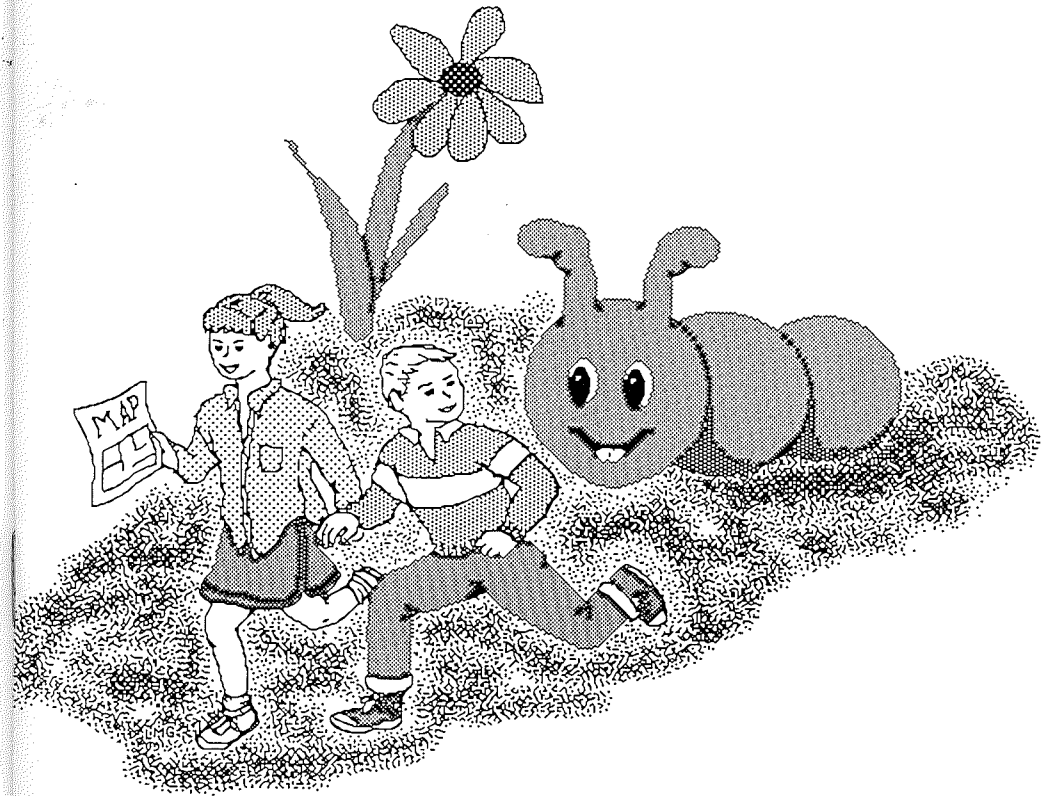


Think Quick!™

A Guide for Parents and Teachers



Contents

<i>Introducing Think Quick!</i>	1
<i>Educational Value</i>	2
The Skills	3
The Curriculum Connection	6
<i>Using the Program in the Classroom</i>	8
Introducing the Program	8
Playing the Game	9
Using the Castle Creator	10
<i>Activities for Home or School</i>	11
Activity 1: Secret Messages	11
Activity 2: Guess My Rule	12
Activity 3: Logic Puzzles	13
Activity 4: Drawing Fun	14

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Introducing *Think Quick!*

Think Quick! is an exciting, fast-paced adventure game that helps children develop critical thinking and reasoning skills. As they explore the many rooms of the Castle of Mystikar, players are challenged to overcome a variety of obstacles and solve intricate maze puzzles. The games, as well as the game editor that allows children to create and play their own games, help build skills in logical thinking, developing strategies, decision making, problem solving, and a host of other cognitive skills necessary for academic success.

Think Quick! features two Castle of Mystikar games for different ability levels that are sure to delight adventurers of any age. Both games contain three levels of difficulty represented by different parts of the castle. Players search the castle rooms for Secret Panels that hide Magic Things — ingredients needed to build an enchanted knight who confronts a dragon at the end of the game. Children use logic to decipher codes on the Secret Panels and to find their way through mazes blocked by doors. They also develop strategies for avoiding the dragon and Slime Worms that roam the castle. Although the games can be timed, players may take cover in the game's Hideout to study castle maps and plan their next move. While quick thinking is rewarded, children can play at their own pace, learning one strategy at a time.

The Castle Creator game editor adds to the program's rich versatility and helps stimulate creativity while reinforcing the game concepts. By designing their own games, children learn to manipulate multiple variables while increasing their ability to plan and understand complex relationships. A variety of challenging additional games created with the game editor are included with the program.

Just like good curricula and good teaching, *Think Quick!* enables children to develop important academic skills in a way that engages their intellect and imagination. What's more, children will play the games again and again just for the fun of it. And that, after all, is how some of the most powerful learning can take place.

