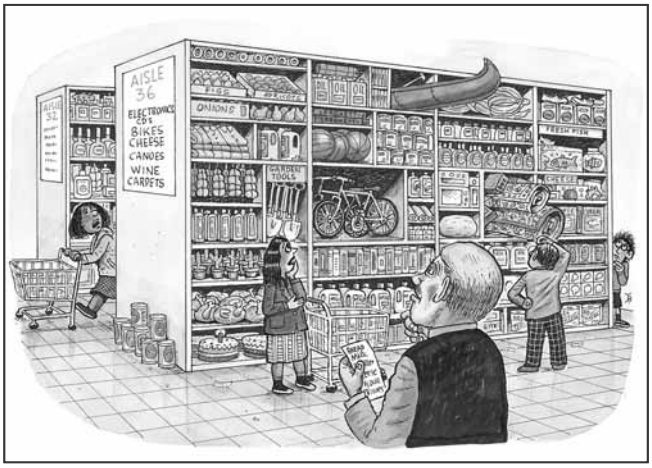
Active Chemistry The Periodic Table

Activity 1 Organizing a Store



GOALS

In this activity you will:

- Plan the arrangement of the items for sale in a store.
- Analyze trends in the arrangement of the store.
- Relate the arrangement of items in the store to the arrangement of elements in the periodic table.

What Do You Think?

Some supermarkets now sell books, flowers, and prescription drugs in addition to eggs, meat, and cereal.

- How many different items do you think that a supermarket has in its inventory?

Record your ideas about this question in your *Active Chemistry* log. Be prepared to discuss your responses with your small group and the class.

Investigate

1. Suppose that you decided to go into the business of opening and running a supermarket grocery store. In your group, brainstorm a list of between 50 and 100 items you would sell at your supermarket.

   A member of your group should volunteer to record the items suggested by all members of the group. Everyone, including the person serving as recorder, should participate in suggesting items to be sold.

   a) Make a map showing the locations of all of the items in your store. Give some thought to what will be at the

What Do You Think?

This is an open question and answers will vary with each group. It should lead to a good discussion. Ask the students which category should be the most active site and which site will probably be the least active site? The number of items in a supermarket will of course depend upon the size of the store.

Student Conceptions

The key concept addressed in this chapter is that elements can be organized according to similar properties, and this organization leads to an understanding about the underlying structure of the atoms of the elements. The structure of atoms, in turn, gives rise to the properties by which the elements were classified.

The first step in organizing elements is to articulate how to classify items and to look at trends that arise in groupings when items are organized. While most students will be able to classify items for sale in a store, they may have difficulty explaining why they grouped certain items together. This activity also introduces the concept of a trend. This is a difficult concept for students to master because they have to identify correlations between patterns. This involves first identifying two patterns, next classifying one as independent and the other as dependent, and finally stating the relation between the two patterns. Eventually, the chapter will lead students to see trends such as the reactivity of metals increasing as the atomic number increases down a group. First, however, students practice this logical reasoning with items for sale in a store and where those items are located in the store.

Investigate

Teaching Suggestions and Sample Answers

1. Encourage the students to list their items quickly and not to be concerned by how they might be related to each other.

front of each aisle, and what will be at the back, and how the store will be arranged from left to right.

b) Keep in mind which items you want shoppers to see as they enter the store and which should be near as they approach the cash register. Would either of these factors alter your arrangement?

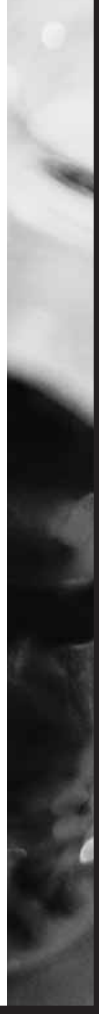
c) Consider the arrangement of items going from left to right across your store. Why did you choose to arrange the items that way?

Reflecting on the Activity and the Challenge

Organizing 50 to 100 items in your store is not unlike the problem faced by Mendeleev when he organized about the same number of chemical elements into the periodic table. In the following activities you will learn about the properties of chemical elements that led Mendeleev to arrange the elements the way he did and the information about them provided by the periodic table. This activity, in which you were asked to organize a group of items familiar in your everyday experience, was designed to acquaint you with some of the problems Mendeleev faced in the hope that you can better appreciate what he did. You may wish to build this experience into the game you design.

Chemistry to Go

1. What is the pattern or arrangement in your store's aisles?
2. Choose one aisle in your store. Describe the arrangement of items going from the front of the store to the back of the store. What is the trend (or general drift) in that aisle?
3. A new item is brought into the store — chocolate covered peanuts. Where would you place this item? Provide an explanation for your decision.
4. Your store decides to sell napkins, plates, and other decorations for Thanksgiving. How will you adapt your store arrangement to accommodate these items?
5. You would like people to purchase a certain item because it gives you a big profit. Where would you place it in your store and why?
6. One of the characteristics of Mendeleev's original periodic table was a series of blank spots. Since As and Se didn't have anything in common with Al and Si, but do with P and S, Mendeleev decided there must be a couple of other elements yet to be discovered. He left spaces for them and put As under P and Se under S where they belong. What would such a "blank" correspond to in your store?



Students will probably arrange their items in a pattern that they have seen in the stores that they frequently shop at. Hopefully, they will try some new patterns. Also, make certain that the patterns that they do develop make use of aisles.

A question you may want to ask students is how they will take into account that some items need to be stored at different temperatures?

Students may wish to record the names of the items they would sell on index cards. Then they can arrange and rearrange the cards on a large, flat surface before making their maps.

Remember that you are not looking for a right answer, but rather that the students are able to create a pattern of their own choice.

Chemistry to Go

1. Have students describe the type of grocery store they chose to have. How many aisles did they have and how many items did they decide to have in each aisle? Also, what order did they use for each aisle?

2. The patterns are going to vary and are dependent on the type of grocery store that they have chosen to start. The decisions that they may use are:
   - Size
   - Color
   - Alphabet order
   - Special needs, such as refrigeration
   - Visual appeal

3. Students will have to decide whether they want to place this in the nut section or whether they want it to be placed in the chocolate section. Another choice that they might consider is whether they would like to place it in the candy section. Also, if this is a new item for the store, they may want to put it on display in a special location.

4. Promotional items will probably be placed in special display sections near the front and center of the store.

5. Customers have a tendency to buy items that are at eye level. You would want to place big-profit items at eye level.

6. Students should realize that new foods are always being developed. For example, milk has been changed from whole milk to include 2%, 1%, half and half, skim milk, soya drink, etc. Other items can go through the same type of changes. Butter is another example of a product that has undergone changes. Have them look at their items and try to determine which items may be changed over a period of time.