

Electric Maze® Tournament Manual

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SECTION 1

Background Information

Introduction

The Electric Maze® is a highly-motivating learning device that consists of a grid and a control box. The grid is a flexible carpeted mat that is divided into 48 squares. All squares have a pressure-sensitive switch. If the square is activated and someone steps on it, the maze alarm sounds. You can activate and deactivate squares on the maze with the control box.

The maze, and the other learning devices produced by Interel, can be thought of as learning hardware. Using a computer analogy, the maze can be programmed with learning software for different learning applications.

What Is the Maze Used For?

You can use the maze for both individual and group development. The three T's of maze usage are **training**, **teambuilding**, and **testing**.

Training activities with the maze help participants to learn interpersonal principles and procedures. Learning through the maze permits participants to actually experience abstract concepts like leadership, trust, synergy, empowerment, and dependency. It also encourages participants to experiment with such procedures as collaborative planning, giving and receiving feedback, and resolving conflicts.

Teambuilding activities with the maze improve the performance, productivity, and cohesiveness of the team. In these activities, the team is given a challenge involving the maze. Team members attempt to achieve a goal (for example, *getting everyone across the maze*) within specific constraints (for example, *without talking to each other, without setting off the alarm, and within 10 minutes*). In the process, they try out various decisionmaking and communication strategies and learn about teamwork. Participants progress from defensiveness to trust and discover how the team can achieve more than a collection of individuals. Using the maze experience as a metaphor, team members identify and implement new strategies to improve their performance.

Testing activities with the maze involve the assessment of the strengths, weaknesses, preferences, and patterns of individuals and teams. Maze activities so intensely involve the participants

that they are caught in the act of being themselves. By observing the behaviors of individuals, we can assess such variables as their leadership potential, problem-solving abilities, communication modes, and thinking styles. By observing the team as a whole, we can assess such variables as its cohesiveness, empowerment, relationship patterns, and cross-gender communication modes.

Why Use the Electric Maze?

The maze is an action-learning device that provides several benefits:

To the *participants*, the maze presents a totally absorbing activity. In general, they will act naturally and be less concerned with posing for other participants.

To the *facilitators*, several maze activities are available to provide a variety of learning, team-building, and testing activities. The same maze activity can be repeated with the same team—and yet produce a novel experience just by easily reprogramming the maze pattern. This enables the team to evaluate its own growth.

To *training designers*, the maze offers opportunities to create appropriate activities that can simulate or highlight different team-based principles and procedures.

Maze Tournaments

In our efforts to continually improve maze hardware and software, we have been experimenting with a new strategy for active learning through conducting tournaments. This book, based on our successful field tests, offers background information and specific details for utilizing our most recent maze strategies.

How To Conduct a Maze Tournament

Facilitators who conduct field research on how adults learn when participating in experiential activities have identified three important principles:

Participating as teams results in more effective learning than participating as individuals. In team activities, the mix of peer support and peer pressure encourages participants to maintain a high level of learning and performance. A common, unifying goal for the team provides a powerful incentive to its members to learn from one another and also to teach one another. Because members of a team bring diverse perspectives and skills to the task, there are ample opportunities for peer coaching and mutual learning.

Repeated participation in the same activity results in more effective learning than one-off participation. There are two reasons why this principle is true. The first reason is that participants have to learn an activity before they can learn from an activity. In the case of a maze activity, participants initially focus on the mechanics of the maze, the rules of the activity, the scoring system, and team membership so that only a part of their attention is available for learning from the activity. After repeated rounds, participants have become so familiar with the mechanics, rules, scoring system, and teamwork that they are able to focus on other learning outcomes. The second reason why repeated practice is more effective is that practice leads to fluency. Complex activities that form the basis of experiential learning require participants to detect patterns and make use of them. Repeated participation in the same type of activity enables people to unconsciously pick up patterns and learn to use them implicitly, almost through osmosis. Eventually, participants acquire a high level of fluency that enables them to act rapidly and intuitively with unconscious competence.

People who design an activity for others learn as much—if not more—as people who participate in an activity. Participating in a prepared activity is the traditional approach to experiential learning. Recent data suggest, however, that designing an activity for others to participate is an interesting and meaningful experience. The approach of learning by designing seems to be as effective as the time-tested approach of learning by teaching.

**Interel’s Maze
Tournament
Program**

These three powerful principles form the basis of Interel’s Maze Tournament program. In this program, participants work in teams. Teams design an Electric Maze activity within a given set of parameters. The activity designed by one team is implemented by the other team and vice versa. Teams work repeatedly on the same type of activity, gaining high levels of fluency.

The heart of the tournament is the mutual contest between pairs of teams. During the contest, each team independently designs an Electric Maze activity using a shell (or a template) that specifies certain parameters. For example, the teams may program a complex path across the maze using not more than 20 pins. At the end of the design time, the teams set up the mazes for each other and score the performance of the other team. In participating in the tournament, each team learns how to collaborate in designing a problem and how to solve the problem designed by the other team.

In keeping with the principle of providing repeated and varied practice, our tournament approach does not use the practice of eliminating a team after its first loss. Instead, we provide a context in which each team gets to play as many of the other teams as possible. This procedure helps team members to analyze their successes and failures and apply what they learned from the earlier rounds to the later ones.

**Round-Robin
Tournament**

This tournament involves four or more teams. For example, let us assume that there are six teams. We can set up the tournament so that every team plays against every other team. As Table 1 shows, we play a total of 15 games, and for maximum efficiency we can conduct three concurrent activities during each of the five time slots. If time permits, the teams can repeat the cycle, participating in another set of 15 activities. At the end of the tournament, each team would have competed with every other team in the same number of activities. The team with the best cumulative score at the end of the tournament wins the tournament.

Table 1. Tournament Schedule for Six Teams

SLOT	GAME 1	GAME 2	GAME 3
1	Team A vs Team B	Team C vs Team D	Team E vs Team F
2	Team D vs Team F	Team B vs Team E	Team A vs Team C
3	Team C vs Team E	Team B vs Team F	Team A vs Team D
4	Team D vs Team E	Team A vs Team F	Team B vs Team C
5	Team C vs Team F	Team A vs Team E	Team B vs Team D

Table 2. Tournament Schedule for Eight Teams

ROUND	NUMBER OF GROUPS	NUMBER OF TEAMS	TEAM PROGRESSION
1	1	8 teams paired	
2	2	4 teams paired 4 teams paired	1 time winner
3	4	2 teams paired 2 teams paired 2 teams paired 2 teams paired	2 time winner 1 time winner 1 time winner

A Self-Balancing Tournament

A modified approach to conducting the tournament is to keep adjusting the teams pitted against each other so that teams at comparable levels compete with each other. In this approach, let us assume that there are 8 teams entering the tournament. Initially, the teams are randomly paired up. At the end of the first round, the winning teams move “up” a level while the losing teams move “down”. For the second round, the teams in the “up” group are paired and the teams in the “down” group are paired. This continues as shown in Table 2.

Blueprints and Barriers

All tournaments involve a maze to be crossed. A key factor in the Interel’s Maze Tournament Program is that these mazes are not programmed by the trainer or facilitator to challenge the team. Rather, in keeping with our learning-by-design philosophy, we permit each team to program a maze to be crossed by the other team. However, rather than requiring teams to learn all the components of the maze and different programming strategies, we provide them with a blank copy of a “blueprint” (maze programming form) along with examples of different types of barrier layouts. (See pages 53-54.) Team members create the maze by placing colored dots on the appropriate squares on the maze programming form. Since the colored dots can be easily peeled and placed on other locations, teams can experiment with alternate maze layouts before settling on the best one to challenge the other teams.

Scoring System

Interel’s Maze Tournament Program makes maximum use of the motivational effect of both cooperation and competition. Team members work cooperatively in designing a challenging activity for the other team and on successfully completing the challenge set by the other team. Part of their motivation arises from the competitive instinct for outperforming the other team. Interel’s recommended tournament structure reduces the undesirable effects of repeatedly pitting one team against another. Instead, each team competes with several other teams. The winning team is the one that accumulates the best total score in competing with all other teams.

Score keeping is a critical element of the tournament system. Specific details of keeping scores for each maze activity template are provided in the appropriate sections of the manual. One score keeping system features tracking the time taken by the team to complete the task. Another tracks the number of times team members set off the alarm in the maze.

Both of the scores operate in the negative direction. In other words, lower scores (fewer number of minutes and fewer alarms) indicate better performance.

Using Scoring Parameters for Different Learning Outcomes

Different scoring parameters can be used to reinforce specific learning outcomes. During the framing or context analysis, tournament activities focus on specific learning areas. Then during the debriefing following the tournament activities, these parameters can be linked to specific learning objectives.

Here are some general examples of linkages:

SCORING PARAMETER	LEARNING OBJECTIVE
Time to cross	Individual and team performance, effectiveness
Number of alarms	Planning, strategy, team learning, communication
Number of participant attempts	Group participation, individual commitment to task, motivation
Number of unnecessary alarms (on the return path)	Communication, effectiveness
Number of rules broken	Coaching, leadership, commitment

	<i>Team learning</i>	<i>Communication</i>	<i>Leadership</i>	<i>Commitment</i>	<i>Effectiveness</i>
Time to cross			X		X
Number of alarms	X	X			
Number of participant attempts			X	X	
Number of unnecessary alarms on return path		X			X
Number of rules broken			X	X	

Sequential and Simultaneous Activities

During a “match” between two competing teams, both teams simultaneously design a maze activity for the other team to complete. The teams are given maze programming forms and asked to make a safe path that will be sufficiently complex and unpredictable to challenge the other team. If several mazes are available, it is also possible to conduct the second phase of the match with both teams trying to complete the activity designed by the other team at the same time. However, our recommendation is to conduct the second phase sequentially with one team monitoring and keeping score while the other team completes the maze activity. Teams learn useful information by watching other teams performing on the maze. However, if there is a need to save time and two mazes are available, the second phase can be conducted at the same time; each team working on the maze designed by the other team. In this case, it is important to have several facilitators or observers available who can monitor the activity and keep the score.