Educational Value

"The central idea of teaching with games, both in and out of the classroom, is to use the time spent in the classroom or doing homework to create a laboratory environment—an environment in which experiments can be made, hypotheses formulated, and new and better experiments planned. Games help to create this laboratory feeling by providing objectives and procedures. They also encourage imaginative freedom to experiment with alternative solutions, while at the same time offering a realistic set of constraints on less practical responses to problems. The students can learn not only by observing the results of games, but also by playing and indeed by designing them."

from *Serious Games* by Clark C. Abt

To a child, *Think Quick!* looks and feels like a game—not an exercise in logical thinking. Extensive field testing has demonstrated that children are highly motivated to spend hours and hours playing it. They know it makes them think, but it is so much fun that they enjoy it.

The concepts and skills in *Think Quick!* are the concepts and skills that help in everyday life situations where problems are presented, often under time pressure, and one needs to quickly consider several alternative strategies and select the best one. Educators call these concepts and skills "problem-solving" or "cognitive" skills. They are also the skills used by scientists in the scientific process of inquiry.

Much attention is currently focused on the importance of developing higher-level thinking and problem-solving skills in education. In this respect, *Think Quick!* becomes a powerful tool for learning, providing an environment that offers the opportunity to engage many skills that have been identified as basic to problem solving.

THE SKILLS

The cognitive skills presented in the *Think Quick!* program, as well as in other programs from The Learning Company, are listed in the chart below. These skills were defined as key problem-solving and critical thinking skills by a major evaluation and dissemination project called CompuTHINK.*

The specific CompuTHINK skills, as well as other cognitive skills, that are presented and reinforced by the *Think Quick!* program are described below. How these skills relate to the whole spectrum of cognitive development is shown on page 7.

CompuTHINK Cognitive Skills Model		THINK QUICK!	MATH RABBIT	READER RABBIT	WRITER RABBIT	MAGIC SPELLS	JUGGLER'S RAINBOW	GERTRUDE'S SECRETS	GERTRUDE'S PUZZLES	ROCKY'S BOOTS	BUMBLE GAMES	BUMBLE PLOT	MOP TOWN PARADE	MOP TOWN HOTEL	ROBOT ODYSSEY
Skills		2-8	K-2	K-2	2-4	1-6	P-1	K-4	3-7	4-up	K-5	4-8	K-5	3-7	7-up
Gathering Information															
Observing		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Recalling		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Organizing Information															
Ordering		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Patterning		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Prioritizing		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Comparing/Contrasting		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Categorizing/Classifying		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Grouping/Labeling		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Analyzing Information															
Formulating Questions		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Recognizing Part/Whole Relationships		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Discriminating Fact and Opinion		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Discriminating Relevant/Irrelevant		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Discriminating Reliable/Unreliable		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Identifying Assumptions		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Identifying Points of View		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Identifying Cause and Effect		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Understanding Statement Meanings		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Expanding Information															
Demonstrating Fluency		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Demonstrating Flexibility		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Demonstrating Originality		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Elaborating		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Synthesizing Information															
Generalizing		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Predicting		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Logical Thinking		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Solving Problems/Making Decisions															
Defining Problems		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Determining Outcomes		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Searching and Applying Solutions		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Evaluating Outcomes		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Revising Solution Strategies		•	•	•	•	•	•	•	•	•	•	•	•	•	•

* CompuTHINK is a dissemination project funded by a grant from the California State Department of Education, Educational Technology Local Assistance Program (AB 803).

- ☐ **Gathering Information: Observing**
- ☐ **Analyzing Information: Identifying Cause and Effect**
- ☐ **Synthesizing Information**

These skills are practiced most intensely when the player first encounters the game and learns how it works. Information is available from many sources: Knight School, the Knight's Guide, and the game itself. People learn in different ways, and some will find the Knight School's step-by-step explanations the best way to learn. Others will want to just jump into the game and use their skills of observation to determine the cause and effect relationships of this new environment. Either way, the success of their approach will readily be seen when they try to win the game.

- ☐ **Gathering Information: Recalling**
- ☐ **Organizing Information: Patterning, Comparing/Contrasting, Categorizing/Classifying, and Grouping/Labeling**
- ☐ **Synthesizing Information: Generalizing and Logical Thinking**

To play the game, players must deduce the rule that determines which Secret Panels to open in order to find the elements they need to win the game. This activity requires the ability to observe similarities of traits among the various geometric shapes in a clue, form a hypothesis about what the rule might be, and test the hypothesis by opening panels. The earlier levels of the game have simpler rules than later levels, allowing the player to build the skill gradually. Recall is important, since the clue is not always with the player. Forming hypotheses about alternative solutions to the mazes and testing them, either directly or by thinking them through, develops the child's reasoning skills.

