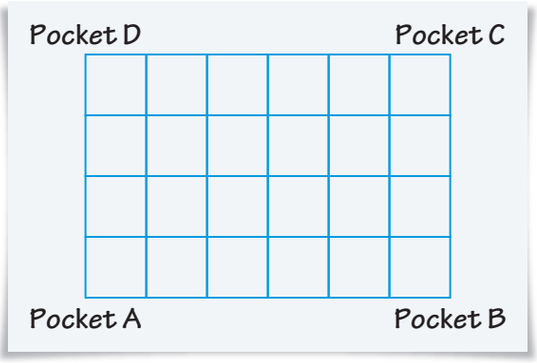
Unit Project

Paper Pool

This project is a mathematical investigation of a game called Paper Pool. For a pool table, use grid-paper rectangles such as the one shown at the right. Each outside corner is a pocket where a "ball" could "fall."

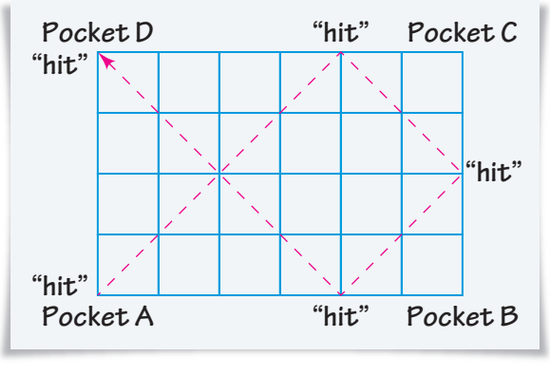


How to Play Paper Pool

- The ball always starts at Pocket A.
- To move the ball, "hit" it as if you were playing pool.
- The ball always moves on a 45° diagonal across the grid.
- When the ball hits a side of the table, it bounces off at a 45° angle and continues to move.
- If the ball moves to a corner, it falls into the pocket at that corner.

The dotted lines on the pool table below show the ball's path.

- The ball falls in Pocket D.
- There are five "hits," including the starting hit and the final hit.
- The dimensions of this pool table are 6 by 4 (always mention the horizontal length first).



Part 1: Investigate Two Questions

Use the three Paper Pool labsheets to play the game. Try to find rules that tell you (1) the pocket into which the ball will fall and (2) the number of hits along the way. Keep track of the dimensions because they may give you clues to a pattern.

Part 2: Write a Report

When you find some patterns and reach some conclusions, write a report that includes all of the following:

- A list of the rules you found and an explanation of why you think they are correct
- Drawings of other grid paper tables that follow your rule
- Any tables, charts, or other tools that helped you find patterns
- Other patterns or ideas about Paper Pool

Extension Question

Can you predict the length of the ball's path on any size Paper Pool table? Each time the ball crosses a square, the length is 1 diagonal unit. Find the length of the ball's path in diagonal units for any set of dimensions.