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## INTRODUCTION

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This is not a book in formal logic, but a book that reinforces logical thinking as a practical tool in a student's academic and personal life. Deduction is necessary for scientific experiments, analysis permits the student to intelligently evaluate changing current events, and induction opens the door to a broader understanding of mathematics. And, most important, logic provides the clarity of thought that allows people to communicate effectively, discover new concepts, and test the validity of information that they receive through the media and from people around them.

The activities in this book are divided into five categories: Sequencing, Inference, Deduction, Creative Logic, and Games for Pairs. Each section has an introduction that outlines the activities in the section and offers suggestions for follow-ups and class discussion. An answer key is in the back of the book.

There are several ways that this book can be used in the classroom. Individuals or pairs can work through the activities with minimal supervision, or the entire class may participate. When students work together to solve logical puzzles, they begin to learn alternative strategies from other students. In situations where a student gives up or fails when working alone, the pair or group may succeed. Thus a potential disappointment can be replaced by a confidence building experience.

Each section is arranged in order of difficulty. The activities may be used in sequence, a few per week, or the activities can be given in a more flexible fashion, according to specific needs of the students. Students who finish other work early can be rewarded with an activity page, while the other students continue with their work.

Students have a practical understanding of logic that they have developed in order to function in society and the natural world. This book reinforces rational skills by applying them to fun situations, and helps students become aware of the way they think.

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## SEQUENCING, SETS, AND ANALOGIES

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The classification systems of science, the genres of literature, and the rules of grammar all stem from the recognition of patterns and relationships. The activities in this section present sets and analogies as ways of structuring information.

**Moving Day, The Tool Tour, Newspaper Tangle, and Twisted Stories:** Students will practise temporal sequencing. A class discussion topic to reinforce this skill could be an exploration of sequencing in the students' personal lives (for example, getting ready for school). Discuss which sequences are crucial and which can be transposed.

**Family Set, Animal Set, and Circle Set:** Students will practise the rudiments of set theory. This skill is essential in preparation for the mathematics they will encounter in later years. A class discussion of sets could focus on science (for example, acids/bases, simple machines/complex machines), social studies (explorers/conquerors, mineral-rich countries/agriculturally-rich countries), or any appropriate subject.

**Analogies I and II:** Students will practise a simple version of SAT-type analogies. In class discussion, students can describe how analogous words are related, and discover the subtle relationships that exist between words.

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# Moving Day

Two movers, Vicki and Jerry, want to unload their truck efficiently. Some of the furniture is heavy, and they must work together to move it. Read the following rules and the list of items to be moved. Then, write a moving schedule on the bottom of the page.

### Rules

1. Vicki and Jerry want to be finished in no more than two hours.
2. They can do different one-person jobs at the same time.
3. The living room paintings must be hung after all of the living room furniture is moved in.
4. Vicki wants to start by carrying in the books, and finish by moving the dining room table.

<u>One-mover Jobs</u>	<u>Time</u>	<u>Two-mover Jobs</u>	<u>Time</u>
Carry in boxes of books	10 min.	Move living room piano	20 min.
Set up living room lamps	20 min.	Move dining room table	20 min.
Set up dining room chairs	20 min.	Move living room couch	10 min.
Shelve boxes of dishes	20 min.		
Set up bed and headboard	30 min.		
Hang living room paintings	40 min.		