- ☐ **Organizing Information: Ordering and Prioritizing**
- ☐ **Analyzing Information**
- ☐ **Planning**

Operating the doors that block mazes throughout the game requires the player to use sequential logic—similar to the logic used by a good chess player—to plan several moves ahead. In the game's more complex mazes, for example, a player may first have to close a door to a desired passage, then open another door in a different room, come back to the first door and reset it, go back to a different door and open it, and finally go through yet another door to get to the goal. The player is slowly introduced to this level of complexity by the easier levels of the game.

- ☐ **Solving Problems/Making Decisions**

The unpredictable appearance of Slime Worms in the game that block one's way requires the player to make decisions quickly. Since there are several alternatives for dealing with the worms (some or all of which may be appropriate at any given time), the player must choose which approach is best at the moment. By carefully observing the worm's behavior, keeping track of the time remaining, and managing the resources available for counteracting the worms, the player can choose the best method of dealing with a worm. Similarly, thinking through alternative strategies for opening the doors in the mazes develops problem-solving skills.

- ☐ **Spatial Awareness and Visualization Skills**
- ☐ **Interpreting Maps**

The *Think Quick!* game environment is visually very complex, consisting of many interconnected rooms which form a maze whose parts are often not all visible at one time. Navigating this maze develops spatial awareness and the ability to visualize oneself in this space (an important abstract thinking skill.) The program provides aids for the learner, such as an interactive map—available at the touch of a key—that shows the layout of the rooms and where the player is at any time. In addition, more detailed maps are available in the Guide for Players. The ability to interpret maps is further enhanced in the game by the construction and use of a picture of one of the rooms in the maze. The player must match the small picture to the full-sized room, then locate a site in the room marked by a dot on the picture.

- ☐ **Expanding Information: Demonstrating Fluency, Demonstrating Flexibility, and Demonstrating Originality**
- ☐ **Designing**

All of these skills, and many more, are developed when the player uses the Castle Creator game editor to create a game for a friend. Just as teaching a subject requires a far greater understanding of it than simply knowing its principles, designing a game requires far greater understanding of its elements than playing it. There is also some social and psychological awareness involved in setting the difficulty level of a game appropriate to the expected player. To quote Clark C. Abt once again, "Students can learn not only by observing the results of games, but also by playing and indeed by *designing them*."

THE CURRICULUM CONNECTION

Think Quick! is an ideal tool for teaching problem-solving skills in the classroom curriculum. These skills are generally covered most intensively in math and science courses, but are also important in other subjects, such as language arts and social studies. The chart below shows how the skills presented in *Think Quick!* relate to those required in the science curriculum at various grade levels and developmental stages of learning.

Think Quick! also correlates with thinking skills such as those described in the California State Department of Education's Mathematics Model Curriculum Guide for kindergarten through grade 8. It states in part that, "Students, through their own experience, come to understand that problem solving is a process, with solutions coming most often as a result of exploring situations, stating and restating questions, and devising and testing strategies over a period of time. They are supported in taking risks to help them realize that it is normal to try ideas and methods that turn out to be unsuccessful in solving hard problems, and that by learning from their mistakes, they are able to increase their ability to choose an effective strategy." *Think Quick!* provides the kind of learning environment that supports the development of problem-solving skills.

**Chart Summarizing
Science Process/Content and Developmental Stages**

Grade-Level Content				Processes	Learners' Developmental Stages
9-12	6-9	3-6	K-3		
Usable-Applicational Principles	Explanatory-Predictive, Theoretical Principles	Active-Relational, Interactive Principles	Static-Organizational Principles	Observing <ul style="list-style-type: none"> • Seeing • Hearing • Feeling • Tasting • Smelling 	Sensory Motor
				Communicating <ul style="list-style-type: none"> • Silent • Oral • Written • Pictorial 	Preconceptual
				Comparing* (includes measuring) <ul style="list-style-type: none"> • Sensory comparisons • Relative positive comparisons • Linear comparisons • Weight comparisons • Capacity comparisons • Quantity comparisons 	Intuitive
				Organizing* <ul style="list-style-type: none"> • Data gathering • Sequencing • Grouping • Classifying 	Concrete Operational
				Relating* <ul style="list-style-type: none"> • Using space-time relationships • Formulating experimental hypotheses • Controlling and manipulating variables • Experimenting 	Formal Operational
				Inferring* <ul style="list-style-type: none"> • Synthesizing, analyzing • Generalizing • Recognizing and predicting patterns, stating laws • Formulating explanatory models and theorizing 	
				Applying* <ul style="list-style-type: none"> • Using knowledge to solve problems • Inventing (technology) 	

*These processes include the application of appropriate mathematical concepts and skills in interpreting data and solving problems.