Organizing an Interel Maze Tournament Program

It takes planning and attention to detail to successfully conduct a maze tournament program. Here are some suggested steps and guidelines:

1. **Identify the participants.** Specify who the team members are going to be and estimate the total number of participants.
2. **Divide participants into teams.** There are two approaches for dividing the participants into teams, each with its own advantages and disadvantages. You may assign members of intact groups to the same team. For example, if participants are from different departments of an organization, members from a particular department may form a team. This has the advantage of building on existing friendships and shared experiences. Alternatively you can assign participants from different departments to the same team. This has the advantage of forming new friendships and team members sharing their different perspectives and skill levels. During this step, decide whether you want to increase diversity or homogeneity among the team members.

3. **Cluster teams into groups.** The round-robin tournament approach that we recommend requires that each team compete against every other team. As the following table demonstrates, the number of matches rapidly increases as the number of teams increase:

Number of Teams	Number of Matches
4	6
5	10
6	15
7	21
8	28
9	36
10	45

If you have several teams, it may be good idea to cluster the teams into two or more groups. For example, you have to conduct 45 matches with 10 teams. However, you need to conduct only 20 matches if you cluster them into two groups of 5 teams each.

4. **Select a maze activity template.** This manual describes several templates for maze activities. Review these activities and select the one template that will be of maximum interest and relevance to your participants. Later, if you have time, you may want to conduct another tournament using another type of activity.
5. **Select a tournament structure.** Earlier we described a round-robin tournament structure and a self-balancing tournament structure. Select one of the two structures for use in your tournament program.

6. **Estimate time requirements.** First, decide how much time will be needed for each match. Then decide whether the match will be conducted simultaneously (with both teams completing the maze activity designed by the other team at the same time) or sequentially (with the two teams taking turns to complete the maze activity designed by the other team). Decide whether several matches will be conducted on the same day among different pairs of teams. Use this information to estimate the total number of hours and days required.
7. **Obtain the necessary number of mazes.** If you decide to conduct the matches with two competing teams at the same time or if you decide to conduct several matches during the same round, you will need extra sets of maze equipment.
8. **Schedule the matches.** Use a calendar to identify available dates for each match (or each round of matches). Make suitable changes to the tournament structure to adapt the program to the available dates.
9. **Use volunteer facilitators.** Conducting the tournament involves detail work for planning, organizing, scheduling, coordinating, and monitoring the matches. You will need several volunteers to assist you in these functions. Be sure to brief the volunteers on exactly what is required of each person.
10. **Kick off the program.** Assemble all teams and explain the structure and the rules of the tournament. Display the maze and demonstrate how the selected type of activity is conducted on the maze. Use randomly selected teams to demonstrate the activity. Answer questions from participants and volunteer facilitators.
11. **Conduct the tournament.** Remind teams of their match dates ahead of time. Conduct the matches with the help of volunteer facilitators.
12. **Keep track of scores.** Maintain a score book and update it at the end of each match. Publicize the standings of different teams through a score board and through an informal newsletter.

- 13. Conclude the tournament.** After the final match, assemble all teams and award a suitable trophy for the best-performing team. In addition, recognize and reward the efforts of the other teams. Conduct an appropriate debriefing of the lessons learned from teamwork. Thank volunteer facilitators and participants.

Two Types of Maze Activities

The second section of this manual contains detailed information for two different types of maze activities. You can incorporate either of these activities (MAZE MATCH or MAZE RELAY) in your tournament program.

How To Conduct Triangular Tournaments

Most sports tournaments involve pairs of teams competing against each other. In this approach, two teams play against each other, abiding by the same rules.

In maze tournaments, there are a few limitations with this traditional tournament approach:

- The difficulty level of the maze crossed by one team may be different from the difficulty level of the maze crossed by the other team. This is because the mazes are programmed by the opposing teams. So you may end up comparing the performance of one team crossing an easy maze with the performance of another team crossing a very difficult maze.
- When two teams are directly pitted against each other, the intensity of competition raises to a very high level. While this may be desirable for TV programs and audience ratings, such intense competition may produce unhealthy consequences when the maze is used within an organization for training or teambuilding purposes.
- When two teams are directly pitted against each other, each team focuses on programming very difficult mazes to cross. Attempting to cross these mazes may produce more frustration than learning insights. For optimum learning, you need mazes at a medium level of difficulty that will produce a flow state among the participants.

Given these limitations with traditional tournaments that involve pairs of teams, we suggest the use of three teams as the basic unit in a new approach to tournaments. This three-team approach enables us to achieve these results:

- Two teams cross the same maze (in different locations or at different times). Thus you are able to compare the ability of the teams in solving the same problem.
- Since a third team programs the maze crossed by the two competing teams, the intensity of competition is indirect.
- The use of three teams enables you to identify and reward the team that has produced an optimum level of challenge which is neither the easiest nor the most difficult maze to cross.

Simultaneous Approach

This approach to triangular tournaments involves three teams of equal size. With very large groups you will need to divide the participants into batches of three teams to use this approach.

Table 3 shows how a three-team tournament is conducted. This approach uses the simultaneous mode in which three mazes are placed in three different rooms and the maze-crossing activities take place at the same time. In this approach, the maze programmed by Team A is located in one room, Team B's maze in another room, and Team C's maze in the third room.

The maze-crossing activity is monitored by the tournament conductors (who are neutral outsiders) who also keep track of the time required by each team to cross the maze. If you don't have enough monitors to conduct the tournament, you can ask two or three members of each team to stay in the room with the maze that it programmed. These team members can then monitor the maze-crossing activity by the members of the other two teams and keep track of their times. (The remaining members of the team will be crossing the mazes in the other two rooms, programmed by the other two teams.)

Notice that in this approach, each team crosses two mazes programmed by two different teams. Also, each maze is crossed by two different teams, neither of which programmed the maze.

Sequential Approach

If you have only one maze, Table 4 shows how to conduct the triangular tournament. Notice that each team crosses the maze programmed by each of the other two teams. The maze-crossing activity is monitored by the team that programmed the maze. In this approach, when one team is crossing the maze programmed by another team, the third team is engaged in some other activity.

Table 3. Triangular Tournament, Simultaneous Approach

ROUND	TEAM A	TEAM B	TEAM C
1	Programs a maze.	Programs a maze.	Programs a maze.
2	Crosses the maze programmed by Team B.	Crosses the maze programmed by Team C.	Crosses the maze programmed by Team A.
3	Crosses the maze programmed by Team C	Crosses the maze programmed by Team A.	Crosses the maze programmed by Team B.

Table 4. Triangular Tournament, Sequential Approach

ROUND	TEAM A	TEAM B	TEAM C
1	Plans a maze using the Maze Programming Form.	Plans a maze using the Maze Programming Form.	Plans a maze using the Maze Programming Form.
2	Crosses the maze programmed by Team B.	Monitors Team A's maze-crossing efforts and keeps time.	Engages in some other activity.
3	Engages in some other activity.	Crosses the maze programmed by Team C.	Monitors Team B's maze-crossing efforts and keeps time.
4	Monitors Team C's maze-crossing efforts and keeps time.	Engages in some other activity.	Crosses the maze programmed by Team A.
5	Crosses the maze programmed by Team C.	Engages in some other activity.	Monitors Team A's maze-crossing efforts and keeps time.
3	Monitors Team B's maze-crossing efforts and keeps time.	Crosses the maze programmed by Team A.	Engages in some other activity.
4	Engages in some other activity.	Monitors Team C's maze-crossing efforts and keeps time.	Crosses the maze programmed by Team B.

Scoring In both the simultaneous and sequential approach, we have two teams crossing the same maze. If we select a crossing time as the scoring parameter, then we can identify the winning team that crossed a specific maze in the shortest amount of time. Since each team crosses two other mazes, it has two opportunities to win. As Table 5 shows, there are three possible comparisons to determine the winning teams.

Table 5. Sample Score Sheet

	Team A Crossing Time	Team B Crossing Time	Team C Crossing Time
Programmed by Team A		14 minutes	11 minutes
Programmed by Team B	14 minutes		12 minutes
Programmed by Team C	14 minutes	15 minutes	

Whichever team has the most number of wins, is the tournament champion. In Table 5, Team C (with two wins against the other two teams) is the overall winner.

If all three teams win once, a tie results. This tie may be broken by adding the total amount of time required for each team to cross the two mazes. The team with the least amount of time wins the tournament.

We can also compute the difficulty level for each maze by adding the time taken by the other two teams to cross the maze. Using the sample times from Table 5, here are the times required for the three mazes:

- Team A's maze: 25 minutes
- Team B's maze: 26 minutes
- Team C's maze: 29 minutes

This indicates that Team C's maze (which required a total of 29 minutes) is the most difficult one to cross and Team A's (which required a total of 25 minutes) is the easiest. If we had specified that the team who created the maze with the medium level of difficulty would win the Optimum Programming Award, then Team B receives this award.

