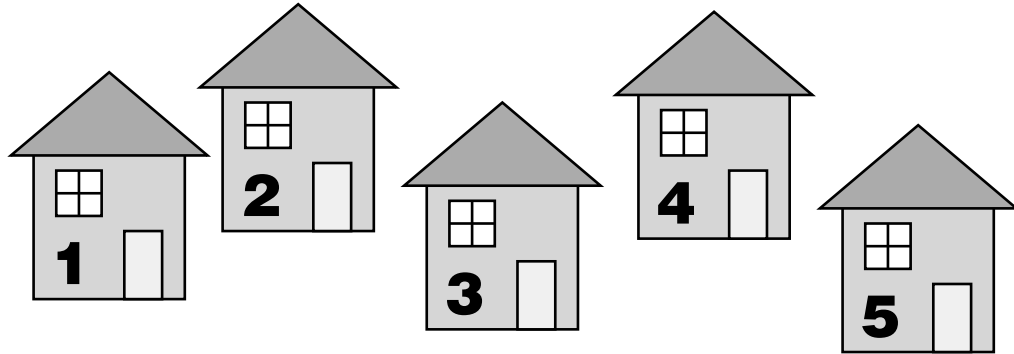


Who Owns the Fish?



There are five houses on a street. Each house is a different color. Each house is inhabited by a different person. Each person has a different preferred beverage, preferred food, and pet animal.

1. The doctor lives in the red house.
2. The firefighter has a dog.
3. The secretary prefers tea.
4. The green house is immediately to the left of the white house.
5. The inhabitant of the green house drinks coffee.
6. The person who likes chocolates has a pet bird.
7. The woman who lives in the middle house drinks milk.
8. The inhabitant of the yellow house likes onions.
9. The physicist lives in the first house.
10. The person who likes olives lives right next to the person who has a pet cat.
11. The person who has a pet horse lives right next to the person who likes onions.
12. The person who likes peanuts drinks juice.
13. The physicist lives right next to the blue house.
14. The journalist likes spinach.
15. The person who likes olives has an immediate neighbor who drinks water.

Now, your question is: *Who owns the pet fish?*

Who Owns the Fish?

Strategy

Basic Principles

- For each statement in the puzzle, make a note of not only the possibilities that are confirmed by the statement, but also those that are eliminated. For example, statement 9 says that the physicist lives in the first house. This statement not only confirms the presence of the physicist in the first house (transforming it from a mere possibility to a certainty), but it also eliminates the possibility of the physicist living in any other house, and it eliminates the possibility of anyone else living in the first house. The possibilities that are eliminated by each statement are just as important as the possibilities that are confirmed.
- Be sure to examine all possibilities for every statement, and carefully mark any possibilities that are eliminated. If at any point only one of five possibilities exists, then that possibility is confirmed. For example, if the possibility of a given person living in houses 1, 2, 3 or 4 has been eliminated, then that person *must* live in house 5.
- Periodically double-check for possibilities that have been eliminated by all the statements considered thus far.
- Use a worksheet (such as the one included with this exercise) to simplify tracking of possibilities.

Using the Worksheet

- The worksheet contains a number of grids, representing the correspondence between occupations and houses, colors and houses, animals and houses, beverages and houses, and so on. Each box in each grid represents a possibility. For example, the box at the intersection of **physicist** and **1** represents the possibility that the physicist lives in house 1.
- If a box in a grid is blank, it means that the possibility it represents has been neither confirmed nor eliminated. If the box contains an **O**, it means that the possibility has been confirmed. If the box contains an **X**, it means that the possibility has been eliminated.
- Mark a **O** in the box representing a possibility whenever a statement confirms that possibility. Then mark **X**'s in all of the boxes in the corresponding row and column of that grid (since confirming the one possibility eliminates all related possibilities).
- If a row or column contains only one blank box with **X**'s in every other box, mark an **O** in the blank box, since it is the only remaining possibility and is thus confirmed.
- Be sure to check all the grids periodically for possibilities that have been recently eliminated, based on changes in other grids.
- As each grid fills, there should be exactly one and only one **O** in each row and one **O** in each column, and no blank boxes. When all grids are full, you'll have the solution to the puzzle.

	1	2	3	4	5
doctor	✕				
physicist	○	✕	✕	✕	✕
firefighter	✕				
secretary	✕				
journalist	✕				