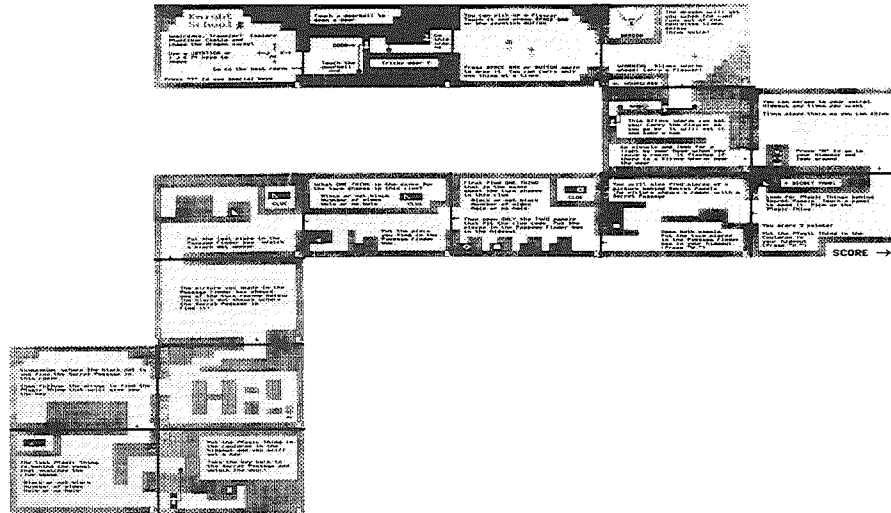
The skills highlighted above are presented in *THINK QUICK!* This chart is from Science Framework Addendum. © California State Department of Education, 1984.

Using the Program in the Classroom

Because time is such a valuable and limited resource in the classroom, it is best to introduce the program to the entire class at once. Then children will know how to play the game when they take their turns at the computer.

INTRODUCING THE PROGRAM

To demonstrate the program, choose Knight School from the menu. Knight School is an interactive tutorial that introduces each aspect of the game a step at a time. You may want to let children take turns so they can all get the feel of using the joystick, mouse, or keyboard to move around. Go through Knight School room by room, reading the instructions aloud or letting the children take turns reading them.



In some rooms, you may want to point out certain things that will help them in the game. For example, in one of the first rooms, a Slime Worm is locked behind the door. Locking Slime Worms behind doors is a good strategy for getting them out of the way in the game. When a player is forced to go near one, using a flower to put the worm to sleep is often the best choice. But flowers are limited, so they shouldn't be used unless necessary. Children

should also be encouraged to study the behavior of the worms, anticipate their movement, and plan their next move accordingly. All these factors are important to consider during the game.

Plan to spend at least 20 minutes demonstrating Knight School. Children may need additional discussion on interpreting the clues found in several of the Knight School rooms. If children have difficulty with the clue concept, you can use some of the off-line activities in the next section to help them. (See Activity 2: Guess My Rule, page 12.)

PLAYING THE GAME

Once children have finished Knight School, let them play Castle Courtyard by themselves. Choose Play the Game from the main menu. This is the first and easiest part of the first game. They can refer to the Knight's Guide for help.

After all of the children have played the game, you can discuss the problem-solving strategies they are using. By naming the strategies and discussing how these same strategies apply to real world situations, you will help the children build important life skills.

As an aid to understanding some of the strategies in *Think Quick!*, refer to Strategies for Success in the Guide for Players. You can photocopy this section for the children to read individually, or discuss it as a group. The children will probably have other strategies to suggest as well.

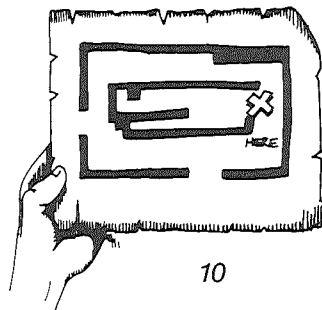
There are many approaches to playing the game. Some children prefer to "play it safe" at all times, while others try to go as fast as they can and take their chances. Some will use the resources in the game's Hideout often to figure out how to get to various parts of the maze, while others seem to do better by just trying several ways and building a mental map of the best path. Some may find it helpful to study the maps included in the *Think Quick!* Guide for Players. Children should be reassured that whatever method they choose is good so long as it works! If they have trouble, they may want to try another approach.

Once children understand how to play the game, they can advance through the three parts of the first game on their own, at their own pace. When they complete all three levels, they can choose to play the expert game, available from the main menu. Because the difficulty level gradually increases from one part of the castle to the next and from one game to the next, children should play them in order, as shown on the Play the Game menu. The three parts of the first game—Castle Courtyard, Throne Room, and Golden Tower—can each be played within one class period. The three parts of the expert game—Entrance Hall, Royal Chambers, and Mystic Tower—become progressively more complex and, although experienced players can complete any part within a class period, first-time players may require more than one class period. It may be helpful to structure the class by suggesting that first-time players concentrate on solving a single maze, or part of it, in the expert game. Children who are especially skilled may enjoy playing the challenging Castle Creator games on the Storage Disk that comes with *Think Quick!* (Load these games by choosing Castle Creator from the main menu.)