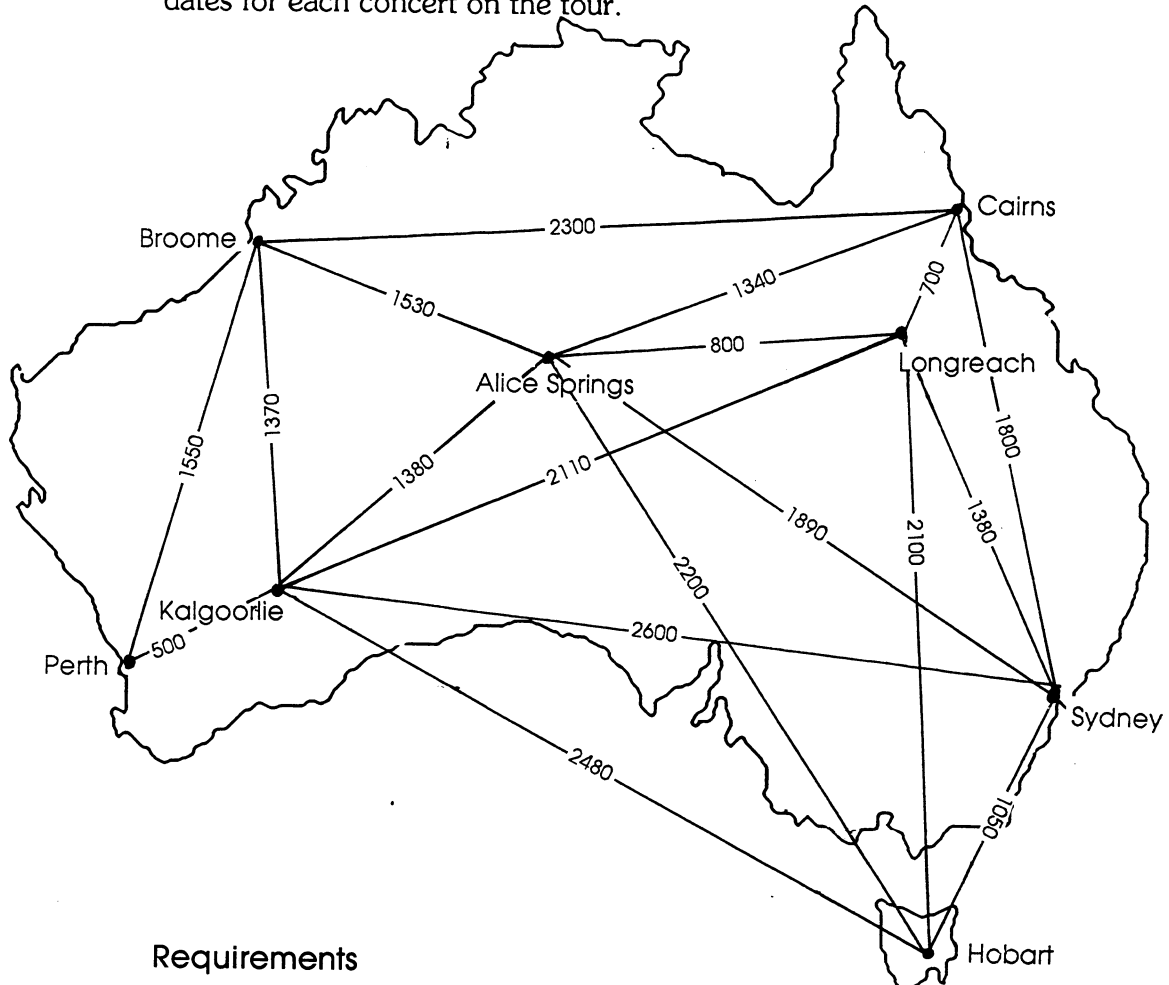
### Schedule

Vicki's Jobs	Two-mover Jobs	Jerry's Jobs
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Name \_\_\_\_\_

# The Tool Tour

Plan the next tour for the *Tools*, a new rock group who like to tour "different" cities to other groups. The map is your guide for distances in kilometres between cities. On a separate piece of paper make a calendar and plan the dates for each concert on the tour.



