

CONTENTS

How SEARCH Evolved	3
Introduction	4
PART I FOR TEACHERS	5
What is Independent Study?	8
Goals and Expectations	10
Teaching Strategies	13
Materials	15
Planning the Project	17
Evaluation Strategies	20
Rest Area Tokens	24
Teacher Evaluation Form	25
SEARCH Lingo	26
Letter to Parents	27
Independent Study Ideas	28
PART II FOR THE STUDENT	31
Student's Table of Contents	32
SEARCH Roadmap	33
The Journey Begins	36
Self-Evaluation Form	79
Appendix	
A. Creative Thinking Strategies	81
B. Components of Quality Research	85
C. Glossary	86
D. Bibliography	91

“The mere formation of a problem is far more often essential than its solution, which may be merely a matter of mathematical or experimental skill. To raise new questions, new possibilities, to regard old problems from a new angle requires creative imagination and marks real advances in science.”

Albert Einstein

INTRODUCTION

SEARCH is for the Gifted, Talented, or Creative Student, in years four to nine, who want to do a science project, enter a competition/show, or for a student who is interested in pursuing an independent study in any subject area.

Each year as part of existing enrichment programs, in programs that offer differentiated curriculum, or through competitive science shows, students present their science and independent study projects for evaluation to teachers, judges and the general public. Students can work in the categories of science: biology, physics, chemistry, computers, the environment and ecology. Some fairs also include engineering and energy as alternative categories. Possible categories of independent study include: social studies (religion, geography, current affairs), local issues (history, culture, politics) and related environmental studies (architecture, ecology, development), and many more.

The first part of **SEARCH: A Research Guide for Science Fairs and Independent Study** is a teacher's guide. It gives directions, guidelines, suggestions and tips for assisting students in the research process.

The second half is the student's section: the guide for the student working independently towards a project or product, developing research skills, problem solving, using higher-level thinking and creativity skills. Through the guidelines in this book, students will be on their way to creating a successful science project or independent study project.

SEARCH: A Research Guide to Independent Study

The value of self-directed research for the classroom is time honoured both in the schools and in the literature. More recently independent study and self-directed research have become the backbone of gifted education and as such have taken on a new and important direction. With this new direction, care is taken that the learner select a topic in the “passion area”. (Betts, Autonomous Learning Model, 1985) The student is now urged to become a “practising professional” (Renzulli, The Enrichment Triad Model, 1977) and to produce a product of interest in the subject field rather than the typical “report to the class”.

Students now construct real investigations that end, perhaps, in the printing of their conclusions in a scientific or historic publication. They might research and create an answer to a traffic problem in their community. They could write, choreograph, and produce a musical for a school event. As a group of concerned students, described by Renzulli, they might collect and study the daily rubbish and paper waste at their school. Then the students could put together a proposal to have the rubbish recycled.