USING THE CASTLE CREATOR

For children who successfully chase the dragon away in either the first or second game, suggest that they use Castle Creator to create new games. Designing a new game requires a deeper understanding of the relationships of the elements of the game than playing it. Creating original games also fosters creativity and imagination and gives the child a sense of mastery.

You may also use the Castle Creator to make simple games for your students, modifying the clues and codes to teach a specific skill. For example, the clue could be the number 24, and the codes for correct panels would be factors of 24, such as 3 and 6, and codes for incorrect panels would be nonfactors of 24, such as 5 and 7.



Activities for Home or School

The activities described below are designed to supplement, as well as extend and enrich, the concepts presented in the *Think Quick!* program. In the classroom, they can be used as introductory exercises before children take their turn at the computer, or as parallel activities while other children are using the computer. At home, they can be used any time the child wants to practice problem-solving skills in new ways. Wherever the activities are used, they will help encourage further development of important thinking skills.

ACTIVITY 1: SECRET MESSAGES

This activity provides practice in map reading and helps reinforce such language skills as spelling and word recognition. To play, children use a map to unravel secret messages written in code. They may use either the map on the activity sheet or load the Letters Game from the Storage Disk (by choosing Castle Creator on the main menu) and work on-line. The Letters Game contains the same arrangement of letters as the map—one per room—but allows players to interact directly with the map by moving inside it.

Make a copy of the Secret Messages activity sheets on pages 15-17 for each child and explain how to read the arrow code: the arrows indicate the direction to move, the numbers indicate the number of rooms to move. (Example: 3→ means move three rooms to the right.) A zero (0) indicates that no move is necessary. Begin at letter D for each message and read the code continuously from letter to letter in the message. For example, the code for "GAME" would read: 3←, 1↓(G), 3→, 2↑(A), 2↓, 3←, 2↓(M), 2↑, 1→(E).

Encourage children to create their own messages and codes for friends to decipher. For example, the code may use words rather than arrows to indicate direction (up, down, right, left), or it may use multiple arrows rather than numbers to indicate the number of rooms to move (→→→ instead of 3→).

Children may also create their own maps with a different number of rooms. For example, they may want to design a map using letters from their names. Remember that the maximum number of rooms in the Castle Creator is 16. Children should not use more than 16

letters in the map if you want them to make and save the game using the Castle Creator. Children may use their maps to write a new language based on a different set of letters. Let them find the smallest set of letters they need to make two different complete sentences. Can they make a useful alphabet without including A? E? I?

Answers

1. Create a dream castle!
2. Slime Worms slither hither.
3. The dragon danced and flew at the disco.
4. Feed flowers to the Slime Worms and watch them smile!



ACTIVITY 2: GUESS MY RULE

This activity helps children recognize a common attribute in a set of objects—a skill they use in the game to decipher clues. In the game, children compare two shapes and learn to identify such common attributes as number of sides, black or not black, and hollow or solid. This activity reinforces this skill and extends it to include other attributes.

Make a copy of the Guess My Rule activity sheets on pages 18–19 for each child. Encourage children to take their time studying each group of shapes to determine what attributes they share. Let them know that some groups have more than one attribute in common.

Children should be encouraged to play guess-my-rule games at home or in the classroom. For example, one child can make up a secret rule about people, animals, plants, or objects. Rules can be anything that divide a group into two sets, such as “They wear wristwatches,” “It has horns,” “It’s made of wood,” or “They are blue.” Players can then ask yes-or-no questions about which people or things belong in the group (matches the rule) and which ones don’t. Players can then deduce the rule by finding the common attribute.

Answers (Note that children may see other valid rules.)

1. b, c
RULE: Dragonworts have four sides.
2. a, d
RULE: Foldies have one line of symmetry—either vertical or horizontal. (When folded along that line, one side of the letter will fit on the other side.)

Answers (continued)

3. c, d
RULE: Wormups have four rounded appendages.
4. b, d
RULE: Castlecritters have two antennae and one eye.

ACTIVITY 3: LOGIC PUZZLES

This activity gives children practice in logical thinking in the context of stories rather than mazes. In the game, children analyze mazes to determine which doors to open and in what order to get through the castle. Here, they apply the same kind of logic to determine who’s who in four stories that contain just enough information. Transferring and applying problem-solving skills to new situations is in itself an important life skill.