In summary, this is how the scoring works:

- Compare the times taken by the two teams to cross the same maze. The team that required the least amount of time wins the maze match.
- Compare the number of wins of each team. The team with two wins is the tournament champion.
- Compare the total times required for crossing each of the three different mazes. The team whose maze required neither the shortest nor the longest amount of time wins the award for optimum programming.

Coaching Tournaments

Coaching is an important management and interpersonal skill. Our associate David Gouthro has designed a triangular tournament approach which rewards teams for their ability to coach. In this approach, each team gets a turn to program the maze. One of the other teams crosses the maze while the third team coaches the crossing team. Neither the crossing team nor the coaching team knows exactly how the maze is programmed. This emphasizes the importance of coaching people on a process (of problem solving) rather than giving specific answers (related to the maze program).

Table 6 summarizes the three rounds in the coaching tournament.

Table 6. Triangular Tournament, with Coaching

	Team A	Team B	Team C
Preparation	Program the maze.	Program the maze.	Program the maze.
Round 1	Monitor Team C.	Coach Team C.	Cross Team A's Maze
Round 2	Cross Team B's maze.	Monitor Team A.	Coach Team A.
Round 3	Coach Team B.	Cross Team C's maze.	Monitor Team B.

Scoring Each team is allowed 15 minutes to cross the maze. For every full minute less than 15 minutes, the team earns 1 point. The coaching team is also awarded the same number of points. For example, during Round 1, if Team C crosses the maze in 13 minutes, it receives 2 maze-crossing points. At the same time Team B (which coached Team C) receives 2 coaching points. At the end of the tournament, there are two winners: The fastest team to cross the maze and the team that coached the fastest team.

Two Types of Maze Activities The next section of this manual contains detailed information for two different types of maze activities. You can incorporate either of these activities (MAZE MATCH or MAZE RELAY) in your tournament program.

How To Set Up the Tournament Maze

The Interel Electric Maze® is a sturdy, reliable, user-friendly learning device. Used properly, it will give many years of reliable service.

Take some time to learn how to set up the tournament maze and program it. This section will help you become familiar with the maze operations.

What Are the Components of the Maze?

The maze is a flexible, carpeted mat divided into 48 squares. There are six columns and eight rows. Each square of the maze has a pressure sensitive switch under it. If the square is programmed to be active, then an alarm sounds when someone steps on that square.

You can activate and deactivate any square by using the control box. This is a battery-operated programming unit that is attached to a cable from the maze.

How To Set Up the Maze

To set up the tournament maze remove the two sections from their case and unroll them. Leave the two sections in an inverted (carpet face down) position next to each other with long sides parallel and control cables emerging from adjacent corners. Carefully align the sections so the edges touch but don't overlap. Apply the Velcro joining strip along the full length of the joined edges.

Holding the edge of the tournament maze grid where the control cables are attached, pick it up and move it toward the opposite edge until the grid is loosely folded in half.

If there is enough room, keep moving the edge until the maze is right side up, with its carpet side showing. If the room does not have enough space after first folding the grid in half, walk to the folded edge and start to work the bottom out from under the top until the grid is flat and right side-up.



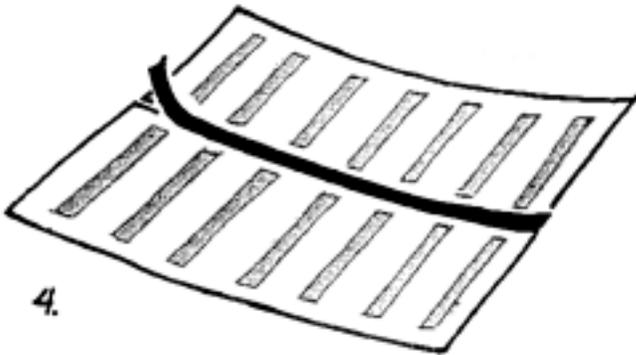
1.



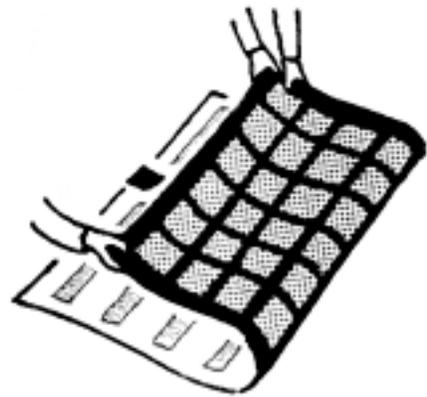
2.



3.



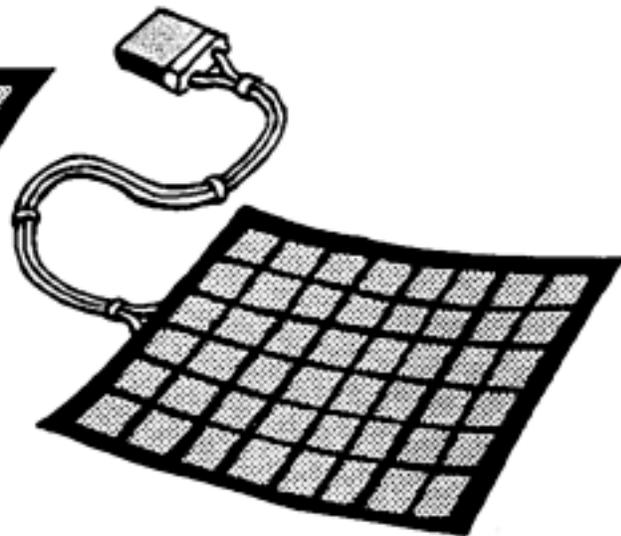
4.



5.



6.



7.

Remove the tournament control box (CB3T) from its case and plug the cables from the tournament maze into the control box. The cable end connectors and the control box connectors are color coded with red and blue dots. Secure the cable connectors with their knurled screws to ensure proper electrical contact.

Lay the control cables alongside each other and bundle them using the Velcro tabs fixed to the cables. This will keep the cables from underfoot during the activities.

How To Program the Maze

The control box has 48 holes, arranged in a 6x8 configuration. Each of these holes corresponds to a square on the maze. You program the control box by inserting the red pins into selected holes.

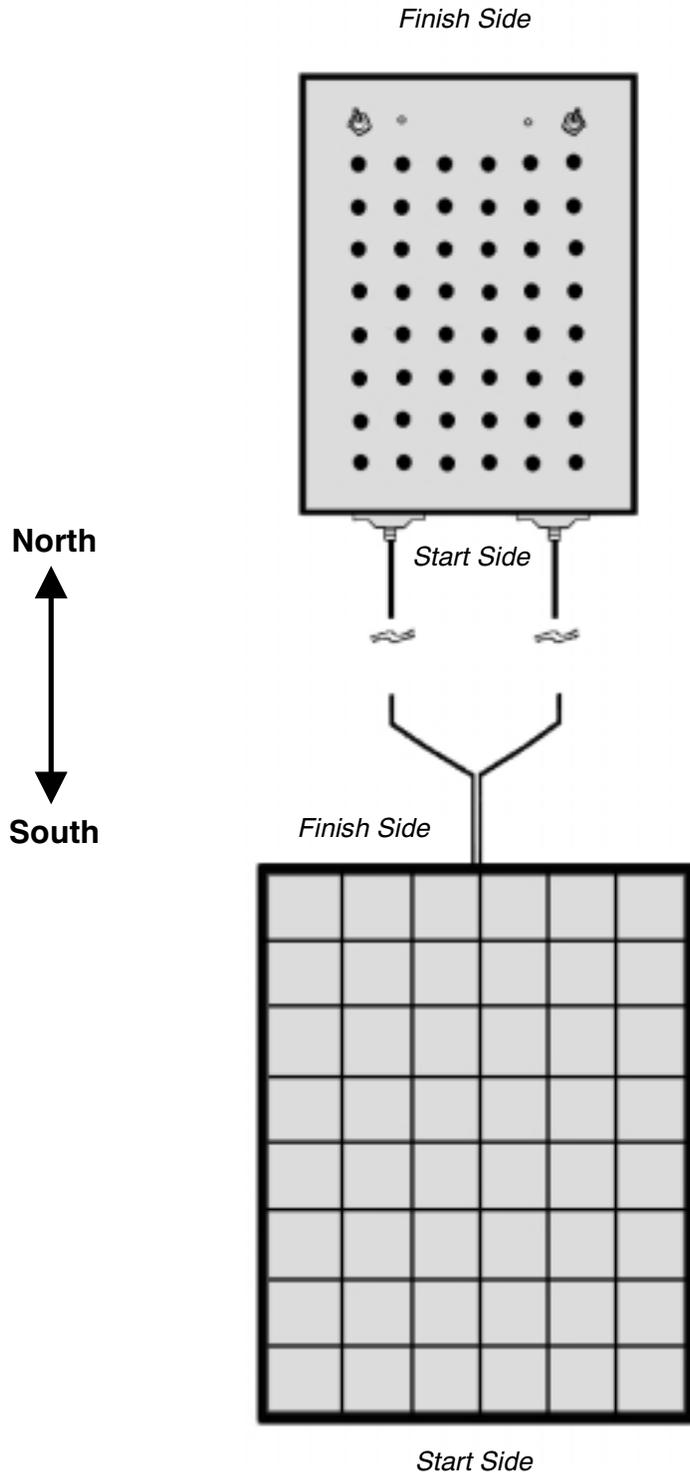
The side of the maze that has the cable coming out of it is referred to as the *North* side. The control box is set up so that the side connected to the cable corresponds to the *South* side of the maze. If you extend the control box as far as possible (face up) from the maze grid, the 48 panel holes on the control box will be oriented the same as the 48 corresponding squares on the maze.