	1	2	3	4	5
red					
blue					
green					
yellow					
white					

	1	2	3	4	5
fish					
horse					
cat					
dog					
bird					

	1	2	3	4	5
spinach					
peanuts					
chocolates					
olives					
onions					

	1	2	3	4	5
milk					
coffee					
tea					
water					
juice					

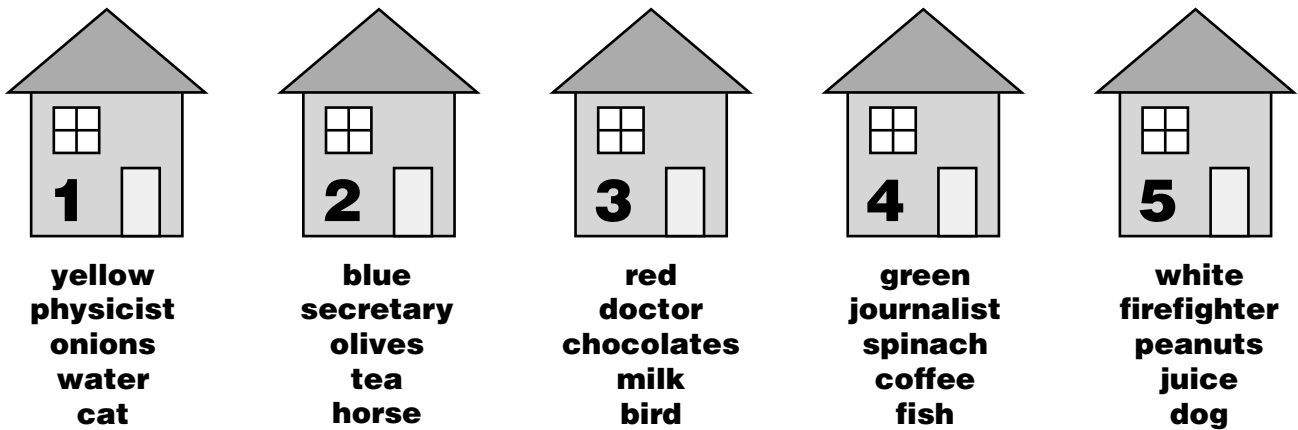
	water	juice	coffee	tea	milk
spinach					
peanuts					
chocolates					
olives					
onions					

	red	green	blue	yellow	white
doctor					
journalist					
secretary					
firefighter					
physicist					

	fish	dog	bird	horse	cat
doctor					
journalist					
secretary					
firefighter					
physicist					

Who Owns the Fish?

Solution



The pet fish belongs to the journalist.

The first house is yellow. It is occupied by a physicist who likes onions and drinks water. He has a pet cat.

The second house is blue and it is occupied by a secretary who likes olives and drinks tea. She has a pet horse.

The third house is red and its occupant is a doctor who likes chocolates and drinks milk. She has a pet bird.

The fourth house is green and is occupied by a journalist. He likes spinach and drinks coffee. He has a pet fish.

The fifth house is white and its occupant is a firefighter. She likes peanuts and drinks juice. She has a pet dog.

	1	2	3	4	5
doctor	X	X	O	X	X
physicist	O	X	X	X	X
firefighter	X	X	X	X	O
secretary	X	O	X	X	X
journalist	X	X	X	O	X

	1	2	3	4	5
fish	X	X	X	O	X
horse	X	O	X	X	X
cat	O	X	X	X	X
dog	X	X	X	X	O
bird	X	X	O	X	X

	1	2	3	4	5
milk	X	X	O	X	X
coffee	X	X	X	O	X
tea	X	O	X	X	X
water	O	X	X	X	X
juice	X	X	X	X	O

	red	green	blue	yellow	white
doctor	O	X	X	X	X
journalist	X	O	X	X	X
secretary	X	X	O	X	X
firefighter	X	X	X	X	O
physicist	X	X	X	O	X

	1	2	3	4	5
red	X	X	O	X	X
blue	X	O	X	X	X
green	X	X	X	O	X
yellow	O	X	X	X	X
white	X	X	X	X	O

	1	2	3	4	5
spinach	X	X	X	O	X
peanuts	X	X	X	X	O
chocolates	X	X	O	X	X
olives	X	O	X	X	X
onions	O	X	X	X	X

	water	juice	coffee	tea	milk
spinach	X	X	O	X	X
peanuts	X	O	X	X	X
chocolates	X	X	X	X	O
olives	X	X	X	O	X
onions	O	X	X	X	X

	fish	dog	bird	horse	cat
doctor	X	X	O	X	X
journalist	O	X	X	X	X
secretary	X	X	X	O	X
firefighter	X	O	X	X	X
physicist	X	X	X	X	O

Who Owns the Fish?

Teacher's Guide

Objective

- The objective of this puzzle exercise is to force the student to speak and (hopefully) think in English while solving a complex problem in logic. Most people find it extremely difficult to solve logic problems and speak and understand a foreign language at the same time, so this exercise forces the student to use her brain much more than it might at first appear.

General Suggestions

- The Strategy sheet is optional, as are the worksheets. These sheets help the student to solve the puzzle, but they are only incidental to the goal of getting her to use English. Hand them out if you think the student will need the help. The Strategy sheet explains some general principles for solving this type of problem and suggests a method for using the worksheets. The worksheets themselves are handy for helping a student to organize information she obtains by examining and sharing clues.
- Make sure your student speaks English while solving the puzzle; the urge to slip back into one's native language when solving difficult problems is often irresistible.
- To force the student to speak and understand English, ask her questions, and if she has answers to the questions, ask her to explain how she logically arrived at those answers. For example, you can ask "Which house is blue?" and the student should reply with "The second house." Then ask her how she concluded that the second house is blue, and the answer should be along the lines of "The blue house is next to the house where the physicist lives, and the physicist lives in the first house."
- Your student may not solve the puzzle before the end of the class. You can give it as homework, or save it and resume work during the next class, or simply give her the solution before she leaves. It's up to you. Some students will be frustrated if they leave without solving the puzzle; on the other hand, other students may be peeved if they are given the solution before they've worked it all out for themselves. *Remember that the goal is to make them use English, not to get solutions to the puzzle.*

Observations and Tips

- Some students will assume that a doctor or firefigther cannot be female, and may reach incorrect conclusions on this basis.
- Make sure that students understand which items are food, and which are drink. For example, students must understand that chocolates are food, not drink (some may confuse chocolates with hot chocolate as a beverage).
- During World War II, some Nazi spies spoke perfect English. In order to determine whether a suspected spy really had English as his native language or not, one test was to ask the suspected spy to solve a math problem on a blackboard *and* explain his work as he went, in English. Spies would often slip into German while solving the problem and thus betray themselves. This illustrates how hard it is to solve a logic problem and speak a foreign language at the same time. But it's great practice.