Make a copy of the Logic Puzzles activity sheets on pages 20–21 for each child. If children have difficulty solving these puzzles, you may want to offer the following technique that helps make abstract reasoning more concrete by organizing information. For each puzzle, have children construct a matrix on paper, writing the names of the characters across the top and their titles or roles down one side, as shown below for puzzle 1. Through a process of elimination, have them check each correlation that they know from the story to be false. Those remaining are the true correlations and the solutions to the puzzle. For example, in puzzle 1, if Sid and Leslie are awakened by the Jester, then Sid and Leslie are not the Jester, so Dennis is. Since Dennis is the Jester, he can’t be either the Dragon or the Drummer. The matrix so far for puzzle 1 would look like this:

	Sid	Leslie	Dennis
Dragon			No
Jester	No	No	Yes
Drummer			No

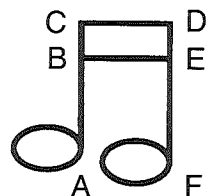
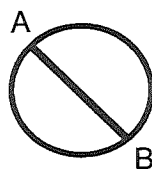
Answers

1. Leslie is the Drummer.
Dennis is the Jester.
Sid is the Dragon.
2. Andy ordered juice.
Pat ordered cereal.
Teri ordered eggs.
3. David is the king.
Sidney is the prince.
Diana is the queen.
Corinne is the princess.
4. Dennis is the detective.
Francine is the minister.
John is the cook.
Sid is the gardener.

ACTIVITY 4: DRAWING FUN

This activity helps reinforce, extend, and enrich analytical thinking while improving visual discrimination skills. Children are first given a general rule and asked to determine which picture or pictures from several sets match that rule. By studying the pictures, children determine which ones can be drawn continuously without lifting the pencil from the paper and without redrawing any lines. Then they are asked to identify the common attribute of these pictures. Similar to deciphering the clue in the game, this activity provides a new context for applying logical thinking skills.

Make a copy of the Drawing Fun activity sheet on pages 22 and 23 for each child and explain the instructions. Note that it is OK to cross previously drawn lines. Provide children with additional paper (tracing paper, if it is available) for drawing the figures in a number of ways, starting at a different point each time. Once they've identified the pictures that match the general rule, ask children to find the common attribute. Ask them to notice the number of lines that meet other lines in each picture. For example, in the first figure below, three lines meet at points A and B. In the second figure, three lines meet at all points except points C and D where two lines meet. With this information, they should be able to deduce the common attribute.



Answers

RULE: All drawings that match the general rule have no more than two points where an odd number of lines meet. These points of intersection where lines converge are called nodes by mathematicians.

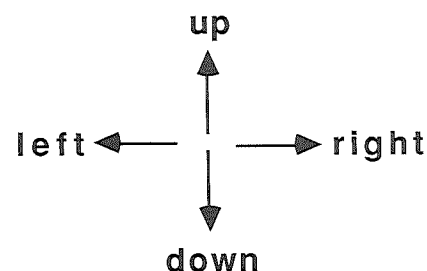
1. a
2. c
3. a, c
4. a, b
5. a, c
6. b, c

SECRET MESSAGES

Use the map here or in the Letters Game to read the secret messages below. The arrows show the direction to move. The numbers show how many rooms to move. Zero means don't move at all. Start at "D" on the map for each message. On the lines above the arrow code, write each letter as you find it.

W			H
T			A
O	S	N	D
G	E	R	L
C			F
M			I

Start here



Message 1

e

3←, 2↓	1↑, 2→	1←	2→, 2↑	1↓, 3←, 1↑	2↓, 1→
2→, 2↑		1↓	1↓, 1←	1←	2→, 2↑
1↑	2↑, 3→, 1↑	1↓, 2←	1←, 1↑	2↓, 3→	2←

Message 2

S

$2 \leftarrow$	$1 \downarrow, 2 \rightarrow$	$2 \downarrow$	$2 \uparrow, 3 \leftarrow, 2 \downarrow$	$2 \uparrow, 1 \rightarrow$		
$1 \leftarrow, 3 \uparrow$	$2 \downarrow$	$2 \rightarrow, 1 \downarrow$	$2 \leftarrow, 2 \downarrow$	$3 \uparrow, 1 \rightarrow$		
0	$2 \rightarrow, 1 \downarrow$	$2 \downarrow$	$3 \uparrow, 3 \leftarrow, 1 \uparrow$	$1 \downarrow, 3 \rightarrow, 2 \uparrow$	$3 \downarrow, 2 \leftarrow$	$1 \rightarrow$
$1 \rightarrow, 3 \uparrow$	$5 \downarrow$	$3 \uparrow, 3 \leftarrow, 1 \uparrow$	$1 \downarrow, 3 \rightarrow, 2 \uparrow$	$3 \downarrow, 2 \leftarrow$	$1 \rightarrow$	

