



Joining Dots

Lesson Plan: Class 01 / PS / 24



Goal: Solving problems and strategizing while solving problems can be very satisfying. Via. small fun games, we wish to help students realize this and inculcate a habit of solving problems rather than getting intimidated by them.

Material required:

Physical:

1. White/Black board and marker/chalks of **different colours**, colour pencils for the students for doing the activity.
2. Projector for showing the PPT.
3. Activity-Sheets and Practice-Worksheets for this activity. (Activity sheet is the last page of this document)

Electronic:

PPT Presentation "Joining Dots"

Procedure Summary:

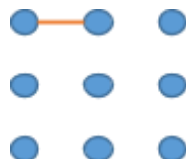
1. Introduce the game of "Joining dots to make boxes"
2. Show some strategies of playing the game that involve thinking ahead.
3. Talk through the worksheet to help them do it

Introduction to the game:

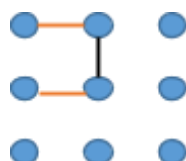
1. Ask if someone can draw a square on the board, allow some student to draw a square, correct it if it's not proper square.
2. Now tell them that they all are going to play a game and as preparation of the game, the first thing they are going to do is drawing a square using dots instead of lines.
3. Proceed to draw a 3 X 3 grid of dots like this on the board:



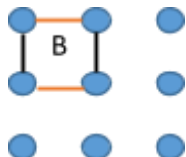
4. Tell them that at least two players are needed for the game, and ask for two volunteers and make them pick a coloured chalk/marker (both the players should not be using the same colour)
5. Now explain that:
 - a. A player's turn consists of connecting two horizontally or vertically **adjacent** dots with a line, like this:



- b. Diagonal lines are NOT allowed.
 - c. A point is scored each time a player completes a square by joining two dots.
6. To illustrate this further, ask the players to draw a line during their respective turns such that it would lead to formation of a pattern similar to this:



- Now, ask the player, the one whose turn it is now to join the dots, to see if joining any two dots would form a small square on the board. If she/he is not able to spot it, guide them to show that joining the first two vertical dots in the left most column would form a small square since the other 3 sides of the square are already present. Now the grid should look like this:



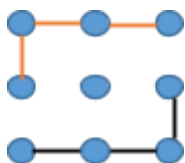
- Tell the student who formed the box that she/he has won a point and that they can write their initials in the box to claim it (or first alphabet of their first name, if both players have first name starting with a different alphabet).
- Now explain that when a square is created, the turn stays with the player who made the square, otherwise the turns alternate. Let the student who just completed the square to take the next turn.
- Explain that the aim of the game is to win maximum such squares/points.

Exercise 1:

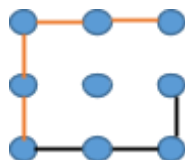
Now get the students to form pairs and distribute the Activity Sheet with a 6 x 6 dotted grid and let them complete the game.

Strategies for helping them think ahead:

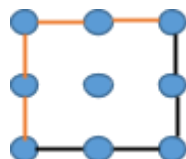
- Draw a grid like this one:



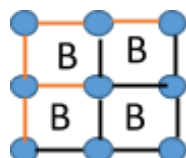
- Now, let's assume it's the turn of the player with orange marker.
- If she decides to avoid giving any squares to the opponent, the player could play something like this:



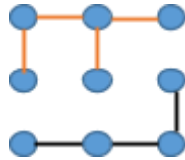
- Now, although in this turn the orange player has avoided giving any squares, it can be a problem because the player with black marker could choose to do this next:



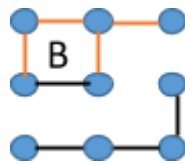
- At this point, no matter where the player with orange marker draws the line, the player with black marker gets all the squares and wins:



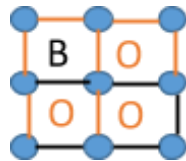
6. Now, go back to the grid we drew in step 1 above and explain that we will see a strategy using which the orange player can win.
7. Reiterate the point that when a player wins one or more squares, they need to take another turn to draw the line and that this rule can be used to the advantage of the orange player.
8. Show them that the orange player could choose to draw a line such that it would sacrifice one square to the player with the black marker like this:



9. So now, the player with black marker will have to either take the sacrificed square, or lose all the squares to the player with orange marker. So, the player with black marker will claim the sacrificed square like this:



10. Now, the player with the black marker needs to take one more turn and now no matter where she draws the line, the player with orange marker wins all the remaining squares, like this:



11. This is how by thinking ahead and sacrificing a square, the orange player can win the match.

Practical Assessment:

Distribute the second worksheet to the students. This worksheet has:

1. An 8 x 8 grid for playing the game.
2. Question that asks them to think what other grid shapes they think could be fun to make and play this game on. If they are unable to guess, tell them that a Triangle shaped grid could be fun and that they should try it. Draw a small triangle shaped grid on the board to help them understand. Now ask them what other shapes they can think of.

