

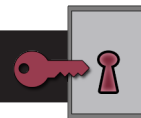
## BONUS ACTIVITY (ONLINE ONLY)



### Solving Logic Problems

**Learning skills:** using deduction, defining knowns and integrating prior knowledge

#### WHY



In a logic problem, solving the problem requires the use of correct reasoning or valid deduction, i.e., going from specific premises to a logically valid conclusion. Solving logic problems strengthens the deductive reasoning skill, which is an extremely important problem solving technique, particularly in the sciences. Your ability to take information you are given and use it to solve problems serves you throughout school, your career, and in everyday life.

#### LEARNING OBJECTIVES



1. Strengthen deductive reasoning skill by solving a logic problem.
2. Practice using the Problem Solving Methodology.

#### PERFORMANCE CRITERIA

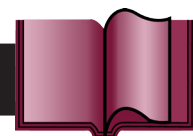


**CRITERION:** process used to solve the logic problem

Attributes:

- a. effective utilization of the Critical Thinking Questions
- b. application of the Problem Solving Methodology
- c. a correct solution

#### INFORMATION



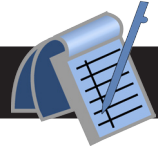
Logic problems of the form in this activity are usually found in magazines used for leisure time. However, there is much to be learned from thinking logically about information that is given to you. In this case, you are given a scenario and told what the general outcome is. From the few clues given, you are to find the specific outcome. As part of the problem solving process, you may make assumptions, but realize that a wrong assumption leads to a contradiction in your solution concerning the given clues. Only when the correct assumptions are made do you find a solution which supports all of the clues.

You can think of the initial solving of the problem as one of working backwards. If you know one of four people did something (set up in the scenario) and the clues directly or indirectly tell you that three of the four people did not do the something, then you know with certainty that it must be the fourth person.

There are different ways to solve logic problems. In many cases, it makes sense to create a table, where the rows of the table are the attributes of an individual and the columns are the types of attributes themselves. In the case of the logic problem presented here, the columns are the names of the students, their majors, their favorite sports, and their extracurricular activities.

Start a new row when you are assured that the individual is not one of the individuals who already has a row. When you have the same number of distinct rows as you have individuals, it is then easy to begin to fill in the information.

## PLAN



1. Read the Information section and the logic problem.
2. Create a 5-row, 4-column table. Each row represents a different person. The columns are: *name*, *major*, *favorite sport*, and *extracurricular activity*.
3. Concurrently solve the logic problem and answer the Critical Thinking Questions.
4. As your team works through the problem, document the thought processes and steps taken to arrive at the solution.

### Logic Problem

Gladys and four of her college friends have a specific major, enjoy a favorite sport, and participate in a specific extracurricular activity. From the clues which follow, find out which sport each student enjoys, what major each student has, and in which extracurricular activity each student participates. No two students share the same major, sport, or extra curricular activity.

### Clues:

1. One student enjoys lacrosse, one student is majoring in physics, and one student participates in the Concert Band as an extracurricular activity. These are not necessarily three different students mentioned in this clue.
2. Last Friday, while Jacob and the student who is majoring in history went out to eat, the student whose favorite sport is soccer studied with the student whose extracurricular activity is acting in theater productions, and Audrey played cards with her roommates.
3. Paul, who is majoring in philosophy, enjoys watching football.
4. Audrey is on the yearbook staff.
5. The art major did not play cards last Friday.
6. The mathematics major, who is not Audrey, enjoys watching basketball.
7. Jacob did not spend any part of last Friday with Todd nor does Jacob work on the student newspaper.
8. The student whose extracurricular activity is a volunteer fire person enjoys volleyball.

## CRITICAL THINKING QUESTIONS



- 1a. What are the first names of the five students?
- 1b. What are the five majors of the five students?
- 1c. What are the five sports the students enjoy?
- 1d. What are the five extracurricular activities in which the students participate?
  
2. How many different students are mentioned in Clue number 2? How do you know?
  
3. How can you use Clue number 2 to begin to fill in your table?
  
4. How can you use Clues 2 and 3 together to help you find out Paul's extracurricular activity?
  
5. How can you use Clues 2, 3, and 6 together to find out the first name of the mathematics major?
  
6. How can you use Clues 2, 3, 6, and 7 to find out Todd's favorite sport?
  
7. What clues help you eliminate Audrey as the volleyball enthusiast?