The control box has two switches. The on-off switch lets you turn the maze on (by switching toward the red dot) or off (by switching away from the red dot). The other switch is the test/loudness switch. This switch has three positions. To test the system, move the switch toward the blue dot. If you move this switch to the center position, the maze will sound a *soft* alarm. If you move the switch away from the blue dot, the maze will sound a *loud* alarm.

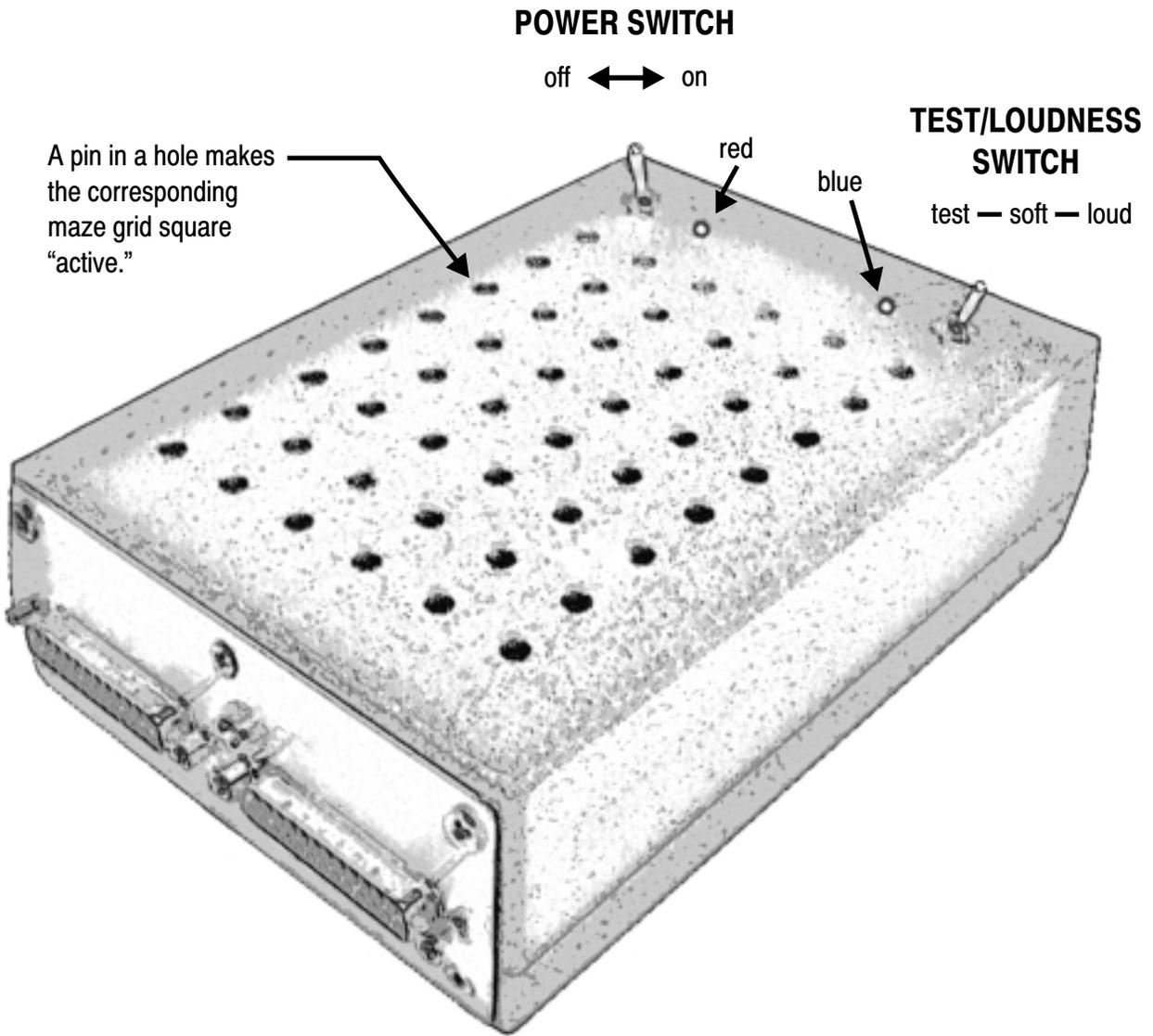
If someone steps on the square that has a red pin in the corresponding hole, the maze alarm will sound. Try this by inserting pins into the holes that correspond with the squares with dots on the programming form on page 27. Then navigate the maze from South end to the North end.

When you are conducting a maze activity, place the control box with its pins facing down. This way, participants cannot look at the pins and figure out the maze pattern.

Tournament Maze Grid and Control Box Orientation

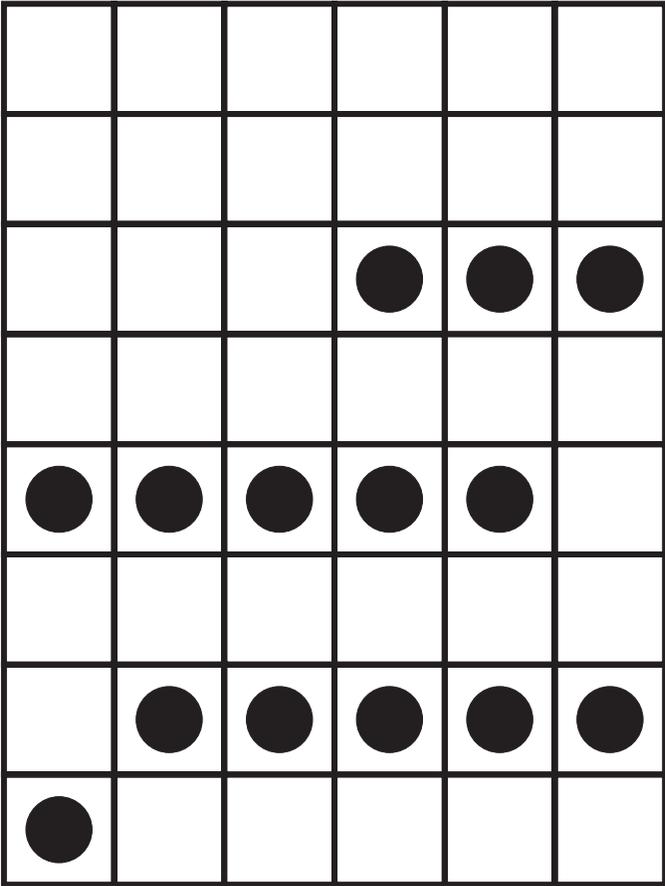


Tournament Control Box (CB3T)

