



Problem Solving: Tic Tac Toe

Lesson Plan: Class 01 / PS / 06



(Rough sketch – design phase)

Overall goal of the lesson: Children will develop problem solving and strategic thinking skills while playing a simple game.

Prior knowledge required: Ability to draw X or O.

MODULE 1:

Module time: 35 minutes

Goal: Learn to play the Tic Tac Toe game and get three Xs or Os in a line to win.

Description: A simple game played by two players on a 3x3 grid. Players take turn drawing X and O and whoever gets three X or three O in a row wins. Children will learn to think ahead and determine how to play to win or to block their opponent from winning. When the children learn the game well, most of the time it will end in a draw. The teacher can later use the game as a teaching tool to review material learned in other classes.

Material required:

Physical:

1. One copy of the worksheet (TicTacToe) per child.
2. Writing material to solve the worksheet: pencil.
3. Blackboard and chalk

Electronic:

PPT TicTacToe

Procedure Summary:

1. Explain the rules of TicTacToe using the PPT.
2. Demonstrate how to play TicTacToe by using blackboard and chalk with teacher as one player and the whole class (or a representative student) as the second player.
3. After several rounds, once the children understand the game, divide the class into pairs.
4. Distribute the worksheets (TicTacToe) one to each pair.
5. Each pair of children will play the 10 games on the worksheet. The player going first uses X, the other one uses O. The children take turns going first.
6. Have a discussion on what they learned and see if the children can spot any patterns or strategy to win the game.
7. Time permitting, divide class into two teams and play tic-tac-toe in a quiz show using material from P01-P05. (See details below).

Procedure Details:

1. Start the class by announcing that today they will be playing a fun game called Tic-Tac-Toe.
2. Draw a 3x3 grid with 9 squares on the blackboard (two vertical lines crossed by two horizontal lines as shown in the PPT).
3. Ask: Has anyone has played the game before? If anyone says yes, engage them to help the other children learn the rules. For example, you could start with two students playing the game on the blackboard to show the class. The other children may immediately pick up on how to play.
4. Explain the rules as follows: there are two players, first to play writes X in any space in the grid. Then the second one writes O in a space. Show which spaces the O can be placed - left or right of X or top or bottom of the X. The players keep writing X or O in turn. If anyone gets three X or three O in one row, they win. Show how the three in a row to win can be vertical or horizontal or diagonal. Show some examples of three Xs and three Os.

If all spaces are filled with X or O and no one got three X or O, no one wins - this is called a draw. Show an example of a winning game and a drawn game.

5. Now play the game with teacher playing X and whole class playing O (to make it easy, one student can represent the class but get prompts from everyone else). Guide them on playing correctly. For example, when you have two Xs in a row, then point out where the O must be drawn to block you from making three Xs. Encourage the children to think ahead and block you from winning.
6. Once everyone understands the game, call upon a few pairs of children to play the game in front of the class. See if the class can prompt them to make better moves.
7. Now divide the class into pairs - if there are two children on a bench, then you can just use this pairing.
8. Distribute the worksheet (TicTacToe) to each pair of children. The worksheet has 10 blank game grids.
9. Have them play the games taking turns being X and O. Whoever plays first uses X.

After everyone has finished, ask some questions:

Did you have fun? Expected answer: Yes :)

Count how many games X won, O won or no one won. Are there any patterns?

Expected answers could be: X (person who plays first) wins more. Many draws. Putting X in a corner makes it easier to win. See if anyone has discovered the "fork" where you have two ways to win. (See PPT for interesting TicTacToe positions. This may be too hard for Grade 1 students.)

(There are no right answers, the idea of the discussion is to just get them to think about the game as a strategy v/s mechanically.)

10. Time-permitting, you could do a quiz show with the whole class playing tic-tac-toe. Divide the class into two teams. Toss a coin to decide who plays first (henceforth called Team X, the other one Team O). Ask a quiz question (E.g. is a mouse an input or output device?) to the first person in Team X using material from previous class (parts of a computer etc.). If they get it right, they get to put X on the board. If they get it wrong, the question goes to Team O. If they get it right, they get to put O on the board. Whoever gets 3 X or O in a row first wins!
11. Suggest the children to play the game with their parents and friends after dinner or during long train journeys! All they need is a paper and pencil or slate and chalk.

Assessment :

Play the game and answer questions in the discussion.

Information Broadcast : In Computer Science, the children learnt to play a simple game that encourages thinking ahead and developing strategy.