

Contents

Introduction	1
How to Solve Matrix Logic Problems	2
Matrix Logic Reminder Page	5
Matrix Logic Problems	7
Make Your Own Logic Problems	37
Answer Key	41

Introduction

In today's society, a person must be able to think clearly, analyze information, and reason logically. The notion that these skills cannot be taught is wrong—critical thinking skills *can* be taught and taught to children at a young age.

The matrix problems in *Digging into Logic* were designed to develop critical thinking skills and to give practice in reading, following directions, and writing. While the activities are called logic *problems*, they are more like puzzles, but with one important difference—there are no tricks. Like good puzzles, these logic problems are entertaining and mind stretching. While your students are enjoying themselves, they will also be working toward a very important goal—developing the ability to think, organize, analyze, and arrive at logical conclusions.

How to use this book

The thirty problems in this book have been developed for students in grades five and up. The problems are arranged by difficulty—simple to complex—and can be used either sequentially or individually. You might use the earlier problems to encourage beginners and use the later problems to challenge your gifted students or students who particularly enjoy logic problems.

In the classroom, the logic problems can be used in any one of three ways: (1) as independent

activities at learning centres; (2) as extra or supplementary work for students who finish their assigned work early; or (3) as a minicourse in thinking skills for the entire class.

We recommend that you introduce the material by leading the students through the sample problem on pages 2–4. This problem shows how to use a matrix. It also demonstrates some of the logical thinking that is involved in solving a matrix problem. We also suggest that you duplicate and hand out the Matrix Logic Reminder Page on page 5. This sheet details the key points that students should remember when working the problems.

In addition to the problem pages, there are three Make Your Own Logic Problem pages. These pages will help your students design their own logic problems to try on their friends. Constructing logic problems can be as demanding as solving them, so these pages will further build your students' thinking skills.

At the back of the book is an answer key. You should decide whether you want to collect students' completed problems and correct them yourself, duplicate the answers so students can correct their own work, or read the answers aloud to the entire class when all the students have finished. This last alternative allows for further discussion and clarification.

How to Solve Matrix Logic Problems

To solve matrix logic problems, you need to gather information from clues. These clues can be tricky. One clue may give you only a little information by itself, but it may give you a lot of information when you put it together with another clue.

To keep track of all the information in this type of problem, you can use a chart called a *matrix*. (We have included a matrix for each problem in this book.) A matrix will help you keep a logical record of what you learn from each clue, and it will allow you to record the facts that can be deduced by putting together two or more clues. To show you how a matrix works, let's go through a sample problem step-by-step.

Here's the problem:

The Artists

Mark, Meg, Melissa, and Marcie are all artists. One child uses only colored felt pens, one child uses only black pencils, one child uses only watercolors, and one child uses only crayons. Find out what each child uses.

1. Melissa loves bright colors, but she doesn't use felt pens.
2. Marcie and Melissa never have paint on their hands.
3. Mark takes excellent care of his brushes.
4. Meg thinks black pencils are boring.

Here's the matrix:

	FELT PENS	PENCILS	WATERCOLORS	CRAYONS
MARK				
MEG				
MELISSA				
MARCIE				

The first step is to read all the information and then write the names and the categories in the matrix. So in this problem you would write the children's names—Mark, Meg, Melissa, and Marcie—in the boxes on the side, and you would write the four types of art materials—felt pens, pencils, watercolors, and crayons—in the boxes on the top. Here's what your matrix would look like:

	FELT PENS	PENCILS	WATERCOLORS	CRAYONS
MARK				
MEG				
MELISSA				
MARCIE				

Now use the matrix to record the information you get from each of the clues. Let's take the clues in order.

Clue 1: Melissa loves bright colors, but she doesn't use felt pens.

This clue tells you that Melissa doesn't use felt pens, so you would put an **X** (meaning "no") in the box where *Melissa* and *felt pens* meet, like this:

	FELT PENS	PENCILS	WATERCOLORS	CRAYONS
MARK				
MEG				
MELISSA	X			
MARCIE				

You can also deduce from this clue that Melissa does not like to use black pencils, since she loves to use bright colors. Therefore, you would put another **X** where *Melissa* and *pencils* meet. The matrix will look like this:

I Rock Around the Block

One Saturday night, three rock groups played in Anytown. The groups were the Remedy, the Rolling Rocks, and the Princess. From the clues given below, find out the order in which the bands played.

1. The Remedy played before the Princess.
2. The Princess played after the Rolling Rocks.
3. The Remedy played after the Rolling Rocks.

