
INTRODUCTION

This workbook is about logic. Do you know what logic is? Logic is not just what is called *common sense*. It is the *study of correct reasoning*, the ability to think clearly. That may sound a little difficult to you. But as soon as you start working the problems in this book, you will find that they aren't difficult at all. Although they are called *logic problems*, they are really like puzzles, with one important difference: There are no tricks as there sometimes are in puzzles. If you like the fun and challenge of working a good puzzle, you will like working these logic problems.

Logic is the study of correct reasoning, and correct reasoning means doing three things: (1) seeing facts; (2) putting those facts together in a way that makes sense; and (3) coming to conclusions. It isn't difficult to see how correct reasoning can help you with your school work, whether it's writing social studies reports, doing science projects or working math problems. And correct reasoning can help even outside school. For example, if you want to buy a new bike, you can collect all the facts about three kinds of bikes, compare the information to find out which one is best for you, and then decide which one to buy. Your parents can use logic when they're figuring out the family budget or deciding whether or not to change jobs. Scientists and engineers use logic to build space ships and computers. Doctors use logic to diagnose diseases. While logical thinking isn't the only way to solve problems (sometimes we use our intuition, or feelings, as well), it is an important and useful skill.

Doing the problems in this book will help you develop the ability to think logically. You can do them for that reason—or just because they're fun.

This book has three kinds of logic problems—matrix logic, syllogisms, and Venn Diagrams. Don't worry if you don't know what they are. Each one is explained very carefully. By the time you work through the first few pages of each section, you'll know all you need to know about solving them. When you've finished with the problems, check your answers in the Answer Key at the back of the book. If you don't always get the right answer, go back over the problems and see if you can find out where you went wrong. After you've finished, make up some of your own logic problems and give them to friends to solve.

MATRIX LOGIC

To do matrix logic problems, start by gathering information from clues. These clues can be tricky. One clue may give you only a little information by itself, but it may give a lot more information when you fit it together with another clue. Here's how it works:

LOLLIES, LOLLIES, LOLLIES

Find out what kind of lolly Tina, Kathryn, and Jacky like, Each child likes only one kind, and no two children like the same kind.

1. Tina hates chocolate bars.
2. Kathryn eats toffee.

(Since each child likes only one kind of lolly, you know that Kathryn doesn't like _____.)

ANSWER: Chocolate bars.

And since Kathryn likes toffee, and no two children like the same kind of lolly, you now know that Tina also doesn't like _____.)

ANSWER: Toffee.

3. Jacky hates lollipops.

(Now you know what all three lollies are:

_____, _____, and _____.)

ANSWER: Chocolate bars, toffee, lollipops.

Since each child likes only one kind of lolly, and Tina doesn't like chocolate bars or toffee, she must like _____.)

ANSWER: Lollipops.

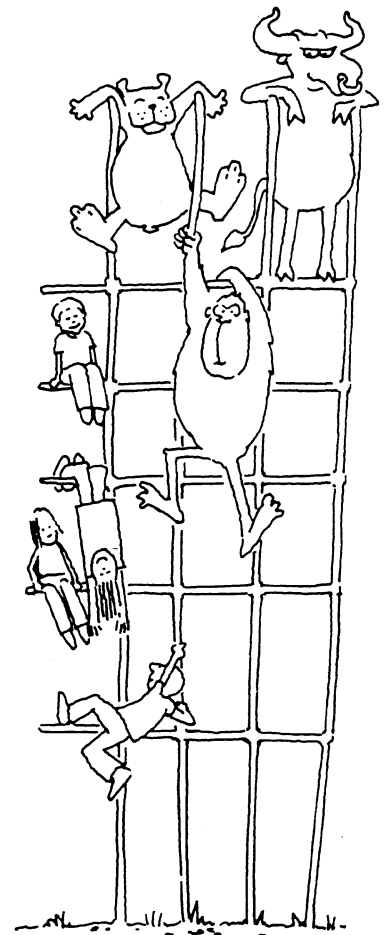
Since Tina likes _____, and Kathryn likes _____,

ANSWER: Tina likes lollipops, Kathryn likes toffee.

there's only one kind of lolly that Jacky could like, and it's

_____.)

ANSWER: Chocolate bars.



To keep track of all the information in this kind of problem, record it on a chart called a *matrix*. Using the matrix below, write down the three children's names in the boxes on the side, and the three kinds of lolly in the boxes on the top.

Now use the matrix to record the information you get from each of the clues.

1. Tina hates chocolate bars.

(Mark a big *X* in the box where *Tina* and *chocolate bars* meet.)

2. Kathryn eats toffee.

(Write *Yes* where *Kathryn* and *toffee* meet. Then mark *X* in the other two boxes next to Kathryn's name, since she only likes one kind of lolly. Finally, mark *X* where *Tina* and *toffee* meet, and where *Jacky* and *toffee* meet—since each child likes only one lolly and Kathryn likes toffee, this means that Tina and Jacky don't like toffee.)

3. Jacky hates lollipops.

(Mark *X* in the box where *Jacky* and *lollipops* meet. Now you can see that there's only one space left next to Tina's name—*lollipops*. Mark that box *Yes*. And there's only one space left next to Jacky's name—*chocolate bars*. Mark that box *Yes*.)

Here's what your completed matrix should look like:

	chocolate bars	toffee	lollipops
Tina	X	X	yes
Kathryn	X	yes	X
Jacky	yes	X	X

You can chart all matrix problems the way you just charted the children-and-lolly problem. A more complicated problem will have more boxes. If you have three people's names, their food choices, and their drink choices, you can use a matrix like the one below.

Fill in the following information:

1. Use the children's names: Pat, James, and Laura.
2. The foods are: pizza, fish, and hot dogs.
3. The drinks are: lemonade, cola, and milk.

1. FLOWERS

Karen, Derek, Fay, Tanya, and Scott each have a special favorite flower. No two of them have the same favorite. Which child goes with which flower?

1. Karen's favorite is not the tulip.
2. Derek hates tulips and roses.
3. Someone really likes daisies.
4. Fay likes violets.
5. Tanya is allergic to carnations.
6. Scott likes the flower to which Tanya is allergic.