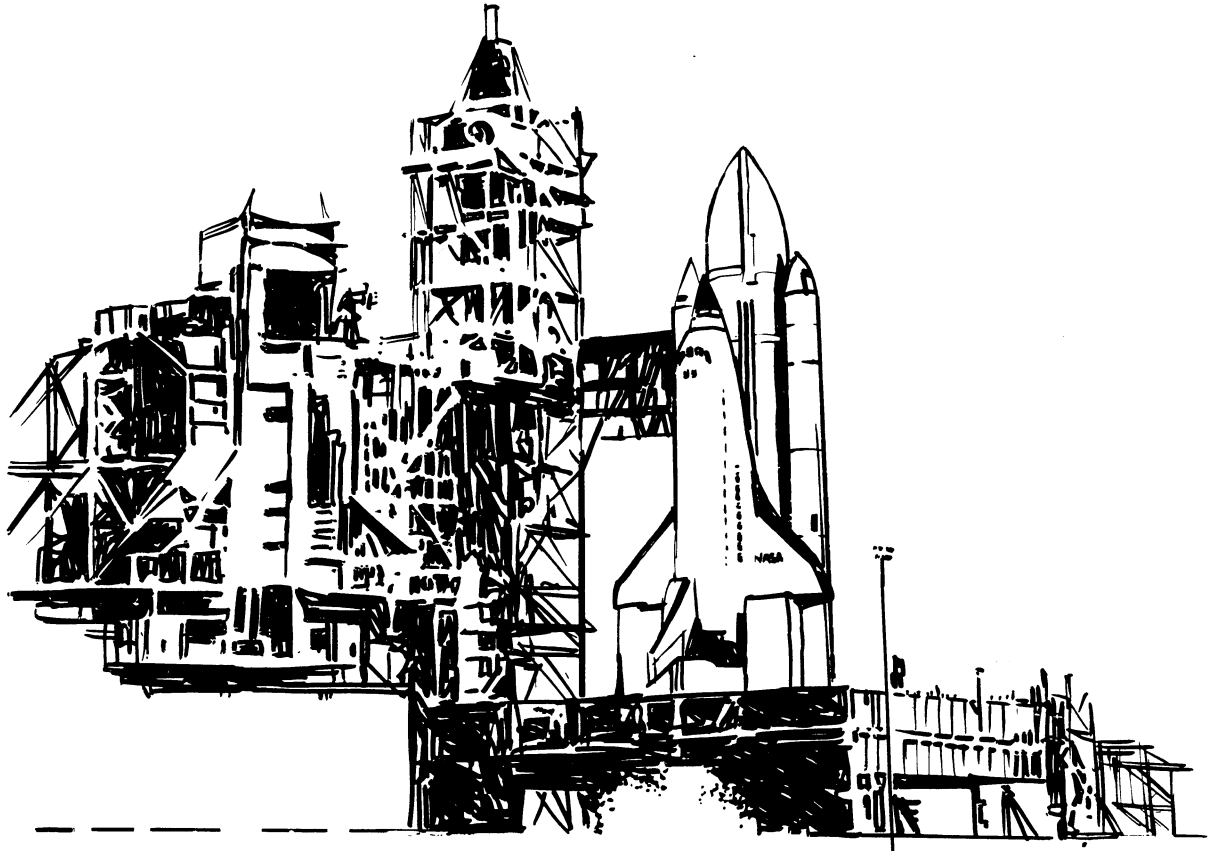
## Requirements

1. They want to play in eight cities: Alice Springs, Broome, Cairns, Hobart, Kalgoorlie, Longreach, Perth and Sydney.
2. The tour will begin on Monday, 2nd July, in Sydney.
3. The tour will end on Sunday, 29th July, in Perth.
4. The *Tools* want to travel less than 13,100 kilometres.
5. In each city, they will perform for two or three days.
6. After each set of concerts in a city, they need at least one day for travel to the next city.
7. They want to have Saturday night concerts in Hobart, Broome, and Perth.

# Newspaper Tangle

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Two reporters wired their news stories to the *Science Reporter* at the same time. The two stories were mistakenly mixed together by the computer. The sentences for both stories are in the correct order, but they need to be sorted out. Read the tangled stories below and, on a separate piece of paper, write the two newspaper articles.



