PRACTICING THE SKILLS

Laboratory Activities

Use the mathematics skills you have learned to complete one or all of the following activities:

Activity 1: Material estimates and costs

Equipment

Measuring tape
Calculator
Price list for:

- $^3/_4$-inch PVC pipe, 10-foot sections
- $^3/_4$-inch PVC unions
- $^3/_4$-inch 90° PVC elbows

Statement of problem

In the workplace, instructions from a supervisor to an employee are important. The instructions must be *written* carefully by the supervisor. They must also be *read* carefully by the employee.

In this activity, you write a problem using clue words. Then you exchange problems with a classmate and work the problem. Finally, you discuss your solutions, determine how well the problem was communicated to you, and if the problem could have been stated more clearly.

Situation: You need to run a temporary cold-water pipe from the nearest water fountain to the wall behind your teacher's desk. The pipe should run along the floor next to the wall and through the doorway. Determine how many 10-foot sections of $^3/_4$-inch pipe, how many $^3/_4$-inch unions (straight pipe to join sections), and how many $^3/_4$-inch 90° elbows (curved pipe for the turns) are needed. Determine how much the material for the cold-water pipe will cost.

Procedure

a. Based on this situation, write instructions to your classmate describing what you want done.

b. 1. Exchange instructions with your classmate and carry out the instructions you receive. Do *exactly* what the instructions say, even if you think they are wrong.

2. Determine how much pipe material you need and what it will cost.

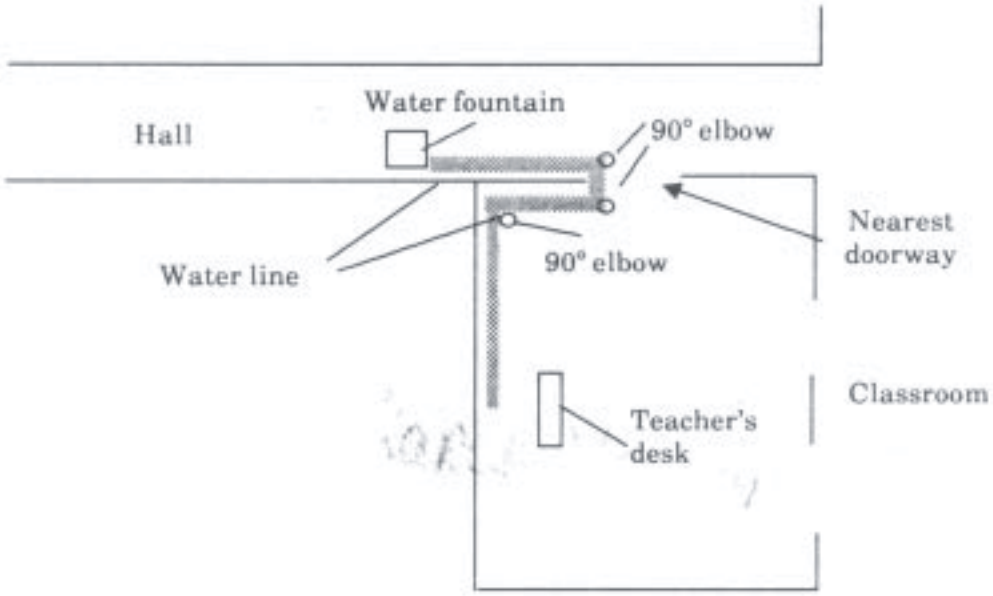
c. With your classmate, discuss the results you got by following the instructions as written by your classmate. Did you do what the instructions said? Did you do what your classmate wanted you to do? Could the instructions have been clearer?

d. Based on the discussions with your classmate, rewrite the instructions to make them as clear as you can. Ask your teacher to review your final set of instructions.

ACTIVITY 1: Material estimates and costs

Specific results for Activity 1 will vary. However, we can provide you with a general procedure that will work and can be used as a guide in helping you get your class started. This is only a suggestion and there are other ways to correctly arrive at the final results.

a. Draw a sketch of the hall and your classroom. Include in the sketch the nearest water fountain and the teacher's desk. Refer to this drawing in the instructions you write. A sample sketch and instructions are included below.



1. Measure the distance from the water fountain to the closer side of the nearest doorway. Record this measured distance on a data sheet.
2. Measure the distance through the doorway. Record this measured distance on a data sheet.
3. Measure the distance from the door to the corner of the classroom. Record this measured distance on a data sheet.
4. Measure the distance from the corner of the classroom to the teacher's desk. Record this measured distance on a data sheet.
5. Add the measured distances and record the total measured distance on a data sheet. Divide this total measured distance by 10 feet per

section. Round the answer up to the next whole section. Record this value as the number of 10-foot sections of pipe.

6. Count the number of 10-foot sections needed to make each run between 90° turns. Add an additional section for sections of the run less than 10 feet long. Subtract one from the number of 10-foot sections. This is the number of unions needed. Record this number on the data sheet.

7. Count the number of 90° turns the water line must make. This is the number of 90° elbows needed. Record this number on the data sheet.

8. Using the price list, multiply the price per 10-foot section by the number of 10-foot sections, the price per union by the number of unions, and the price per 90° elbow by the number of 90° elbows. Add these prices together. This is the cost of the materials for the materials for the water line. Record this cost on the data sheet.

b. Your students should exchange instructions and follow the instructions they receive.

c. Your students should discuss the results they got by following the instructions they received.

d. Your students should rewrite the instructions based on the discussion of the results. The original instructions, results, and new instructions should be turned in for grading.