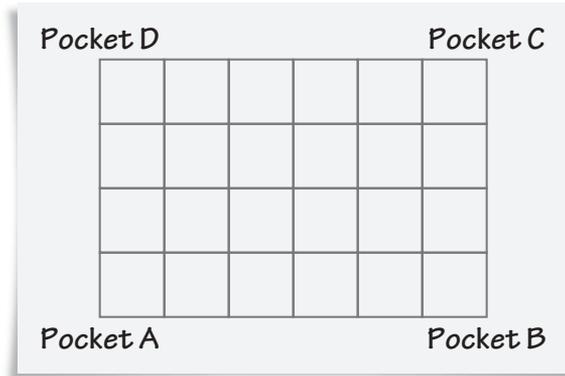


# Unit Project

## Student's Guide, Part 1

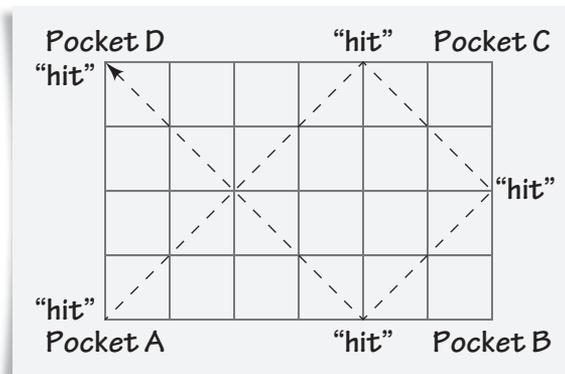
Kim made up a game called *Paper Pool*. Her “tables” are rectangles traced on grid paper. There are “pockets” at each corner of the table. The pool table pockets are labeled A (bottom left corner), B (bottom right corner), C (upper right corner), and D (upper left corner). One of Kim’s Paper Pool Tables is shown below.



Kim’s game has the following guidelines:

- 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  $45^\circ$  diagonal across the grid.
- When the ball hits a side of the table, it bounces off at a  $45^\circ$  angle and continues to move.
- If the ball moves to a corner, it falls into the pocket at that corner.

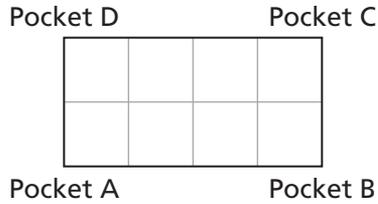
Kim has played her Paper Pool game on the table below. The lines show the path that the ball traveled on the table. She notices that the ball dropped in Pocket D and that the ball has a total of 5 hits: the initial hit to get the ball moving, three hits from the ball bouncing off the sides of the table, and one hit when the ball hits into the pocket and drops.



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## Student's Guide, Part 1

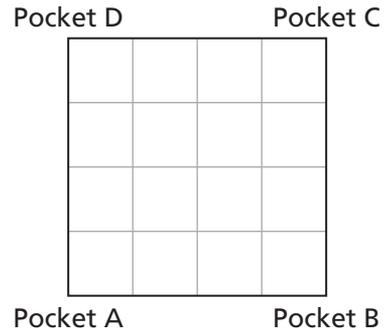
Draw the path a ball would take on the two Paper Pool Tables below. Record what pocket the ball drops into, how many hits occur on its journey, and the dimensions of the tables, giving the bottom length first and the side length second.



Corner \_\_\_\_\_

Number of Hits \_\_\_\_\_

Table Dimensions \_\_\_\_\_



Corner \_\_\_\_\_

Number of Hits \_\_\_\_\_

Table Dimensions \_\_\_\_\_

After playing Paper Pool on several different-sized tables, Kim wonders if there is a way to predict which pocket the ball would drop into and how many hits would occur by the time the ball drops.