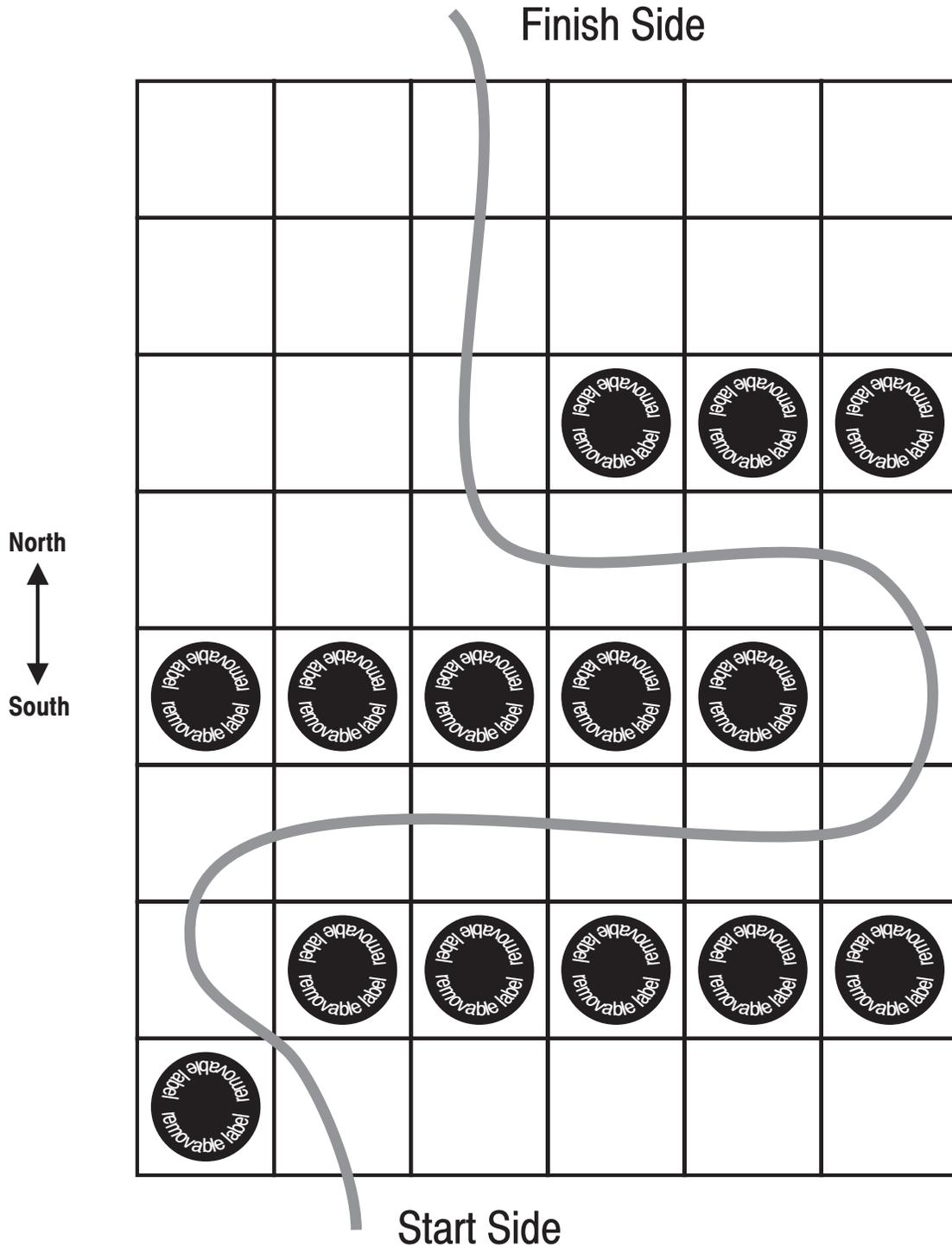


Test Pattern

North
↑
↓
South



Maze Programming Form Example



How To Take Down the Maze

Turn the control box off. Separate the two control cables by undoing the Velcro bundling tabs. Disconnect the control module from the tournament maze by first unscrewing the knurled screws on the cable connector bodies, then separating the connectors by gently pulling them apart (A *slight* rocking motion is helpful.)

Turn the tournament grid upside down so that the carpet side is facing down. Use the same folding technique that you used to set up the maze.

Remove the Velcro strip joining the two maze grid sections. Then slide one section over the other with all edges aligned.

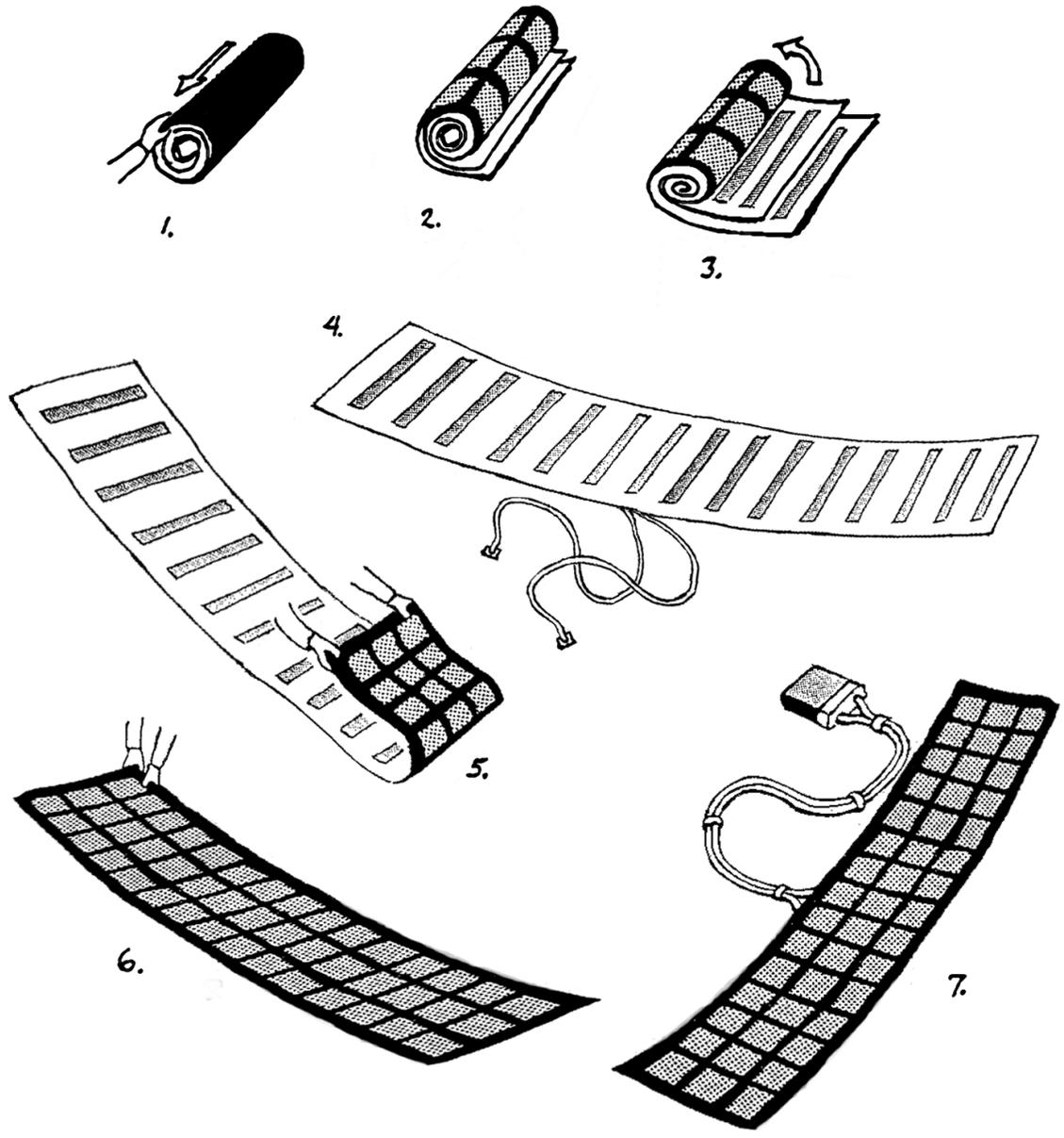
Loosely coil the control cables along the North end of the grid sections.

Roll the two grid sections around the control cable. Begin by rolling the edge to which the cables are attached into no less than a 5-inch diameter roll.

Place the rolled grids in their carrying case.

How To Set Up the Narrow Maze

In some of the tournament activities, we use the maze in a narrower configuration with 3 columns and 16 rows.



How To Set Up the Narrow Maze

To set up the narrow tournament maze remove the two sections from their case and unroll them. Leave the two sections in an inverted (carpet face down) position next to each other with short sides parallel and control cables emerging from adjacent corners. Carefully align the sections so the edges touch but don't overlap. Apply the Velcro joining strip along the full length of the joined edges.

Holding one end of the tournament maze grid, pick it up and move it toward the opposite edge until the grid is loosely folded in half.

If there is enough room, keep moving the edge until the maze is right side up, with its carpet side showing. If the room does not have enough space after first folding the grid in half, walk to the folded edge and start to work the bottom out from under the top until the grid is flat and right side-up.

Remove the tournament control box (CB3T) from its bag and plug the cables from the tournament maze into the control box. The cables' end connectors and the control box's connectors are color coded with red and blue dots. Secure the cable connectors with their knurled screws to ensure proper electrical contact.

Lay the control cables alongside each other and bundle them using the Velcro tabs fixed to the cables. This will keep the cables from underfoot during the activities.

How To Program the Narrow Maze

Programming the 3 x 16 maze requires some creative visualization on your part. Once you have mastered the basic principles you should have no difficulty in using the control box to program this narrow maze.

Because the tournament maze comes in two sections, you can create the 3 x 16 maze as shown in the left side of Figure 1. However, since the control box has a 6 x 8 configuration of holes, you need to visualize how the 3 x 16 maze can be programmed by using the standard control box.

If you study Figure 1 again, you will see how the squares in the 6 x 8 maze are relocated in the 3 x 16 maze. For example, Square A which is on the top left corner of the maze is relocated as the square on the ninth row, first column. Similarly, Square H on the bottom right corner of the maze is relocated as the top left square of the narrower 3 x 16 maze.

One way of understanding this transformation is to remember these two facts:

- The left half of the 6 x 8 maze becomes the lower half of the 3 x 16 maze.
- The right half of the 6 x 8 maze is turned “upside down” to become the upper half of the 3 x 16 maze.

Study Figure 1 carefully to visualize what happens to different squares when the 6 x 8 maze is rearranged into a 3 x 16 maze. Once you have mastered these transformations, you should not have any difficulty in programming the narrower maze.

Study Figure 2 to show how the 3 x 16 maze is programmed. To program the maze on the left side, you have to visualize it as a transformation of the 6 x 8 maze on the right side. Therefore, to program the narrow maze on the left, all you have to do is to place the pins in the control box to correspond to the dots on the diagram of the 6 x 8 maze.

The programming form for the narrow maze shows the 3 x 16 arrangement with letters identifying the eight key cells. The form also contains a diagram of the 6 x 8 configuration for you to duplicate the colored dots in the right location. You can use the 6 x 8 diagram to program the control box.