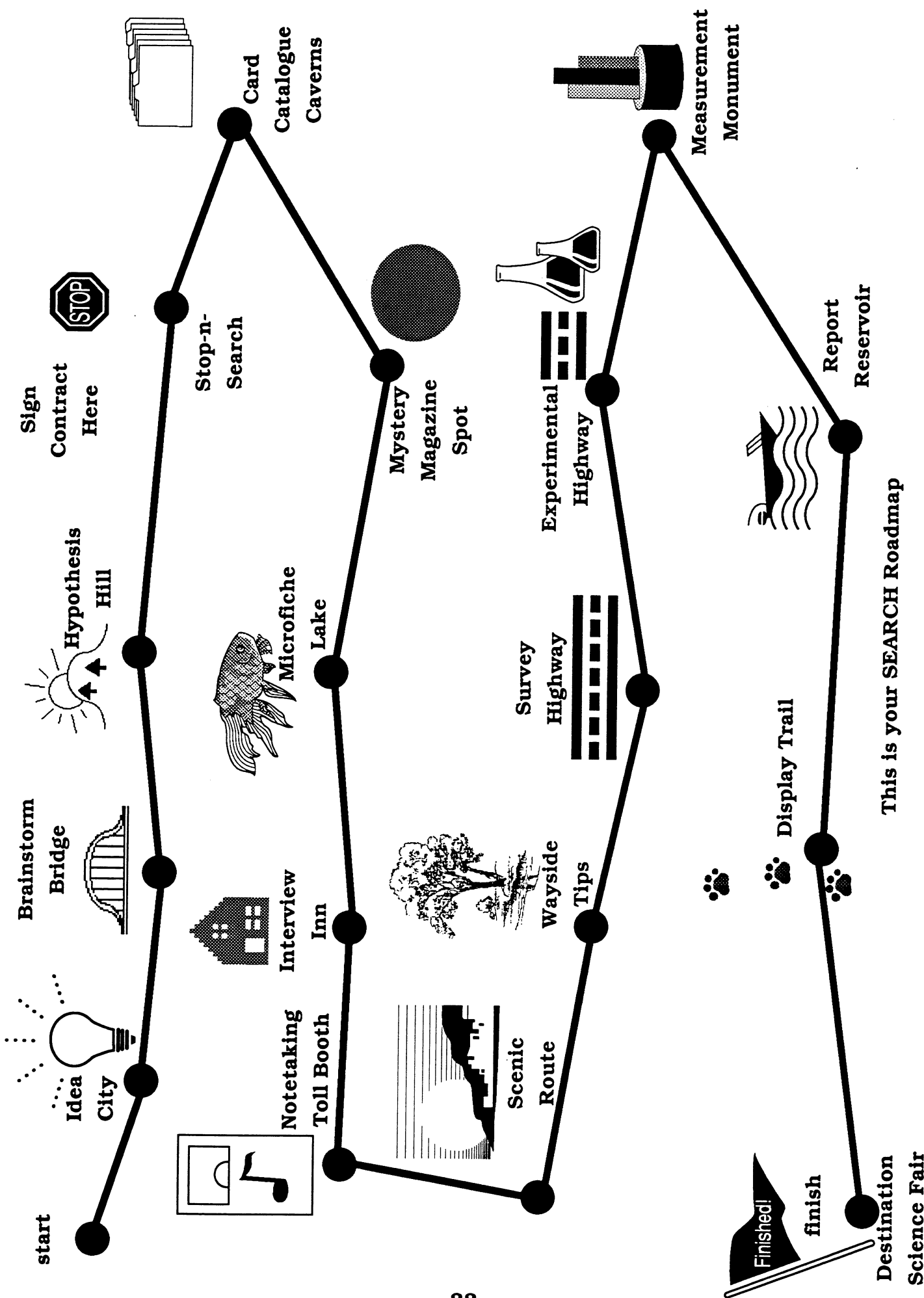
A young age does not limit the ability to contribute to society. Louis Braille, a blind French student, conceived the idea of an alphabet for the blind when he was ten years old. By the time he was fifteen he had worked out all the details. Examples like these may help your students consider their own abilities and look for ways to make a contribution to others.

The purpose of SEARCH:

1. To assist the student in planning a science project or independent study using research skills in
 - a. the acquisition of information
 - b. the analysis of data
 - c. the concise reporting of information.
2. To communicate to students how to conduct original research through the experimental method. This includes experimental factors and control factors, and collection and recording of the data results.