Message 3

T

$3 \leftarrow, 1 \uparrow$	$1 \downarrow, 3 \rightarrow, 2 \uparrow$	$3 \downarrow, 2 \leftarrow$				
$2 \rightarrow, 1 \uparrow$	$1 \downarrow, 1 \leftarrow$	$1 \rightarrow, 2 \uparrow$	$2 \downarrow, 3 \leftarrow$	$1 \uparrow$	$2 \rightarrow$	
$1 \rightarrow$	$1 \uparrow$	$1 \downarrow, 1 \leftarrow$	$2 \leftarrow, 2 \downarrow$	$1 \uparrow, 1 \rightarrow$	$2 \rightarrow, 1 \uparrow$	
$1 \uparrow$	$1 \downarrow, 1 \leftarrow$	$1 \rightarrow$	$2 \downarrow$	$1 \uparrow$	$2 \leftarrow$	$1 \leftarrow, 3 \uparrow$
$2 \downarrow, 3 \rightarrow, 1 \uparrow$	$1 \downarrow, 3 \leftarrow, 1 \uparrow$	0	$1 \downarrow, 3 \rightarrow, 2 \uparrow$	$3 \downarrow, 2 \leftarrow$		
$2 \rightarrow, 1 \uparrow$	$3 \downarrow$	$3 \uparrow, 2 \leftarrow$	$1 \leftarrow, 2 \downarrow$	$2 \uparrow$		

Message 4

F

$2 \downarrow$	$1 \uparrow, 2 \leftarrow$	0	$2 \rightarrow, 1 \uparrow$				
$2 \downarrow$	$1 \uparrow$	$3 \leftarrow, 1 \uparrow$	$2 \uparrow$	$3 \downarrow, 1 \rightarrow$	$1 \rightarrow$	$1 \uparrow, 1 \leftarrow$	
$1 \leftarrow, 1 \uparrow$	$1 \downarrow$	$1 \uparrow$	$1 \downarrow, 3 \rightarrow, 2 \uparrow$	$3 \downarrow, 2 \leftarrow$			
$1 \uparrow$	$2 \rightarrow, 1 \downarrow$	$2 \downarrow$	$2 \uparrow, 3 \leftarrow, 2 \downarrow$	$2 \uparrow, 1 \rightarrow$			
$1 \leftarrow, 3 \uparrow$	$2 \downarrow$	$2 \rightarrow, 1 \downarrow$	$2 \leftarrow, 2 \downarrow$	$3 \uparrow, 1 \rightarrow$			
$2 \rightarrow, 1 \uparrow$	$1 \downarrow, 1 \leftarrow$	$1 \rightarrow$	$3 \leftarrow, 2 \uparrow$	$2 \downarrow, 3 \rightarrow, 1 \uparrow$	$1 \downarrow, 3 \leftarrow, 1 \uparrow$	$3 \downarrow$	$2 \uparrow, 3 \rightarrow, 2 \uparrow$
$2 \downarrow, 3 \leftarrow, 1 \uparrow$	$1 \downarrow, 3 \rightarrow, 2 \uparrow$	$3 \downarrow, 2 \leftarrow$	$1 \leftarrow, 2 \downarrow$				
$3 \uparrow, 1 \rightarrow$	$1 \leftarrow, 3 \downarrow$	$2 \uparrow, 3 \rightarrow, 2 \downarrow$	$2 \uparrow$	$2 \leftarrow$!		

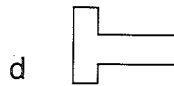
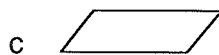
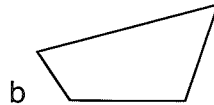
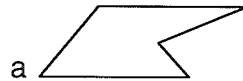
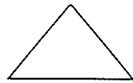
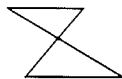
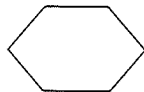
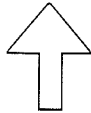
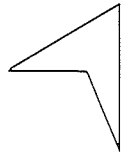
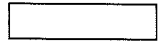
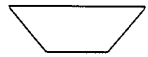
GUESS MY RULE

Study the shapes below and find the rule. In the third column, circle the shapes that match the rule. Then write the rule on the line.

1. Dragonwords

Not Dragonwords

Which are Dragonwords?



What's the rule? _____

2. Foldies

Not Foldies

Which are Foldies?

A

E

M

Y

F

S

Q

R

a **C**

b **J**

c **G**

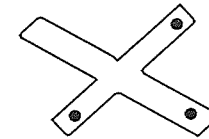
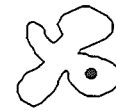
d **W**

What's the rule? _____

3. Wormups

Not Wormups

Which are Wormups?



a



b



c



d

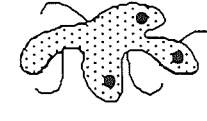
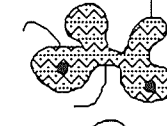
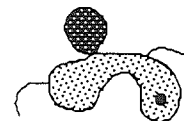


What's the rule? _____

4. Castlecritters

Not Castlecritters

Which are Castlecritters?



a



b



c



d



What's the rule? _____

LOGIC PUZZLES

Find out who's who in the stories to solve these puzzles.
Work backward and figure out who each character is *not*.