Figure 2. Program Example for the Narrow Maze

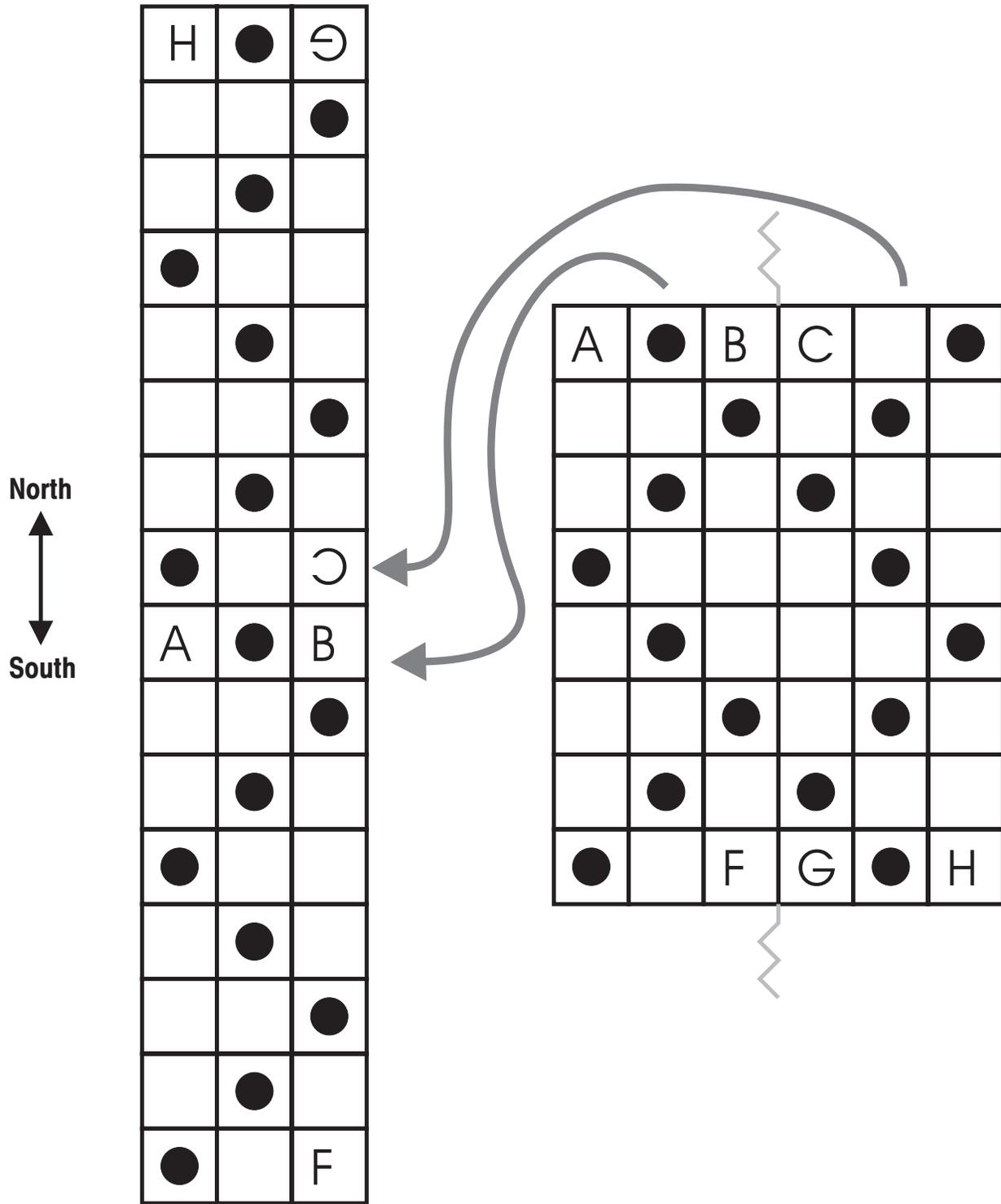
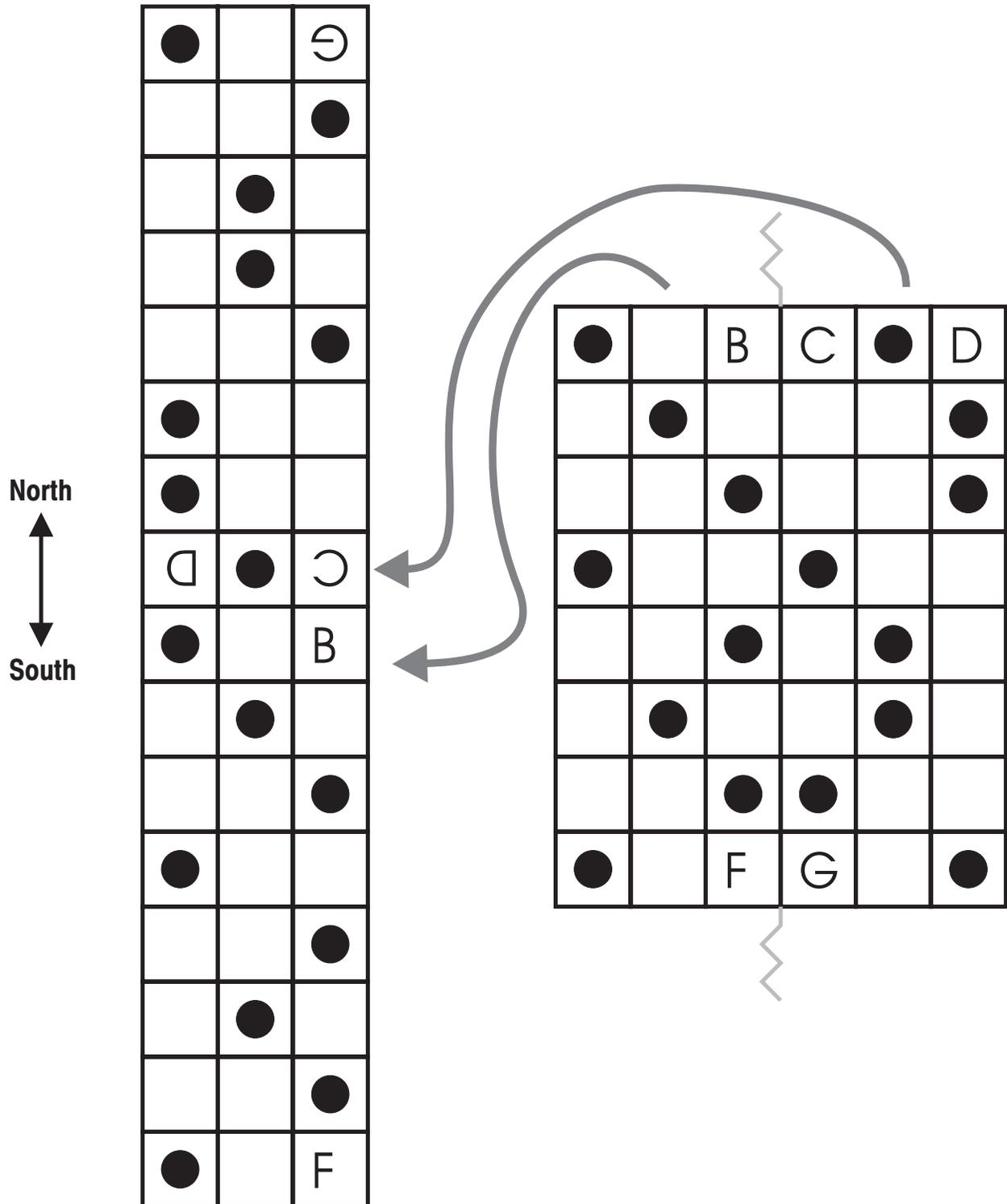


Figure 3. Another Program Example for the Narrow Maze



SECTION 2

Maze Activities

MAZE MATCH: Briefing

Before you begin the tournament, you must brief the teams. The purpose of this activity is to present and clarify the basic rules related to crossing the maze and participating in the tournament. Specifically, this briefing activity answers these seven questions:

1. What is the maze?
2. What is the goal of the maze activity?
3. How do participants cross the maze?
4. What happens when the alarm sounds?
5. How do we program the maze?
6. What do we do during the tournament?
7. How do we win the tournament?

The following set of answers are presented as our recommended standard procedure. Use them during the briefing activity. After you are familiar with the basic maze activity and the tournament procedure, you can modify the answers to suit your preferences, needs, resources, and constraints. For the present, however, we suggest that you stick to this script (but feel free to explain the content in your own words).

Before you present the basic rules, set up the maze with a fairly simple configuration. We suggest that you use the configuration shown on page 27. Assemble the participants around the maze and proceed with your presentation.

What Is the Maze?

The maze is a carpet with 48 squares that are arranged into six columns and eight rows. Some of the squares on the maze are activated to sound an alarm when someone steps on it.

(Demonstrate the alarm by turning the power switch on and first stepping on a safe square and then stepping on an activated square.)

What Is the Goal of the Maze Activity?

The basic goal for the activity is to walk across the maze starting at the South side and ending on the North side. (Identify the North and South sides.) All members of your team should complete this task within the time limit, without setting off the alarm.

How Do Participants Cross the Maze?

You walk across the maze, one square at a time. You can move one square horizontally, vertically or diagonally. (Demonstrate acceptable moves from an edge square and from a square in the middle of the maze.) You cannot skip a square or jump across squares.

There are several other constraints on crossing the maze:

- *Only one team member can be on the maze at a time.*
- *Team members cannot enter the maze for their second try until everyone has completed his or her first try.*
- *Once the first team member has stepped on the maze, team members may not talk. However, they may communicate through gestures and grunts and groans.*
- *Team members cannot use any writing materials.*

What Happens when the Alarm Sounds?

Every time the alarm sounds, your team loses a point. If you set off the alarm, you must return to the previous square. From there, you should backtrack and leave the maze from the square where you started. You must retrace the exact path without stepping on new squares and setting off the alarm again.

How Do We Program the Maze?

