

Unit Project

Student's Guide, Part 2

Investigate:

Explore the questions about Paper Pool that are listed below.

- Into what pocket will the ball drop?
- How many hits will occur by the time the ball drops?

Each question is asking you to notice what is happening to the ball as it travels on the Paper Pool tables. Some tables are provided (Labsheets Paper Pool A–C) to get you thinking about these questions. Make conjectures about what pocket the ball will drop into and how many hits will occur by the time the ball drops. You may need to draw additional tables on grid paper to check out any ideas you have and to test any conjectures you make.

When you think you can predict outcomes, write a rule that you could use to determine what will happen to the ball as it travels on the Paper Pool table. This means that your rule should tell you, *without drawing the path*, the number of hits and the dropping pocket for the ball on a Paper Pool table of any size. Remember:

- The ball always starts in the bottom left hand corner of the table (at Pocket A).
- The ball travels on a diagonal path across the square grids.
- If the ball hits the side of the table, it bounces off at a 45° angle.
- When the ball comes to a pocket, it drops in.

Report:

When you have finished exploring different-sized Paper Pool tables and have reached some conclusions, write a report on your work. Be sure to include the following:

1. A summary of the rules you found, why you think your rules are correct, and anything else you discovered. (You might discuss what you noticed as you examined the paths for the different tables and what helped you to arrive at your rules.)
2. For each rule given, draw one new Paper Pool table (not one from the ones given to you) that shows that your rule accurately predicts what happens.
3. Include your drawings of ball paths on the given Paper Pool tables as well as any additional Paper Pool Tables you made to help you write your rules.
4. Include any tables, charts, or other tools you used to help you organize your information and look for patterns that would lead to rules.
5. Explain any other patterns or ideas about Paper Pool tables and the path of the ball that you observed. (For example, on which tables does the ball's path follow the same basic course? For which tables does the design traced by the ball's path look the same?)