Puzzle 1

Sid, Leslie, and Dennis lived a long time ago in the Castle of Mystikar. As Dragon, Jester, and Drummer they spent their lives helping to make the castle and town an exciting and colorful place to live.

One day, Leslie and Sid were awakened by the Jester. Sid wanted to sound the drum roll alarm, but he had never learned to play the drum.

Who was the Drummer? _____

Who was the Jester? _____

Who was the Dragon? _____

Puzzle 2

Pat, Teri, and Andy like to eat breakfast together. Since they like to share their food, they never order the same things to eat. We know that one of them always orders juice, one always orders cereal, and one always orders eggs.

Teri didn't order cereal or juice, and Pat didn't order juice either. Can you tell what each person ordered for breakfast?

Who ordered juice? _____

Who ordered cereal? _____

Who ordered eggs? _____

Puzzle 3

Diana, Corinne, Sidney, and David are members of the Mystikar royal family. One is a king, one is a prince, one is a queen, and one is a princess.

Diana and the princess beat Sidney and the king at capturing the Dragon of Mystikar. Can you tell each person's rank?

Who is the king? _____

Who is the prince? _____

Who is the queen? _____

Who is the princess? _____

Puzzle 4

Francine, Dennis, Sid, and John are characters in a book. They are a detective, a minister, a cook, and a gardener.

Find each person's job if you know that:

- ☐ Sid, John, and the detective live on the same street.
- ☐ Sid and the cook love asparagus.
- ☐ The minister is always losing her appointment book.

Who is the detective? _____

Who is the minister? _____

Who is the cook? _____

Who is the gardener? _____

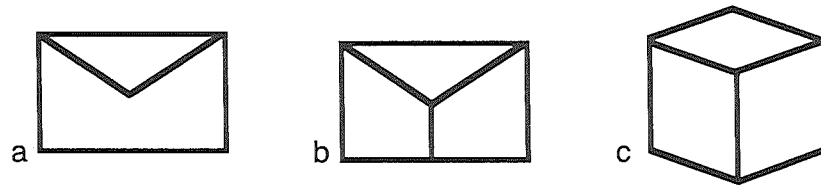
DRAWING FUN

Find the pictures below that you can draw:

- without lifting your pencil off the paper, and
- without redrawing any lines. (It's OK to cross lines.)

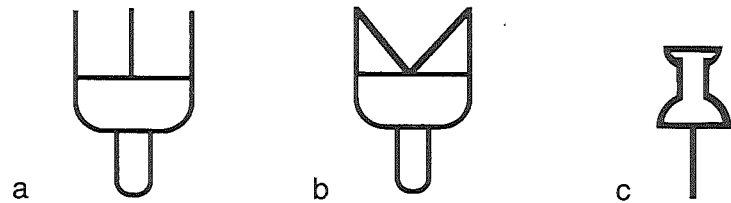
Trace them with a crayon or colored pencil and write their letters on the lines at the right. Then find the rule that makes it possible to trace some pictures but not others. Write the rule on the line at the bottom.

1.



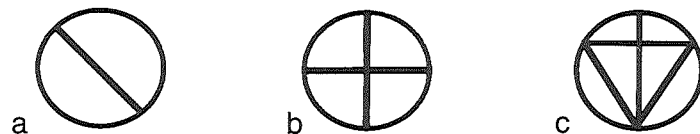
I can trace: _____

2



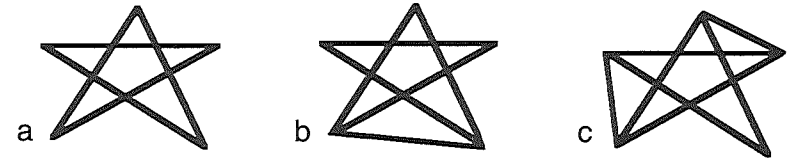
I can trace: _____

3.



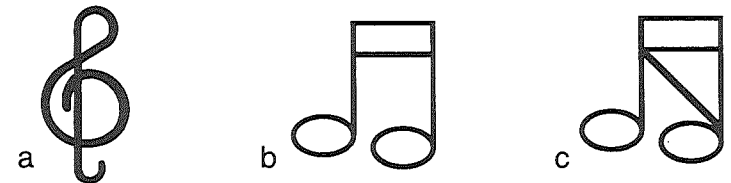
I can trace: _____

4.



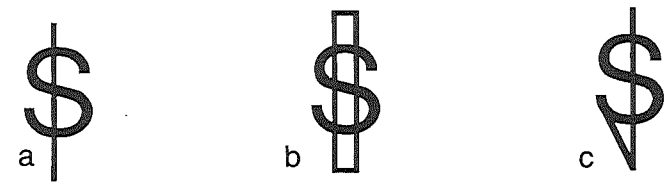
I can trace: _____

5.



I can trace: _____

6.



I can trace: _____

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