(Show the control box and programming pins. Align the box correctly.) This is the control box for the maze. Each hole in this box corresponds to each square in the maze. (Remove a pin and show it.) This is a programming pin. When you insert this pin in any hole in the control box, you program the corresponding square on the maze to be activated. Now, when someone steps on that square, the alarm will go off. (Demonstrate how to program the maze by moving the pins around. Ask players to suggest where the obstacles should be placed on the maze.)

(Distribute copies of the maze programming form and removable dots.) To help you create a suitable maze configuration, you may use this programming form and the removable dots. Let's create a new maze using this programming form. (Invite participants to help create a maze on the grid form.) Notice that

you can move the dots from one square to another while you are creating the maze. When you are satisfied with the maze that you created, you can program the control box by inserting the pins in appropriate holes. (Demonstrate how to do this.)

(Distribute copies of sample barrier layouts and encourage participants to study them. Invite them to figure out the path for crossing each of the maze grids and suggest that they incorporate these types of obstacles while designing their own maze later.)

What Do We Do During the Tournament?

The tournament consists of a number of matches. There are two phases in each match.

During the first phase, you work as a team to create a maze, using the maze programming form. You will be limited to a specific number of removable dots or programming pins that activate different squares. For example, this maze has 14 pins. During the first phase of the tournament, you should try to design a maze that will be difficult for the other team to solve. Remember that the other team will be creating a difficult maze to stump you.

During the second phase, you will try to cross a maze created by the other team within the time limit. Your team will begin with 100 points. Every time you set off the alarm your team will lose a point. If you cross the maze successfully within the time limit, you will earn 50 points.

Also, during the second phase, the other team will attempt to cross a maze that you created. They will lose points for setting off the alarm and gain points for crossing the maze.

How Do We Win the Tournament?

At the end of the second phase of a match, the team with the higher score wins the match. During the tournament, your team will participate in matches against several opposing teams. At the end of the tournament, the team who won the most matches will become the champions.

Follow Up

After your presentation, invite questions.

If time permits, set up the maze with another pattern and let participants have fun practicing the maze-crossing activity on their own.

MAZE MATCH: Conducting

Synopsis Two teams each create mazes for the other team to solve. During the match, the first team sets up its maze and challenges the second team to cross it within the time limit. The first team also keeps time, does the scoring, and ensures that all rules are enforced. Later, the second team sets up its maze for the first team to cross. Both teams begin with 100 points. The teams lose a point for each time the alarm is set off, and gain 50 points if they cross the maze within the time limit. The team with the higher score wins the match.

Goal To cross the opposing team's maze within 15 minutes and without setting off the alarm.

Teams Two teams, each with five to eight members.

Agenda 5 minutes: Briefing
10 minutes: Both teams create their mazes using the maze programming forms.
5 minutes: First team sets up the maze. Second team plans its strategy.
15 minutes: Second team crosses the maze. First team keeps time and score.
5 minutes: Second team sets up the maze. First team plans its strategy.
15 minutes: First team crosses the maze. Second team keeps time and score.
Total time requirement: 1 hour

- Supplies**
- Maze programming form with removable dots
 - Tournament maze with control box and specific number of programming pins
 - Timer
 - Poker chips or pennies
 - Paper cups

Setting Up Set up the maze with plenty of space all around. Attach the maze to the control box without inserting any programming pins.

Place 100 poker chips in each of two different paper cups.

Briefing Provide the standard briefing (pages 37-39).

Facilitation *Phase 1. Creating Mazes*

- **Distribute supplies.** Give each team blank copies of maze programming forms, examples of barrier layouts, and removable colored dots.
- **Specify the task.** Tell both teams that they have 10 minutes to create a maze with a specific number of active squares to be crossed by the other team. Invite them to borrow ideas from the example barrier layouts and incorporate them in the mazes that they create. The number of active squares should be 14 to 20 for most tournaments.
- **Keep time.** Send teams to different locations and start the timer. Periodically announce the remaining time. After the 2-minute announcement, inform the teams that you will take their maze programming forms at the end of 2 minutes even if they are not ready.
- **Conclude the session.** When 10 minutes are up, collect the maze programming forms from both teams.

Phase 2. Maze Crossing

- **Select a team.** Toss a coin to select a team. Ask this team whether they want to cross the maze first or let the other team cross the maze first.
- **Initial period.** Send members of the maze-crossing team outside the room to plan their strategy for 5 minutes. Remind them that they will not be permitted to talk with each other once the first person steps on the maze. Help the other team to set up the maze. Make sure that the maze program has a safe path to cross the maze. If not, move or remove one or more dots to allow for a safe path. Be sure that the program pins in the maze control box correspond to the dots on the team's programming form.
- **Start the activity.** After 5 minutes, bring the maze-crossing team back. Start the timer and remind them that they can continue talking to each other for some more time if they desire. However, once any member of the team steps on the maze, all team members may not talk until they have crossed the maze or the time limit has passed.
- **Monitor the activity.** Give the monitoring team a paper cup with 100 poker chips. Ask the score keeper to remove a chip from the cup whenever the alarm sounds. Supervise this score-keeping activity. Also ask the monitoring team to point out any rule violations (such as talking, jumping over squares, or not retracing the path when the alarm sounds). Ask the maze-crossing team to rectify their errors and impose appropriate penalties for repeated violations (by removing suitable number of poker chips from the paper cup).
- **Conclude the activity.** Stop the activity when the team has run out of time or when all team members have successfully crossed the maze. Congratulate the members of the team. Ask the score-keeper to count the remaining number of poker chips in the paper cup. This is the score for the team. Be sure to add 50 points if the team has successfully crossed the maze.
- **Repeat the procedure.** Switch team roles so the other team crosses the maze. Follow the same rules. Compute the score for the second team.

Conclude the Match

Compare the scores. Announce the scores for the two teams and identify the winning team. Congratulate the team and thank both teams for their participation.

Debrief. Invite participants to reflect on their experience and share their insights.

Explain next steps. Explain what will happen during the next round of the tournament, depending on the type of tournament that you are conducting. Announce the time, date, and location for the next match.

Variations

Timed scoring. If all members of a team successfully cross the maze, stop the timer. In addition to the 50 points, give 10 bonus points for each remaining minute.

Selective penalties. Do not remove a poker chip the first time an alarm is set off. Start penalizing beginning with the second alarm on the same square. Alternatively, penalize one poker chip for the first alarm, 2 poker chips for the second alarm (on the same square), and 5 poker chips for all subsequent alarms.

Faster game. Allow 5 minutes for creating the maze and 10 minutes for crossing it.

Modified goal. Instead of requiring all team members to cross the maze, consider the team to have succeeded when the first member crosses the maze.

MAZE RELAY: Briefing

Before you begin the relay-race tournament, you must brief the teams. The purpose of this activity is to present and clarify the basic rules related to running the relay-course and participating in the tournament. Specifically, this briefing activity answers these seven questions:

1. What is the relay course?
2. What is the goal of the relay race?
3. How do participants run the relay race?
4. What happens when the alarm sounds?
5. How do we program the relay course?
6. What do we do during the tournament?
7. How do we win the tournament?

Here are answers that present our recommended standard procedure for use during the briefing activity. After you are familiar with the relay race and the tournament procedure, you can modify the rules to suit your preferences, needs, resources, and constraints. For the present, however, we suggest that you stick to this script (but feel free to explain the content in your own words).

Before you present the basic rules, set up a relay-course with a fairly simple configuration. We suggest that you use the configuration shown in Figure 2 on page 33. Assemble the participants around the relay course and proceed with your briefing.

What Is the Relay Course?

The relay course is a 3 x 16 carpet with 16 rows of three squares. Some of the squares on the course are activated to sound an alarm when someone steps on it. (Demonstrate the alarm by turning the power switch on and first stepping on a safe square and then stepping on an activated square.)

What Is the Goal of the Relay Race?

The basic goal for the activity is for all members of a team to move across the course starting at the South end and finishing at the North end. (Identify the North and South edges.)

How Do Participants Move Across the Relay Course?

Each member of the team (except the one in front) should be in "contact" with the member before and after him or her. Contact can be made with hands or objects such as ropes or batons). The entire team should proceed through the course, one row at a time. Members may not share a square; only one member may stand on a square at any given time. Each member should place his or her feet on two separate squares in each row. (Demonstrate acceptable and unacceptable moves on the relay course.) The team completes the relay course when its last member steps off the last row.

What Happens when the Alarm Sounds?

An alarm will sound whenever a team member steps on an activated square. When this happens, all team members should step off the relay course, return to the Start and proceed again.

How Do We Program the Relay Course?

(Show the control box and programming pins.) This is the control box for the maze. Each hole in this box corresponds to each square in the relay course. (Remove a pin and show it.) This is a programming pin. When you insert this pin in any hole in the control box, you program the corresponding square on the relay course to be activated. Now, when someone steps on that square, the alarm will go off. (Demonstrate how to program the relay course by moving the pins around. Show the relationship between the holes and the squares on the two halves of the relay course. Ask players to suggest where the pins should be placed on the obstacle course.)

(Distribute copies of the relay course programming form and removable dots.) To help you create a suitable relay course configuration, you may use this programming form and the removable dots. Let's create a new relay course using the form.

(Invite participants to help create a relay course on the programming form.) Notice that you can move the dots from one square to another while you are creating the course. When you are satisfied with the course that you created, you can program the control box by inserting the pins in appropriate holes. (Demonstrate how to do this.)

(Distribute copies of sample relay course programs and encourage participants to study them. Invite them to

incorporate patterns and ideas from these examples while designing their own relay courses later.)

