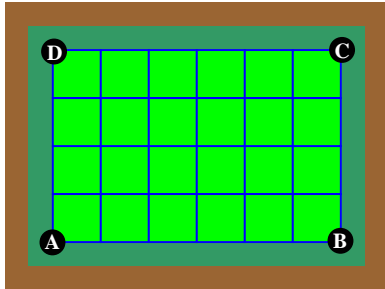


# Paper Pool Game

NAME \_\_\_\_\_

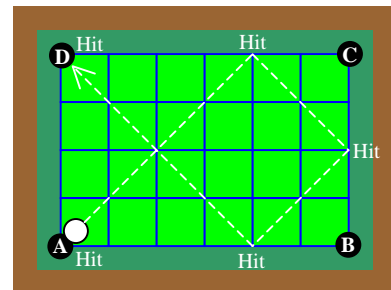
Marisa created a game called *Paper Pool*. Her pool tables were rectangles drawn on grid paper. The pockets at each corner were labeled **A** (lower left), **B** (lower right), **C** (upper right), and **D** (upper left). Marisa described each table by its size, giving the horizontal length first and the vertical height second. The figure below shows a  $6 \times 4$  table.



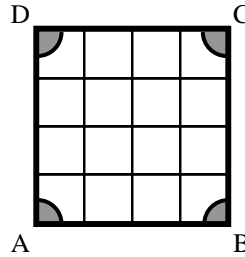
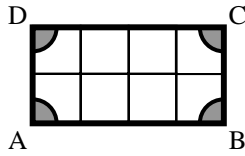
## How to Play Paper Pool

- The lower-left corner is always corner A, and the labeling continues counterclockwise with B, C, and D.
- The ball always starts in corner A.
- The ball is hit with an imaginary cue (a stick for hitting a pool ball) so that it travels at a  $45^\circ$  diagonal across the grid.
- If the ball hits a side of the table, it bounces off at a  $45^\circ$  angle and continues its travel.
- The ball continues to travel until it hits a pocket.

Marisa played Paper Pool on the  $6 \times 4$  table. The diagonal lines show the ball's path. On this table, the ball stops at corner D and has a total of 5 hits — one when it was struck by the imaginary cue, three as it bounced off the sides, and one when it stopped at pocket D.



Draw the path the ball would take on the two Paper Pool tables below. For each table, record the pocket at which the ball stops, how many hits occurred on its journey, and the dimensions of the table (give the horizontal length first and vertical height second).



Corner: \_\_\_\_\_

Corner: \_\_\_\_\_

Hits: \_\_\_\_\_

Hits: \_\_\_\_\_

Dimensions: \_\_\_\_\_

Dimensions: \_\_\_\_\_

After designing Paper Pool and playing several games on tables of various sizes, Marisa wondered about two things.

- Is there a way to predict the pocket at which the ball will stop?
- Is there a way to figure out how many hits will occur?

In the rest of this unit, you will perform investigations and try to answer her questions.