## The Tangled Stories

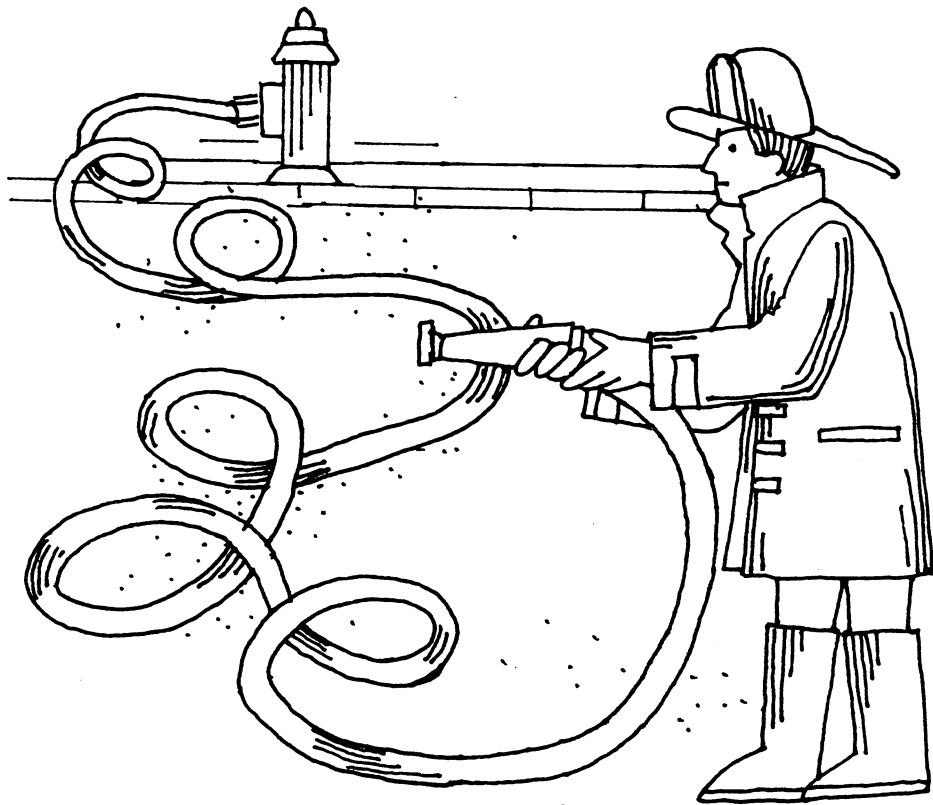
NASA expects, once again, to launch the Space Shuttle near dawn this Thursday. A weather satellite is malfunctioning as a result of a computer error, the Weather Service announced today. The satellite provides pictures of the southwestern United States, and is important for predicting changes in air temperature and pressure. The earlier computer problems that threatened to delay the launch have been fixed. The Weather Service believes the malfunction can be fixed in the next few days. "Everything, including the weather, looks good," said launch engineer Marshall Peters. The Space Shuttle will be taking photographs of the sun for scientists to study. Until then, balloons and other older methods will be used. "At least this isn't the rainy season," commented one meteorologist. The photos might help show a relationship between sunspots and weather patterns.

Name \_\_\_\_\_

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## Twisted Stories

Two reporters wired their news stories to the *Daily Gazette* at the same time. Unfortunately, the stories were scrambled by the computer. Read the sentences below. On a separate piece of paper, write the two original stories with the sentences in the correct order.



### The Twisted Stories

By 10.00 a.m., the flames dwindled, and several volunteers offered temporary shelter for the shop's dogs, cats, snakes, and rabbits. Rescue and observation teams, who had been expecting the eruption for several weeks, moved quickly to evacuate the area. She also reported that many kangaroos and possums had fled through the nearby town to safety. Early this morning, before the shops opened, a fire broke out in the Centre City shopping centre. According to Sue Landoni, the evacuation director, by 3.30 a.m. everyone had been successfully relocated. After the fire was out, Mr. Lansing said, "I think I was more frightened than were the trapped pets." Within minutes, the lava had spread over a 200 hectare area, endangering hundreds of families and countless native animals. Fire engines rushed to the scene, after the fire was discovered by Larry Lansing, a pastry shop owner. Shortly after 2.00 a.m. this morning, the ancient volcano Quixtola erupted. Although no people were inside, the fire fighters used axes to get to animals trapped in a pet shop.