**What Do We Do
During the
Tournament?**

The tournament consists of a number of races. There are two phases in each race.

During the first phase, you work as a team to create a relay course, using the maze programming form. You will be limited to a specific number of removable dots or programming pins that activate different squares. For example, this relay course has 16 pins. During the first phase of the race, you should try to design a course that will be difficult for the other team to cross. Remember that the other team will be creating a difficult course to stump you.

During the second phase, you will cross a relay course (created by the other team) as fast as you can. If you cross the relay course faster than the other team, you win the race.

**How Do We Win
the Tournament?**

At the end of the second phase of a race, the team with the faster time wins the race. In the tournament, your team will participate in races against several different teams. At the end of the tournament, the team who won the most races will become the champions.

Follow Up

After your presentation, invite questions from participants.

If time permits, set up the relay course with another pattern and let teams have fun practicing for the race.

MAZE RELAY: Conducting

Synopsis Two teams each create relay courses for the other team to complete. During the match, the first team crosses the relay course created by the second team. Later, the second team crosses the relay course created by the first team. The team that crosses the course in less time wins the match.

Goal To cross the opposing team's relay course faster than the opposing team is able to cross your relay course.

Teams Two teams, each with five to eight members.

Agenda 5 minutes: Briefing
10 minutes: Both teams create their relay course using the programming forms.
5 minutes: First team sets up the relay course. Second team plans its strategy.
15 minutes: Second team crosses the relay course. First team monitors the activity.
5 minutes: Second team sets up the relay course. First team plans its strategy.
15 minutes: First team crosses the relay course. Second team monitors the activity.
Total time requirement: 1 hour

Supplies

- Relay course program forms with removable dots
- Tournament maze with control box and specific number of programming pins
- Stop watch

Setting Up Set up the relay course with plenty of space all around. Attach both halves of the course to the control box without inserting any programming pins.

Briefing Provide the standard briefing (pages 44-46).

Facilitation *Phase 1. Creating Relay Courses*

- **Distribute supplies.** Give each team copies of sample relay-course programs, blank relay-course program forms, and 16 removable colored dots.
- **Specify the task.** Tell both teams that they have 10 minutes to create a relay course to be “run” by the other team. The relay course should have one active square in each of the 16 rows. Invite them to borrow patterns and ideas from prepared relay-course configurations and incorporate them in the maze course they create.
- **Keep time.** Send teams to different locations and start the timer. Periodically announce the remaining time. At the 2-minute announcement, inform the teams that you will collect their final relay-course programming form in 2 minutes even if they are not ready.
- **Conclude the session.** When 10 minutes are up, take the relay-course program forms from both teams.

Phase 2. Maze Crossing

- **Select a team.** Toss a coin to select a team. Ask this team whether they want to run the relay first or let the other team run the relay first.
- **Initial period.** Send members of the relay-running team outside the room to plan their strategy for 5 minutes. Help the other team to set up the relay course. Make sure that the relay course configuration is exactly the same as indicated on the programming form.
- **Start the activity.** After 5 minutes, bring the relay-running team back. Start the timer and remind team members of the rules of the race. Emphasize that the entire team has to start over again whenever the alarm sounds. Remind the team about key rules such as one foot on each of the two safe squares in each row.

- **Monitor the activity.** Blow a whistle and start the stop watch. Ask the monitoring team to listen carefully for alarm sounds and to point out any rule violations (such as not placing both feet on each row). Ask the relay “running” team to rectify their errors and impose penalties for repeated violations (by adding a suitable number of seconds to the elapsed time).
- **Conclude the activity.** Stop the stop watch when all members of the team have crossed the relay course. Congratulate the members of the team. Record the time taken to “run” the relay course.
- **Repeat the procedure.** Switch team roles so the other team “runs” the relay course. Follow the same rules. Compute the time taken by the second team.

Conclude the Match

Compare the times. Announce the time taken by the two teams and identify the winning team. Congratulate the team and thank both teams for their participation.

Debrief. Invite participants to reflect on their experience and share their insights.

Explain next steps. Explain what will happen during the next round of the tournament (depending on the type of tournament that you are conducting). Announce the time, date, and location for the next relay race.

Variations

Time limit. Announce a suitable time limit of 5 to 10 minutes. If a team is unable to complete the relay within this time limit, count the number of rows they have successfully traversed and compute the average time required for crossing each row. If the other team runs the course within the time limit, it wins the race. If not, whichever team required the shorter average period of time wins the race.

Course variations. Change the requirements by requiring only one foot per row. Increase the difficulty of the one foot per row relay by allowing more than 16 active squares (some rows will have 2 active squares).

SECTION 3

Handout Masters

MAZE PROGRAMMING FORM

Finish Side

North

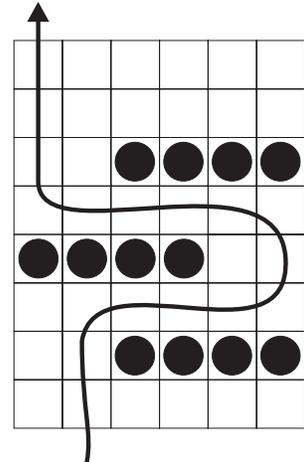
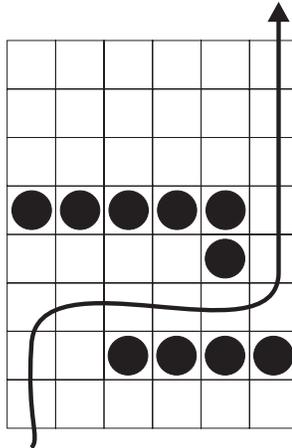
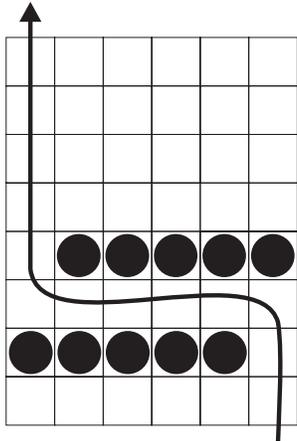


South

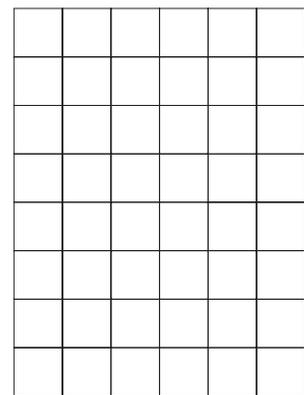
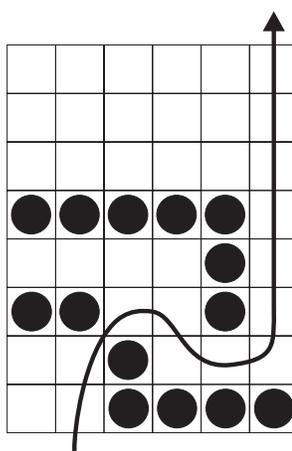
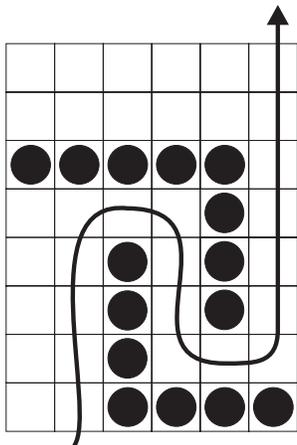
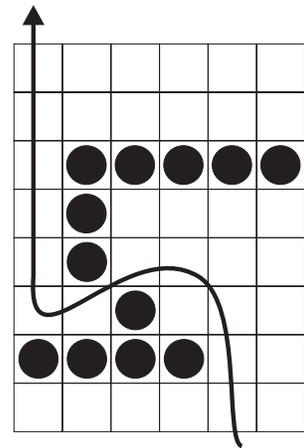
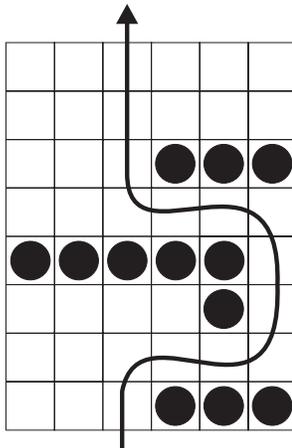
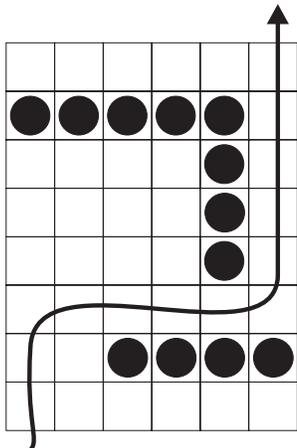


Start Side

MAZE BARRIER EXAMPLES

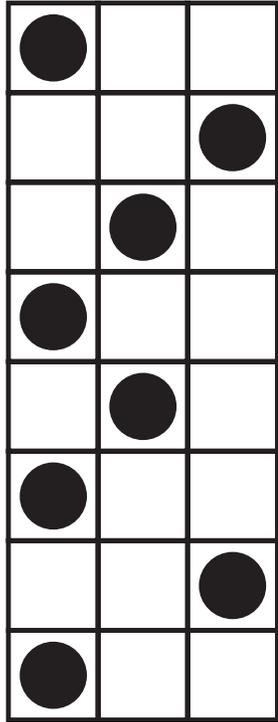


North
 ↑
 ↓
 South



NARROW MAZE EXAMPLES

2 feet per row (16 pins)



1 foot per row (24 pins)