TABLE OF CONTENTS FOR PART II FOR THE STUDENT

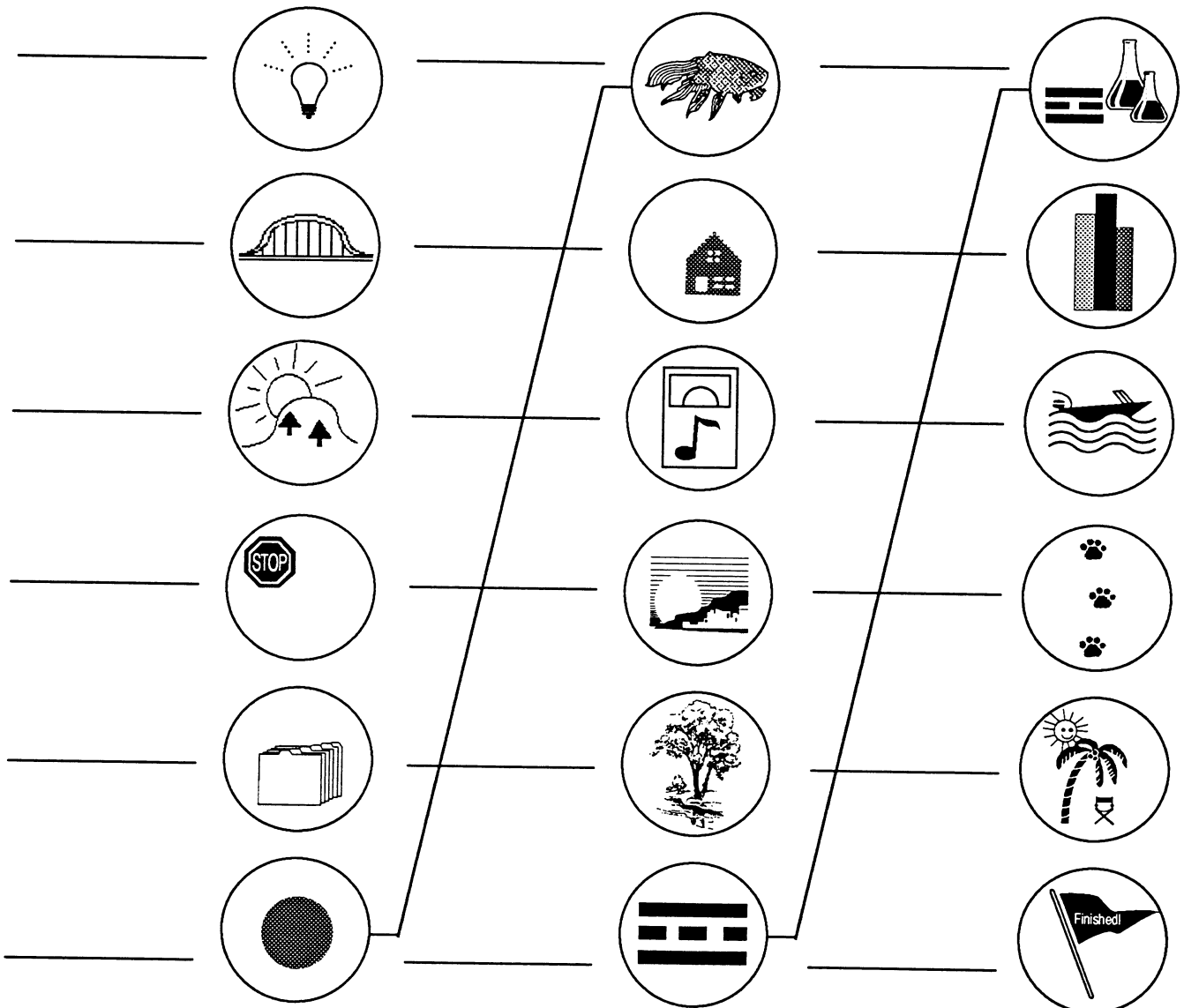
The SEARCH Roadmap	33
Introduction to SEARCH	34
The Road Signs	34
Rest Area Worksheet	35
The Journey Begins	36
Idea City	37
Brainstorm Bridge	40
Concept Mapping	41
Hypothesis Hill	43
Choosing Your Product	44
Independent Study Contract	46
Independent Study Worksheet	48
Independent Study Daily Record	50
Independent Study Checkpoints	51
Stop-n-Search Site	52
Card Catalogue Caverns	53
Magazine Mystery Spot	55
Microfiche Lake	56
Interview Inn	57
Notetaking Toll Booth	59
Notetaking Worksheet	60
Scenic Routes	61
Wayside Tips	65
Survey Highway	66
Experimental Highway	68
Experiment Memo	70
Measurement Monument	72
Report Reservoir	74
What Is an Abstract?	76
Display Trail	77
Destination Science Fair	78
Self Evaluation	79



INTRODUCTION

SEARCH is a guided tour of the research processes necessary to complete an independent study or science project. The purpose of an independent study is to create a project that has a purpose and is useful. It may also help you to explore a science career, study a topic in-depth, or discover new areas of interest and concern.

On the previous page is the **SEARCH** Roadmap, specially designed to take you, step-by-step, through all the things you need to do to complete a successful project. At each stop along the way, there are new words to learn, assignments to complete, and worksheets for practising what you've learned. Any time you need help, refer to the beginning part of your packet, or ask your teacher for a meeting. Use the learning centre available to you in your classroom, and all the other resources offered by your teacher and through your library. Stay on the road and pause at each rest stop; you are off on an exciting and productive adventure!



Identify each of the symbols on the **SEARCH** Roadmap. Write the answers on the lines.